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Chief Review Services / Chef - Service d'examen

CRS / CS Ex

Evaluation of the CF/DND Component of the National Search and Rescue Program

January 2008

1258-159 (CRS)



Canada

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LIST OF ACRONYMS

1 Cdn Air Div	1 Canadian Air Division
A3 APT Rdns	A3 Aviation, Patrol, Transport Readiness
ADM(IM)	Assistant Deputy Minister (Information Management)
Asst CAS	Assistant Chief of the Air Staff
C2	Command and Control
Canada COM	Canada Command
CAS	Chief of the Air Staff
CASARA	Civil Air Search and Rescue Association
CCG	Canadian Coast Guard
CF	Canadian Forces
CFACC	Combined Forces Air Component Commander
Comd Canada COM	Commander Canada Command
CRS	Chief Review Services
DND	Department of National Defence
ELT	Emergency locator transmitter
Ex Dir NSS	Executive Director National Search and Rescue Secretariat
FSP	Federal Search and Rescue Program
FY	Fiscal year
IAMSAR Vol IV	International Aeronautical and Maritime Search and Rescue Manual Volume IV
ICSAR	Interdepartmental Committee on Search and Rescue
JRCC	Joint Rescue Coordination Centre
JTF	Joint Task Force
JTF(A)	Joint Task Force (Atlantic)
JTF(P)	Joint Task Force (Pacific)
LMSAR	Lead Minister for Search and Rescue
MND	Minister of National Defence
MOB	Main operating base
MRSC	Marine Rescue Sub-centres
NATO	North American Treaty Organisation
NORAD	North American Aerospace Defence Command
NSM	National SAR Manual
NSP	National Search and Rescue Program
NSS	National Search and Rescue Secretariat
OIC	Officer in charge
ORD	Operational Research Division
RSMS	Regional Supervisor Maritime SAR
SAR	Search and Rescue
SARSAT	Search and Rescue Satellite System
SISAR	Système d'informations SAR (SAR Program Information Management System)
SMMS	SAR Mission Management System
SMO	Senior Military Officer
SRR	Search and Rescue Region
SRR Commander	Search and Rescue Commander
SRU	Search and Rescue Unit
TARM	Total Air Resource Management
TTP	Tactics, techniques and procedures

RESULTS IN BRIEF

The management and delivery of search and rescue (SAR) services by the Department of National Defence (DND) and the Canadian Forces (CF) is effective and, overall, the Canadian structure and capability are considered as a model internationally. Although overall effectiveness is not questioned, this evaluation identified opportunities for improvement in two areas:

- **Governance.** The command and control (C2) relationships for SAR are not published in any common CF/DND documents.
- **Performance Measurement.** While some performance measures are in place at the tactical level, strategic-level guidance for measurement is lacking. Due to the differences in software packages and the relevance of information across departments, there is no method to easily report compiled performance results in a timely manner.

Overall Assessment

- The CF/DND component of SAR operations functions quite well and remains highly relevant.
- Canada is viewed as a model by its international peers for the way it operates its Joint Rescue Coordination Centres (JRCC)—CF/Canadian Coast Guard (CCG).

Main Findings and Recommendations

Governance

Doctrine for SAR. The CF does not have operational-level doctrine for SAR in place; however, development of Air Force operational SAR doctrine is planned for 2008. In lieu, the National SAR Manual (NSM) is being used as guidance until it will be replaced by the International Aeronautical and Maritime Search and Rescue Manual Volume IV (IAMSAR Vol IV)—Canadian supplement.

Command and Control in Support of SAR Operations—Post-CF Transformation. Canada is consistently considered a world leader in SAR response. C2 for SAR operations are conducted within a short chain of command that enables the needed assets and personnel to be coordinated, tasked and directed to conduct SAR operations effectively. Although the C2 relationships are understood by the current personnel, they have not been widely published.

Performance Measurement

Performance Measurement and Objectives Achievement in Operational SAR. Current performance measurement is focused on the immediate tactical response to a SAR incident. While the importance of strategic performance management has been acknowledged, progress to develop a strategic measurement framework has been slow. The Chief of the Air Staff (CAS) and the Commander Canada Command (Comd Canada COM) need to determine their strategic-level performance measurement information requirements for SAR within the CF. However, this should also be part of a whole-of-government performance measurement strategy for SAR. Accordingly, Asst CAS as the CF member of the Interdepartmental Committee on Search and Rescue (ICSAR) should recommend that a National Standard of Service for SAR be developed.

Data Integrity in the Système d'informations SAR (Search and Rescue Program Information Management System) (SISAR). The SAR Mission Management System (SMMS) is a tool that improves the effectiveness of controllers, but at the same time adds to their workload in terms of data entry. The data and reportable information that ultimately is transferred to SISAR is generally not reportable for two to three years after the closing of a SAR incident file. Thus, it is not timely or reliable enough to contribute to strategic decision making. It is recommended that an assessment be made of ways to improve the inter-connectivity of SMMS and SISAR and/or consideration be given to procure a fully integrated SAR Mission Management and Data Reporting System to meet the needs of CCG and CF/DND.

Note: For a more detailed list of CRS recommendations and management response, please refer to Annex A—Management Action Plan.

INTRODUCTION

Background

In accordance with the fiscal year (FY) 2006/07 work plan, Chief Review Services (CRS) conducted an evaluation of the CF/DND component of the National Search and Rescue Program (NSP), which was last evaluated in 1992. Much has changed since then, including the introduction of the CH149 Cormorant & CH146 Griffon Helicopters and CF Transformation in FY 2005/06.

Objectives

The main objectives of the evaluation were to determine:

- The program rationale and relevancy of the CF/DND delivering SAR services and if there are viable alternatives that should be considered;
- The effectiveness of the current governance structure for SAR service delivery and the extent to which changes should or could be made to achieve positive impacts;
- The extent to which the CF/DND is able to achieve its SAR objectives and if there are measures of effectiveness in place that contribute to the sound management of the program; and
- The comparability of CF/DND SAR governance with that of allied military organizations from a benchmarking/best practices perspective.

Scope

The scope of the evaluation is internal to the CF/DND except for the necessary liaison with the CCG in relation to the functioning of the JRCCs and the maintenance of the SISAR.

Methodology

The evaluation used a mixed methods approach including a literature search, question programs for face-to-face and telephone interviews, facilitated group discussions and gathering and analysis of qualitative and quantitative data from a range of sources. Key information was sought from CF/DND senior leadership and managers at a range of levels, other government departments, allied military organizations, academia and private industry.

PROGRAM DESCRIPTION

Policy Basis

The policy basis to support CF delivery of SAR is provided for in the 1994 White Paper, which states:

"The Department of National Defence and the Canadian Forces make a vital contribution to the maintenance and operation of Canada's search and rescue capability. While elements of this capability are provided by other federal and provincial organizations, the Canadian Forces:

- are responsible for air search and rescue;
- provide significant resources to assist the Coast Guard in marine search and rescue;
- assist local authorities in land search and rescue; and
- operate three Rescue Coordination Centres that respond to thousands of distress signals every year.

Search and rescue represents a significant challenge for Canadian Forces personnel and their equipment. The distances involved can be enormous and the operating conditions very difficult. Nevertheless, for Canadians, safeguarding human life remains an absolute priority, and the Canadian Forces will continue to play a major role in this vital area."[1] Although this policy dates back to the 1990s, there are no foreseeable changes in responsibilities with respect to SAR.

National SAR Program

The national SAR objective is stated as follows: "…to prevent loss of life and injury through SAR alerting, responding and aiding activities that use public and private resources. Where possible and directly related thereto, reasonable efforts will be made to minimize damage to or loss of property. Through prevention measures focused on owners and operators most commonly involved in SAR incidents, the National SAR Program will attempt to reduce the number and severity of SAR incidents…."[2]

Although the NSP is considered a national program, the six separate federal-level SAR organizations have their own budgets for SAR and report activity plans annually through their respective Reports on Plans and Priorities. As well, these departments also report on individual performance through their own annual Departmental Performance Reports. The common link for these departments is the National Search and Rescue Secretariat (NSS), which works through ICSAR to establish operating frameworks to guide and influence a horizontal approach to the NSP.

[1] 1994 White Paper on Defence, Chapter 4, Protection for Canada.
[2] National Search and Rescue Manual (National SAR Manual) B-GA-209-001/FP-001 DFO 5449, Chapter 1, pp 27, May 1998.

The Federal Search and Rescue Program (FSP) logic model,[3] included at Annex B, provides a high-level view of the activities, outputs and outcomes of the federal component of the NSP. The CF/DND SAR capability plays a key operational role in supporting the strategic outcomes of the overall NSP. A proposed draft logic model for the CF/DND Component of FSP is included as Annex C.

The CF/DND component is one element of the overall NSP. Within the CF there are several relevant components that contribute to an effective capability including a C2 structure, a process to generate the required personnel and equipment, and finally the units and crews that directly respond to SAR incidents. One of the strengths of the CF/DND structure is the availability of other units which can be redirected from their primary duties to also participate in a SAR response should the requirement arise. Another national strength associated with the CF/DND is the Civil Air Search and Rescue Association (CASARA).

Spending

Annual forecast spending for FY 2006/07 for the federal component of the NSP has been estimated at $219 million. The CF/DND share of this forecast is reported as approximately $102 million or 46.6 percent of total Federal SAR forecasted expenditures.[4] The CCG, a special operating agency reporting to the Minister of Fisheries and Oceans, is a second significant participant in budgetary terms, forecasting $104 million in expenditures or 47.5 percent of declared expenditures for the federal component of the NSP. The other four federal organizations with NSP responsibilities are Parks Canada, Environment Canada (Meteorological Services Canada), the Royal Canadian Mounted Police and Transport Canada.

The seventh key participant in the federal component of the NSP is the NSS, which was established in 1986 to provide leadership to the NSP through the ICSAR. ICSAR, chaired by the Executive Director National Search and Rescue Secretariat (Ex Dir NSS), comprises representatives from the six federal-level SAR organizations. The NSS is a small organization of approximately 20 staff with a budget that fluctuates between $9 and $11 million per year, led by an executive director reporting to the LMSAR. The Minister of National Defence (MND) is designated as the Lead Minister for Search and Rescue (LMSAR) by Cabinet direction.

[3] Logic Model for the Federal Search and Rescue Program, Issued by the National Search and Rescue Secretariat, 29 March 2004.
[4] 2007-2008 Estimates, Part III Report on Plans and Priorities, p. 97.

FINDINGS AND OBSERVATIONS

Governance

C2 is functioning effectively and accountabilities are clear. There is Air Force doctrine for SAR at the strategic and tactical levels which is published and being employed. While development of the Air Force's operational doctrine for SAR is planned for FY 2008/09, current guidance exists in the form of the NSM, a joint CF/CCG document.

Command and Control

For the purposes of C2, Canada and the adjacent ocean areas are divided into three SAR regions as indicated in Figure 1. Figure 2 depicts the C2 structure for aeronautical SAR operations. Comd Canada COM leads the force employment of aeronautical SAR services through the three Search and Rescue Regional Commanders (SRR Commanders). In the cases of the Victoria and Halifax SRRs the commanders are senior naval officers who are also designated as the Commanders of the Joint Task Force (Pacific) and (Atlantic), respectively. The Commander 1 Canadian Air Division (Comd 1 Cdn Air Div), also designated as the Combined Forces Air Component Commander, commands the Trenton SRR. Located in each SRR is a JRCC, commanded by an Officer in Charge (OIC) that directs the response to any specific incident. In each case the OIC of the JRCC reports directly to his/her respective SRR Commander.

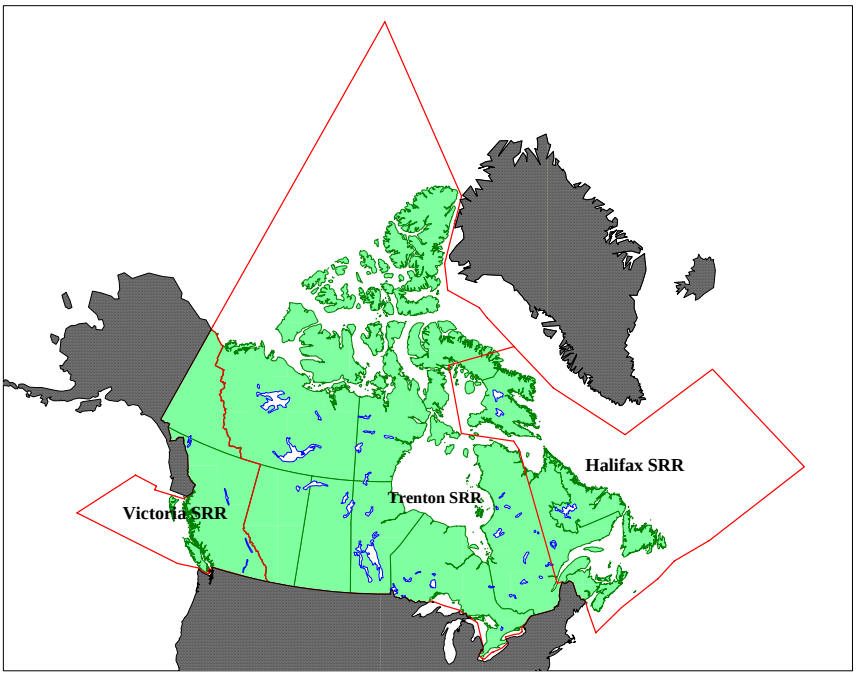


Figure 1. SRRs on Canada's Land Mass and off its Coasts. *The land and sea boundaries for SAR that Canada has committed to servicing by international agreement.*

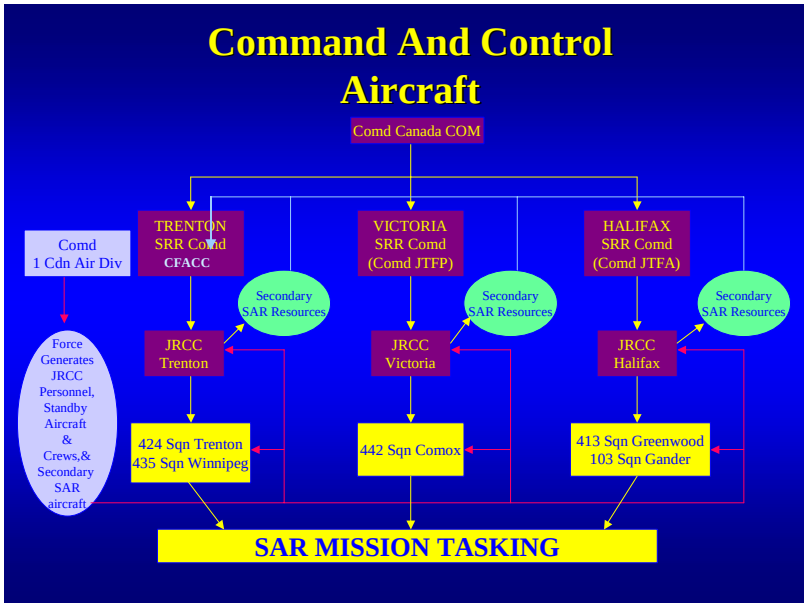


Figure 2. Command and Control Primary Domestic SAR Aircraft.

Figure 3 shows how C2 functions for marine incidents. Just as incidents requiring the deployment of air assets are responded to by the CF's JRCC coordinator staff, incidents requiring a marine response are addressed by the CCG. While overall responsibility rests with the OICs of their respective JRCCs each JRCC also has a Regional Supervisor Maritime SAR (RSMS) who reports operationally to the JRCC OIC and administratively to the CCG**.** In addition to contributing key operational staff and other resources to the three JRCCs in Victoria, Trenton and Halifax, CCG also provides, operates and equips Marine Rescue Sub-centres (MRSC). There are mission co-ordination and other administrative staffs at the two MRSC locations. Each of the sites (MRSC Québec and MRSC St. John's) are led by an RSMS.

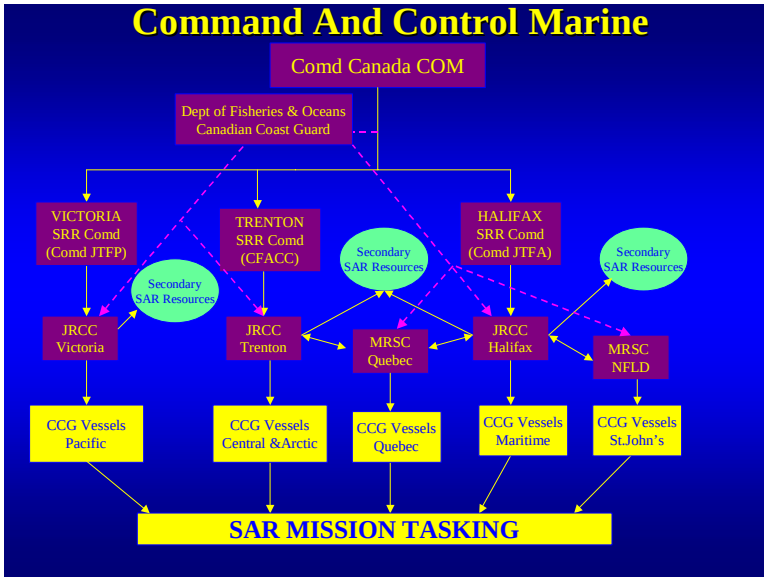


Figure 3. Command and Control Primary Domestic SAR Marine.

Command and Control in Support of SAR Operations

While the C2 structure reportedly functioned effectively from an operational perspective prior to the CF 2005 transformation, the evaluation team found that since transformation began, C2 for SAR is more effective. With the creation of Canada COM, force generation of SAR forces is assigned to CAS while the Comd Canada COM controls employment on operations. Commander Joint Task Force Atlantic (JTF(A)), Commander Joint Task Force Pacific (JTF(P)) and Combined Forces Air Component Commander (CFACC), as the SRR Commanders for the Halifax, Victoria and Trenton SRRs, respectively, are now responsible to the Comd Canada COM for the coordination, control and conduct of the SAR operations within their respective SRRs. To ensure the accountabilities of each commander were clearly understood, CAS and Comd Canada COM issued a joint instruction in June 2006 detailing the roles and responsibilities of each commander.

In each SRR, OICs of the JRCC reports directly to their respective SRR Commander. The OICs also have direct access to a designated Senior Military Officer (SMO) to coordinate assets outside of the primary standby units. For the two coastal SRRs, the SMOs are the senior naval operations officers (Captain (Navy)) appointed by JTF(A) and JTF(P). This arrangement is particularly effective due to the predominance of maritime SAR cases in those regions. For the Trenton SRR, the SMO is A3 APT Rdns at 1 Cdn Air Div HQ, Winnipeg. From the SRR commander down to OIC of the JRCCs, this short chain of command provides an effective capability to react quickly to SAR incidents.

Force Generation

Force generation responsibilities within the CF are primarily assigned to the three Environmental Chiefs of Staff and, in the case of aeronautical SAR forces, to CAS. While CAS establishes strategic policies, Comd 1 Cdn Air Div establishes, monitors and verifies the training and standards of the personnel assigned to primary SAR units. He/she is also responsible for identifying and managing the equipment and aircraft required to conduct SAR operations. Today's primary SAR forces operate Hercules and Buffalo[5] fixed-wing aircraft and Cormorant and Griffon helicopters from five main bases located across Canada as indicated in Figure 4.

[5] While planning for a replacement of the fixed-wing capability has begun, a specific solution and schedule is subject to the CF/DND Capability Development Process and government policy.

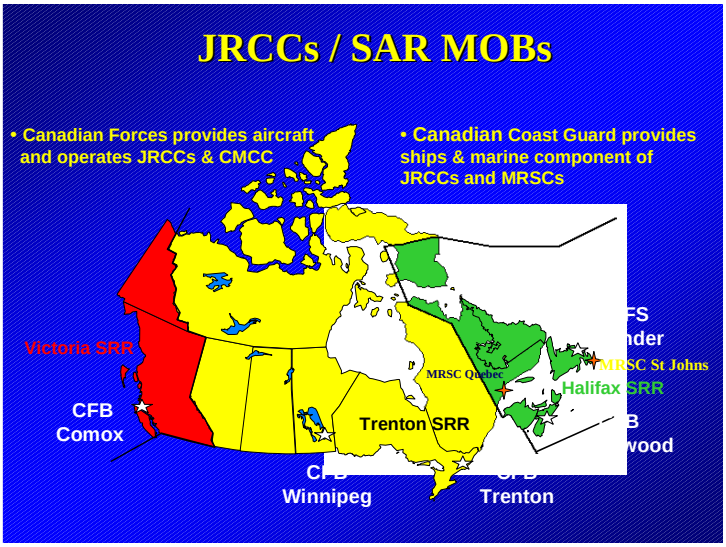


Figure 4. Joint Regional Coordination Centres and Primary SAR Main Operating Bases. *Primary CF SAR forces operate from five bases across Canada.*

CASARA and its Contribution to the NSP

CASARA is a federally incorporated non-profit volunteer organization that is sponsored through a federal contribution agreement between the Crown and the Association. The Crown is represented by MND. The federal contribution is in the order of $2.5 million annually, ensuring that a significant SAR capability exists in a volunteer organization. As shown in Table 1, CASARA supports, augments and offers a responsive, locally based capability that assists DND in its SAR Operations. It also supports Transport Canada in fulfilling its NSP responsibilities by actively participating in aviation safety and promoting SAR prevention. MND's representation in the contribution agreement is on behalf of the DND and Transport Canada.

CASARA's range of activities includes provision of aircraft and crews, SAR spotters, ground homing of emergency locator transmitters (ELT) alarms, assistance in the set-up and running of deployed search headquarters, local knowledge of geography, aviation safety training courses, and safety conscious aviators throughout the aviation community.

Year	2001	2002	2003	2004
CASARA Air Taskings	123	146	173	182
Aircraft Taskings other than CASARA	509	437	569	512
Chartered Taskings	43	27	25	12
Total Contracted Air Taskings	675	610	767	704
CASARA as % of Total Contracted Taskings	18%	24%	23%	26%

Table 1. CASARA's Contribution. *CASARA participation in SAR activities has increased during the period 2001-2004.*

Air Force Doctrine for Search and Rescue

Of the three levels of doctrine, within the Air Force, the strategic and tactical doctrines are published and are being employed. While development of the Air Force's operational doctrine for SAR is planned for FY 2008/09, current guidance exists in the form of the NSM, a joint CF/CCG document.

Strategic doctrine for the Air Force is provided by the recently updated B-GA-400-000/FP-000 (Canadian Forces Aerospace Doctrine) in which SAR is one of many mission types covered under the "Sustain" function. At the tactical level, published tactics, techniques and procedures (TTP) are employed by all SAR units and are updated quickly as changes to equipment require. At the operational level there is a void within CF publications. Filling that void is the NSM, a joint publication developed and issued by the CF/DND and CCG, but which has no stature as CF doctrine. Civilian organizations also use the NSM for guidance. The SAR Manual will be replaced by the IAMSAR Vol IV—Canadian Supplement.

Target date for the joint release of the bilingual document by the DND/CF and CCG is currently forecast for fall 2008.

Recommendations

OPI	RECOMMENDATION
Comd Canada COM	**Command and Control.** The current C2 relationships for SAR be articulated in 1 Cdn Air Div orders and included in the first update of the IAMSAR Vol IV publication.

Performance Measurement

While there is a system in place to measure personnel readiness to conduct SAR operations and manage SAR response in the most effective manner possible, the CF lacks strategic-level performance measures for its SAR capability. As well, the six federal-level SAR partners do not have available to them a National Standard of Service for SAR into which their individual performance standards can be integrated. Performance data integrity problems exist in the system due to software issues, although progress is being made in this area.

Objectives for Operational SAR

Readiness. There is an effective system of measuring the readiness of individuals and crews to conduct SAR operations. That information is used daily in the management of resources to ensure SAR forces are available at all times in accordance with the established readiness posture.

As SAR operations are predominantly reactive, the standards that are established and against which the CF is measured are those of readiness to react. The two components of readiness are:

- the abilities of the individuals and crews to respond to a variety of situations; and
- the speed with which an aircraft and crew can respond to a specific tasking from their JRCC.

In the first component, SAR crews maintain their ability through frequent training while recording specific drills and/or actions monthly, quarterly and annually. They are also routinely tested by the 1 Canadian Air Division Transport and Rescue Standards and Evaluation Team to ensure a common standard is maintained among all SAR crews across Canada. The standards team verifies unit records and will conduct a practical assessment of aircrews' tactical effectiveness. If at any time an aircrew member fails a standards examination, he or she is immediately removed from SAR standby duties until the deficiency is rectified and the crew member is re-tested.

The second component of readiness is the actual readiness posture that standby crews maintain. "…The minimum state of readiness for each rescue squadron shall be one SAR aircraft of each type, on 30 minutes standby during work hours and on 2 hours standby during quiet hours and statutory holidays …."[6] The posture within any SAR unit can be expressed as availability and as actual response. Information on availability is current and visible at JRCCs 24 hours a day. That information is also relayed to Comd 1 Cdn Air Div whenever a problem is evident so corrective action can be taken immediately. However, there is no running measure of failures in availability to show trends at a particular SAR unit. Instead, major changes such as a reduction in aircraft availability result in an impact assessment and a reassignment of resources, including secondary assets.

6 National Search and Rescue Manual (National SAR Manual) B-GA-209-001/FP-001 DFO 5449, ANNEX 4A Chapter 4, pp 99, May 1998.

Response. Data is also captured regarding the actual response to an incident and is used immediately to help guide a specific search. However, this information is time-sensitive and, due to problems in data integrity and collation, it is not available to aid a lessons-learned process for another two to three years after an incident. Thus, management awareness and resultant reaction to developing trends is delayed by that same two to three years.

In cases of actual response, data is captured on all SAR mission reports indicating the following:

- date and time the Squadron was tasked;
- take-off time of the primary SAR aircraft;
- transit time to and from the search area;
- SAR time (time spent in the search area doing SAR activities); and
- total time (sum of transit and search time).

When the target launch time is not met, reasons are described in the SAR mission report. Most SAR crew members reported favourably on the reasonableness and utility of the target launch times. While the 30-minute launch time (during regular working hours) was often tight, many reported consistently doing better than the 2-hour target for other times, averaging 70 to 75 minutes in those instances. Due to the problems of recovering current information, the actual response times after 2004 were not available.

Several interviewees raised another performance criterion that was developed in response to a request from the NSS for operational departments to produce a SAR service-level document and to establish roles and responsibilities relating to the SAR mandate. The document stated that "…a primary Canadian Forces SAR aircraft will be capable of arriving at the start of a search pattern (Commence Search Point) for any aeronautical or maritime SAR incident occurring in a Canadian search and rescue region within 4 hrs of being tasked for 90 percent of SAR incidents and within 11 hours of being tasked for 100 percent of SAR incidents. The above response times may be susceptible to delays due to extreme weather conditions, mechanical failures, or to adhere to flying regulations…."[7] While the CF did provide this requested documentation to the NSS, this measure has not been adopted by the NSS as a national standard.

In a 2005 study[8] related to response times the CF's departmental Operations Research team determined that there was a strong correlation between where Canada's SAR main operating bases (MOB) are located and where the highest numbers of incidents occur. As a result of the study, the Operations Research team concluded that Canada's current basing was "…very well positioned…" for helicopters and "…suitably positioned…" for fixed-wing assets to respond to SAR incidents occurring within Canada.

[7] "Canadian Forces Search and Rescue Levels of Service and Roles and Responsibilities" 3010-6 (D Air FE), signed by CAS, 21 August 2002.
[8] Operations Research Study "Support to Air Transformation (Search and Rescue)," ORD Technical Report TR 2005/15, April 2005.

CF Performance Measurement in SAR

Readiness and Response. Current performance measurement within the CF is based at the tactical and operational levels to ensure the current readiness posture is met with professional crews and that any response is managed in the most effective manner possible.

Aside from the preparation of forces and the immediate response there has been little focus on performance measurement beyond annual business plans. This has been hindered by the lack of the Air Force's identification of strategic-level performance measurement information requirements and the absence of a high-level National Standard of Service for SAR. While there are periodic reviews of a specific topic, such as the 2005 Operational Research Division (ORD) basing study, these studies cannot rely on the support of current SISAR data for their analysis as it is normally two to three years out of date.

The Air Force has begun to address part of this through the Total Air Resource Management (TARM) process that will synchronize the apportionment of the yearly flying rate with the annual business planning process. From a strategic-level performance measurement perspective, it is anticipated that TARM will give visibility to the priority and use of SAR assets and provide some high-level indications of the SAR capability in comparison with other aspects of Air Force operations.

In discussions on performance measurement and SAR with the staff of Canada COM HQ, it was determined that a review of performance measurement in SAR is scheduled for FY 2008/09.

NSS Role in Performance Measurement

Recent Treasury Board guidance on the management of government[9] indicates that "…the government is changing the way it works, the way it accounts to Canadians and they way it serves them…." The federal government's method for pursuing these objectives is accomplished, in part, by promoting a whole of government approach to governance, accountability and performance measurement that will be beneficial to individual departments, as well as strengthening horizontal initiatives. The federal portion of the National Search and Rescue program, comprising the NSS and its six partners—Environment Canada, Parks Canada, Canadian Coast Guard, Department of National Defence, Royal Canadian Mounted Police and Transport Canada—is an excellent example of just such a horizontal initiative that could benefit from this approach.

The NSS, through ICSAR, acknowledged the importance of strategic performance measurement in the federal portion of National Search and Rescue Program in a 1999 NSS sponsored study.[10] In December 2005, ICSAR approved the development of a performance measurement strategy that built on many of the constructs that already existed in partner departments; however, progress to date has been slow.

[9] http://www.informationmanagement.gc.ca/docs/guid-orient/concepts/concepts03_e.asp, updated 22 January 2007.
[10] Review of SAR Response Services, Issued by Director, Program Review Services, National Search and Rescue Secretariat, 30 June 1999.

As a completed National Standard of Service for SAR would serve all federal SAR partners, it is recommended that Asst CAS highlight the effort to date and propose to ICSAR that the NSS be tasked to move forward with this initiative.

Data Integrity

Search and Rescue Mission Management System (SMMS). The SMMS is a tool that improves the effectiveness of controllers and collects relevant data for each SAR incident. The data that is transferred to SISAR is generally not reportable for two to three years after the closing of a SAR incident file. Thus, while SMMS aids immediate operations, the time lag for any detailed analysis of data from SISAR significantly delays any potential improvements to overall program effectiveness.

The SMMS was developed to provide an integrated and comprehensive means for JRCCs and Marine Rescue Coordination Sub-Centres to effectively and efficiently coordinate/manage aviation and marine distress cases. The SMMS provides the JRCC and MRSC coordinators with a set of SAR software tools centred on the client-server application SARMaster.[11] SARMaster allows JRCCs and MRSCs not only to collect and manage vital information within their centres, but also to share information with other centres that may be assisting or sharing responsibilities in the conduct of a SAR mission.

Although primarily designed to manage SAR operations, SMMS is also the data source for SISAR, which is the ultimate statistical data repository for SAR operations. SISAR is managed and maintained by CCG, but receives its data input from the CF and CCG mission coordinator staff at the JRCCs and the MRSCs. While SISAR has powerful reporting capabilities, data integrity is a major issue partly due to a lack of quality control of data entered by the JRCCs. Also, some system deficiencies in exporting data from SMMS to the SISAR system need to be resolved.

While the CF/DND mission coordinators based at the JRCCs are significant contributors of input to SISAR through SMMS along with their CCG colleagues, DND is also a major beneficiary of data/information extracts from the system. DND obtains routine reports from SISAR, but also requires tailored data extracts for special studies (CRS, Operations Research, air requirements staff, 1 Cdn Air Div analysis), as well as briefings to the Minister and others.

Although some progress has been made on resolving these problems, SISAR's data manager could only provide assurances of data integrity up to 2004. The current date for implementation of an appropriate solution is October 2008.

[11] SARMaster is a case management tool specifically developed for the Canadian SAR process.

Recommendations

OPI	RECOMMENDATION
CAS	**Strategic-Level Performance Measurement.** CAS and Comd Canada COM determine their strategic-level performance measurement information requirements for SAR.
CAS	**Strategic-Level Performance Measurement.** A National Standard of Service for SAR be developed.
CAS	**Data Integrity** • An assessment be made of the effectiveness and efficiency of having SMMS and SISAR as two separate pieces of software linked by an interface to collect data and produce reports. • Consideration be given to implement a fully integrated SAR Mission Management and Data Reporting System to meet the needs of CCG and CF/DND.

Other Options

Other options in SAR delivery were considered both in contracted service delivery and in reviewing international SAR operations. The research clearly demonstrated that direct comparisons were limited by a lack of comparable data. The differences in geography and national approaches prevented direct international comparisons and the unique nature of SAR resulted in there being no similar capability within Canada against which cost or effectiveness could be measured. What can be stated is that Canada's SAR service is considered a model of effectiveness by other countries and that alternative solutions have been assessed and adopted in recent renewal activities.

Alternative Service Delivery

In considering alternative service delivery options, the evaluation found evidence that alternative solutions are assessed and adopted when there is a demonstrated advantage. As part of the New Search and Rescue Helicopter (NSH) project (circa 1995) to replace the Labradors, a number of options were analyzed and the decision was taken to proceed with a mix of military aircrew with civilian contracted support. In attempting to consider a potential, larger contracting solution (i.e., either a fully or even a largely contracted primary aeronautical SAR capability), the evaluation was limited by the fact that there is no other comparable service provided in Canada against which cost or effectiveness could be measured.

Benchmark Analysis

Lack of available, comparable, and consistent data impeded the evaluation team in drawing value-added comparisons among nations. There are international differences in the establishment of performances standards, SAR levels of service and basis for gathering statistical information. More importantly, geography, topography, climate, sources of funding and political systems have a direct impact on the countries' SAR organizational systems and goals which hindered a meaningful analysis in the context of this evaluation.

At the 2004 Saly-Portudal Conference,[12] SAR participants from most parts of the world shared views on some fundamental inherent principles in the management of complex services like SAR systems. These principles for an effective SAR system are: minimizing the number of decision-making levels, having an appropriate delegation of decision-making power and provision of the service should be as efficient as possible. DND/CF clearly meets two of the three main principles. The DND/CF portion of the NSP is designed to deliver the service by having the minimum number of decision-making levels and the proper delegation of the decision-making power, improving the effectiveness of the program. There was unanimous agreement among JRCC OICs and mission coordinators that the short chain of command and empowerment of JRCC co-ordinators is well-designed and functioning as intended.

[12] SAR Funding Conference (Saly-Portudal), 25-28 October 2004.

From interviews with Canadian SAR staff, consultation with other foreign governments, and literature reviews on national and international SAR issues, a consistent theme that surfaces is that Canada is viewed by many nations as one of the better models of delivering SAR services. Specifically, the JRCC concept adopted by Canada is considered a best practice and a model for many nations with established SAR capabilities and is the goal for others who are trying to put a capability in place.

Other Issues

Cospas-Sarsat System – Cease Processing 121.5 /243 MHz Alerting Services

The international Cospas-Sarsat System will cease satellite processing of 121.5 / 243 MHz beacon distress signals beginning 1 February 2009. While the responsibility is with individual aircraft and marine operators to ensure that they have the replacement 406 MHz ELT, or comparable device, a concern expressed by the CF/DND SAR responders is that the private citizens in need of assistance will continue to expect a timely SAR response whether they have the new technology or not. Since the SARSAT will no longer report the position of the old beacon, the risk is increased that there will be more SAR system time spent on lengthy searches and call-outs than is currently the case.

ANNEX A—MANAGEMENT ACTION PLAN

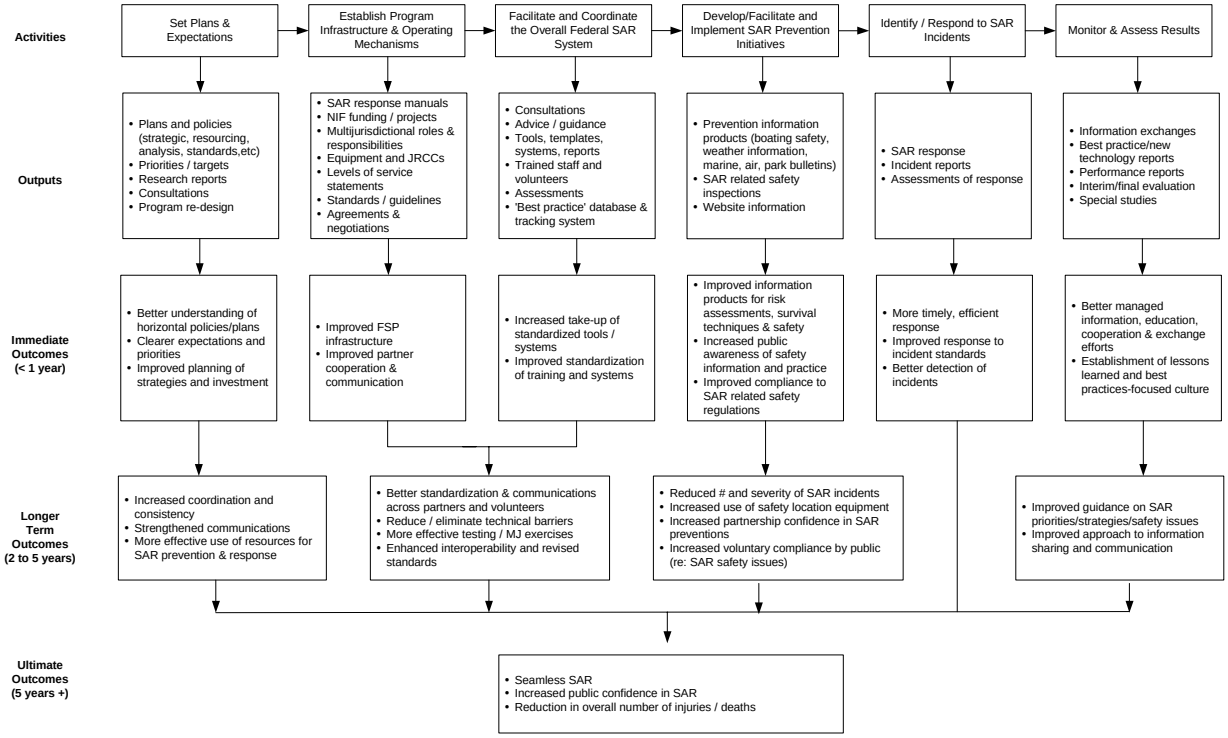
Ser	CRS Recommendation	OPI	Management Action	Target Completion Date
Governance				
1.	**Command and Control.** The current C2 relationships for SAR be articulated in 1 Cdn Air Div orders and included in the first update of the IAMSAR Vol IV publication.	Comd Canada COM	Coordination on-going to ensure post-transformation C2 relationships understood and reflected in relevant documents.	Any amendments decided upon will be included in the next available update to the IAMSAR Vol IV manual.
Performance Measurement				
2.	**Strategic-Level Performance Measurement.** CAS and Comd Canada COM determine their strategic-level performance measurement information requirements for SAR.	CAS	A proposed level of service statement for CF SAR signed by CAS prior to CF Transformation was submitted to the NSS in 2002. Its continued applicability remains valid today as re-affirmed by statistical analysis (November 2007). Unless it is endorsed as an acceptable standard within an overall national-level service agreement, there can be no basis to measure performance against it.	Completed in 2002
3.	**Strategic-Level Performance Measurement.** A National Standard of Service for SAR be developed.	CAS	Assistant CAS will table this item for discussion at the next ICSAR meeting with recommendations that: • NSS undertake the responsibility to complete a National Standard of Service for SAR; • ICSAR provide guidance to NSS; and • a timeframe for the work, including a target completion date, be determined.	Milestones to be confirmed following winter/spring 2008 ICSAR meeting.

ANNEX A

Ser	CRS Recommendation	OPI	Management Action	Target Completion Date
Performance Measurement (cont'd)				
4 a)	**Data Integrity** • An assessment be made of the effectiveness and efficiency of having SMMS and SISAR as two separate pieces of software linked by an interface to collect data and produce reports.	CAS	a) A solution to resolve the limitations of the two systems not communicating together has been identified. This will dramatically increase the effectiveness to produce the required report from SISAR. Compounding issues with business rules, data validation and standardization including the different needs from both organizations/ departments have slowed the finalization of the project.	October 2008
4 b)	• Consideration be given to implement a fully integrated SAR Mission Management and Data Reporting System to meet the needs of CCG and CF/DND.		b) This will be considered (in consultation with CCG) in due course given the imminent transfer to ADM(IM) Group of responsibility for support to SMMS under IM/IT rationalization	To be determined

ANNEX B—FEDERAL SEARCH AND RESCUE PROGRAM LOGIC MODEL (NATIONAL SEARCH AND RESCUE PROGRAM LOGIC MODEL)

Exhibit 3.0 Logic Model for Federal Search and Rescue (SAR) Program (FSP)



v4 (29/03/2004)

ANNEX C—CF/DND COMPONENT OF THE FEDERAL SEARCH AND RESCUE PROGRAM LOGIC MODEL

INPUTS	ACTIVITIES	OUTPUTS	OUTCOMES – IMPACT		
			Short	Medium	Longer term
Personnel Equipment	Establish CF/DND SAR Policy	Canadian Forces search and rescue policies are promulgated including levels of service, mission statements, departmental strategies and goals, unit resource allocations, and through the Interdepartmental Committee on Search and Rescue recommendations are made for national SAR policy initiatives relevant to Canadian Forces responsibilities and overall national system. Performance measures are developed and are available to enable ongoing assessment of program performance and influence program management. Liaison, coordination, and establishment of appropriate agreements with relevant national and international departments, organizations, agencies, and other groups public or private concerning SAR matters. Development and issuance of governing policy documents and support services for the Civil Air Search and Rescue Association in coordination with Transport Canada.	Clear objectives of CF/DND SAR program Clear performance indicators Effective capability for coordination in SAR community	Well understood/sound policy base	Efficient, cost effective SAR capability Reduction in numbers of injuries/ deaths

ANNEX C

INPUTS	ACTIVITIES	OUTPUTS	OUTCOMES – IMPACT		
			Short	Medium	Longer term
Financial resources Government Policies International Agreements	Force Generation	Provision of SAR aircraft in response to SAR incidents within the Canadian area of responsibility Provision of search and rescue units (SRUs) in support of the prosecution of aeronautical and maritime SAR operations and to exercise ultimate authority in the allocation of all SRUs during a SAR incident; Setting of priorities pertaining to the allocation SRUs to SAR operations Provision of skilled resources to operate the Canadian components of the SARSAT system. Establishment of Search and Rescue Region(s) and Joint Rescue Coordination Centre(s) to effectively deliver a response to aeronautical and maritime SAR incidents that occur within the Federal area of responsibility. Provision of SAR services that can effectively respond to aeronautical and maritime incidents occurring within the Canadian SAR area of responsibility. Co-ordination of the Civil Air Search and Rescue Association training requirements.	Effective SAR capability (pers and eqpt)	Highly trained personnel Reliable, appropriate equipment Other resources available as required	High level of Public confidence in SAR services in Canada
	Force Employment	Through the Joint Rescue Coordination Centers, control and conduct of SAR operations in relation to aeronautical and maritime SAR incidents within the Canadian area of responsibility Conduct of ground searches in relation to aeronautical and maritime SAR incidents Co-ordination of the Civil Air Search and Rescue Association operational activity. Coordinate allocation of SRUs to humanitarian incidents within the Canadian area of responsibility.	Saved lives Commitments to National SAR program, NATO and NORAD met Humanitarian assistance rendered (e.g., fuel delivery, Medevacs)	Capability is established and improves with operational experience Positive/or negative public impression of CF through media coverage	