



SURVEILLANCE AND CANADIAN MARITIME DOMESTIC SECURITY

by Captain (N) Peter Avis

Since September 2001, governments and armed forces around the world have been searching for a path forward in the greatly altered arena of national domestic security. In North America, where a number of government departments concerned with domestic affairs have responsibilities for enforcing security, military planners have been attempting to find useful ways for the armed forces to support overall government efforts to shore up a sagging domestic security system. In particular, maritime domestic security has captured the interest of both government and media because seaways and ports are so vulnerable to terrorist attacks. This vulnerability is not at all surprising considering how open and fluid sea trade has become over the last twenty years. Our government is striving to close the gaps that the post-11 September era has revealed. This article is intended to provide a Canadian perspective on these efforts.

TERRORISTS HAVE CHANGED THE BATTLESPACE

By coming from nowhere and attacking civilians using civilian transport as weapons, and in a military way, terrorists have altered the way we must think about domestic security. Before 11 September, it was a simple matter to separate military from civilian security concerns; it will never be so again. A consequence of this new form of asymmetric warfare has been the necessary binding together of various branches of government as they react to this 'threat without a flag'. Included in this trend toward greater cooperation is the notion that maritime surveillance and its new technologies must dovetail into a system of intergovernmental

collaboration in order that information on maritime terrorism can be useful for national aims.

In hindsight, it is now clear that strategic-level contact between Canadian government departments with maritime concerns had been dwindling prior to 11 September. Individual departmental mandates had created closed loops with no apparent need to change. Even the slight readjustment of these structures during the 'Y2K' scare proved ephemeral. No single government agency had the full picture on maritime activities, vulnerabilities, jurisdictions, or threats. Canada was not alone; most western nations were experiencing the same problems of attenuation and dispersion.

CANADIAN GAPS

With a coastline of 243,772 km and an area of responsibility over 11 million square kilometres, Canada has a formidable challenge in its quest for maritime security. Clearly, with a population of only 31 million and a GNP to match, setting priorities in surveillance coverage is necessary. There are 250 ports in Canada, with shipping arriving and departing every day. On a typical day, there are some 1700 ships in our area of responsibility, and, as one would expect, there are many more non-reported contacts the further one travels away from our major ports or our vessel traffic management systems. Furthermore, coordination is a challenge since many departments and agencies with overlapping mandates

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generate information about the maritime picture. Our goal in maritime security is to know what is happening and where it is happening in the maritime approaches so we can deal with a potential asymmetric threat instead of reacting to the consequences of a disaster.

To give a better idea of how dependent Canada's economy is on free-flowing maritime trade, several pertinent figures will help highlight the scope of this activity.

- In 2001, the total tonnage in maritime trade was 310 million tonnes.
- The total value to the Canadian economy was 110 billion dollars.
- In 2001, there were 1.3 million container unloadings.
- Every year, over 1 million unchecked containers enter Canada and the U.S. through the ports of Vancouver, Montreal, and Halifax.

Against this backdrop of robust maritime trade, our maritime surveillance capability is rather disappointing. We simply lack sufficient capability to cope with the asymmetric threats that now seem so obvious in the wake of 11 September. The exchange of information and sharing of data-bases is limited. While coordination between departments has been good for specific responses, the day-to-day coordination of surveillance over the complete area of responsibility needs to be greatly improved. Most important, the physical assets needed to conduct effective surveillance (the ships, aircraft, radar stations and other collection assets) are limited, and this has resulted in a number of gaps in capability.



Crude oil tanker.

The events of 11 September forced us to carry out a number of gap analyses to understand where to go with respect to our national surveillance plan. In the short term, we have been able to reduce the risk somewhat by developing a surveillance plan based on intelligence and analysis. While all areas are covered to some degree, surveillance is based on traffic reports and threat assessments, and the capability to track one particular ship among many leaves something to be desired. The key is improved gathering and exchange of information among the agencies involved in order to allow activities to be targeted and derive intelligence. The resultant synergies allow our national authorities to focus on the unexpected – the anomaly that a terrorist will eventually create. One catches Al Capone only by trapping his accountant. This desired end-state requires the fusion of data from several government partners that normally do not share information. Data fusion is the activity which leads to situational awareness for decision-makers: the desired

result of surveillance. But even with the fledgling data-fusion centres on our coasts, the Canadian maritime surveillance net still has significant holes that need improved capability and efficiency to be mended.

INITIAL RESPONSES

In the months after the 11 September attacks, Canada and the US worked feverishly to improve maritime security by increasing vigilance in the ports and on the seaways. In some cases, the more we uncovered the less we liked the look of things. On a positive note, both nations extended the vessel reporting requirement from 24 hours to 96 hours prior to entering territorial waters. This dramatically increased the warning time needed for research about each vessel. Physical security in our major ports was upgraded, and inspections of containers increased. While not in the same range as US expenditures, the Canadian government has spent \$9.5 billion to improve public security since 2000. For Canada this is significant. With this concentration of effort against terrorism, it was deemed necessary to appoint the Deputy Prime Minister, the Honourable John Manley, as Canada's lead representative in organizing our response to public security and anti-terrorism.

“By pooling our resources in maritime surveillance, and sorting out lines of command, we should be able to work together to set a reasonable maritime security system in place against the terrorist threat.”

Under Mr. Manley, a government structure focused on domestic security is being developed. At the forefront of this structure is the ad hoc Committee of Ministers on Public Security and Anti-Terrorism (PSAT). This committee is made up of ministerial-level representatives from the Privy Council Office, DND, the Solicitor General, the Canada Customs and Revenue Agency, Citizenship and Immigration Canada, Transport Canada, Fisheries and Oceans Canada, the Coast Guard and the police. Since last October, the committee has been conducting ongoing hearings and allocating resources to the departments demonstrating the most urgent needs.

On 20 November last year, PSAT laid out these five priorities to guide the government's response to anti-terrorism:

- keeping terrorists out of Canada;
- deterring, preventing, detecting, prosecuting and removing terrorists;
- facilitating Canada–US relations;
- facilitating international initiatives; and
- protecting our infrastructure.

The PSAT Committee also proposed to Cabinet several distinct marine security measures. Transport Canada was tasked as lead department to undertake a comprehensive threat assessment and a vulnerability gap analysis. The Coast Guard and Fisheries and Oceans Canada were tasked with increased surveillance of our ocean approaches, and the Canada Customs and Revenue Agency was given responsibility to increase security at ports, most particularly in the handling of containers. Funding followed these taskings.

The Minister of Transport was given responsibility for forming the ad hoc Interdepartmental Maritime Security Working Group (IMSWG). This interagency group presents mature findings to the Minister of Transport for presentation to PSAT and to Cabinet. It must be noted that the mandates of Canada's departments differ quite radically from their US counterparts. For instance, our Coast Guard has no broad law enforcement mandate, such as that held by the US Coast Guard, but rather is an organization devoted to safety, surveillance, and administration.

The IMSWG was given \$60 million over five years to fund essential maritime security initiatives. Thirty-nine million dollars was allotted for the IMSWG contingency fund, \$2 million of which has already been split between Fisheries and Oceans Canada, which is developing an Automatic Identification System (AIS) for merchant vessels, and DND, which is investigating an upgrade to maritime information data fusion and management. A further \$6 million was provided to Transport Canada for ongoing threat and port vulnerability assessments, and \$15 million went to the Coast Guard to improve surveillance and navigation systems.

A MARINE SECURITY PLAN

A Memorandum to Cabinet, drafted by IMSWG for the PSAT, was approved in December 2002. It promulgates the Canadian marine security plan for the first time and allocates funds. It identifies the most urgent gaps in our existing system and delineates methods of rectifying the problem areas. It also sets priorities for departmental requests for funding in such a way that allotted money will be spent optimally. It is recognized in the Memorandum to Cabinet that the foundation of any maritime security plan is 'domain awareness' and the ability to manipulate data in such a way that government officials assigned to the task can arrive at appropriate decisions.

There are many good ideas encapsulated in this maritime security plan that may assist other nations with their maritime security and surveillance. The Canadian maritime security plan is based on a concept of concentric circles that expand outwards from Canada. The first circle is a small one around a domestic port, such as Montreal. Next, bounded by the 12-nautical-mile territorial limit, is a larger circle that covers the coastal and internal waters. The next circle covers international waters between North America and Europe. And finally, the last circle covers foreign ports, such as Antwerp or London.

Each circle has specific security activities associated with it – safeguarding, reaction, domain awareness, and collaboration. In a matrix of the concentric circles with these four security activities, the home port circle, for example, will require safeguarding activities such as personnel screening, physical security (e.g. fencing and cameras), container searching, etc. In the coastal waters and seaways circle, the focus will be on the combination of domain awareness, collaboration and reaction. This will encompass domain awareness activities such as surveillance by ships, aircraft, radar, and satellites; collaboration activities such as data-base sharing and analysis for data fusion; and reaction activities such as boarding and rummaging techniques. In the foreign port circle, domain awareness and collaboration stand out, with intelligence gathering and cooperation with foreign authorities to share port shipping information that pertains to the threat.

The matrix shows that security requirements are increasingly information-based the farther one is from Canada, while closer to Canada the requirements are more physical and reactionary. The overarching goal of the system is to use information as efficiently as possible in order to be able to react to a threat before it arrives in Canadian territorial waters.

One result of the matrix is very clear: for Canada, given its existing maritime security capabilities, collaboration is an 'enabler' essential for the overall functioning of the system. And domain awareness, which was seen to be lacking in ports and coastal waters, hinges primarily on maritime surveillance of the Canadian area of responsibility. As has been noted, while surveillance of Canadian home waters has certain resources devoted to it, a significant number of gaps exist. Surveillance sources include Fisheries and Oceans Canada, the Coast Guard, the RCMP and DND. Other departments contribute to the overall picture with information on the ships, crews, passengers and cargo. Positional information, weather reports, and the 96-hour report that is a requirement when using major shipping routes, are obtained from the ships. The recognized

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Great Lakes bulk carrier.

Author's collection

maritime picture is compiled by fusing all this information and combining it with reports from naval ships and aircraft in their areas of operations. It is important to reinforce the point that aircraft are by far the best all-around surveillance vehicle, whereas ships make the best reaction vehicles. The Department of Fisheries and Oceans shares their Recognized Maritime Picture (RMP) information, acquired from their civilian aircraft patrols. This near real-time information is fed into the military RMP and shared with all other departments via an unclassified Web site.

Adding to vehicular surveillance are the developing contributions of radar and satellite systems. On Canadian coasts, several Coast Guard-operated vessel traffic systems cover natural choke points with land-based radar. On the east coast, DND has built two High Frequency Surface Wave Radar (HFSWR) sites that can track vessels of 3000 or more tonnes as far as 170 miles off the coast. This technology is seen as being in the forefront for future surveillance and tracking in Canadian off-shore waters, especially for tracking vessels which do not comply with other automatic tracking systems.

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Satellite imagery, which includes photographic, electro-optical, radar, and other sensors, is also now available. However, this is at an early stage in development, and can better be considered as promising surveillance assets for the medium-term. Of course, signals and acoustic intelligence from military sources add to the overall picture. Other interesting sources of surveillance information are the NATO Shipping Centre, Lloyd’s Registry, Fairplay on the Internet, and human intelligence from other departments. These sources add significant pieces to the overall surveillance puzzle.

The challenge now is to create a structure under which all the surveillance data from these systems and platforms is fused together to tell the whole story on each vessel. Surveillance plus intelligence plus fusion equals situational awareness.

NEW INITIATIVES

There are several Canadian surveillance initiatives that have been ‘fast-tracked’ and are now being implemented. The Automated Identification System (AIS) is an initiative of the International Marine Organization (IMO). Both the Canadian and US governments support this world-wide programme and hope to have it functioning in about four years time. DFO and the Canadian Coast Guard have been given \$1.5 million to jump start this project. To multiply the benefits of Canada’s current, modest data-fusion capability, the requirement for a government-wide classified network has been stated. As mentioned earlier, the Marine information Data Management and Exchange project has been allotted half a million dollars to investigate the integration of all departments into a secret-level, wide-area network in which everyone in the government maritime community can participate and manage information. This manipulation of intelligence and data is envisioned to take place at a national coordination centre, which will be fed by regional centres with interdepartmental staffs.

Furthermore, the Interdepartmental Maritime Security Working Group has recently formed communication links with the coastal Interdepartmental Maritime Operations Committees and with the St. Lawrence Seaway Enhanced Screening Committee. These important links will enable federal policy makers to pass their information expeditiously, and will permit the flow of ideas from the operational side to the centre.

Last fall, members of the private seaway corporations and Canadian and US government departments gathered for a series of meetings at the St. Lambert locks in Montreal. This was the



Roll-on Roll-off (Ro-Ro) vessel.

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birth of the St Lawrence Seaway Enhanced Screening Committee. This group has produced a protocol for screening vessels which enter continental waters and travel by the St. Lawrence River system. It is interesting to note that 70 percent of vessels using the St. Lawrence Seaway are destined for American ports, and it has become

apparent to both countries that we will have to share data and intelligence in order to target the right vessels. Through this cooperative venture, intelligence is shared and action is left to the Canadian authorities to prosecute vessels before they enter US waters. Thus, the vessel in question is boarded only once, and trade is not slowed by a second, US boarding at the entrance port of Messina. Under this group, Canadian customs is pressing on with the creation of Joint Vessel Targeting Teams, which would screen each vessel and target potential risks from the information received from bilateral sources.

Beyond the very prudent change to 96-hour reporting, information has also been gleaned from several new initiatives. DND has already purchased two sites for High Frequency Surface Wave Radar on the east coast and has them functioning and performing trials. This modern radar uses ground waves to bend around the circumference of the earth thus increasing the range of surface contacts. It is envisioned that DND will have a series of 25 of these stations around the three Canadian coasts to track all contacts approaching our coasts. As well, the Canadian Coast Guard has increased patrols in the Great Lakes to augment the effort of the United States Coast Guard (USCG), and the RCMP has instituted a Coastal Watch Program based on the same principles as the American initiative of the same name.

To complement these surveillance methods, Fisheries and Oceans Canada and the Navy have teamed up to share the information produced by the private enterprise fisheries surveillance flights and DND surveillance flights on both coasts. This near real-time plot information is downloaded into the database in the Navy’s data-fusion centres in Halifax and Victoria and then displayed on CANMARNET – the unclassified, shared information network. The goal of these initiatives is to create solid situational awareness so that we can intercept the threat at the greatest possible distance from our shores. Finally, DND and the Hydrographic Division of Fisheries and Oceans Canada have collaborated to carry out sea-bed mapping of all the major ports and seaways, starting with the St. Lawrence River. This, of course, prepares the country for anti-mine warfare scenarios. The memorandum of understanding with the US on data exchange will be used to pass this information to the USN and the US Hydrographic Service in exchange for like information in our shared waterways.

BILATERAL COOPERATION

On the bilateral side, there have been several excellent projects that add considerably to the surveillance picture. One successful initiative – the Joint In-Transit Container Targeting Teams – has been instituted in Halifax, Montreal, Vancouver, Seattle, and Newark. These bilateral, interdepartmental teams check information on containers coming into ports and target potential criminal or terrorist activity.

Bilateral intelligence and information sharing at the regional/coastal level has been excellent, based on years of dealing with similar and overlapping problems. The USCG has embarked on an initiative with Transport Canada, the Revenue and Customs Agency, and the RCMP on sharing boarding and searching techniques so that the expectations of each country can be met and confidence in our mutual procedures can grow. Furthermore, at DND’s suggestion, the USCG will move forward on bilateral exercises to train our joint teams and test our bilateral protocols. Through these sorts of interdepartmental and bilateral initiatives, the combined tools of North American governments are being used to develop an efficient maritime picture.



Container ship departing port.

Author's collection

FROM SURVEILLANCE TO COORDINATED ACTION

Surveillance is an integral part of maritime domestic security. It appears from many sources and in many forms. To achieve Canadian aims, we will be forced to re-examine our huge challenges and seek synergies among government departments where overlap and complimentary capability exists. By finding the means to bring individual parcels of information from different departmental sources together in a central system, then analyzing the data and fusing it with background data through comparison and selection, we will create a common picture. What is needed is the construction of an organizational architecture that formalizes the

exchange of information and coordinates ensuing activities. A lead agency must be selected to organize the surveillance data into a recognized maritime picture that allows decision-makers quick access to the pertinent information that is needed to support operational decisions. The result is a national capability to fuse surveillance data, analyse it, and coordinate action in the maritime sphere.

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When the term ‘surveillance’ is used in the post-11 September world, it must be used in as broad a context as possible to be successful in maritime domestic security affairs. Even the new CANUS Planning Group, which will be located in Colorado with NORAD, will include the ideas of domain awareness, government

collaboration, bilateral sharing and data-fusion to fulfill its mandate. Thus, surveillance in aid of domestic maritime security is, of necessity, a job of coordination and fusion, such that the decisions that result from this process neutralize the threat before it enters the danger zone.

CONCLUSION

Both Canada and the US are taking maritime domestic security very seriously. It has become apparent to everyone that the vulnerable North American ports and seaways could be prime targets for a future terrorist attack. It is domain awareness fuelled by the many facets of maritime surveillance that forms the foundation of this security regime. Continued dialogue and confidence building are necessary so nations get to know their very different systems and understand how to make them function together toward the same ends. Throughout all of these endeavours in the ‘battlespace changed by terrorists’, we see that the only way to move forward is together – with combined military and civilian departmental conferees inside each country. To use contemporary jargon describing organizations lacking lateral communications and liaison: ‘Stovepipes’ make holes. Terrorists exploit holes. Bilateral or multi-lateral military planning teams working with civilian experts will assist in closing the holes as we move forward. By pooling our resources in maritime surveillance, and sorting out lines of command, we should be able to work together to set a reasonable maritime security system in place against the terrorist threat.



Members of HMCS Montreal's Naval Boarding Party disembark from a vessel in the Gulf of Oman after inspecting for escaping Al Qaeda or Taliban leaders, January 2003.