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An Array of Blunders: The Northern Watch Technology Demonstration Project

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Introduction

At the end of the Cold War, the importance placed on the Canadian Arctic decreased significantly. When Canadian defence spending dropped off in the 1990s, the Arctic was suddenly starved for resources. This drought appeared to end with the 2006 election, which seemed to herald a dramatic shift in Arctic defence spending. During the election campaign the Arctic became a focus for Canadian political parties – and in particular the Conservatives. In December 2005, Stephen Harper shared what Arctic security would look like under a Conservative government. His plans called for an Arctic sensor system to monitor the movement of submarines, construction of three armed icebreakers, a new naval port near Iqaluit, aircraft and drone patrols, an Arctic training centre at Cambridge Bay, an expanded Rangers force, and a reconstituted airborne regiment. The Conservatives estimated the cost of these plans at around $3.5 billion.[1]

The Arctic sensor system, one of the most innovative proposals, was to become the Northern Watch Technology Demonstration Project (NWTDP). It appeared that a serious effort would be made to monitor underwater activity at several chokepoints in the Canadian Arctic archipelago. Such a system would greatly enhance the ability of the Canadian military to surveil the country's Arctic waters, while also improving the organization's command, control, communications, computers, intelligence, surveillance and reconnaissance (C^4ISR) capabilities. While the project started out with lofty goals and an aggressive timeline, things quickly went off the rails.

Over a decade later this system, which became known as the Northern Watch Technology Demonstration Project (NWTDP), has yet to accomplish its goal of creating an automated

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surveillance system at its Devon Island location. This paper uses de-classified material to piece together the history of this secretive and important project, which has largely faded from the national consciousness. It contrasts the political statements and reports surrounding the project with the on-the-ground realities at Devon Island, and offers the most comprehensive analysis to date on the progress that has been made – and the gaps that remain. This paper will lay out the ways in which the project failed to live up to its goals and the reasons why. In so doing, it will provide clarity on a project which, despite receiving an enormous amount of attention when conceived, has never been given the examination warranted by its potential impact on Canadian sovereignty and security.

The Project

Shortly before the beginning of the NWTDP, a presentation given in 2007 by Dr. Jean Luc Forand, the lead scientist of Northern Watch, discussed several possible chokepoints for the deployment of the surveillance system. These sites include: the Kennedy Channel between Ellesmere Island and Greenland; the small gap between Ellesmere Island and Devon Island; the current site in the Barrow Strait between Devon Island and Somerset Island; the Bellot Strait between Somerset Island and the Beothia Peninsula; the Dolphin and Union Strait between Prince Albert Island and the mainland; the Fury and Hecla Strait between Baffin Island and the Melville Peninsula; and the Hudson Strait between Baffin Island and Labrador.[2]

Given this, not surprisingly, the NWTDP is located at Gascoyne Inlet on Devon Island, positioned at a natural chokepoint for shipping in the area.[3] Its aim is to test various surface and underwater surveillance technologies to evaluate how they operate in the local conditions. When Northern Watch was first announced by the Harper government in 2008, it received considerable attention. For example, on 8 May 2008 CBC News ran a story detailing how NWTDP was getting underway "as part of a major study to help affirm Arctic sovereignty and security."[4] The project, as originally approved, had a budget of $9.75 million, was scheduled to run from 30 April 2007 to 31 March 2011, and sought to demonstrate a 24/365 surveillance capability.[5]

There has been a surveillance gap in the Arctic since acoustic research was halted at the end of the Cold War. There has been suspicion that nuclear submarines – American and Soviet/Russian – have used Canadian Arctic waters as a transit route since the 1960s, and that they continue to do so. There are fairly clear indications that Soviet submarines operated in Canadian waters,[6] and it would not be a stretch to believe that Russia has continued to use the routes, knowing that Canada has no way of surveilling ice-covered waters. There is credible evidence that submarine activity has occurred in the Arctic in recent years. On 31 July 2008 a large explosion was heard in the vicinity of Pond Inlet, and a submarine was sighted on 9 August. In an after-action report, Rear-Admiral Paul Maddison, Commander of Joint Task Force Atlantic at the time, wrote: "I agree with the Reporting Officer who concluded that an explosion did occur in Pond Inlet 31July 2008, and that the sighting incident of 9 August 2008 'can only be judged as a credible report of a possible submarine.'"[7] The following year, another sighting was reported in the vicinity of Grise Fjord by witnesses at different vantage points and at different times. The report on that incident concluded that "the object observed was probably a submarine."[8] Quite clearly, submarine activity in the Canadian Arctic has continued and it has occurred without the

knowledge of Canadian authorities. If Canada were aware of vessels, it would not spend time and resources investigating the claims. These voyages present a significant security threat in addition to an erosion of sovereignty.

The NWTDP seeks to rectify the surveillance issue, with a particular emphasis on the sub-surface. The project involves testing several sensor technologies, both under and above the surface of the water. According to a summary submitted by Defence Research and Development Canada (DRDC), the project originally consisted of acoustic, magnetic and electric field sensors positioned in the Barrow Strait, with a 10 kilometre sea cable connecting them to the camp. The land-based sensors included marine navigation radar, an electro-optical (EO) system, an electronic intelligence (ELINT) receiver and an Automatic Identification System (AIS). In addition, DRDC was testing Automated Dependent Surveillance Broadcast (ADS-B) systems at the site. The reason for including ADS-B is that the Department of National Defence (DND) considers that the Canadian Armed Forces (CAF) may need a separate warning system from that of Nav Canada and the Northern Watch Stations provided an opportunity to incorporate the technology.[9]

The acoustic technologies consisted of different variations of active and passive sonar, which utilizes sound waves for the detection of submarines. Technical support for the acoustic sensors was provided by the CAF's Acoustic Data and Analysis Centre. Magnetic sensors detect local magnetic anomalies in the water, while electric sensors measure variations in the local electric field. These three technologies are complementary and are employed together. The combination of these technologies suggests that the work being done is focused heavily on sub-surface detection. However, several items were tested in order to build a robust surface suite as well.

The first land-based sensor to be utilized and tested was the marine navigation radar. Navigation radar is an inexpensive piece of equipment, but it has limitations in its display and processing functions. Therefore, it is not an ideal sensor when dealing with a fast craft with a small radar cross-section.[10] However, the ships that will be traveling in Arctic waters will be large tankers and cargo vessels, and possibly naval ships. These are slow-moving ships with a large radar cross-section, making navigation radar a useful tool for monitoring their movements.

EO systems are sensors which read visible light band wavelengths between 0.4-0.7μm.[11] EO sensors use the sun as a light source to gather imagery and can be optimized to see through visual restrictors such as weather and pollution. Since EO sensors operate on the visible light spectrum, they do not operate at night and, as a result, are often found in tandem with infrared sensors. The imagining suite that was tested as part of NWTDP is known as the Canadian Arctic Night and Day Imaging Surveillance System (CANDISS). It consists of a high-resolution colour visible imager (EO), a multiple field of view thermal (far-infrared) imager, a high-resolution gated active near-infrared imager, along with a wide-angle camera and laser for situational awareness and range. All of this equipment is mounted on a tilt-and-pan platform with an integrated data recorder and geo-referencing system.[12]

CANDISS is a multi-use platform that was hoped to be of use to the project. However, a re-evaluation of the contributions of CANDISS was conducted in March and April of 2010,[13] and the evaluation report concluded that "while CANDISS is a capable multi-sensor imagery system, most of its capability will not be used in the Northern Watch Surveillance system. The Northern Watch imagery requirement can be satisfied by a single Narrow Field of View Camera, cued by the Radar for bearing and range and/or AIS."[14] The standard visible light camera was justified

due to more than 22 hours of daylight from mid-April to mid-August during the main shipping season, reducing to 16 hours by mid-September, which is at the end of the shipping season.[15] It is perhaps for that reason that CANDISS re-appeared in the NWTDP field notes during the 2012 season. The system was deployed to a hillside sensor camp known as BIRDSEYE, along with radar and radio detection systems.[16] There is no indication as to how successful the system was during the season.

Another land sensor tested an ELINT receiver which was used to receive and interpret communications signals into a product that could be understood by the end user. This piece of equipment was being used during the NWTDP to provide electronic signal information, such as radar and communications. It could also provide a bearing for the signals that are received.[17] It is difficult to believe that this would be part of the autonomous end system since the power requirements to run the processor are quite large.[18] It seems likely that DRDC was using the NWTDP as an opportunity to do some cold weather testing on communication and radar technologies.

The final land-based technology to be tested is AIS, which is a system that tracks the position of ships at all times. It operates in the VHF maritime band and uses GPS to calculate a ship's position every two seconds. Other information that is sent includes course, heading and speed. An international agreement was signed in 2002 making it mandatory for ships of a certain size to install the transponders and outlining circumstances for other ships.[19] The International Maritime Organization (IMO) ordered that ships over 300 gross tonnes, which are capable of international voyages must be outfitted with an AIS system. In addition, all passenger vessels must have the system installed. Thousands of ships have now been equipped with AIS.

While AIS is an integral part of marine navigation on the East and West Coasts of Canada, the lack of receiver stations in the Arctic means that there is currently no operating AIS in the region. It is likely that DRDC was conducting cold weather testing to see if an autonomous receiver station could function properly in the Arctic.

The Arctic is Still Cold

Climate change is dramatically altering the landscape of the Arctic. The ice cap is shrinking, invasive species are moving in, and human activity is increasing. However, the Arctic still poses a formidable challenge to operations. When the project was conceived, the harsh climate of the Arctic was given such little consideration that it bordered on neglect. Because of this, the project experienced a series of setbacks in the first couple of seasons, but the government was reluctant to admit the fact. A CBC report from 8 August 2008 states that the team had been unable to install the main underwater cable due to high winds.[20] In fact, only nine kilometres of sub-sea cable were installed, with none of the underwater arrays being added. In addition, only one land-based sensor was installed that year.[21]

On Again, Off Again

On 23 July 2009, it was announced that the project would be placed on hiatus. According to DND, researchers wanted to evaluate the data that had already been collected.[22] However, annual reports from the project show that no equipment had been installed at the site by the time the announcement was made. Despite the official stance that the project was on hold, work was actually carried out during the summer of 2009, with the underwater array system being installed and tested between 30 August and 4 September.[23] It is curious that the government would announce that work was not being done during that season while still progressing with the project.

The official reason given for the hiatus did not match up with the timeline of activities and the real reason is more complicated. The decision to place the project under review was made on 13 November 2008. At the meeting that day it was revealed that there had been inadequate planning for adverse weather, damage to the cable array from ice, and severe budget issues.[24] The project faced three possibilities: "cancel the project, maintain project objectives and schedule while increasing the costs up to 25%, or reduce project objectives to stay within the current schedule and budget."[25] It was with those options in mind that the review was conducted.

An email dated 20 November 2008 and sent to the project team explained the situation further. It stated that "the Northern Watch project has been red carded. This is the equivalent to the project being suspended until further notice, until any approval is granted by the Associate DGSTO, you are requested as of 20 Nov 08 to suspend all project spending, travel, and related activities."[26] A more definitive answer to the status of the project was provided the following day by Paul Poirier, the Technology Demonstration Project (TDP) Manager. He revealed that $50,000 was to be spent on a contract for options analysis, with additional funding becoming available if the Project Manager could justify it.[27]

As a result of the review, it was announced on 9 June 2009 that there would be some leadership changes, the most notable that Bruce Grychowski was taking over as Project Manager from Nelson McCoy.[28] Grychowski developed a plan by August that maintained many of the original objectives, but revised the completion date to July 2013.[29] Meanwhile, work continued at the site. According to the annual report from 2009, between 25 June and 16 July several buildings were repaired, a new bunkhouse was built, a propane toilet system was removed, and a water purification and heating system, washrooms and showers were installed.[30]

On 2 November 2009 it was announced that the project would continue and the official reasoning for the hesitation was given. It was stated that the facilities at the site had been badly damaged during the winter and needed repair. It was also made public that the team had been able to gather four weeks of data from the underwater sensor array, breathing new life into the project.[31] While the issue with the facilities was true, holding off on the announcement that the project was going ahead gave the government an out. As far as the public was aware, the project was still suspended. The crucial aspect that allowed it to proceed was the successful deployment and gathering of data from the underwater array. If no data had been gathered during the 2009 season, it is likely that the project would have been shuttered.

The confusion over its status persisted into 2010, however. On 22 June 2010 the land use permit issued by the land administration body for the government of Nunavut expired.[32] It was not until 14 July 2010 that a request for an extension was received.[33] This confusion even led to a

misstatement by Shelagh Grant in her book *Polar Imperative* that Northern Watch had been cancelled.[34] While this may be a small error, it displays the confusion that was common to those who were observing the progress of the project during the first few years.

Back on Again

With some of the major issues seemingly behind it, the NWTDP appeared to be moving forward with a plan for the future. The project began in 2008 with the installation of a cable and one land-based sensor. Very little sensor data was collected during that season.[35] In 2009 the main sensor array was installed with the assistance of the CCGS *Terry Fox* and the ship's boats.[36] During the 2010 season, military divers helped remove loose gravel from the foreshore pipe which was there to allow cables to run from the sea floor to equipment on shore without being exposed to ice scouring.[37]

There was limited activity in 2011, with a small team of military engineers doing maintenance and construction work at the camp. In addition, "The underwater sensors from Gascoyne Inlet and Barrow Strait were recovered; ... [and] taken to Halifax for inspection and refurbishment."[38] This indicates that they were left over the winter, likely to test the impact of ice on the integrity of the system. In 2012 the scientists successfully launched, tested and recovered two acoustic systems with the assistance of CFAV *Quest*. They also placed an underwater data recorder at the mouth of Gascoyne Inlet, with the intent to recover it in summer 2013.[39] That did not occur however, as activity at the site was limited to a single half-day visit during the season.[40] The 2014 field season was also disappointing in terms of activity. A team of two people visited the site for just half a day to check on the camp.[41] There is no indication in either the 2013 or 2014 reports as to why work was not conducted during those field seasons.

With the loss of several seasons, technical setbacks and numerous other issues, several revisions were made to timeline and costs of the NWTP. As noted, the project was originally envisioned to run until 2011 and cost $9.75 million. By 2010 the completion date had been pushed to 2014 and costs were estimated at $15.7 million.[42] Before the end of the year, however, the cost estimate had already increased to $18.725 million for the project with funding extending through the fiscal year 2015/16.[43] The most recent figure for the total cost of the project is estimated at $16.1 million – though that dates back to September 2013.[44] A revised timeline for the project was set in 2012, which planned for a six-month trial scheduled for 2015.[45] Despite the failure of the 2013 season, DRDC stated that it believed it could maintain that schedule.[46] However, the lack of activity during the 2014 season made that timeline untenable.

In a March 2015 report to the Nunavut Impact Review Board (NIRB) (the territorial body that reviews environmental impact), a comprehensive plan was laid out to try and complete the project as envisioned. The camp was to be open from 21 July to 21 September, with the team comprising up to 25 individuals at one time. They were to expand the accommodations and build a science hut to support the research activities. In addition to the array, the systems to be tested included navigation radar, AIS, ADS-B and meteorology.[47] The demonstration itself was to be conducted between 4 August and 14 September 2015, following work on the foreshore cables and installation of two underwater seabed sensors. The project would use RCN ships to test the sensors and collect data.[48] While it was encouraging that work was to take place, the

demonstration was a fraction of what was originally planned when the project was announced. The NWTDP was planning on demonstrating a remote sensor capability over the course of a minimum of six months. A test of seven to 10 days under idyllic conditions was not nearly as ambitious. To the team's credit, they were planning on using a government satellite communications channel, so perhaps some work on remote operation was being conducted.[49]

A report submitted in March 2016 by Defence Construction Canada to the NIRB provides some indications that a successful trial was completed in 2015. According to the report, maritime sensors were temporarily erected on a ridge south of the camp and operated for 38 days and underwater arrays were placed in Barrow Strait and connected to the camp through existing underground pipe, which indicates that the fixed array was utilized. C and Ka Band satellite ground stations were operated for 42 days and "a maritime surveillance demonstration was conducted."[50] It is difficult to judge the quality of the work conducted in 2015 without access to further documents, but it appears that there was significant progress in the season.

No work was carried out on Devon Island in 2016, which may have been due to the team still working through the 2015 data or a review of the project by the new Liberal government.[51] The plan laid out for 2017 was for about 20 personnel to be on site to conduct maintenance and install a sensory pack approximately 500-100 metres from shore that would measure water temperature, salinity and depth.[52] The sensor was part of a Fisheries and Oceans Canada initiative to build a real-time network that will allow the department "to forecast freeze-up, and in the future ... allow for predictions of break-up, as well as key properties of the biological system including seasonal productivity and seasonal timing."[53] The project was unrelated to the NWTDP, but took advantage of its infrastructure and provided information on the potential environmental stresses put on the acoustic equipment.

Events have shown that the original timeline and budget for the NWTDP were unrealistic. Equipment failures, bad weather and difficult logistics should have all been anticipated at the outset of the project but seem to have been overlooked. The project leadership seemed taken aback and entirely unprepared for the difficulties that they faced. As shown, the original timeline envisioned the project running for four seasons with a budget of less than $10 million. Within those parameters, it was expected that the NWTDP would demonstrate the feasibility of technology never proven reliable in the environment, while on a remote island in the middle of the Arctic Archipelago, with little support from other areas of government. The fact that anything was produced at all in those initial stages is a testament to the people working on the project.

Sharing their Toys

The Harper government was clear when the project was launched that the NWTDP was intended to strengthen Canadian sovereignty in the North. That objective was meant to be achieved by monitoring and tracking traffic through the Northwest Passage. The monitoring has been divided into five distinct groupings by DRDC: declared shipping and cruise traffic through the Northwest Passage; undeclared maritime traffic; undeclared pleasure craft; pollution from a ship; and, willful, unannounced incursion by a foreign military vessel. The intruding warship was chosen as the test scenario for the NWTDP sample because it represented "a severe test of Canada's ability to assert sovereignty in its northern territory."[54] Due to its mandate, this scenario is the only one

that would involve the military in the lead role. The other scenarios would be responded to by a mixture of RCMP, Coast Guard, Transport Canada and Canadian Border Service Agency (CBSA) forces, with the Coast Guard the only one to have any role in the NWTDP.

Cooperation between the CAF and other government departments was explicit in the NWTDP's ultimate objectives. Despite this, there is little evidence that civilian departments and agencies were consulted or involved in the project. The NWTDP Exploitation Strategy (from September 2010) lists only Canada Command, Chief of Force Deployment, DRDC and the Chief of the Military Staff (CMS) as beneficiaries. Departments such as Public Safety (RCMP) and the CBSA are listed as *potential* beneficiaries, which gives an indication of their involvement in the project.[55] Additionally, a display concept for the project describes how the NWTDP team and the military will access the information, but makes no mention of how other clients may access the data.[56] While a presentation by Bruce Grychowski, shortly after taking over as Project Manager in 2009, stated that "the demonstration will not be limited to DND requirements but will consider the needs of whole of government for arctic sovereignty, and management," potential partners were rarely, if ever, consulted.[57]

The limited engagement with other departments is because DRDC considered it a military project. Within the framework of the *Canada First Defence Strategy* and *Canada's Northern Strategy*, the NWTDP was meant to "improve northern and maritime situational awareness and response," which is a defence and security role.[58] Strengthening Canadian security should be the focus of the military, but ultimately the impact of the NWTDP on Canadian sovereignty will be limited by the access that other departments have to the data. How Northern Watch information was to be disseminated remains uncertain but a proper whole-of-government approach would require the CAF to relinquish some control or, at least, engage in more serious effort to bring other departments into the process.

This focus on the military and defence uses makes sense given the purpose of DRDC, but it has thus far only added to the confusion over jurisdiction and responsibilities. While the project is rightly focused on getting the technology working, there has, apparently, been no consideration on how the system would be utilized by the various agencies.

Reinventing the Wheel

The NWTDP was planned around building a new sensor system that could withstand the environmental conditions in the Arctic. The array made use of a pre-existing foreshore pipe and was largely composed of a long cable with sensors attached. While that makes sense at a glance, those with knowledge of DRDC's research activities would ask why a new array had to be created from scratch. For a number of years, DRDC has been involved in developing a deployable, autonomous sensor unit known as the Starfish Array. The Starfish Array is a prototype autonomous sensor that has magnetic, electric, pressure, acoustic and acoustic gradient sensors. Data from all the sensors are combined in a process known as 'fusing,' which computes characteristics such as speed, size and depth.[59] Currently DRDC is working on limiting the amount of power the computer processing uses, making it more effective as an autonomous unit.[60] Officially, the Starfish Array has not been directly involved in the NWTDP trails, as it has not appeared in any annual reports or government documents. It was considered as early as 2009

after the failure of the original array, but it should have been part of the NWTDP conversation from the outset.[61]

The Starfish Array was built by Omnitech Electronics Inc., the same company that built the NWTDP fixed array for $1.2 million.[62] The Starfish has an extensive history of tests with NATO allies and other partners. One example of this is the tests that were carried out from 29 September-5 October 2010 with the Swedes.[63] The Swedish component was comprised of electro-magnetic and acoustic sensors while the Canadian participation involved the Starfish Array. The tests involved placing the arrays in the water of Ferguson Cove at the NATO Sound Range and measuring the equipment readings against the observed ship traffic. The Halifax test built upon a cooperative test with Norway in 2008, for which the Starfish Array was also employed.[64] The results of the Norwegian trial were directly considered in the NWTDP planning sessions, but there was no indication that the Starfish would be used in the trials.[65]

The resources given to the Starfish project were far beyond that of the NWTDP. Collaboration with numerous other countries continued, with a clear focus on developing a working sensor. An exchange of scientists with the US Naval Research Laboratory, work within the Maritime Systems Group Technical Panel 9 (MAR TP-9) Underwater Networking Initiative with the United States, and work within the NATO Next Generation Autonomous Sensor Joint Research Project were all part of the Starfish development research.[66] This level of research was not repeated with regards to the NWTDP array, but a large number of the DRDC personnel involved in the Starfish research are also assigned to the NWTDP team.[67] Considering that the same company was tasked with building both arrays and a number of the same DRDC people were involved in both projects, it is clear that there should have at least been some lessons from the Starfish research that could have been applied to the NWTDP. While the collaboration with partners on the Starfish Array and the knowledge derived from it served to strengthen the NWTDP research, it is unclear as to why the Starfish was not at least tested for applicability to the NWTDP.

Official documents from DRDC and other departments that were accessed for this research make no mention of the Starfish Array being used in the trials, but there is direct evidence that the system was tested at the Devon Island site. In a series of informal email updates from Garry Heard, one of the DRDC staff who was at Devon Island, it is apparent that the Starfish sensors were an integral component of the 2012 field season. The type used was actually a wireless version that utilized acoustic modems to communicate, thereby resolving the problems experienced by the line array with regards to damage from the environmental conditions. They were first deployed on 2 August and, after a series of issues getting the system running, were successful in gathering a large amount of data. By the time of their recovery on 23 August, the Starfish had gathered almost 90GB of data, while the traditional array was not successful in gathering any information.[68] Clearly the Starfish Array was a success during the field trial and it raises questions as to why it was not included in the program from the outset. The work plan for 2015 seemed to indicate that a cabled system was to be used in the trials that year, given the work that was to be done to the foreshore pipe.

It is unclear what level of involvement the Starfish system will have, but it seems odd they invested so much time into developing two systems that are so similar in nature, especially when the wireless version has demonstrated success in the environment.

Lost in Translation

If statements from both Conservative and Liberal governments are to be taken at face value, the NWTDP will result in a comprehensive and effective surveillance system. This perception is reinforced by the long-term visions produced by DRDC.

The key word in the project is *demonstration* and that is something that the scientists working on it have reiterated many times. In fact, it seems that the government and other elements of the military did not fully understand what the project was going to produce. Among the exclusions from the work conducted during the NWTDP was the development of any new electro-optical (EO) sensors, a multiple field of view thermal (far-infrared) imager or other underwater technologies, legacy installations of permanent surveillance sensor systems, and terrestrial-based wide-area surveillance of the approaches to the Arctic region.[69] While the exclusions may seem self-limiting, the NWTDP was given neither the budget nor the personnel to go beyond its given scope.

The program was also handicapped by the lack of a stated user requirement. Obviously, there would have been a lot of frustration among the DRDC scientists who were tasked with delivering a project with no obvious end goals. The minutes from a meeting of the Senior Review Board on 9 March 2010 provide some insight into the lack of direction due to this gap. The subject was broached about:

> how the project is tied back to the CF capability deficiencies. Maj. [Francis] Fillion [CFD/D Mil CM4-6/ EM Northern Watch] stated that there is no specific identified capability deficiency, but there are some generic capability deficiencies to which the requirement can be tied. LCol [John] Blythe [ADM(IM)/ DCCI 2] added that there are seven to eight sense capability deficiencies that apply. Mr. [Rick] Williams [DGSTO] requested that the project team take on a task to provide that linkage.[70]

Clearly this is a peculiar way of doing defence research and indicates that the political leadership of the time was disconnected from the work of the scientists. It is also evidence that the project was ordered by the government to fulfill a campaign promise made in the 2006 federal election, rather than being developed internally by the military. If the project had been conceived of by the military, it would have been in response to a capability deficiency. Instead, the project appears to have started looking for a deficiency to fill after several years of research.

A project meeting held on 9 March 2010 was critical in this regard, as it occurred at the same time as the selected sensors were being reviewed for their applicability to the project. During the discussion the question was raised as to:

> how the original suite of sensors were obtained and whether user requirements were considered. Mr. [Rick] Williams [Director General Science and Technology Operations] explained that this TDP was unusual in that the original TDP was initiated without a specific user requirement but in response to a general government interest in the Arctic. As such, when the project was initiated, DRDC proposed a suite of sensors as a result of a series of conferences, with many of the initial sensors being quite specialized and not necessarily suited to the new objectives.[71]

This revelation, buried within meeting minutes, is an important one. It shows that many of the issues experienced by the NWTDP in the early phases did not occur as a result of deficiencies in DRDC capability or knowledge, but due to a lack of direction. The project was being led by Conservative Party politicians for political gain, the results of the project were secondary. The NWTDP was used as an opportunity to show that something was being done on the sovereignty front without committing a large amount of money and resources. It is this lack of clear requirements and direction that are largely to blame for the numerous setbacks that were experienced in the early phases of the NWTDP.

Lessons (Hopefully) Learned

There have been several setbacks and failures associated with the NWTDP from which lessons can be learned. The technologies being tested at the Devon Island site have changed significantly since the inception of the program, largely due to the naiveté of the planners with respect to the environment in which they were expecting to operate. The weather and ice conditions wreaked havoc on buildings and instruments, resulting in large portions of the short research season being dedicated to repairs. Perhaps the largest hindrance to the progress of the NWTDP was the lack of clarity over the requirements of the program. It was initiated for political reasons, without any clear need or defined outcomes, which resulted in the loss of several field seasons as the researchers tried to make the political leadership understand what a demonstration program actually meant. It also took a number of years for DND to fit the ongoing program into its current needs.

The Liberal defence policy document, *Strong, Secure, Engaged*, does not make explicit mention of the NWTDP, as it does other programs and initiatives, but the program can potentially play a role in several of the goals mentioned. As well, the document seems to refer to the NWTDP when it states that there should be a focus on "Intelligence, Surveillance and Reconnaissance as a defence research and development priority to produce innovative solutions to surveillance challenges in the North."[72] Throughout the document, there is a consistent focus on communications and surveillance solutions for the Arctic. While not one of its primary goals, the NWTDP's attempts to automate and share live data via satellite has given DRDC critical experience in establishing data links from remote sites in the Arctic.

It is unclear whether the NWTDP will be allowed to accomplish its original goal of an automated underwater surveillance system, but it does broadly fit into several objectives of the defence policy. The ability to keep track of activity in the Canadian Arctic archipelago is a crucial facet of enforcing Canadian sovereignty and the country must move quickly to establish a robust surveillance and enforcement system prior to the arrival of private enterprises and foreign governments in large numbers.

Notes

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