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Audit of the Chemical, Biological,  
Radiological and Nuclear (CBRN)  
Defence Omnibus Project

May 2008

7050-11-40 (CRS)



Canada 

## **CAVEAT**

This audit is not intended to assess the performance of contractors; rather, it is an internal assessment of capital acquisition processes and practices within the Department of National Defence (DND).

This audit represents a high level of assurance.



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## ACRONYMS AND ABBREVIATIONS

ADM(Fin CS)	Assistant Deputy Minister (Finance and Corporate Services)	DSCS	Director Strategic Corporate Services
ADM(IM)	Assistant Deputy Minister (Information Management)	DSSPM	Director Soldier Systems Program Management
ADM(Mat)	Assistant Deputy Minister (Materiel)	EPA	Effective Project Approval
CAS	Chemical Agent Sensor	FMAS	Financial Managerial Accounting System
CBRN	Chemical, Biological, Radiological and Nuclear	FSD	Fixed-Site Detector
CF	Canadian Forces	FY	Fiscal Year
CFD	Chief Force Development	GOV	Governance
CID	Capability Investment Database	HHD	Hand-Held Detector
CLS	Chief of the Land Staff	ID	Identification
CMP	Chief Military Personnel	IOC	Initial Operational Capability
COTS	Commercial Off-the-Shelf	IRM	Integrated Risk Management
C Prog	Chief of Programme	IRU	Immediate Reaction Unit
CRS	Chief Review Services	KNet	Knowledge Network
DAOD	Defence Administrative Order and Directive	MA&S	Materiel Acquisition and Support
DCSEM	Director Combat Support Equipment Management	MCF	Management Control Framework
DFPPC	Director Force Planning and Program Coordination	MOTS	Military Off-the-Shelf
DGJFD	Director General Joint Force Development	NBC	Nuclear, Biological, Chemical
DGLEPM	Director General Land Equipment Program Management	NBCD	Nuclear, Biological, Chemical Defence
DGMSSC	Director General Materiel Systems and Supply Chain	NCE	National Command Element
DJCP	Director Joint Capability Production	OPI	Office of Primary Interest
DMGSP	Director Materiel Group Strategic Plans	PAG	Project Approval Guide
DMPP	Director Materiel Policy and Procedures	PCO	Privy Council Office
DND	Department of National Defence	PDS	Personal Detection System
		PD	Project Director
		PL	Project Leader
		PM	Project Manager
		PMB	Program Management Board
		PMPR	Project Management Personnel Resources
		PMWG	Project Management Working Group
		PPA	Preliminary Project Approval
		PWGSC	Public Works and Government Services Canada



R&D	Research and Development	SS(ID)	Synopsis Sheet (Identification)
Recce	Reconnaissance	TB	Treasury Board
RFP	Request for Proposal	TBD	To Be Determined
RMF	Risk Management Framework	WBS	Work Breakdown Structure
ROM	Rough Order of Magnitude	VCDS	Vice Chief of the Defence Staff
SI&DS	Sensor Integration and Decision Support	VP Bio Sentry	Vital Point Biological Sentry
SOR	Statement of Requirement		
SRB	Senior Review Board		



## RESULTS IN BRIEF

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The objective of this audit was to provide assurance that the CBRN Defence Omnibus Project has governance, risk and management control frameworks in place to ensure a cost-effective acquisition.

### Findings and Recommendations

**Project Governance.** Project leader (PL) ranks were not compliant with the criteria set in the Project Approval Guide (PAG). Project oversight is a systemic issue for 76 other capital projects worth \$10.8 billion where the PL is either over- or under-ranked. Appropriate senior management experience and span of control is not in place. Governance is also hampered by the 62 percent Project Office vacancy rate for military and civilian positions in the Omnibus project umbrella. With respect to project scope, only 8 of the 16 CBRN inter-related defence projects worth ..... are governed by the Omnibus project. Other projects would benefit from centralized governance and dedicated support.

It is recommended that capital acquisition PL rank comply with PAG criteria and Project Office staffing be addressed with a risk-based approach. To optimize governance, other CBRN defence inter-related projects would benefit from the Omnibus project centralized governance and dedicated support such as logistics and procurement.

**Operational Requirements.** CBRN Defence Omnibus sub-projects' Statement of Requirements (SOR) .....  
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<sup>1</sup> .....

### Overall Assessment

Moderate improvement is required in project governance and risk management. A number of the shortfalls are systemic to departmental policy and oversight and are beyond the control of the CBRN Defence Omnibus Project Office.

Assurance cannot be provided that the CBRN Defence Omnibus acquisition is cost-effective due to the Vital Point Biological Sentry (VP Bio Sentry) sub-project contract award and amendment process.

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..... By streamlining these processes by one month, \$8.6 million in Department of National Defence (DND)-wide capital equipment project management resources could be assigned to other projects.



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**Schedule.** Based on the Program Management Board (PMB) target acquisition cycle of 55 months from project identification to contract award, CBRN Defence Omnibus sub-project delays have increased project management costs by an estimated \$5.2 million and have delayed .....

It is recommended that the PMB seven-month contract award target be set at a more attainable milestone and the expenditure approval process be streamlined to reduce project management costs associated with schedule slippage in the future.

**Contract Management.** A lack of DND involvement in the \$31.7-million VP Bio Sentry contract negotiations resulted .....

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..... In addition, a high proportion of payments ..... are to be made prior to the first delivery of the VP Bio Sentry equipment for a modified military off-the-shelf (MOTS)/commercial off-the-shelf (COTS) product.

It is recommended that the CBRN Defence Omnibus Project Office negotiate spares and consumables before contract award or as a contract amendment for other sub-projects. To ensure timely payments, project management and PAG training should be improved so that capital acquisition project offices provide input into contract negotiations and terms and conditions in accordance with procurement policy.<sup>2</sup>

## **Innovative Management Practices**

### **Governance**

- One joint annual Senior Review Board (SRB) for 13 CBRN projects instead of individual SRBs;
- Project Office in-house training specific to CBRN Defence;
- Dedicated CBRN Omnibus support staff (integrated logistics support, training, finance, procurement); and
- CBRN Defence capability development Project Director (PD) Handbook.

### **Risk Management**

- Five-level risk severity assessments;
- Monthly Project Status Report on risk to CBRN Omnibus PD; and
- Sub-project Risk Management Plans in place.

### **Options Analysis**

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..... RFP option clauses included to obtain additional units at a lower price than the price and availability at EPA.

<sup>2</sup> PWGSC Supply Manual, Chapter 3, Annex 3.1 Code 4.6.2, Chapter 7, 7D448 <http://www.tpsgc-pwgsc.gc.ca/app-acq/ga-sm/chapitre03-chapter03-eng.html#ann31>.



**Options Analysis.** Options analyses were conducted for only three of the four CBRN Defence Omnibus sub-projects. Although a mandatory requirement in the PAG, the options analyses did not fully address detailed costing of options, life cycle costs, industrial regional benefits, environmental concerns, and procurement strategy implications. During the options analysis phase, three of the four sub-projects' budgets had to be reduced from the rough order of magnitude (ROM) estimates, ..... More rigour must be applied when providing estimates to reduce the risk of not meeting all mandatory requirements. In accordance with the PAG, omnibus sub-projects do not require a Synopsis Sheet (Identification) (SS(ID)). Most SS(ID)s for omnibus projects do not specify the options that will be examined in each sub-project—the main purpose of the SS(ID).

It is recommended that the CBRN Defence Omnibus Project Office increase the rigour of project options analysis with costing for other sub-projects. The PAG should be revised to require an SS(ID) for each omnibus sub-project ("child").

**Information for Decision Making.** Some of the project approval documentation lacked complete information to support sound decision making. Excused delays to vendor reporting requirements after contract award will increase future workload of the Omnibus project staff and delay project schedule, as many of the outstanding reports will require review and analysis.

It is recommended that the CBRN Defence Omnibus Project Office provide complete sub-project approval documentation in other sub-projects and link key vendor reports to payments in future contracts.

**Risk Management.** The CBRN Defence Omnibus sub-projects did not quantify the cost of schedule risks, align risk severity with contingency funding, or report risks to senior management. Vendors were not required to quantify risks nor were they given specific reporting requirements.

It is recommended that the CBRN Defence Omnibus Project Office quantify risks, report them to senior management, align them with contingency funds and require vendors to report on risks in high-value contracts.

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

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## INTRODUCTION

### Background

The ..... CBRN defence acquisition program consists of 16 individual projects (see [Annex C](#)). Eight of these projects, listed in Table 1, worth ..... in total are governed by the CBRN Defence Omnibus Project. At the time of audit, expenditures had only amounted to \$16 million.

Ser	CBRN Defence Omnibus Sub-Projects	Value (\$M)	Phase
1	.....	.....	.....
2	.....	.....	.....
3	.....	.....	.....
4	.....	.....	.....
5	.....	.....	.....
6	.....	.....	.....
7	.....	.....	.....
8	.....	.....	.....

**Table 1. CBRN Defence Omnibus Projects.** *The four sub-projects in the options analysis phase were not examined in detail.*

**Rationale for Audit.** .....<sup>3</sup> .....  
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### Objective

The objective of this audit was to provide assurance that the CBRN Defence Omnibus Project has governance, risk and management control frameworks in place to ensure a cost-effective acquisition.

<sup>3</sup> .....



## Scope

The audit scope included:

- The complete acquisition cycle from identification to implementation for the four sub-projects that were no longer in the options analysis phase;
- Interdependencies with the eight other CBRN Defence projects, worth ..... ([Annex C](#)); and
- A sample of expenditures from fiscal year (FY) 2002/03 to FY 2006/07 totaling \$10.1 million (63 percent coverage of all expenditures at the time of audit).

Scope limitations:

- The audit of CBRN defence equipment contractors and sub-contractors was not included (an Audit Services Canada role).

## Methodology

- Data analysis from DND information systems: Financial Managerial Accounting System (FMAS), Dynamic Object Oriented Requirements System, Defence Integrated Human Resource System, Canadian Forces Supply System, and the Capability Investment Database (CID);
- Interviews with key staff within the CBRN Defence Omnibus Project Office, Director Force Planning and Program Coordination (DFPPC), Director Strategic Finance and Costing, Director Strategic Corporate Services (DSCS), Director Materiel Policy and Procedures (DMPP), and Chief Military Personnel (CMP);
- Project documentation review including approval synopsis sheets, vendor reports, task directives, and test and evaluation reports;
- Site visit to the primary end user who has taken delivery of the prototypes—..... and .....
- Project schedule benchmark with 28 similar value capital equipment projects.

## Criteria

Some of the key criteria assessed during this audit include:

- Payments were made in accordance with the *Financial Administration Act* and DND/Canadian Forces (CF) policies and regulations;
- Appropriate monitoring and reporting strategies are in place;
- Risks are understood and appropriately managed; and
- The Crown is receiving value for money.

[Annex B](#) provides a complete list of criteria for each audit objective with a corresponding scorecard assessment.



## FINDINGS AND RECOMMENDATIONS

### Project Governance

*Effective governance was hampered by project staff shortfalls and project scope.*

### Project Leader Rank

The PAG sets the rank for the PL based on the expenditure level as shown in Table 2. The Omnibus project was under-ranked while two sub-projects were over-ranked.

Project Name	Project Value	PAG PL Criteria	Actual PL Rank	Over-/Under-Ranked
.....	.....	.....	.....	Under
.....	.....	.....	.....	Over
.....	.....	.....	.....	Over

**Table 2. Project Leader Ranks.** *The project leaders were under- or over-ranked for a two- to three-year period.*

A similar situation was found Department-wide with a sample of 122 active capital projects worth \$36 billion in both definition and implementation phases.

- 20 projects worth \$9.6 billion (26 percent) had under-ranked PLs. This poses a significant risk for high-value projects with insufficient senior management oversight.
- 56 projects worth \$1.2 billion (3 percent) had over-ranked PLs. This could lead to an excessive span of control and workload.

### Project Office Vacancies

Of the 43 Project Office positions, which include consultants and DND personnel, 15 were vacant (35 percent). Of the 29 DND Project Office positions, 18 (62 percent) were vacant, including 7 of the 13 (54 percent) Project Management Personnel Resource (PMPR) positions, exceeding the Department PMPR vacancy average of 35 percent. The project staff shortfall has resulted in excessive workload for “double-hatted” positions. For example:

- The project manager (PM) for both the VP Bio Sentry and Recce System projects was the same individual;
- The PM for the CBRN Omnibus project and the SI&DS project was the same individual; and



- To fill the vacant military/civilian/PMPR positions, 17 consultants occupied 61 percent of the 28 filled Project Office positions for an average duration of four years. Current military Omnibus sub-project PMs were in the position for only one year and sub-project PDs for three years on average. Consequently:
  - Although consultants have no executive authority they occupied most deputy PM/PD positions. If military PMs/PDs were absent, project decisions could not be made by the deputy PMs/PDs.
  - The four-year staffing of Project Office positions with consultants provides continuity and expertise; however, it poses the risk of claims against the Crown if employer/employee relationships are held for the entire acquisition cycle of 10 years.

## **Training Shortfall**

Five of the sub-project PMs/PDs had no formal risk management or project management basic training. A major cause of the training shortfall is the lack of centralized funding for PD staff since only the 643 Assistant Deputy Minister (Materiel) (ADM(Mat)) PM staff benefit from the centralized training funds available at the ADM(Mat) Materiel Management Training Centre.

Another major cause of the training shortfall is the absence of a DND functional lead for 1,333 National Defence Headquarters project management staff positions that deliver a \$70-billion capital program. Defence Administrative Order and Directive (DAOD) 1000-0 Corporate Administrative Direction does not assign an Office of Primary Interest (OPI) for project management development, training or practices.<sup>4</sup>

At the time of the audit, there were 171 staff Department-wide working on 124 capital equipment or construction projects in the options analysis phase, who required common project management training. PDs and other staff prepare the majority of project approval documentation. PDs are also involved throughout the project test, evaluation and training processes for project deliverables. However, the options analysis staff training requirement is out of scope with the on-going ADM(Mat)-led Project Management Development Project.

## **CBRN Defence Omnibus Project Scope**

At the time of audit, only 8 of the 16 CBRN Defence program projects were governed by the CBRN Defence Omnibus Project umbrella. Given their interdependent nature, other projects could benefit from centralized governance and dedicated support services, as follows:

- integrated logistics support;
- financial management;
- procurement expertise;

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<sup>4</sup> DAOD 3000-1 Project Management, in draft since December 2005, does not distinguish between the roles of VCDS and ADM(Mat) in the project management function.

- engineer consulting services;
- supply technician assistance;
- public relations; and
- training development.

Similar value non-omnibus projects rely on external support organizations that facilitate other higher-priority capital projects as well as operation and maintenance activities.

#### **Innovative Management Practices**

- Rather than separate SRBs, one combined annual SRB for 13 CBRN Defence projects provides better coordination;
- Omnibus project staff in-house training specific to CBRN defence;
- CBRN Defence Capability PD Handbook; and
- Dedicated CBRN Omnibus support staff.

OPI	RECOMMENDATION
VCDS	Ensure that PL rank for all capital projects comply with the PAG criteria and that the CBRN Omnibus Project Office staffing shortfalls be addressed. With the assistance of ADM(Fin CS) revise DAOD 1000-0 to appoint an OPI for the project management function.
VCDS	Increase the CBRN Defence Omnibus Project scope to ensure other CBRN projects would benefit from centralized governance and dedicated support.



## Operational Requirements

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## Vital Point Biological Sentry

As shown in Table 3, the VP Bio Sentry sub-project .....

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Operational Tasks	VP Bio Sentry	CAS Ph1 FSD, HHD	CAS Ph2 PDS
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*\*The full HHD requirement was not in the SOR but was satisfied by an exercised contract option clause.*

**Table 3. DND Operational Tasks.** .....

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## Chemical Agent Sensor

**Phase 1.** The March 2006 SOR for Phase 1 of the CAS sub-project .....

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**Phase 2.** The May 2006 SOR for the CAS sub-project Phase 2 for PDS .....

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OPI	RECOMMENDATION
VCDS	.....
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## Schedule

*The Department's contract award and expenditure approval process has.....  
 ..... increased Omnibus project management costs by \$5.2 million.*

## Acquisition Cycle Time

In an effort to reduce the capital acquisition cycle time by 30 percent,<sup>5</sup> the PMB established the following milestone targets in December 2003:

- A 24-month options analysis phase – SS(ID) to preliminary project approval (PPA);
- A 24-month definition phase – PPA to EPA; and
- A 7-month contract award phase – EPA to contract award.

This total cycle time target of 55 months was further reduced by ADM(Mat) in September 2004 to 48 months with only three months for the contract award phase. The reduction was justified based on the assumption that acquisition contracts were tendered prior to EPA, which is the case only for high-value major Crown projects.

## ..... CBRN Defence Capability

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Project	.....	.....	.....
Collective Protection	.....	.....	...
VP Bio Sentry	.....	.....	...
CAS	.....	.....	...

**Table 4.** ....

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<sup>5</sup> *Strategy 2020* Objective 8, 28 June 2003.

<sup>6</sup> CRS *Evaluation of CF/DND Nuclear, Biological, Chemical Defence*, February 2001.





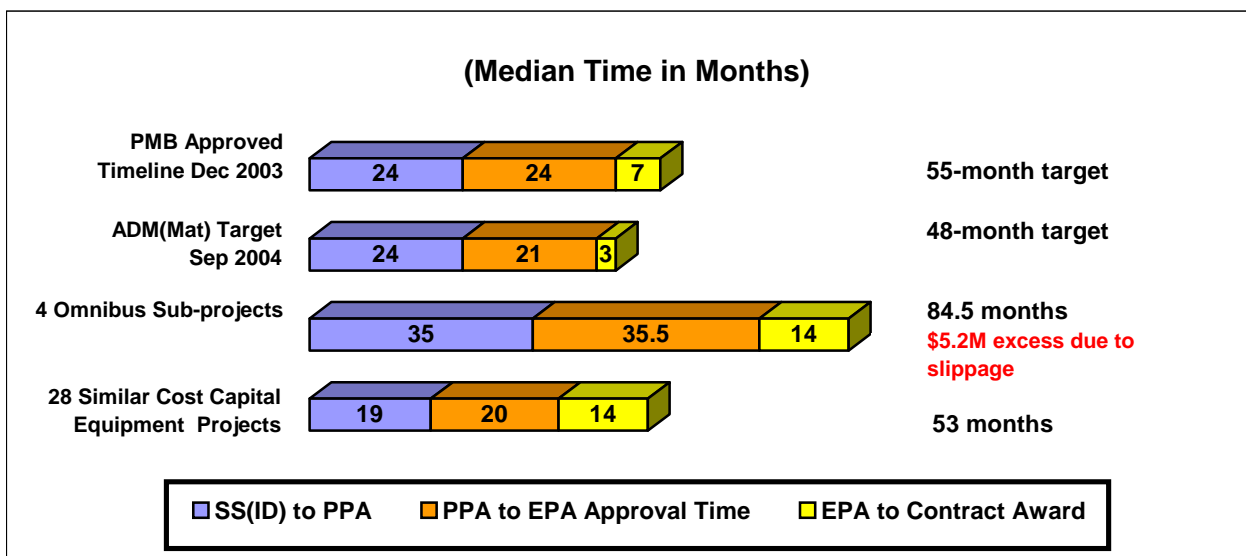
## Financial Impact of Omnibus Schedule Delays

An analysis of CBRN Omnibus project management cost was performed by comparing the actual project schedule for each of the four sub-projects to the PMB target of 31 months from PPA to contract award (Figure 1).

- The cost for the Omnibus running over the PMB target was \$613,000 per month, and by the time all four sub-projects reach contract award could amount to \$5.2 million.
- The three-phase approach for two CBRN Omnibus sub-projects has extended the time between PPA and EPA .....  
 .....  
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### Cost of Capital Acquisition Cycle Delay

Currently, 37 other capital projects are in the definition phase. Their combined total monthly project management costs are \$8.6 million. Streamlining the capital acquisition cycle would allow these project management resources to be assigned to other capital projects.<sup>7</sup>



**Figure 1. Project Acquisition Timelines.** *The most difficult target to achieve has been the seven-month period between EPA and contract award.*

## Contract Award

A comparison of contract award phase targets to the four CBRN Defence Omnibus sub-projects and similar value projects found a median time of 14 months to reach contract award after EPA. Schedule drivers for the contract award phase were:

- six months from EPA to receipt of bids,
- three months required for the bid evaluation process, and
- five months necessary from bid evaluation to contract award.

<sup>7</sup> The Department's median monthly project management cost per project is \$98,826.

In view of the historic data and schedule drivers, it is unrealistic to expect projects to achieve PMB's seven-month contract award target or ADM(Mat)'s three-month target under normal circumstances. In the past, the CBRN Omnibus Project Office experienced an accelerated contract award process with a co-located Public Works and Government Services Canada (PWGSC) contract officer; however, this co-location arrangement was terminated by DND to save costs. There may be a business case to offset the median project management schedule delay costs of \$98,826 per month per project with a co-located PWGSC contract officer resource costing \$13,339 per month.

### **Expenditure Approval Process**

At the request of the CBRN Defence Omnibus project office, the audit team examined schedule delays that could be attributed to the expenditure approval process. The Defence Management Committee approved a revised Corporate Submission Process in 2007<sup>8</sup> that was to provide an improved comprehensive end-to-end process for all submissions for Minister of National Defence (MND) and Treasury Board (TB) approval, including capital projects. The new process would include tangible efficiencies in the flow of submissions, improved Management Accountability Framework assessments and the elimination of one of the submission documents—the Synopsis Sheet.<sup>9</sup> The submission preparation time, strategic and financial analysis and 5 of the 11 submission sign-offs were now to be completed before PMB endorsement. The new approval process was examined to determine the impact on the remaining CBRN Omnibus sub-projects that would be seeking expenditure approval in the future.

Based on this new corporate submissions process map which sets out allowable working days, equipment projects greater than \$30 million, requiring TB approval, could take 8.4 months (181 working days) to obtain PPA expenditure approval, assuming that some steps are done concurrently. Subsequently, another 8.4 months (181 working days) for EPA expenditure approval is required for a total time of 16.8 months (362 working days). This submission process time amounts to 35 percent of the 48-month project life prior to the contract award phase. Consequently, there is little time built in for a project office to perform detailed options analysis and refine cost estimates prior to preparing an expenditure approval submission.

The new submission process map schedule drivers for each 8.4-month (181 working days) expenditure approval submission process are:

- 65 working days for ADM(Fin CS) cost validation, strategic analysis, language quality review and coordination. ADM(Fin CS) provides an independent cost analysis and a strategic analysis challenge function.<sup>10</sup> Currently the VCDS sets the departmental

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<sup>8</sup> Over an 18-month period, ADM(Fin CS) and VCDS organizations were tasked with examining the corporate submissions process, roles, structure, etc. to streamline the process. A consultant interviewed Level 1 stakeholders and developed a process map; submission prioritization was transferred from ADM(Fin CS) to VCDS group. The process map is a living document and was refined again in October 2007.

<sup>9</sup> Prior to the 24 April 2008 PMB, Synopsis Sheets were still circulated for all three capital projects on the agenda.

<sup>10</sup> Strategic analysis is a challenge function to ensure due diligence and ensures intergroup/interdepartmental policy, legal, program, political, environmental and public affairs concerns are addressed, along with consultation with stakeholders, TB and PCO.



submission priorities, and ADM(Fin CS), as the Senior Financial Officer, is the point of contact for expenditure approval submissions to the MND and TB.

- 44 working days to obtain 11 submission signatures, including the MND and TB approval stamp, and another 20 days for submission circulation coordination time. Efforts are being made to obtain some of these signatures on the same day at PMB as well as reduce the time to receive the TB decision.
- 32 working days for Project Office coordination to draft the expenditure approval submission.
- The remaining 20 days are for translation and VCDS staff coordination.

Examination of the actual working days tracked in the Corporate Submissions tracking database since July 2007 for 20 projects has found the median expenditure approval time to be as follows:

- A median of 74 working days was tracked (3.7 months) for 11 approved capital equipment projects initiated between July and November 2007. These 74 days did not include the 24 allowable days for TB approval of the submission. To expedite the approval process for high priority projects, overtime is often required by ADM(Fin CS) staff. This overtime is not captured in the submission tracking database as it only records document transfer dates.
- To date, a median of 149 working days (not including 24 days for TB approval) have been consumed for nine other projects initiated between August and September 2007, which the MND has not yet approved. The high number of vacant senior analyst positions in ADM(Fin CS) (12 of 20 positions are not staffed) has resulted in low priority submissions taking longer.

These preliminary results of the new approval process demonstrate that there is a wide variance between project approval times that may be influenced by urgent corporate priorities and operational requirements. To validate the new corporate submission process timings more approved projects will be required to determine expenditure approval bottlenecks and capacity issues.

OPI	RECOMMENDATION
VCDS	In conjunction with ADM(Fin CS), examine the capacity and structure to streamline the expenditure approval submission process.
ADM(Mat)	Negotiate specific service-level standards with PWGSC, advise PMB on the likelihood of achieving the seven-month contract award target, and assess the merit of co-locating PWGSC contracting officers.



## Contract Management

*Changes in design specifications worth \$7.9 million after contract award and significant payments before delivery of hardware did not assure value for money.*

### VP Bio Sentry Contract Amendment

Lack of DND participation in the VP Bio Sentry sub-project contract award process<sup>11</sup> resulted in

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### VP Bio Sentry Contract Terms of Payment

The \$31.7-million contract was amended such that ..... in progress payments are made to the vendor before any hardware deliverables are provided. Classified as a modified MOTS/COTS product by the project team, the high proportion of payments before hardware testing and delivery places the Department at risk. Often for MOTS/COTS acquisitions, RFPs only provide for payment on delivery, as the vendor is not incurring any developmental costs. By advancing only one-third of the cash flow before the receipt of deliverables, the Department's future value of money loss of \$370,400 on this contract would have been avoided. Although procurement policy<sup>13</sup> has provisions for DND input into contract terms and conditions with respect to the basis of payment, this did not take place. It was observed that the formal DND project management courses do not include the PM staff role in contract negotiations.

OPI	RECOMMENDATION
ADM(Mat)	Ensure that the CBRN Defence Omnibus Project Office negotiate initial provisioning of spares and consumables before contract award or as a contract amendment for other sub-projects. Provide contract negotiation training input into the Project Management courses.

<sup>11</sup> PWGSC Supply Manual, Chapter 7, 7D448 <http://www.tpsgc-pwgsc.gc.ca/app-acq/ga-sm/chapitre07-chapter07-eng.html#negotiations>.

<sup>12</sup> VP Bio Sentry System Solicitation Amendment #: W8476-06AKVP/A, 2006-08-08, Part 2, Page 3.

<sup>13</sup> PWGSC Supply Manual, Annex 3.1, <http://www.tpsgc-pwgsc.gc.ca/app-acq/ga-sm/chapitre03-chapter03-eng.html#ann31>.



## Options Analysis

*CBRN Omnibus sub-project options analyses were incomplete and did not consider full requirements due to financial constraints of initial estimates in the SS(ID).*

### Options Analysis Deficiencies

Three of the four main sub-projects completed a formal options analysis report. While each report varied in length and complexity, the following mandatory topics stipulated in the PAG<sup>14</sup> were not substantially documented:

- Detailed costing of options
- Full operational capability milestone
- Trade agreements
- Industrial regional benefits
- Environmental concerns
- Procurement strategy
- Life cycle costs
- International Traffic in Arms Regulations

The SS(ID) for the Omnibus project did not include the options to be considered for each sub-project (“child”); this guidance is essential for the options analysis phase. The PAG needs to be revised to require an SS(ID) for each omnibus “child” project.

### Sub-projects Limited by Financial Constraints

Three of the four sub-projects’ options analyses were bound by the SS(ID) ROM estimates. During the options analysis phase, three of the sub-projects’ budgets were reduced from the ROM estimate by \$10.3 million—8 percent of their total project value. As a result:

- Many options were deemed to be unaffordable as the Project Office felt bound by SS(ID) ROM estimates.
- CBRN Recce sub-project could only consider options with vehicles already in CF inventory due to cost constraints. This has resulted in .....
- .....however, subsequent bids found that the full requirement was affordable.
- To date, only the CAS sub-project has been successful in increasing the SS(ID) ROM of .....

#### Innovative Management Practice

..... RFP option clauses were included to obtain additional units at a lower bid price than the price and availability estimate provided by vendors prior to expenditure approval.

OPI	RECOMMENDATION
VCDS	Ensure that the CBRN Defence Omnibus Project Office increase the rigour of project options analysis with costing for future sub-projects and consider a revision to the PAG to require SS(ID) for each omnibus sub-project (“child”).

<sup>14</sup> *Project Approval Guide*, Chapter 4, Page 39.



## Information for Decision Making

*Complete project documentation and timely vendor reports were not available for effective decision making.*

### Project Approval Documents

Not all CBRN Defence Omnibus sub-project approval synopsis sheets had complete information to support decision making. The following information shortfalls prevented a complete assessment of the risks associated with the sub-projects:

- The CBRN Defence Omnibus SS(ID) did not provide the details of the sub-project options that would be examined in the definition phase;
- Budget tables did not provide the breakout of military/civilian PMPRs and funding status;
- Schedule tables did not include baseline dates, expected dates, actual dates and variances;
- Project interdependency tables did not include the impact of the interdependent projects on the CBRN Defence Omnibus sub-projects; and
- The SRB checklist, an attachment to the project approval synopsis sheets, did not include scope changes and contract awards.

### Capability Investment Database (CID) Progress Reports/Documentation

Complete and reliable information was not always available to the Project Office and to independent analysts for decision making. Project approval documentation and progress reports must be compiled in the CID for all capital projects to monitor the capital program.

- 30 percent of sub-project documents were not uploaded to the CID until four months after approval;
- For some projects, schedule slippage was difficult to determine because major milestone baseline dates in CID progress reports had been changed and contract award dates were not consistent; and
- The automated replication of information in different CID reports was not reliable and the CID output formats were not compliant with approval document formats.

### Vendor Reporting

.....  
Vendor reports were not linked to payments and there were no penalties for late deliveries in the contract. These reports serve to assess the performance of the vendor and the progress of the work.



- ..... and the Project Office waived 25 percent of the reports without receiving any consideration. The Project Office determined that these waived reports added little value to the delivery of a proven MOTS product.
- .....  
.....  
.....

The project staff acknowledged the reporting schedule was too aggressive for both vendors. As a result, the Project Office will be faced with a surge of vendor reports to review, resulting in potential delays in equipment delivery.

OPI	RECOMMENDATION
VCDS	Ensure that the Project Office provide complete sub-project approval documentation for other sub-projects. In conjunction with ADM(IM), resolve the CID data replication reliability and improve functionality.
ADM(Mat)	Ensure that the Project Office link key vendor reports to payments and holdbacks in future contracts.





## Risk Management

*Project risk was neither quantified, aligned with project contingency funds, nor reported to senior management.*

Some of the findings in this report could have been mitigated with more rigorous risk management practices:

- Contingency funds could have been estimated for schedule risks caused by staff shortfalls, expenditure approval and contract award;
- “Positive opportunity” risks<sup>15</sup> of inflated price and availability could have mitigated what were thought to be unaffordable operational requirements; and
- Identification of risks associated with contract cash flow and delivery of key vendor reports could have been addressed with more DND input into contract terms and conditions.

### Innovative Management Practices

- Five-level risk severity;
- Monthly Project Status Report to the Omnibus PD that included risks; and
- Sub-project Risk Management Plans in place.

## Risk Assessment

A risk management process was in place for all four CBRN Defence Omnibus sub-projects, and each sub-project assessed and tracked risks using a varying degree of rigour and slightly different processes. However, it was observed that:

- No cost impact was calculated for schedule risk;
- The October 2006 ADM(Mat) Knowledge Network (KNet) risk impact thresholds were not used by the project offices;
- Risks were not regularly reported to senior management at SRB or PMB; and
- The overall risk assessment reported for the CBRN Defence Omnibus was ....., but the average ..... contingency funding in Table 5 is in the ..... range.

Sub-project	Qualitative Overall Risk Assessment	Qualitative Cost Risk Assessment	Average Contingency Rates
CAS	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
VP Bio Sentry	.....	.....	.....
Omnibus	.....	.....	.....

**Table 5. Risk Assessment and Contingency Misaligned.** .....

<sup>15</sup> TB Risk Management Framework, 1 April 2001 [http://www.tbs-sct.gc.ca/pubs\\_pol/dcgpubs/RiskManagement/rmf-cgr01-1\\_e.asp#Key%20Concepts](http://www.tbs-sct.gc.ca/pubs_pol/dcgpubs/RiskManagement/rmf-cgr01-1_e.asp#Key%20Concepts).





## Vendor Risk Reporting

While VP Bio Sentry and CAS contracts required the vendors to report on risks, the RFP and/or contract did not specify requirements such as:

- Cost, schedule, and performance risk impact thresholds as prescribed in the ADM(Mat) KNet;
- Quantification of risk mitigation cost; and
- Linking of payments to vendor reports.

## Risk Management Policy

Project Office staff require a consistent DND policy regarding risk management. A comparison of ADM(Mat) and VCDS risk management policy found the following differences:

- ADM(Mat) KNet risk impact thresholds have not been adopted by the January 2007 VCDS Integrated Risk Management (IRM) Framework. The ADM(Mat) risk criteria would apply to all Level 1s that engage in project and contract management ([Annex D](#)).
- ADM(Mat) KNet probability descriptions are not aligned with the VCDS IRM ([Annex D](#)).

It was also observed that the ADM(Mat) KNet and the VCDS IRM do not quantify probability thresholds.

OPI	RECOMMENDATION
ADM(Mat)	Ensure that the CBRN Defence Omnibus Project Office quantify risks, report them to senior management, align them with contingency funds, and require vendors to report on quantified risks in high-value contracts.
VCDS	Align risk impact criteria and probability thresholds with ADM(Mat) for project and contract management.



## ANNEX A—MANAGEMENT ACTION PLAN

Ser	CRS Recommendation	OPI	Management Action	Target Completion Date
<b>Project Governance</b>				
1a.	Ensure that PL rank for all capital projects comply with the PAG criteria and that the CBRN Omnibus Project Office staffing shortfalls be addressed. With the assistance of ADM(Fin CS) revise DAOD 1000-0 to appoint an OPI for the project management function.	VCDS/CFD  VCDS/C Prog  VCDS/C Prog	Project leaders (PL) in the CBRN Defence Omnibus Project are now appointed in accordance with the instructions in the PAG (4.3.7).  The PL delegation guidelines in the PAG are considered correct and need to be re-enforced at the time of departmental project approval when the resources are assigned to the project at PMB. We will look into how this might be done in the PAG revision. Those 76 capital projects where the PL is either over- or under-ranked will be rectified.  DAOD 1000-0 will be revised in consultation with ADM(Fin CS) and ADM(Mat) to assign an OPI for the project management function.	April 2008  December 2009  December 2009
1b.	Increase the CBRN Defence Omnibus Project scope to ensure other CBRN projects would benefit from centralized governance and dedicated support.	VCDS/CFD	The Decontamination, Collective Protection, and New Gas Mask projects have been moved under the Omnibus project. Two mature, legacy projects remain outside the Omnibus. Other CBRN defence projects belong to external organizations and are not appropriate for transfer. The CBRN Defence Program will assign all new projects to the Omnibus project.	Ongoing
<b>Operational Requirements</b>				
2.	..... ..... ..... ..... ..... ..... ..... .....	VCDS/CFD	Until recently, projects followed the 2002 Capability Based Planning instructions (Canadian Joint Task List and Force Planning Scenarios) and were adjusted by the requirements of DND operational tasks. Over the life of the Project, VP Bio Sentry saw three different defence policies and a substantial downsizing of the CF. The baseline has been a moving target. In the future, Sections 1 and 2 of the SORs will reflect changes in Defence Policy, the structure and the concept of employment of the CF as they come into force. VP Bio Sentry Project purchased the full operational requirement for the CF ..... ..... ..... The CBRN Omnibus PD Handbook will expand on this issue and standardize the approach as required.	September 2008



**ANNEX A**

Ser	CRS Recommendation	OPI	Management Action	Target Completion Date
Schedule				
3a.	In conjunction with ADM(Fin CS), examine the capacity and structure to streamline the expenditure approval submission process.	VCDS/C Prog	This is an ongoing process issue that VCDS, with ADM(Fin CS), are dealing with. A new Program Guidance Memorandum will be released soon and the new process instituted as quickly as possible.	December 2009
3b.	Negotiate specific service-level standards with PWGSC, advise PMB on the likelihood of achieving the seven-month contract award target, and assess the merit of co-locating PWGSC contracting officers.	ADM(Mat)/DMGSP	DMGSP will examine the feasibility of negotiating specific service-level standards with PWGSC, in consultation with key stakeholders from DMPP and PWGSC. Discussions will take place to examine the requirement to include a reference for negotiations within the Procurement Administration Manual and the PAG.	December 2008
		ADM(Mat)/DGLEPM	The Omnibus PM agrees with this option and plans to co-locate PWGSC contracting officers.	December 2008
Contract Management				
4.	Ensure that the CBRN Defence Omnibus Project Office negotiate initial provisioning of spares and consumables before contract award or as a contract amendment for other sub-projects. Provide contract negotiation training input into the Project Management courses.	ADM(Mat)/DGLEPM	This is a lesson learned that will be passed to other CBRN projects by DCSEM. Contract clarifications/negotiations will be identified as a WBS activity prior to contract signature and it will be accounted for in project timelines and funding. The requirement for DND to participate in contract clarification/negotiation will be addressed in the service-level agreement between ADM(Mat) and PWGSC. This lesson learned will be recorded in the CID.	September 2008
		ADM(Mat)/DGMSSC	Project Management course material is being reassessed as part of the MA&S Learning Strategy and the Project Management Competency Development initiative. Negotiation skills have been identified as a required competency for PMs.	March 2009
Options Analysis				
5.	Ensure that the CBRN Defence Omnibus Project Office increase the rigour of project options analysis with costing for future sub-projects and consider a revision to the PAG to require SS(ID) for each omnibus sub-project (“child”).	VCDS/CFD	An instruction for the conduct of options analysis by sub-projects has been developed and published in the CBRN Omnibus PD Handbook. All new projects will require an SS(ID) complete with costing data.	March 2008
		VCDS/C Prog	The significance of the options analysis and a business case approach to reporting the results of the options analysis needs to be re-enforced. We will take the necessary steps in the PAG revision to ensure "omnibus" projects have only one SS(ID) that is revised for new sub-projects.	December 2009



**ANNEX A**

Ser	CRS Recommendation	OPI	Management Action	Target Completion Date
<b>Information for Decision Making</b>				
6a.	Ensure that the Project Office provide complete sub-project approval documentation for other sub-projects. In conjunction with ADM(IM), resolve the CID data replication reliability and improve functionality.	VCDS/CFD  VCDS/C Prog  VCDS/C Prog	Documents are being uploaded once they are approved. The CBRN Omnibus PD Handbook will expand its instruction on the use of the CID.  C Prog does indeed require complete approval documentation for all activities seeking a new expenditure authority. CBRN project will need to comply.  The sustaining support to the CID has suffered from funding constraints and its future will be examined as part of the Investment Plan lessons learned.	September 2008  Ongoing  December 2010
6b.	Ensure that the Project Office link key vendor reports to payments and holdbacks in future contracts.	ADM(Mat)/ DGMSSC/ DMPP  ADM(Mat)/ DGLEPM	Procurement and finance awareness sessions are mandatory for incoming ADM(Mat) personnel. These sessions promote payment based on deliverables or, when not feasible, payment should be based on progress reports showing evidence of value for money.  DCSEM agrees with the observation. The problem can best be addressed during contract clarifications/negotiations.	As required
<b>Risk Management</b>				
7a.	Ensure that the CBRN Defence Omnibus Project Office quantify risks, report them to senior management, align them with contingency funds and require vendors to report on quantified risks in high-value contracts.	VCDS/CFD  ADM(Mat)/ DGMSSC	The project team will consult more closely with both ADM(Fin CS) and DFPPC to make sure there is a better correlation between a project risk level and amount set aside for contingency.  The Project Management Working Group (PMWG) is developing standards for risk management, including the quantification and reporting of risks. Furthermore, the PMWG was tasked by PMB to develop risk management process and reporting requirements with a goal of having an integrated approach to risk management in the Department. The CBRN Omnibus project will conform to the revised corporate process.	April 2008  March 2009
7b.	Align risk impact criteria and probability thresholds with ADM(Mat) for project and contract management.	VCDS/CFD  VCDS/C Prog	The CBRN Omnibus project has replaced its own risk management direction with the ADM(Mat) Risk Instruction.  We will seek to ensure improved alignment with the VCDS directives on Risk and Performance Management/Measurement in the PAG revision.	January 2008  December 2009



## ANNEX B—AUDIT CRITERIA SCORECARD

Objective	Criteria	Score	Justification
GOV	Roles and responsibilities are well defined for the management of the contract.		CBRN Defence Omnibus and two sub-project PLs were over-/under-ranked.
GOV	Necessary skills, staff, and resources are available to govern the project.		62% military/civilian Project Office vacancy. Insufficient training for project staff.
GOV	Project approval and monitoring processes with accurate information for decision making are in place.		Project approval documentation incomplete. .... not linked to payments.
RMF	Risks are identified, assessed, ranked, mitigated, quantified, reported by the Project Office .....		No five-level impact/probability threshold criteria. Project/..... did not quantify and report risk.
RMF	Stakeholder analysis has been performed to ensure project success.		Informal analysis: meetings, workshops, continuous communication, SRB discussion.
MCF	.....		.....
MCF	Options analysis alternatives include measurable criteria, operational research, R&D, cost benefit analysis, and life cycle support.		Little information for mandatory PAG options analysis topics. Three of four sub-projects had options analysis documents.
MCF	Total cost of ownership estimates are based on valid information from reliable sources linked to a WBS, budget elements with appropriate contingency.		Incomplete WBS resources assigned for VP Bio Sentry Definition Phase.
MCF	The schedule is realistically based on a detailed WBS taking into account linkages with interdependent projects.		ADM(Mat)/PMB acquisition cycle targets have not been achieved.
MCF	Payments are made in accordance with the <i>Financial Administration Act</i> , TB/DND policies.		Payment to consultants not linked to sub-project WBS. Phase III CAS late payment interest, wrong commitment value.
MCF	Material assets procured under the CBRN Defence Omnibus project are accounted for.		Definition phase assets worth \$200K not on end user account or reconciled with FMAS expenditures.
MCF	The procurement plan, bid evaluation, and contract terms and conditions provided value for money assurance.		Only ..... of VP Bio payments linked to hardware deliverables; .....
MCF	.....		Mature MOTS HHD product, .....

Satisfactory

Needs Minor  
Improvement

Needs Moderate  
Improvement

Needs Significant  
Improvement

Unsatisfactory



## ANNEX C—CBRN DEFENCE EQUIPMENT ACQUISITION PROGRAM

Ser	Project Name	Value (\$M)	Phase	Project Leader	Original IOC	Current IOC
1	.....	.....	.....	.....	.....	.....*
2	.....	.....	.....	.....	.....	.....*
3	.....	.....	.....	.....	.....	.....
4	.....	.....	.....	.....	.....	.....*
5	.....	.....	.....	.....	.....	.....
6	.....	.....	.....	.....	.....	.....*
7	.....	.....	.....	.....	.....	.....*
8	.....	.....	.....	.....	.....	.....
9	.....	.....	.....	.....	.....	.....*
10	.....	.....	.....	.....	.....	.....*
11	.....	.....	.....	.....	.....	.....*
12	.....	.....	.....	.....	.....	.....
13	.....	.....	.....	.....	.....	.....
14	.....	.....	.....	.....	.....	.....
15	.....	.....	.....	.....	.....	.....
16	.....	.....	.....	.....	.....	.....
	<b>Total</b>	.....				

The projects highlighted in yellow are sub-projects within the ..... CBRN Defence Omnibus Project.

\* .....



## ANNEX D—ADM(MAT) KNET AND VCDS IRM ALIGNMENT

### ADM(Mat) KNet Risk Impact Threshold Criteria

Impact	Cost/Budget Objectives	Schedule Objectives	Performance Objectives
<b>Severe (5)</b>	>15% Cost Increase	>20% Slippage	Failure to meet requirement/lose a major capability
<b>Major (4)</b>	>10-15% Cost Increase	>10-20% Slippage	Lose a major requirement
<b>Moderate (3)</b>	>5-10% Cost Increase	>5-10% Slippage	Degradation of a major requirement
<b>Minor (2)</b>	Up to 5% Cost Increase	< 5% Slippage	Experience a reduction in technical performance
<b>Insignificant (1)</b>	Insignificant <\$10K Cost Increase	Insignificant slippage	No significant reduction

ADM(Mat) threshold criteria should be adopted by VCDS for project and contract management.

### Comparison of ADM(Mat) and VCDS Probability Thresholds

<b>Almost Certain (5)</b>	Expected to occur in most circumstances. (VCDS) <i>You would be surprised if this did not happen. (ADM(Mat))</i>	<b>(0.61 – 0.99)</b>
<b>Likely (4)</b>	Will probably occur in most circumstances. <i>More likely to happen than not.</i>	<b>(0.46 – 0.60)</b>
<b>Possible (3)</b>	Could occur at some point. <i>Just as likely to happen than not.</i>	<b>(0.31 – 0.45)</b>
<b>Unlikely (2)</b>	Not expected to occur. <i>Less likely to happen than not.</i>	<b>(0.16 – 0.30)</b>
<b>Rare (1)</b>	Occurs in exceptional circumstances only. <i>You would be surprised if this happened.</i>	<b>(0 – 0.15)</b>

VCDS probability (black text) should replace the ADM(Mat) probability description (blue text). Red font probabilities are suggested by CRS. VCDS policy does not include defined quantitative probability parameters. ADM(Mat) risk radar probabilities are too high for the “possible” threshold.

