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Captain(N) Peter Avis joined the Atlantic Fleet in 1980 upon completion of a Bachelor of Arts with Honours in English at the Royal Military College in his hometown of Kingston, Ontario. He was Cadet Wing Commander in his final year. In 1991, he was favoured with a wonderful Staff College posting to Paris, France at the Ecole Militaire. The exposure to the cultures and professional methods of officers from fifty-five nations, most of whom were francophone and non-NATO, was truly a high-point in his military career. After Staff College, he returned to the National Defence Headquarters to serve in the Joint Staff in Naval Plans for four months and then was selected to serve as the Staff Officer to the Vice-Chief of the Defence Staff.

In 1996, he returned to sea as Executive Officer of NCSM VILLE DE QUEBEC, the East Coast's only francophone, mixed gender ship. Following his excellent cultural experience, he was appointed as Executive Officer of the Sea Training Unit in Halifax. He was promoted to Commander on completion of the Sea Training appointment. As a commander, he served once again in National Defence Headquarters in Ottawa as the Current Operations Section Head for the Chief of the Maritime Staff. He assumed the position Commanding Officer of HMCS FREDERICTON in May 1999. Over a two-year period of command, he took part in two SNFL deployments and several major NATO exercises.

Two years ago, Captain(N) Avis took over the position of Director Maritime Policy, Operations and Readiness for the Chief of the Maritime Staff in Ottawa. His primary tasks were the sustainment of the Canadian Task Group in the Arabian Gulf for the War Against Terrorism and the formation of maritime policy in the areas of Maritime Surveillance and Interagency Cooperation concerning Maritime Domestic Security in Canada. Capt(N) Avis is currently attending the Norman Paterson School of International Affairs at Carleton University in their Masters program in International Affairs and Security-related topics. Captain(N) Avis keeps his home in Ottawa with Susan and his two children, Jennifer and Matthew.

Abstract

Much has happened in the realm of domestic security since September 11th 2001. Major legislative changes have taken place here in Canada as well as in the United States. Moreover, the domestic side of military preparedness has changed dramatically for many countries. As many are realizing, the importance of domestic security is growing daily – and with the dust settling from armed conflict in Iraq and terrorist strikes in Morocco and Saudi Arabia, it is clear that we must organize ourselves for possibilities that we would never have dreamed of two

years ago. Maritime domestic security has captured the interest of governments and the media in particular due to vulnerability to terrorist attacks against seaways and ports. This is not at all surprising in that we have all collectively engineered a wonder of open and fluid sea trade in the last twenty years. Our government is striving to close the gaps that the new era has revealed, and this article is intended to provide a Canadian perspective on these efforts.

THE TERRORIST CHANGED THE BATTLESPACE – SURVEILLANCE AND CANADIAN MARITIME DOMESTIC SECURITY

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by Captain (N) Peter Avis

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THE TERRORIST CHANGED THE BATTLESPACE.

The terrorist changed the battlespace. By coming from nowhere, striking at civilians using civilian means of transportation as weapons, *but in a military way*, the terrorist has altered the way we think about domestic security. In North America, before September 11, it was easy to separate military concerns from civilian security concerns -- **nevermore**.

When one is dealing with the topic of security, 3 key lessons from 9-11 and its aftermath become clear:

- 1) The terrorist has found a seam in western organizational structures by striking at the **local level** but using federal-level apparatus. No flag, small and secretive, dispersed – the modern terrorist focuses huge destructive power at a local target for maximum

sensation;

- 2) The terrorist owns the timeline in domestic security operations. The onus is on the defending government to disrupt this timeline; and
- 3) Only through mastery of information and swift reaction will prevention of terrorist attacks occur.

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

Looking back before 11 September, it is now clear that strategic-level contact between departments of the Canadian government with maritime concerns was dwindling. Individual departmental mandates had created closed loops, and there was 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 experienced 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 35 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 from our major ports or our vessel traffic management systems. What is more, coordination is a challenge, since many departments and agencies with overlapping mandates generate information about the maritime picture. Our goal in maritime security is to know what is happening and where in the maritime approaches so we can deal with a potential asymmetric threat before having to react 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, the total container unloadings was 1.3 million;

! Every year, over 1 million containers enter Canada and the US unchecked through the ports of Vancouver, Montreal and Halifax.

Against this backdrop of robust maritime trade is a rather disappointing capability in maritime surveillance. 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.

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 a particular ship amongst the many leaves something to be desired. The key is improvement in the gathering and exchange of information among the agencies involved in order to allow activities to be targeted and intelligence to be derived. The resultant synergies allow our national authorities to focus on the unexpected, the anomaly that the 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 has significant holes which need improved capability and efficiency to mend them.

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 expanded the vessel reporting requirement from the usual 24 hours out to 96 hours prior to entering territorial waters. This dramatically increased the warning time needed for research about each vessel. The 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 the lead representative

for Canada in organizing our response to public security and anti-terrorism.

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, Police, Customs, Immigration, Transport, Fisheries and the Coast Guard. 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 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-U.S. 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 were tasked with increased surveillance of our ocean approaches, and Customs 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. From the outset, one must bear in mind 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 is 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, 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 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 which 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 in an optimum way. 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. It is planned for this document to be broken out of the MC and made available to all Marine Security stakeholders by the end of summer 2003.

There are many good ideas encapsulated in this maritime security plan which may assist those responsible for maritime security and surveillance from other nations. The Canadian maritime security plan is based on a concept of concentric circles that expand outwards from Canada. The first circle would be 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 area of coastal and internal waters. The next large circle would cover international waters between North America and Europe. And finally, the last circle would cover a foreign port, such as Antwerp or London.

Each of the concentric circles have specific security activities associated with them – safeguarding, reaction, domain awareness, and collaboration. In a matrix of the concentric circles and these four security activities, the home port circle, for example, would require safeguarding activities such as personnel screening, physical security (such as 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 would 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 the requirements for security 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 in as efficient a way as

possible in order to be able to react to a threat before it arrives in Canadian territorial waters.

It must be understood that the decision to place greater weight on the perimeter of maritime Canada as opposed to concentrating on the internal waters was deliberate. It was obvious that improvements had to be made to prevent threats from entering our territory; however, it was equally obvious that improvements to security in the more populous and more economically developed "4th Ocean" region would have to be undertaken. The IMSWG, knowing that cabinet had finite resources to devote to an mc on maritime security, chose to work towards keeping the threat out of Canada first. Having chosen that route, they understand that the Great Lakes will need attention in the next foray to cabinet and eventually, the arctic will have to dealt with as well.

One result of the matrix is very clear: for Canada, given its existing maritime security capabilities, collaboration is an 'enabler' is essential for the overall functioning of the system. And domain awareness, which was seen to be lacking in ports and coastal waters, is hinged 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, the Coast Guard, the RCMP and DND. Other departments contribute to the overall picture with information on the ships, crews, passengers and cargo. From the ships themselves is gleaned positional information, weather reports, and the 96-hour report that is a requirement when using major shipping routes. The recognized 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 (presently) 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 internet web-site.

Adding to vehicular surveillance are the developing contributions of radar and satellite systems. On Canadian coasts, there are several Coast Guard-operated vessel traffic systems that 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 tons and over out to 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.

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

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 have supported 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. The Maritime Information Management and Data Exchange (MIMDEX) project initiated by DND is in the process of being approved by IMSWG to investigate the integration of all departments on a protected, wide-area network on which everyone could participate. This will form the foundation of what seems to be the all-important link to maritime surveillance -- data-fusion. 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.

Now that the memorandum to cabinet on maritime security has been passed by the CCEU, the major items to be funded through the PSAT security fund can be discussed. The MC approved requests from departments worth \$172.5m plus \$20.1m recurring. As the top priority, a marine security coordination fund was set up under Transport Canada worth \$16.2m with \$2m recurring over 5 years. This new fund will allow TC to fund such programs as the DND follow-on CANMARNET information management system (estimated at \$7.5m once the initial study is completed). Also stemming from this fund would be the inclusion of OGDs at a national coordination centre (possibly housed in the JFIIC) fed by regional centres with interdepartmental staffs and eventually bi-lateral staffs. Second on the priority list is the automated identification and long-range vessel tracking system (AIS), which will be funded at \$27.5m with \$1.5m recurring. DFO will administer this system; however, DND is integrated into the recognized maritime picture it will augment and, thus, will take great benefit from this new worldwide system. Next is the continuation of Provincial Airlines flights by DFO which once again augments DND's maritime picture even in the present system. This will be funded at \$10m over 5 years. The single largest funding item in the MC was DND's high frequency surface wave radar (HFSWR) which extends radar ranges off the coast five times to 200 nautical miles. Five sites of HFSWR were funded for \$43.1m with \$1.1m recurring over 5 years. These were the main items in the MC that benefited DND directly. Also funded were projects in visas for seafarers (CIC and CSIS), IMO security regulation development (TC), counter-terrorism training exercises (Sol Gen), port physical security oversight (TC), marine facilities workers clearances

(TC & RCMP), radiation detection equipment (CCRA), passenger and crew screening (CIC) and emergency response team training for RCMP.

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, Canadian and US government departments gathered for a series of meetings at the St. Lambert locks in Montreal. This was the 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 down by the US stopping him again 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, several other initiatives have been started. The Canadian Coast Guard has increased patrols in the Great Lakes to add to the effort of the United States Coast Guard (USCG), and the RCMP have instituted a Coastal Watch Program based on the same principles as the American initiative of the same name.

To complement the surveillance methods listed already, Fisheries 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-level 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 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, Customs, 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. Of course, the embryo of the Bi-National Planning Group in Colorado has a maritime cell which will eventually provide a conduit for assessment and warning information between Canada and the US. Eventually, they will produce bi-national plans for military support in Domestic Security. Through these sorts of interdepartmental and bilateral initiatives the combined tools of North American governments are being used to develop an efficient maritime picture.

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 means to bring individual parcels of information from different departmental sources together in a central system, then analyzing the data and then contextualizing it with background data through comparison and selection, we will have created a common picture. What is needed is the construction of a governance architecture that formalizes the exchange of information and coordinates ensuing activities. The head of this architecture must be able to take fused data and turn it into action at the federal level, if need be, to disrupt the terrorist's timeline and prevent the planned event. This action group or leader of the architecture would have at his disposal surveillance data transformed into a recognized maritime picture which would allow decision-makers to drill down to pertinent information to support operational decisions. The result would be a national capability to fuse surveillance data, analyze it and coordinate action urgently within the maritime sphere.

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 Bi-National Planning Group will include the ideas of domain awareness, government collaboration, bilateral sharing and early warning to fulfill its mandate. Thus, surveillance in aid

of domestic maritime security is necessarily a job of coordination and fusion such that the threat is neutralized before it enters the danger zone by decisions that have resulted from this process.

CONCLUSION

Both northern North American nations 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 the terrorist', we see that the only way to move forward is together with combined military and civilian departmental confreres inside each country. '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. The IMSWG has started this process by creating a national plan to improve the capability to thwart terrorists entering the North American perimeter. It is now very important to undergo a similar process in order to improve the maritime security of the Great Lakes and St Lawrence seaway.

As you have seen, the changed battlespace has caused government to alter its approach to maritime security. There is more change coming. Based on the local/federal seam the terrorist has uncovered, it is evident that a permanent, federal, action group of some sort is necessary in this new battlespace to take data and transform it into action on an urgent basis in order to disrupt the terrorist timeline. Finally, it is clear that there is a need to seize this fertile moment to create a Canadian security strategy which paints broad strategic strokes of how our nation will work together against a changed threat. From this broad direction, crafters of the maritime security plan and national surveillance policies will find the solid foundation they need to orchestrate this complex but important area of endeavour.

