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June 2000

ARCTIC CAPABILITIES STUDY

References: A. Defence Management Council 2 March 2000
B. VCDS Action Directive 28 March 2000
C. 1994 Defence White Paper
D. Defence Planning Guidance 2001
E. DGSP 1998 Military Assessment
F. Canadian Forces Command System Project 23 March 2000
G. Strategy 2020

BACKGROUND

1. With the passing of the Cold War, the nature of security issues is evolving, with an increasing focus on environmental, social and economic aspects. In the Arctic region, these issues are assuming growing importance. In the coming decades, environmental protection, climate change leading to potential increases in shipping, increases of air transport activities as well as concerns regarding trans-national criminal activity are but a few of the new challenges the CF may be called upon to assist in confronting in Canada's Arctic regions.

2. At Reference A, Commander CFNA argued that these evolving issues rendered the North increasingly vulnerable to asymmetric challenges at a time when the CF is reducing its activities in the region. Consequently, the Deputy Minister requested a study to determine whether increased CF efforts in the North are warranted and to assess achievability in the near term. The Deputy Minister also requested a review of Other Government Department (OGD) activities and their plans for future involvement with regard to Canadian sovereignty in the North. Reference B provides the study's mandate and strategic direction.

METHODOLOGY

3. This study has been conducted using a number of standard review methodologies, with inputs gathered from CFNA and the wider DND/CF community, as well as from other Government agencies and representatives of academe. Following a period of in-house research, the Arctic study group travelled to Yellowknife and Cambridge Bay to see first-hand some of the issues under review and to receive briefings from interested parties. On return from the North, discussions were held with CMS/CLS/CAS to confirm and/or qualify the validity of the information. The results of the study, including decisions required, were presented and accepted at post-DEM on 12 June 2000.

OUTLINE

4. The ‘Discussion/Analysis’ section of this report consists of four parts. Part 1 provides a departmental policy overview related to the Arctic. Part 2 consists of a review of OGD activities and plans for future involvement with regard to Canadian sovereignty in the North. Part 3 addresses the other component of DMC’s direction and focuses on current DND/CF involvement in the Arctic and assesses the requirement for an increase in CF activity. Part 4 suggests ways of increasing CF presence in and surveillance of the area. The report concludes with some options for improving CF capabilities in the near term within current budgetary guidelines. It also addresses certain longer term issues requiring further investigation. Finally, the report identifies decisions required from DMC.

AIM

5. The aim of this study is to provide information, analysis and recommendations with regard to the need for and the feasibility of an increased CF presence in and surveillance of the Arctic region.

DISCUSSION/ANALYSIS

Part 1 - Policy Overview

6. The 1994 White Paper states that the CF will be capable of “mounting effective responses to emerging situations in our maritime areas of jurisdiction, our airspace, or within our territory, including the North. Specifically, the CF will:

- demonstrate, on a regular basis, the capability to monitor and control activity within Canada’s territory, airspace and maritime areas of jurisdiction;
- assist, on routine basis, other government departments in achieving various other national goals in such areas as fisheries protection, drug interdiction, and environmental protection;
- be prepared to contribute to humanitarian assistance and disaster relief within 24 hours, and sustain this effort for as long as necessary;
- maintain a national search and rescue capability;
- maintain a capability to assist in mounting, at all times, an immediate and effective response to terrorist incidents; and,
- respond to requests for Aid of the Civil Power and sustain this response for as long as necessary.”

7. Within this policy context, DPG 2001 lists the following Defence Objectives that have direct relevance to Northern security. They are:

- **Defence Objective 1 (DO1):** To provide strategic defence and security information to the Government;
- **Defence Objective 2 (DO2):** To conduct surveillance and control of Canada's territory, airspace, and maritime areas of jurisdiction;
- **Defence Objective 5 (DO5):** To assist other government departments and other levels of government in achieving these goals. This includes such areas as fisheries protection, drug interdiction, and environmental protection;
- **Defence Objective 6 (DO6):** To provide support to broad Government programs;
- **Defence Objective 7 (DO7):** To provide emergency and humanitarian relief. This includes contributing to emergency preparedness, humanitarian assistance, and disaster relief. It also includes providing a national search and rescue program; and,
- **Defence Objective 8 (DO8):** To maximize defence capabilities through the efficient and effective use of resources.

8. In meeting these objectives, the Department's contribution to security and sovereignty protection in the North is complemented by the activities of a large number of federal departments and agencies. The main inter-departmental forum for security issues in the North is the Arctic Security Inter-departmental Working Group (ASIWG). The ASIWG is the result of a Symposium on Arctic Security Issues held at Canadian Forces Northern Area Headquarters (CFNA HQ) Yellowknife in May 99. Federal representatives at that meeting agreed that an interdepartmental working group was required to better co-ordinate the efforts of the various federal departments/agencies involved in security in the North.

Part 2 – Other Government Departments

9. Apart from DND, federal departments/agencies represented at the first ASIWG meeting in Nov 99 meeting included Environment Canada (EC), Royal Canadian Mounted Police (RCMP), Canadian Coast Guard (CCG), Citizenship and Immigration (CIC), Canadian Security and Intelligence Service (CSIS), Transport Canada (TC), Canada Customs and Revenue Agency (CCRA), Indian Affairs and Northern Development (DIAND), and Foreign Affairs and International Trade (DFAIT). Their presence in the North and their contribution to northern security are described below.

10. Environment Canada (EC) - EC's presence in the North focuses on enforcement and environmental emergencies. For enforcement purposes, EC has 7 officers in the three territories and has opened an office in Nunavut. With regard to environmental emergencies, EC runs a program based on prevention, preparedness, and response. EC also administers the Canadian Ice Service, which regularly uses RADARSAT-1 for wide area coverage for regional scale mapping. The possibility of equipping a CF Challenger aircraft with a synthetic aperture radar (SAR) to address the risk of data gap between the end of RADARSAT-1's availability and the start of RADARSAT-2's operations is currently being investigated by EC. EC has indicated that this radar capability would be available for DND when not used by the Canadian Ice Service. To fulfil their mandate in the North, EC possesses a variety of vehicles, boats, snowmobiles, and storage facilities. DND assists through forecasting from the weather station at CFS Alert.

11. RCMP - The RCMP provides police services to the Territories under the provisions of their territorial policing agreements. The RCMP maintains approximately 57 detachments consisting of roughly 380 people in the three territories, divided administratively into "M" division (Yukon), "G" division (Northwest Territories), and the new "V" division (Nunavut). The RCMP is also a member of the Criminal Intelligence Service of Canada (CISC). Its Alberta provincial bureau, known as the Criminal Intelligence Service of Alberta, deals mainly in the investigation of organized crime for the North. An important factor in policing the North is the combination of a relatively young population and high unemployment, resulting in the highest crime rates in Canada. The RCMP's program highlights for the North include monitoring organized crime activity related to the diamond industry, drug awareness programs, search and rescue activities, and aboriginal programs.

12. Canadian Coast Guard (CCG) - CCG programs and services for the North include search and rescue response, icebreaking, aids to navigation, co-ordination of sealift services in the Eastern Arctic, radio communication services through the Northern Canada Traffic Regulation System (NORDREG), navigable waters protection, and vessel support to OGDs. CCG has 3 patrol vessels (for the Mackenzie River), 6 icebreakers, as well as 9 helicopters assigned to the North (6 assigned to vessels and 3 to specific programs), all operating only during the summer. CCG is currently planning to expand its "Auxiliary" program (similar to the CF's Ranger program) from 3 communities to 4 or 5 more. The Auxiliaries would reinforce the CCG's marine search and rescue capability. Also, CCG will enter into Memoranda of Understanding with the

territorial governments with respect to oil spill response, and with Citizenship and Immigration Canada to develop marine response procedures to deal with illegal immigration.

13. Citizenship and Immigration Canada (CIC) - Of the approximately 200,000 immigrants arriving in Canada each year, the NWT and Nunavut receive about 150 (most settle in and around Yellowknife). CIC has one full-time employee in Yellowknife, but none in Iqaluit (immigration service there is provided by Canada Customs). CIC conducts security and intelligence through its Security and Review Division, which liaises with DND (among others) on relevant issues. Also, as mentioned above, CIC is in the initial stages of preparing a marine response procedure with the CCG to deal with the possible arrivals of illegal immigrants in the North.

14. Canadian Security and Intelligence Service (CSIS) - While CSIS did not make a formal presentation at the AISWG meeting, its representative made the point that CSIS has no assets in the North. CSIS does, however, carry out security clearances for federal employees in the North.

15. Transport Canada (TC) - TC is involved in a number of important activities in the North. It works to ensure that ship voyages are conducted in a safe and efficient manner and in conformity with the Agreement on Arctic Cooperation and Canada's legislation, including the Arctic Waters Pollution Prevention Act. TC also seeks to ensure that small communities continue to enjoy reliable air service and that northern airports remain safe and viable. An important part of TC's activities involves minimizing the risk of environmental damage from transportation accidents, and promoting environmentally-friendly operations in the transportation sector within the context of the federal inter-departmental sustainable development strategy. Its contributions include:

- ensuring an integrated and coordinated approach for marine pollution prevention and emergency response;
- developing an international code of polar navigation to promote pollution prevention in Arctic waters;
- working on special area designation for the Arctic Ocean to protect from environmental degradation; and,
- participating in the International Northern Sea Route Operations Program (INSROP) (This program encourages increased collaboration among Arctic States with regard to the safety and efficiency of shipping.)

16. Canada Customs and Revenue Agency (CCRA) - CCRA has designated ports of entry in Iqaluit, Inuvik, and Yellowknife. Iqaluit has become a major fuel stop for aircraft travelling from Europe to North America. In 1998, CCRA cleared roughly 4000 passengers and crew. Inuvik saw 200 air travelers and 500 cruise ship passengers, while CCRA processed approximately 600 air travelers and 50 commercial imports at Yellowknife. The cruise ship industry is rapidly growing in the North, with many proposed stops at ports of entry other than the designated ports mentioned above. In some cases, RCMP officers assist Custom agents in clearing travelers. In the case of scientists visiting CFS Alert, designated military personnel provide this service on CCRA's behalf.

17. Indian and Northern Affairs (DIAND) - DIAND's activities in the North are not security related, but focused on development. Nevertheless, DIAND staff in the North numbers between 150 and 200 and travel extensively in the region. As a result, part of their work involves witnessing and reporting any suspicious activity that they come across to the relevant authorities.

18. Natural Resources Canada (NR Can) - NRCan does extensive research in Arctic issues though none are directly related to security issues.

19. Privy Council Office (PCO) - In light of the growing interest in Arctic security issues, PCO has decided to organize an inter-departmental group to prepare an intelligence assessment of Arctic security for presentation to the Intelligence Assessment Community.

20. Foreign Affairs and International Trade (DFAIT) – On 8 June 2000, DFAIT presented a new policy framework entitled, “The Northern Dimension of Canada’s Foreign Policy.” This document outlines Canada’s northern foreign policy objectives, including security and prosperity for Canadians; preserving Canada’s sovereignty; integrating the circumpolar region as a rules-based international system; and promoting human security of northerners and sustainable development of the Arctic. To achieve these objectives, four priority areas for action are outlined:

- strengthening of the Arctic Council
- establishment of a University of the Arctic
- cooperation with Russia
- promoting sustainable economic opportunities and trade development

The policy framework makes only passing reference to northern sovereignty and does not address the role of DND in the North.

21. Ambassador for Circumpolar Affairs - DFAIT has established an Ambassador for Circumpolar Affairs, who reports to both the Minister of Foreign Affairs and the Minister of Indian Affairs and Northern Development. The Ambassador's mandate includes representing Canada at international meetings on circumpolar issues (notably the Arctic Council) and coordinating federal efforts on such issues. The Interdepartmental Committee on Circumpolar Affairs provides the Ambassador with an interdepartmental forum for advice and consultation on policy development, and for coordination concerning international arctic issues (the Committee does not examine military/security issues, however, as they are not part of the Arctic Council's mandate).

22. Inter-departmental Program Co-ordination and Review Committee (IPCRC) - In 1990, the President of the Treasury Board commissioned a study to examine the Federal Government's marine fleets. The results of the study became known as the Osbaldeston Report. Its recommendations included the establishment of the IPCRC to facilitate inter-departmental co-ordination between the two departments that operate fleets (DND and DFO) and those departments (RCMP, CCRA, and DIAND, for example) that receive fleet-related services from the operating departments. In 1999, the national Operational Sub-Committee of IPCRC directed

that a new, Central and Arctic Zone Operational Sub-Committee be established to better coordinate federal fleets in the Arctic.

23. Northern Science & Technology – An ADM level interdepartmental committee on Northern S&T, including among others EC, DND, DFAIT, TC, NR Can and DIAND, is developing a Business Case outlining new models for Northern research funding and performance. This Business Case, to be completed in summer 2000, will be used as a basis for consultations later this year with Cabinet on federal re-investment in northern science and technology and approaches to address the Northern S&T capability gap.

Part 3 - DND/CF Responsibilities in the Arctic

24. The preceding paragraphs point to a wide range of issues which are of concern to many government departments and agencies, including DND. However, DND/CF's role and specific responsibilities in the North must be viewed through the prism of the current strategic environment. As stated at Ref C and Ref E, there is presently no immediate direct military threat to Canada. Nevertheless, there remain many significant security/sovereignty challenges of a different nature emerging in the North, a fact confirmed during our discussions with representatives from CFNA and other concerned government departments. There is therefore a cross Government need to monitor these issues which, if ignored, have the potential to lead, in the long term, to an erosion of Canada's sovereignty in the North.

25. Of particular importance is the possible opening of the Northwest Passage for maritime transit. The scientific community appears fairly confident that the present thinning of the Northern ice will continue and that the Northwest Passage could be open for navigation for most of the year within 10 to 20 years. The impact of a significant increase in shipping activities through the Northwest Passage would affect many departments as well as the Arctic's delicate ecosystem. There is also a possibility that the opening of the Northwest Passage to regular use could result in legal challenge to Canada's interpretation of the status of that waterway as an internal one. As specified under UNCLOS III (United Nations Convention on the Law of the Sea), a passage used regularly can be considered an international strait. Other challenges include the continuing increase of air traffic over the region, possibly exacerbated by the opening of the Russian airspace, the rise of organized criminal activity, illegal immigration as well as environmental conservation issues.

26. In acknowledging these trends, one must recognize that these Northern issues must be weighed against other emerging security challenges faced by Canada, and that, while important to monitor, they present no immediate concern to the CF. They do however validate a requirement to monitor the Arctic area, to respond when required and to cooperate with OGDs.

27. This study has focused the bulk of its analysis on those areas for which DND/CF has a leading role in accordance with Ref C and Ref D, namely the conduct of surveillance and control operations, search and rescue and assistance to other governmental departments. While it is important to state that DND/CF is not the lead Department in addressing these new security challenges, DPG 2001 Change Objective Seven requires the CF to undertake joint planning with OGDs to achieve national objectives and to support a coordinated approach to a national security strategy.

28. Current Capabilities and Activities in the North. CF assets in northern Canada include:

- One headquarters (CFNA) with 77 personnel;
- 440 Squadron consisting of four Twin Otter transport aircraft;
- 1 Canadian Ranger Patrol Group (CRPG) with 58 patrols in communities across the North;
- 41 radar sites of the North Warning System (NWS);

- four Forward Operating Locations (FOL) for fighter operations; and
- CFS Alert/Eureka.

29. CFNA HQ. Reference D tasks CFNA to coordinate and facilitate military activity in the North and to coordinate surveillance of the North. However, few Regular Force scheduled activities relate to the conduct of northern surveillance and control operations. Land Force sovereignty operations (SOVOPS) were usually conducted five times a year. Due to OP ABACUS, none were conducted in 1999/2000 and only two are planned for 2000/2001. Four patrols by CP-140 Aurora Maritime Patrol Aircraft are planned for 2000, down from approximately twenty in the mid-nineties. CFNA lacks the staff resources or situational awareness to coordinate more than a nominal level of activity. Only in exceptional cases does CFNA have access to the information necessary to cue CF assets to respond to activity or incidents.

30. 440 Squadron. 440 Squadron provides utility transport to CFNA in support of the Commander's liaison function and of the Ranger, Junior Ranger and Cadet programs. The four aircraft provide an important visible assertion of CF presence in the North, as at one time or another during a given year one or more of the aircraft will fly into every northern community. In addition, the squadron has recently been assigned a "surveillance while en route" role, using the Mark 1 eyeball. This is strictly a collateral benefit to the normal utility transport role. The Twin Otters are well suited to their northern transport role although their slow speed adds time to the Command's liaison tasks. They do not permit the rapid deployment of the Commander, his staff or a Ranger patrol. In addition, they are not large enough to deploy a Ranger patrol nor can they handle the summer movement of Cadets to camp. These factors have caused an increasing reliance on commercial air. As a result, the Comd CFNA has requested the addition of DASH 8 aircraft to 440 Squadron.

31. FOLs. There has also been little use of the FOLs for fighter operations. Since 1997, three exercises have been conducted: one in Iqaluit and two in Inuvik. The latest NORAD exercise took place in Inuvik in early 2000.

32. North Warning System. The NWS provides air surveillance along the edge of continental Canada but leaves vast areas of the North without coverage. Activity in support of the stations, only 2 of which are manned by civilian contractors responsible for maintenance, provides a collateral degree of surveillance and demonstration of Federal Government presence, although not normally by CF personnel.

33. Canadian Rangers. The majority of CF related activities taking place in CFNA revolve around the Ranger Program, the Cadet Program and the Junior Canadian Rangers Program. There are presently 58 Ranger patrols in CFNA, up from 25 in the 1980s. The Rangers are tasked by CFNA to conduct sovereignty patrols within the immediate areas of their home communities. Funding currently limits these activities to only 30 patrols, less than one per patrol per community annually. In addition, CAS has in the past provided funding for patrols to the unmanned NWS sites for security checks. While 440 Squadron provides utility transport in support of many of these activities, there is no other capability for patrols beyond foot or snow machine range of home communities.

34. Following the approval of CAN RAN 2000, a review of the Canadian Ranger program, the number of patrols in the North will expand only to the currently planned 60 (this is limited by the number of communities in the North). Provision is made for larger patrols and improved command and control, instruction, clothing and equipment, including GPS and HF radios. However, CAN RAN 2000 does not address several issues that are perhaps specific to Rangers north of 60. These include the issue and maintenance of arctic clothing (Northerners are no longer necessarily self equipped to live on the land), the provision of surveillance and recording equipment (cameras, binoculars) and funding for increased patrol activity.

35. MAJAID. While the risk of a major air disaster is relatively low, the 2 September 1998 crash of a Swissair MD-11 serves to remind us that an incident of this nature can occur, without warning, at any time and place. A capability such as MAJAID is particularly pertinent to the Canadian North and the Northern requirement must be retained in the planned updating of the MAJAID plans and must be included in any consideration of an expansion of the scope of MAJAID to include provision for its employment in a variety of disasters.

36. Summary. CF activities in the North have decreased over the years and our ability to monitor activity and to respond in an appropriate manner remains limited. This shortcoming is likely to become more significant as activity in the Arctic increases. For example, CFNA has essentially no capability to collect and collate on a systematic basis information on activities of potential interest to the CF. This is particularly obvious when compared to our capabilities on the Atlantic and Pacific coasts; there is no equivalent to the “Recognized Maritime Picture” for the North. While there is no current requirement to duplicate those capabilities in every respect, if the CF is to be able to meet its White Paper obligations in the North some improvements to our capabilities both to monitor and to respond should be considered.

Part 4 - Options For An Increased CF Presence And Capability in the North

37. At Annex A, a range of options to increase the CF capability in the North are discussed and assessed for effectiveness and affordability. Several of the options, such as increased CF-18 and Arcturus/Aurora patrols or the deployment of ice-capable ships, either do not satisfy the requirement, are considered excessive to the requirement or are assessed as unaffordable. However, several of the options offer promise of an increased CF capability in the North at a reasonable cost and are worthy of further investigation. These potential improvements to CF capability in the North are discussed below. The first part looks at short to medium term options while the second part identifies longer term options dealing with surveillance capabilities and global deployability.

Short/Medium Term Options

38. Improved inter-departmental cooperation. Several government departments and agencies have personnel and conduct tasks throughout the North. There is now no formal means of centrally collecting and collating the information obtained in the course of carrying out their diverse duties. Although perhaps difficult to arrange, inter-departmental sharing of information offers the best opportunity to increase awareness of activity in the North. This initiative would assist with the implementation of DPG 2001 Change Objective 7, “establish clear, strategic partnerships to better position Defence to achieve national objectives”.

39. Situational Awareness of CFNA HQ. CFNA now has essentially no intelligence collection or analysis capability. While CFNA is connected to the CFCS, there is virtually no information relative to the north on that system. Unlike the other two coasts, where Recognized Maritime Pictures are maintained, there is no northern equivalent. CFNA would require an increased intelligence staff, a secure facility and connectivity to those existing intelligence and reporting systems that have relevant information or have the potential to provide relevant information. Our intelligence resources and systems need to begin to focus on the north. In this respect, CFNA would need to become a contributor of information and analysis for northern intelligence. In particular, CFNA would need access to the information and intelligence provided by space based sensors. This constitutes the most cost-effective way to make effective use of existing and potential surveillance and response resources. This Northern requirement should be factored into the ISR studies that are implementing the DPG Change Objective Three requirement to develop an enhanced ISR capability.

40. Increased CFNA HQ Capability. In addition to an ability to formulate a Northern operational picture, an integral planning capability would permit CFNA to assess the requirement for a CF response. CFNA HQ should have the capability to formulate the best possible operational picture of Northern activity, to assess where more information is required, to assess what activity justifies or requires a CF response and to recommend a response to the DCDS for tasking. The addition of more capable aircraft to 440 Squadron should be investigated to assess the business case for utility transport, the operational requirement for a more rapid response capability, the potential for a collateral surveillance capability and the value, from a CF presence point of view, of operating more and larger aircraft throughout the North. It is not

certain that the CF DASH 8's, as currently configured, are suitable for operations in the North, this would also need to be assessed.

41. Increased Ranger Activity. Ranger funding now allows only 30 sovereignty patrols a year, plus NWS inspections funded separately by CAS (the future of this funding is not certain). They have the capacity for more. This would be a very cost-effective way to make better use of an existing resource to extend CF surveillance activities. However, to extend Ranger reach to areas beyond their local communities would require funding for the provision of airlift, whether chartered or CF. The CAN RAN 2000 review did not include funding for increased Ranger activity in the North; another source of funding would be required.

42. Increased Ranger Capability. GPS, binoculars, cameras, VHF radios and full provision and maintenance of Arctic clothing would enhance the morale and effectiveness of the Ranger surveillance patrols and enable Rangers to report incidents more rapidly and accurately. The CAN RAN 2000 review addresses only some of these requirements, additional funding would be required.

43. Rapid Reaction Force – Land. A sighting or activity in the North may require CF intervention, as called for in the White Paper requirement for the CF to control activity. It is impracticable (and unaffordable) to base a force in the North beyond those indigenous to their communities, the Rangers. A serious incursion or incident will be beyond the limited capability of the Rangers and a demonstrated capability to deploy Land Forces in a timely manner is required. As noted above, CLS has been unable to fund sovereignty exercises to the extent required. Additional funding would be required.

44. Rapid Reaction Force – Air. There is a requirement to provide confirmation of suspected activity. Where this is not possible by satellite or Ranger patrol, an aircraft must be tasked. While the Air Force maintains CF-18s on immediate NORAD alert, these aircraft have short ranges, require extensive local support and the aircrews are not trained in observation and reporting. Aurora/Arcturus aircraft are suitable for self-sufficient northern deployments and have the necessary range to operate in the North. CAS, of course, now responds with maritime patrol assets when required and has a DPG 2001 task to provide surface surveillance within 24 hours in support of CFNA. Locally based aircraft could perhaps be used in some circumstances and, as noted above, the operational effectiveness and affordability of this possibility should be assessed.

Long Term Options

45. Intelligence, Surveillance and Reconnaissance. CF ISR studies and efforts to develop and enhance our capabilities, as required by Change Objective 3 in DPG 2001, must include our requirements in northern Canada. The CF has ISR requirements in the north as well as overseas and on the east and west coasts. The environmental conditions prevailing in the North (cold climate, changing weather, vast distances, etc) will have to be factored into the following four representative specific initiatives:

- Space-Based Sensors. Space based sensors offer an unparalleled ability to monitor vast areas of the North. CFNA should have access to the products of these sensors. Projects aiming to provide this capability to the CF should include the CFNA requirement.
- High Altitude Long Endurance Unmanned Aerial Vehicle (HALE UAV). HALE UAVs would provide wide area and spot aerial surveillance and contribute to the formulation of an operational picture for the North. Information collected by the UAV could be used to cue manned response aircraft or other appropriate resources. The low cost and risk of HALE UAVs compared to manned airborne alternatives make this platform a logical choice for routine patrols.
- The Joint (Maritime) Intelligence and Surveillance. If approved by CMS, this project will both establish a networked surface surveillance capability to detect and track surface and air targets out to 250 NM from the Canadian Atlantic and Pacific coasts as well as a remote deployable undersea detection capability in the Pacific, Atlantic, Arctic Archipelago and the Arctic Basin. This capability relates to several of the options at Annex A, some of which are otherwise considered unaffordable. This project should be supported and the Northern requirements for surveillance must be included.
- High Frequency Surface Wave Radar. HFSWR holds the potential of providing a much greater surveillance capability for the North. Although HFSWR would need to undergo further testing to determine the extent of its capabilities in the North, it does offer the potential of a relatively low-cost air and surface target detection capability. The HFSWR project should be monitored to ensure that the requirements for Northern surveillance are investigated.

46. Deployability. Projects and studies intended to implement the DPG Change Objective Four to enhance our global deployability must include our requirement to be able to respond quickly to events in the Canadian north with an appropriate force. Given the size of our country, the CF has an obligation to the North that at least equals its obligation to events overseas.

CONCLUSIONS

47. Efforts are presently being made to restructure DND/CF to deal with current fiscal realities while addressing the challenges created by an increased level of operations around the world and the need to keep up with the latest technological developments. Emerging challenges in Canada's northern regions must therefore be balanced with other commitments and addressed, where appropriate, within the Department's current resources and capabilities. While the issues raised by Comd CFNA are valid, a majority of these concern DND/CF only indirectly. It is important to underline that DND/CF's primary role in the Arctic region is not monitoring economic activities, dealing with illegal immigration or preventing pollution and criminal activity. Therefore, there is clearly a need for the Government as a whole to examine these issues and decide whether the changing situation in the Arctic over the next ten to twenty years warrants the allocation of more resources to the departments concerned, including DND.

48. Nonetheless, certain measures could be implemented in the short to medium term and at relatively low cost to help the CF in general and CFNA in particular in performing the tasks outlined in the *1994 White Paper* and in the *Defence Planning Guidance 2001*. These options have been evaluated through two criteria:

- 1) Their relevance to the CF's primary missions in the North
- 2) Their feasibility within current resources

49. Conducting surveillance and control of Canada's territory, airspace and maritime areas of jurisdiction remains one of the primary responsibilities of the CF. However, responsibility for many of the activities related to surveillance lies with other governmental departments and civilian agencies. In addition, several OGDs and agencies have personnel and conduct activities throughout the North. Therefore, the first recommendation of this study calls for better co-ordination and information sharing between the respective departments and agencies operating in the North. More specifically, the Arctic Security Interdepartmental Working Group should play a central role in monitoring on an on-going basis the evolution of security concerns in the North. The inter-departmental group being formed at PCO to produce an Arctic intelligence assessment should also be supported by DND. These initiatives will undoubtedly contribute to raising the awareness of northern security issues at the federal government level.

50. Improvement of CFNA's situational awareness is fundamental to ensure the effectiveness of this co-ordination. CFNA must have access to information on activities that may impact on its area of responsibilities. CFNA is already connected to JC²IS/CFCS TITAN which provides access to classified networks such as MCOIN III (Maritime Command Operational Information System). Canadian Forces Information Operation Group (CFIOG) also intends to place information provided by the Global ELINT picture on JC²IS shortly. This will also address part of the connectivity problem experienced by CFNA. Securing access to other relevant information and intelligence networks will provide CFNA with a much greater amount of data on domestic and global activities but not necessarily on Arctic activities as these other networks are not Arctic focused. CFNA must try to supplement this information with their own resources and/or request it be produced by the appropriate agency and to assist (if possible) in its collection and production. CFNA must adopt the role of contributor as well as consumer by becoming a full participant in the information and intelligence networks. Perhaps the most effective way to heighten awareness of Arctic issues and their relevancy to Canada's wider security is through CFNA contributing, in the form of daily or weekly reports and briefs, to the information and intelligence networks to which it is connected.

51. Furthermore, a proper communications channel enabling Comd CFNA to transmit and receive information from other government departments/agencies operating in the North is also essential to produce an accurate picture of on-going activities in the region. Agreements with the Coast Guard, the Canadian Ice Service, the Department of Fisheries and Oceans and other related departments/agencies should be established to ensure an efficient flow of information. Eventually, a system similar to CANMARNET could evolve. CFNA would also require sufficient planning and operations staff to collate, assess and respond to this information. Enhanced automation and more PYs will be needed if CFNA is to truly contribute to and benefit

from the increased amount of information and intelligence that will become available to them through greater connectivity. An in-depth study would be required to further define the requirements.

52. Increasing the capabilities of the Rangers is another way to enhance overall surveillance capabilities in the North. The provision of cameras, binoculars, GPS, ground/air radios and Arctic clothing to the Rangers would increase the effectiveness of these patrols at a reasonable cost. An increased level of activity for the Rangers to permit more frequent sovereignty patrols should be assessed for affordability. CAN RAN 2000 has planned funding for some of these initiatives; a detailed review will be required to determine what additional funding would be required.

53. The northern reaction capability of the Land Forces should also be exercised. Sovereignty operations will be conducted two times this year. This rate of activity should be augmented to five annually, as it was 2 years ago. A demonstrated capability to deploy Land Forces in a timely manner is required. Additional funding would be required.

54. The options retained for the longer term deal with Intelligence, Surveillance and Reconnaissance (ISR) and Global Deployability. Most of the surveillance requirements for the Arctic could be fulfilled by remote platforms and systems that are presently being considered as part of the CF's ISR study. The development of any future CF wide ISR framework must take the Arctic dimension into consideration. Likewise, studies on structure and strategic lift resources must take our requirement to respond to events in the North, as well as around the world.

RECOMMENDATIONS

55. The following recommendations should be accepted for further study by the designated OPI to determine specific requirements and resource implications. Staffing for approval and allocation of resources would follow.

56. Short/Medium Term Recommendations:

- Strengthen inter-departmental cooperation through:
 - Continued DND participation in the Arctic Security Interdepartmental Working Group (ASIWG) (ADM (Pol)/Comd CFNA);
 - Participation in inter-departmental group in Privy Council Office/Intelligence Assessment Secretariat with view to produce an Arctic intelligence assessment (DCDS);
 - Continued DND participation in Northern S&T committee (ADM (S&T))
 - agreements with OGD/agencies working in the North for the exchange of information (ADM (Pol)/Comd CFNA)

- Enhance connectivity of CFNA to relevant DND/CF operations and intelligence systems (DCDS)

- Enhance the analysis and planning capabilities of CFNA (DCDS/Comd CFNA)
- Increase Rangers capabilities and activity levels (DGRC /Comd CFNA)
- Exercise the northern reaction capability of the LF (CLS)
- Assess options for providing CFNA with necessary level of air support (CAS)

57. Longer Term Recommendations

- Include Arctic dimension in the development of future CF ISR framework (DCDS)
- Include the northern requirement in development of an enhanced global deployability for the CF (VCDS)

OPTIONS FOR AN INCREASED CF PRESENCE AND CAPABILITY IN THE NORTH

INTER-GOVERNMENT DEPARTMENT COOPERATION

1. Several government departments and agencies have personnel and conduct tasks throughout the North. There is now no formal means of centrally collecting and collating information obtained in the course of carrying out their diverse duties. This could be an important source of information for the compilation of an operational picture.

Advantages.

- a. leverages existing resources and activities; and
- b. provides the widest possible coverage of northern Canada.

Disadvantages.

- a. other Departments may not wish to report to DND;
- b. might put DND in a de facto leadership position in areas in which we have no interest or jurisdiction other than information.

Conclusion. Although perhaps difficult to arrange, inter departmental sharing of information offers the best opportunity to assemble information on activity in the North. DND's overall responsibility would have to be carefully spelled out.

SITUATIONAL AWARENESS CFNA HQ

2. CFNA now has essentially no intelligence collection or analysis capability. Unlike the other two coasts, where Recognized Maritime Pictures are maintained, there is no northern equivalent. CFNA would require an increased intelligence staff, a secure facility and connectivity to existing intelligence and reporting systems. In particular, CFNA would need access to the information provided by space based sensors. This capability is essential to making effective use of existing and potential military surveillance and response resources.

Advantages.

- a. would provide situational awareness for the effective employment of other resources; and
- b. would assist the CF in meeting the White Paper task to monitor threats to Canadian sovereignty.

Disadvantages.

- a. would require additional personnel (intelligence, operators, data base managers, etc) and increase communications costs; and
- b. there may be insufficient information sources to maintain a complete operational picture.

Conclusion. This is an essential first step to enable the CF to make effective use of its resources in the North. Even if the operational picture is rudimentary, it will at least begin to provide sufficient warning of increased activity to permit the deployment or development of sensors and resources required to monitor the activity.

INCREASED CFNA HQ CAPABILITY

3. In addition to an ability to formulate a Northern operational picture of activity of interest to the CF in the North, an integral planning capability would permit a local assessment and ability to recommend an appropriate response. There would also be merit in providing CFNA with integral air resources to both conduct aerial surveillance and better support the Rangers. In that regard, Comd CFNA has recently made a case for the provision of DASH 8 aircraft for general transport duties in the North. These aircraft also have a useful coastal patrol capability, although an operational research assessment of their capabilities against the surveillance requirement in the North would be required.

Advantages.

- a. provides an integrated intelligence assessment and response capability;
- b. makes best use of local knowledge and perspective; and
- c. provision of aircraft would provide an immediate response capability.

Disadvantages.

- a. likely to generate increased costs as resources are tasked to collect information; and
- b. provision of more aircraft to CFNA would be relatively expensive.

Conclusion. CFNA HQ should have the capability to formulate the best possible operational picture of Northern activity, to assess where more information is required, to assess what activity justifies or requires a CF response and to determine what resource should be tasked. CFNA should have funding and authority to task some resources, such as the Rangers and local aircraft, and the mandate to seek the deployment of additional surveillance/response resources through the DCDS.

INCREASED RANGER ACTIVITY

4. Ranger funding now allows only 30 sovereignty patrols a year, plus NWS radar site inspections funded (in the past) separately by CAS. They have the capacity for more.

Advantages.

- a. low cost;
- b. very effective surveillance and reporting; and
- c. morale boosting for the Rangers.

Disadvantages.

- a. Ranger patrols are limited to local areas, unless additional funding for local airlift or CF tactical airlift is provided to permit a further reach; and
- b. Rangers have neither the capability nor the mandate to take action beyond reporting.

Conclusion. This would be a very cost-effective way to make better use of an existing resource. However, to extend Ranger reach to areas beyond their local communities would require additional funding for the provision of airlift, whether chartered or CF. Even this would be far less expensive than deploying Regular Force land elements.

INCREASED RANGER CAPABILITY

5. Binoculars, cameras and full provision and maintenance of Arctic clothing would enhance the morale and effectiveness of the Ranger surveillance patrols.

Advantages.

- a. enhances an existing capability; and
- b. reasonable cost.

Disadvantages.

- a. Ranger patrols are loosely structured and supervised. A certain amount of misuse and loss would have to be factored in;
- b. initial capital cost; and
- c. an increase in O&M costs for the Rangers.

Conclusion. A cost effective way to enhance one of the most capable northern surveillance capabilities we have.

RAPID REACTION FORCE - LAND

6. A sighting or activity in the North may require CF intervention, as called for in the White Paper requirement for the CF to monitor and control activity. It is impracticable (and unaffordable) to base a force in the North beyond those indigenous to their communities, the Rangers. A serious incursion or incident will be beyond the limited capability of the Rangers and a demonstrated capability to deploy Land Forces in a timely manner is required. The Land Forces now maintain Immediate Reaction Units in each LFA for domestic operations. This capability needs to be exercised.

Advantages.

- a. provides obvious demonstrations of sovereignty; and
- b. does not increase readiness demands on the Land Forces, except that the IRUs must ensure that Arctic kit is ready.

Disadvantages.

- a. dependent on air transport for response time;
- b. quick response only within LOSV/foot range of a Hercules capable airstrip. Responses to situations away from airstrips would require more deliberate staged deployments using helicopters and/or small ice or rough terrain capable aircraft; and
- c. beyond Land Force financial capabilities to exercise.

Conclusion. A visible and effective means of demonstrating CF capability to respond when required in the North without significant set up or maintenance costs. Would require funding for exercise of the capability.

RAPID REACTION FORCE - AIR

7. There is a requirement to provide confirmation of suspected activity. Where this is not possible by satellite or Ranger patrol, an aircraft must be tasked. While the Air Force maintains CF-18s on immediate NORAD alert, these aircraft have short ranges, require extensive local support and the aircrews are not trained in observation and reporting. Aurora/Arcturus aircraft are suitable for self-sufficient northern deployments, have the necessary range to operate in the North. There are also circumstances when local aircraft, whether CF or rented civilian aircraft with CF observers, could and should be used.

Advantages.

- a. makes use of existing resources; and
- b. provides a timely and effective means of investigation and reporting.

Disadvantages.

- a. short notice deployment of Aurora/Arcturus aircraft would require diversion from tasks now given higher priority;
- b. CAS may be unable to afford the additional costs; and
- c. requires a pre-existing effective intelligence and tasking capability.

Conclusion. A requirement, as is now included in DPG 2001, for CAS to maintain a response capability for an Aurora/Arcturus for northern patrol would provide an effective means of investigating an incident or activity that cannot be investigated by other means. However, this would be dependent on a consistent and effective cueing capability that presently does not exist. There is limited value in flying aircraft over empty terrain on speculation, although training flights could be used to fill gaps in the intelligence picture.

INCREASED AURORA/ARCTURUS PATROLS

8. Scheduled sovereignty patrols have decreased in frequency over the years. More patrols would obviously increase CF activity levels in the North and provide more information on activity in the North.

Advantages.

- a. effective surveillance of patrol route; and
- b. highly visible CF presence.

Disadvantages.

- a. without cueing, patrols may be over empty terrain;
- b. transient activity will be seen only by chance; and
- c. high cost.

Conclusion. Aerial surveillance must be part of a package that includes the ability to formulate an operational picture of the area of interest, the ability to task the most appropriate means to investigate suspected activity and an ability to deploy suitable forces to respond, if required. Routine patrols are probably not as good a use of resources as is the deployment on demand of appropriate aircraft.

INCREASED CF-18 DEPLOYMENTS

9. Deployments of NORAD CF-18s to the FOLS have decreased in frequency over the years. More frequent deployments would greatly increase the perception of CF presence in the North.

Advantages.

- a. very visible presence; and
- b. maintains a NORAD capability.

Disadvantages.

- a. very expensive;
- b. limited to the four FOLS, where sovereignty is not at risk; and
- c. short range and lack of observer training limits usefulness for any but the intercept role.

Conclusion. Increased frequency of CF-18 deployments would not add to either the compilation of an operational picture or of CF ability to respond to suspected activities in a meaningful way.

ICE-CAPABLE MARITIME SHIPS

10. The maritime forces now have no capability to operate in the North. A capability to conduct coastal patrols and monitor foreign shipping would be highly effective means of asserting Canadian sovereignty in the North.

Advantages.

- a. very effective surveillance and response capability;
- b. very public display of Canadian sovereignty; and
- c. would put Arctic on the same basis as the other two coasts.

Disadvantages.

- a. high cost; and
- b. no significant military threat in the North.

Conclusion. While this is a very desirable solution, the high cost makes it impractical. It should be noted, however, that the current Afloat Logistics Sealift Capability (ALSC) project's concept

of employment calls for the ALSC to have a minimal ice-capability and operate in conditions where the ice is up to 0.7 metre thick.

HIGH ALTITUDE LONG ENDURANCE UNMANNED AERIAL VEHICLE (HALE UAV)

11. As scheduled sovereignty patrols have decreased over the years due to the cost of increased Aurora/Arcturus patrols HALE UAVs offer a more cost-effective solution for the provision of increased surveillance of the North.

Advantages

- a. offers wide area surveillance and high resolution;
- b. endurance/range and loiter;
- c. provides Canada with its own independent surveillance capability;
- d. cost-effective and low risk (increased airframe lifespan as no on-going training needed, no aircrew, small ground crew; ease of maintenance).

Disadvantages

- a. limited self defence capability;
- b. Mission planning is still a tedious and lengthy process.
- c. potential bandwidth limitations for real time processing of data.

Conclusion

HALE UAVs would provide wide area and spot aerial surveillance and contribute to the formulation of an operational picture for the North. Information collected by the UAV could be used to cue manned response aircraft or other appropriate resources. The low cost and risk of HALE UAVs compared to manned airborne alternatives make this platform a logical choice for routine patrols.

HIGH FREQUENCY SURFACE WAVE RADAR (HFSWR)

12. DND/CF presently has a limited capability to track aircraft and surface vessels in the North. The installation of a HFSWR at a site or sites in the North would provide some measure of capability of air and surface target detection (dependant on the amount of ice) . Detection of air and/or surface contacts would allow the cueing of other assets such as the Aurora. Research is required to determine the utility of HFSWR for the Northern Area as the current HFSWR project does not explore this capability.

Advantages

- a. would provide an increased measure of surveillance over open water;
- b. may provide an increased measure of detection of low flying aircraft over ice; and
- c. HFSWR system is not overly expensive (it is cheaper than a microwave radar solution and most likely would not have to be manned)

Disadvantages

- a. system needs further testing before full capabilities for Northern Area known
- b. high cost attached to provision of power to run the HFSWR.
- c. darkness in Arctic region could impose limitations on system efficiency
- d. system is weather dependent

Conclusion: HFSWR holds the potential of providing a much greater surveillance capability for the North. Although HFSWR would need to undergo further testing to determine the extent of its capabilities in the North, it does offer the potential of a relatively low-cost air and surface target detection capability. The HFSWR project should be monitored to ensure that the requirements for Northern surveillance are investigated.

RAPIDLY DEPLOYABLE UNDERWATER ACOUSTIC SURVEILLANCE SYSTEM

13. With the demise of the national Integrated Undersea Surveillance System capability DND/CF has no way monitor undersea activity and subsequently to control the Northern undersea approaches. Undersea sensors at choke points would assist in formulating an operational picture for the North. These sensors would also allow for the cueing of other assets to respond to contacts. The Joint (Maritime) Intelligence and Surveillance project, now in early stages and if approved by CMS, would provide a suitable capability.

Advantages

- a. an underwater acoustic surveillance system would provide an undersea surveillance capability;
- b. interoperable with other sensor systems; and
- c. compared to other underwater acoustic systems, this capability is inexpensive.

Disadvantages

- a. CF relative inability to respond to under-ice contacts.
- b. Waters in the Arctic are presently covered with ice 10 to 11 months per year.

Conclusion

As part of the Joint (Maritime) Intelligence and Surveillance, the Rapidly Deployable Underwater Acoustic Surveillance System would provide an undersea surveillance capability that presently does not exist in the North. The cost of the system is relatively inexpensive

compared to previous projects. The Rapidly Deployable Underwater Acoustic Surveillance System project should be considered for its utility in enhancing the Northern surveillance capabilities.

SPACE-BASED SENSORS

14. Space based sensors offer an unparalleled ability to monitor vast areas of the North.

Advantages.

- a. uses existing resources;
- b. coverage on demand;
- c. capabilities will improve in the future; and
- d. there are existing CF plans to use these sensors.

Disadvantages.

- a. some sensor coverage comes at a cost per use;
- b. not suited for detection and surveillance of some types of activity; and
- c. requires a tasking and analysis capability, with attendant PY and facilities costs.

Conclusion. Perhaps the best source of overall surveillance information of the North.