

# Analysis of Small-Scale Contingency Operations NATO Study SAS-027

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## ABSTRACT

The NATO Studies, Analysis, and Simulation Panel has initiated a study, labelled SAS-027, to investigate the issues surrounding the planning for and analysis of Small-Scale Contingency (SSC) operations. This paper presents the work program for the study that will lead to the production of the final deliverables – a catalogue of models and methods, a Code of Best Practice (COBP) for analysis, an historical database of recent SSC operations, and a symposium for the benefit of the wider NATO and Partners for Peace (PfP) nations.

## BACKGROUND

The Post-Cold war era has witnessed a proliferation of peace support operations, humanitarian operations, and a variety of other smaller scale contingency operations. These have challenged NATO and others with their complexity, intractability, and cost. Such operations are likely to remain a major task for the alliance and the international community for the next decade.

Therefore, it is imperative that improved analytical tools, techniques, and approaches be developed as we search for ways to achieve more efficient, effective, and economic SSC operations. Such improvements will also ensure that future alliance capabilities are better balanced to deal with emerging operational challenges without hindering warfighting (Article V) capabilities.

In planning for this new realm of operations, nations continue to act on the premise that if one structures and equips oneself to handle warfighting tasks, then one should easily be able to handle the non-warfighting tasks. Nations are finding out that reality isn't quite so simple. In addition, the balance of a nation's forces and equipment suites quickly can become

stressed with the number and diversity of demands placed on them. SSC type operations place abnormally high demands on some military units and capabilities (trained infantry units, combat engineers, communications, command and control, tactical air transport, strategic transport, land aviation, medical units, and surveillance assets, for example), and much reduced demands on some traditional war-fighting units such as armour and artillery.

In setting up Study SAS-027 under the Studies, Analysis, and Simulation Panel, NATO has acknowledged that analysis can contribute to improving the efficiency, effectiveness, and economy of SSC operations. What makes SSC operations different? How can we measure success in these operations? How can we better plan for these operations? What types of analytical tools are most useful? SAS-027 will attempt to address these wide-ranging questions and issues.

The SAS-027 Study was set up with a two-year mandate. The inaugural meeting was held in Washington, DC, in April 2000.

## **DEFINITIONS**

One of the first tasks of the group was to simply define what is meant by a “Small-Scale Contingency.” It was argued that the scope is so broad that any definition would be hopelessly unsatisfactory. None-the-less, the following definition was tendered: “a SSC is an operation involving a coalition force initially deployed for up to six months and of no more than 100,000 personnel. The operation may continue at significantly reduced force levels for a longer duration.”

“The emphasis is on military contributions to operations whose primary objectives are diplomatic or humanitarian. The task of the military is to create and maintain a set of conditions within which a non-military goal can be achieved.”

## **PARTICIPATION**

The following nations and agencies are active participants in SAS-027 (Table 1). Two of the NATO ‘Partners for Peace’ nations, Sweden and Georgia, have opted to participate. Also, an invitation to participate was extended to Australia who had expressed an interest in this particular study.

## **ACTIVITIES AND DELIVERABLES**

The study has identified a set of deliverables, and a chain of key activities leading to the production of these deliverables. The primary vehicle for the group is a four-part questionnaire that will be filled out by the participating nations. The following questions are being asked:

NATION	AGENCY	REPRESENTATIVE
Chairman	DSTL(UK)	R. Underwood
UK	MoD & DSTL	M. Neill, A. Caldwell, A. Shoolbread, G. Beare
USA	OSD PA&E	Cdr A. Gangsaas, W. Brundage, R. Orlov, M. Lidy
Canada	OR Div	D. Mason
Netherlands	TNO	S. Van Merrienboer, E. Van Zijderfeld
Norway	FFI	T. Langsaeter
Turkey	Gen Staff	Maj A. Ozkil, Capt. O. Kulac
(NATO)	NC3A	P. Chouinard
France	DGA	V. Auger
Italy	CJO IT	A. Venanzi
Sweden	FOA	B. Backstrom, T. Eriksson, E. Limen
Georgia		N. Javakhishvili
Australia	DSTO	G. Searle, S. Bocquet

*Table I:* National participation in NATO SAS-027.

1. Describe your national planning process for SSC operations, including both deliberate planning for future operations and reactive planning for real imminent operations;
2. Describe how your nation employs scenarios within its SSC planning processes, and provide a brief overview of the set of scenarios you employ;
3. Describe the role of Operational Research in the analysis process of SSC, and describe those formal and informal approaches, methods, models, tools, and techniques employed; and
4. Provide details on those instances since 1990 that have involved deployment of your nation's defence forces outside your national boundaries on SSC operations.

Annex A contains the Canadian responses to the above questions. The work of the SAS-027 group will lead to the production of the following deliverables.

#### CATALOGUE OF EXISTING TOOLS AND TECHNIQUES FOR SSC ANALYSIS

As a first step, the study team will take inventory of the tools, techniques, methodologies, models, etc., that participating nations are employing (or are in the process of developing) to apply to studies on SSC topics. The full breadth of possible topics for analysis is considered. This would include tools/methods to support the reactive planning in support of imminent SSC operations, as well as the deliberate planning of force structures, equipment suites, readiness postures, etc., to meet the full spectrum of anticipated future SSC operations. All aspects of an operation would be considered, including deployment, operational effectiveness, sustainment, and recovery.

The study will focus not only on documenting the inventories of relevant tools in participating NATO nations, but in attempting to identify potential areas of future collaboration in model/tool development.

## HISTORICAL DATABASE OF PAST SSC OPERATIONS

Planning must be done from the perspective of history. The requirements for future SSC operations — be they force structures, equipment suites, procedures, tactics, etc. — will be heavily influenced by what has been experienced from past operations. Analyses that deal with SSC issues will undoubtedly benefit from having a qualitative and quantitative picture of the nature of past SSC operations. Therefore, the SAS-027 study team decided to generate a database of information concerning SSC-type operations that have been conducted in the recent past.

Canada has accepted the lead in this area, and has contracted a professional military historian, Dr. Sean Maloney, to compile such a database. Dr. Maloney is a part-time lecturer at the Royal Military College in Kingston, Ontario.

The database will cover all Small-Scale Contingency operations worldwide since 1990, which have involved the commitment of a nation's defence forces outside its national boundaries. The year 1990 was chosen for several reasons. Firstly, it coincides with the termination of the Cold War when nations started to turn their focus to a broader world security environment. An equally important reason, however, was practicality. We will assess the effort and value associated with this initial production, and then possibly push to expand the database further back in time.

The database will include the following data attributes on each SSC operation identified:

- a. Geographic location;
- b. Dates of start and finish;
- c. Controlling organisation;
- d. Background description of this conflict/event;
- e. Mission statement (of controlling organisation in this operation); and
- f. Overview of opposing forces, if applicable.

For each instance in which a nation has committed forces to the SSC the following data elements will be collected:

- a. Dates of start/finish of commitment;
- b. National mission statement;
- c. Number and types of units assigned;

- d. Rotational information (dates, identity of new units);
- e. Total number of troops deployed, by phase;
- f. Regular/reserve force ratio;
- g. Professional soldier/conscript ratio; and
- h. Numbers and types of equipment deployed.

The data elements have been designed with the view to supporting future analyses of the requirements for nations involved in SSC operations. The focus is on what forces were sent, and what was the general nature of the operation, rather than the details of what events actually transpired at the time.

NATO nations are providing releasable background documents that might be available on the deployments of their own nation's forces in SSC operations. These documents will supplement the open sources that Dr. Maloney will research in compiling this database. The final database is scheduled for completion by April 2002.

#### CODE OF BEST PRACTICE

The primary deliverable from this study will be a Code of Best Practice (COBP) for the analysis of SSC operations.

In general, this analyst guidance document will identify tools, techniques, methodologies, and models suitable for application to the analysis of defence forces for SSC operations. The term "analysis" will be used in its broadest possible scope. The COBP will identify important factors, appropriate measures of merit (MOM), the strengths and weaknesses of various analytical approaches and models, and general rules-of-thumb for dealing with issues in this domain.

MOMs will receive particular attention in the COBP. The effectiveness of military forces in a non-warfighting setting can have many subtle and diverse dimensions. Clearly, any analysis of SSC issues must first come to grips with the problem of defining what it means to be effective or successful in such operations. Measures of effectiveness and MOMs have been the focus of this and earlier Cornwallis symposia and the group will benefit from the previous attention that this topic has received in this forum.

#### A FINAL SYMPOSIUM FOR NATO AND PFP NATIONS

The final deliverable will be a symposium to showcase the deliverables of the study, and to demonstrate those national tools and methods that will be applicable to the analysis of SSC issues. The audience will be the defence analysis and planning organisations within all NATO and Partners for Peace (PFP) nations.

## ANNEX A: CANADIAN SAS-027 QUESTIONNAIRE RESPONSES

### QUESTION 1: OVERVIEW OF CANADIAN PLANNING PROCESSES FOR SSCS

1. Deliberate Planning. The development of formal plans for possible future SSC operations in Canada is the responsibility of the J5 (Plans) cell within the Joint Staff of the Department of National Defence (DND). The process is very much reliant on having experienced planners in this cell, and uses as its primary vehicle the conventional “Staff Check” process. A comprehensive set of defence force packages (e.g. helicopter squadron, infantry battalion, recce squadron, naval task group, ...) have been identified. Periodically, depending on an assessment of current world events/hotspots, a Staff Check exercise will be imposed on the departmental organisations responsible for the selected force packages identified as potentially deploying to a given theatre with a given mission. The Staff Check process basically assesses the state of readiness of the identified forces for that mission. In reality, it is seldom actually actioned. There exists a set of about 20 plans that are being updated and reduced in number. Eventually there will exist a number (less than 10) of updated formal plans addressing a range of classes of operations, SSC and others, representing our national commitments. The Joint Staff meet every workday morning to ensure issues are being dealt with in a responsive manner.
2. Reactive Planning. The Joint Staff organisation conducts such planning with heavy reliance on experienced military officers within their organisation. Experienced officers within the J1 (Pers, Med), J2 (Intel), J3 (Ops), J4 (Log/Move), J5 (Plans), J6 (IM/IT), J7 (Trg, Lessons Learned), and J8 (Legal) cells all participate in the process to ensure that all details of the imminent operation are handled. All types of operations and all phases of the operation are dealt with using more-or-less the same planning organisation and processes.

### QUESTION 2: THE USE OF SCENARIOS

The Canadian Defence Department has identified a set of 11 scenarios for the support of defence force planning. They are generic in the sense that they do not identify the exact geographic locale or the nationality of the threat forces involved. The level of detail in these scenarios is minimal, but a number of the higher intensity scenarios are being fleshed out to a level of detail that would permit conflict simulation tools to be applied. The scenarios cover the full range of phases. The scenarios are employed in future force structure studies, and in scenario-based analyses in support of capital equipment acquisition programs. This set of scenarios has an approximate mapping to the set of (6 to 20) deliberate operational plans discussed in the previous section. These scenarios are as follows:

1. Scenario 1: Search and Rescue in Canada. The Department of National Defence (DND) has clear search and rescue (SAR) responsibilities. To fully capture the capabilities required to carry out this mission, three sub-scenarios are proposed. The first involves a rescue from a ship at sea. The second involves a search and rescue of an overdue small aircraft in the north. The third scenario entails a major airliner that has been forced down in a remote area in the north. Each of these sub-scenarios presents unique challenges for the Canadian Forces (CF) in carrying out their SAR responsibilities. SAR is one of the few CF missions where the full operational role is carried out on a day to day basis; thus expansion of these incidents should not require much effort. Any of these scenarios would operate concurrently with normal search and rescue activity.
2. Scenario 2: Disaster Relief in Canada. The CF plays a key role in responding to natural and man-made disasters. The proposed scenario is one developed by Emergency Preparedness Canada and concerns an earthquake that has occurred on the West Coast of North America. Major devastation has occurred north and south of the border, resulting in significant damage. The CF is called in to assist in the relief of human suffering and to help authorities re-establish the local infrastructure.
3. Scenario 3: International Humanitarian Assistance. The CF is being called upon to provide humanitarian assistance/ disaster relief in an international setting. The proposed scenario involves a Central African country, where, as part of an international force, elements of the CF are to provide a secure environment, deliver humanitarian aid to relieve human suffering and help improve the situation until non-governmental organisations (NGOs) once more can function and assume control.
4. Scenario 4: Surveillance/ Control of Canadian Territory and Approaches. The provision of surveillance and control is an integral part of CF activities in Canada. The proposed scenario situates this day to day responsibility, using incidents of drug smuggling/ landings of illegal immigrants as catalysts. In this scenario the CF work in co-operation with other government departments (OGDs) to conduct surveillance and control operations.
5. Scenario 5: Evacuation of Canadians overseas. The CF must maintain the capability to assist the Department of Foreign Affairs and International Trade (DFAIT) in the protection and evacuation of Canadians from areas threatened by imminent conflict. The scenario proposed involves a permissive evacuation of Canadians and other nationals by a combined force.
6. Scenario 6: Peace Support Operations (Chapter 6). Canada is strongly in favour of a vigorous and effective UN, and believes that situations requiring international military action should be dealt with in accordance with the terms of the Charter. The proposed peacekeeping scenario involves the CF participating in a UN peacekeeping force brokering a cease-fire along the border between the two countries, as well as enforcing a naval embargo and a no-flight zone.

7. Scenario 7: Aid of the Civil Power. Throughout Canadian history, provinces have been able to call upon the CF to maintain or restore law and order where it is beyond the power of civil authorities to do so. The proposed scenario centres on CF assistance in the establishment of law and order in a time of severe drought in Canada where disputes have escalated beyond the point where local authorities can cope.
8. Scenario 8: National Sovereignty/Interests Enforcement. Canadians have made clear their wish to protect Canada's natural resources from illegal and highly damaging exploitation. The proposed scenario uses this theme, centring the operation around the protection of mineral deposits off Canada's coasts. The mission is to assist OGDs in the enforcement of Canadian claims in the extended Economic Exclusive Zone.
9. Scenario 9: Peace Support Operations (Chapter 7). As previously stated, Canada is supportive of a strong UN. The scenario proposes that elements of the CF, as part of a coalition, are to conduct operations to restore pre-conflict boundaries during a dispute between two countries. This type of operation has already occurred, and is representative of peace support operations mandated under Chapter 7 of the UN Charter.
10. Scenario 10: Defence of Canadian/ U.S. Territory. Canada is committed to play its part in the defence of the combined territories; the planning of which has evolved into the Canada U.S. Basic Security Plan. The proposed scenario involves the timely provision of threat warning and attack assessment in times of heightened tension. In an attempt to extract economic concessions from Canada, a nation plans to begin a series of hit-and-run military incursions. In co-operation with the United States, the CF undertakes operations to counter this threat.
11. Scenario 11: Collective Defence. In the 94 Defence White Paper, Canada re-affirmed its commitment to contribute to international security. Indeed, Canada's defence policy is built on the foundation of collective defence. The scenario proposed, which involves the invasion of a NATO member state, illustrates one particular example of this commitment and draws upon clear commitments.

### QUESTION 3: OPERATIONAL RESEARCH AND MODELS EMPLOYED

The five-person Joint Staff Operational Research Team (JSORT) supports planning for all types of operations. The JSORT generally employs methods and models of relatively simple form, as operational planning assistance is not as technical a field as some others are. 'Quick and dirty' methods often are better suited, especially in reactive planning situations. Techniques applied range from spreadsheet type methods to help organise and provide checklists for established plans (often with the facility to conduct 'what-if' excursions from those plans), to 'whiz-wheel' calculators for various deployment estimates, to high level force-on-force simulations.



At a higher level, the five-person Strategic Planning Operational Research Team (SPORT) supports planning for future operations at the force structure level – i.e. identification of the future force structures required to meet the projected demands of future operations. Most tools and methods applicable in this area tend to be problem structuring and decision support methods. Both JSORT and SPORT use the following models and methods in the broadest context of ‘planning for SSCs’. Note that simple spreadsheet-based tools used to document organisations and equipment, or to serve as a checklist for planners are not covered. These items have no analytical component.

<b>NAME</b>	<b>Flashpoints</b>
Developer	Dr. P.F. O’Neill, Canada
Model Domain	Operational planning, Force structure balancing
Model Class	Strategic analysis and prediction tool
Model Status	In operation
Quantitative Methods	Historical data analysis and projection methods
Qualitative Methods	Strategic assessments by experts
Resources Required	1-2 person-months annually to maintain strategic analysis database (Excel)
Special Facilities	None
Software Implementation	MS Excel
Frequency of Use	Ongoing
Documentation	“Flashpoints Analysis”, by Dr. P.F. O’Neill, DLOR RN 9605
Strengths and Weaknesses	Combines information from diverse sources on world trouble spots. Shows historical demands for Canadian Forces units. Of course, it is only as good as the information entered.

<b>NAME</b>	<b>Risk Analysis For Linked Systems (RAFLS)</b>
Developer	Dr. P.F. O’Neill, Canada
Model Domain	Operational planning
Model Class	Critical path-type methods
Model Status	In operation
Quantitative Methods	Evaluates linked functional requirements for various operational units, using a “level of service” measure.
Qualitative Methods	Employs graphic representations within MS Excel environment to facilitate user appreciation of complex inter-unit dependencies
Resources Required	To Maintain: minimal Typical Application: 2-3 person-months to build application and perform analysis
Special Facilities	None
Software Implementation	MS Excel and Tom Sawyer Graph Editor Toolkit
Frequency of Use	Several times per year
Documentation	Briefing notes only.
Strengths and Weaknesses	Not assessed.

<b>NAME</b>	<b>Army Risk Assessment Model (ARAM)</b>
Developer	Dr. P.F. O'Neill, Canada
Model Domain	Operational planning
Model Class	Enterprise project management
Model Status	In operation
Quantitative Methods	Assessment of time and resource allocations in a project management framework, identifying troop availability and readiness
Qualitative Methods	Relies on and complements traditional manual 'staff check' process.
Resources Required	To Maintain: 1 person-month annually to update inter-unit relationships Typical Application: minimal, if information current.
Special Facilities	None
Software Implementation	Primavera project management software environment
Frequency of Use	Unknown
Documentation	Only briefing notes.
Strengths and Weaknesses	New tool, difficult to assess.

<b>NAME</b>	<b>Theater Analysis Model (TAM)</b>
Developer	Booz, Allen, and Hamilton, Inc., Washington, DC, USA, under contract to US DoD (JCS J-8)
Model Domain	Mission rehearsal, Operational planning
Model Class	Simulation of explicit operations over space and time
Model Status	In operation
Quantitative Method	Attrition algorithms based on weapon scores
Qualitative Method.	Human decision makers in the loop
Resources Required	To Maintain: < 1 person-month to maintain expertise annually Typical Application: about 6 person-months, including scenario development, data input, and play.
Special Facilities	Map boards, pins, etc., to facilitate player visualisation
Software Implementation	PC-based software, no special requirements, no access to code.
Frequency of Use	2-3 times in past 10 years
Documentation	"The Theatre Analysis Model (TAM) Version 3.10, Documentation of the Campaign Model", by C. Menard, DLOR Research Note 91/6. "Overview of the Theatre Analysis Model (TAM)", by D.G. Brown, DLOR Research Note 91/9.
Strengths and Weaknesses	Its strength is its flexibility and responsiveness

<b>NAME</b>	<b>Hierarchical Framework for the Analysis of Mission Effectiveness (HFRAME)</b>
Developer	OR Division, Canadian Dept of National Defence
Model Domain	Force structure balancing (balance of investment)
Model Class	Problem structuring and analysis tool (decision support)
Model Status	In operation
Quantitative Methods	Simple comparison to performance standards
Qualitative Methods.	HFRAME provides a framework for judgements of experts
Resources Required	To Maintain: est. 1 person-week for user to learn before use. Typical Application: 2-12 person-months of effort, depending on scope modelled and the range of expert inputs required
Special Facilities	None
Software Implementation	C++, running under Windows on PC
Frequency of Use	1-2 applications per year
Documentation	Software released within NATO/PfP nations. HFRAME Users Guide included
Strengths and Weaknesses	HFRAME is a flexible, generic method applicable to a wide range of hierarchical, balance-of-investment type problems. It deals with simple step-type performance scales and employs simple performance standards logic, thereby avoiding problems associated with modelling artificial and overly-complex relationships. The primary downside of a tool like HFRAME is extracting the diverse and extensive inputs required from the subject matter experts.

#### QUESTION 4: HISTORICAL INFORMATION ON PAST SSC OPERATIONS

The document *Canadian Forces Operations, 1970-2000* is completed and available for release. The contract is in place with Dr. Sean Maloney to compile the historical SSC database for SAS-027, using the national inputs gathered by this questionnaire as primary information sources.