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PERSPECTIVES ON THE CAPITAL EQUIPMENT ACQUISITION PROCESS

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EXECUTIVE SUMMARY

According to studies conducted by the Assistant Deputy Minister (Materiel) (ADM(Mat)) organization, the acquisition of capital equipment by the Department of National Defence (DND) takes in the order of 15 years, a fact that has not changed in over 30 years despite continuous modifications to the acquisition system. The cycle time is influenced by the complexity of the acquisitions in question. The situation is not much different than that of Canada's allies except for one important distinction: the allies spend a good deal of this time on research and development. Canada spends upwards of eight years in the requirements, options analysis and definition phases, but typically purchases manufactured goods from other nations.

As echoed by the Minister and others, it simply takes too long to acquire new weapons, as systems are often delivered too late to meet requirements and are then in danger of being overtaken by technology. The capital equipment acquisition process must be reformed so that the end products are relevant in tomorrow's environment. Given existing government policy, the Chief of the Defence Staff's vision and ongoing transformation initiatives, the time is right to consider a number of systemic reforms to the capital acquisition process in the areas of program development, project management and the approval process.

The purpose of this study is to examine the capital equipment acquisition system with a view towards making recommendations for reducing the acquisition cycle time at the front end, from Synopsis Sheet Identification (SS(ID)) to Effective Project Approval (EPA). Drawing on the experiences and best practices of our allies as well as departmental experts, this report examines the issues and provides alternatives. In this regard, the report is intended to stimulate informed discussions and debate with a view towards restoring timeliness to the acquisition of capital equipment.

With regard to program development, the report concludes that top-down direction is essential with a focus on capability development, with enhanced responsibility and accountability. The culture needs to shift from one of being parochial and platform-centric, to one of being capability-centric wherein all components of a given capability such as equipments, personnel, logistics, etc., are considered upfront in terms of their impact and execution of the program.

Two models for altering the way in which acquisition of equipment is managed are proposed. The selection of either model would result in a revised approach to program management reflecting enhanced accountability. A revised process model designed to reduce the timeframes for approvals is also put forward along with recommendations for other organizational/structural considerations.

It is further recognized that discussion with other government departments and agencies will be required as the resolution to some of the issues extend beyond the Department. However, while there are political and economic constraints impinging on capital acquisition, the military requirements need to be rebalanced against industrial/economic ones with an emphasis on defence objectives.



INTRODUCTION

Background

1. In 1986/87, Chief Review Services (CRS) conducted an evaluation of the acquisition process within DND, and a number of reforms were implemented. However, in the intervening years, many of the same issues that had been raised are still unresolved: costs are escalating while performance and schedule suffer as systems are delivered too late to meet strategic requirements and with technology that is often obsolete. In the DND management of time, cost and performance objectives for capital equipment acquisition, time has often been treated as a residual. This, in turn, has produced negative impacts on cost and performance. In effect, a system designed to be risk averse is generating risk, as equipment delivery is not timely. As a result, systems may be obsolete or suffer interoperability issues. Capability during the period of acquisition is lost, thereby increasing operational risk as well. This issue has also emerged as a dominant concern for the defence departments in a number of countries, including Australia, Great Britain and the United States (US), where process reviews are under way. It simply takes too long to acquire new weapons systems; hence, there has been a renewed focus on reducing the time required.

2. DND's ADM(Mat) noted in a study from 2002 that the process of acquisition can take upwards of 15 years. This is not unlike the time frames occurring among our closest allies. The ADM(Mat) study further noted that a contributor to lengthy cycle time lay in the front end of the acquisition process—in the requirements/options analysis and definition phases. This part of the cycle was found to take on the order of eight years, a time frame similar to that of the US. What makes this particularly interesting is that in the American system much of the time involved was spent in research and development into new technologies for any given acquisition project. On the other hand, in the Canadian context, the Department has not been involved to such a degree in weapons development and has typically purchased end items and made some modifications. Intuitively then one would expect that in Canada, cycle times would be dramatically shorter than currently exist.

Aim

3. The purpose of this study is to examine the capital acquisition system and make recommendations for reducing the acquisition cycle time, particularly at the front end of the process, from SS(ID) to EPA. It is intended that this report stand as a collection of issues and ideas for further consideration and debate.

Methodology

4. The methodology employed in this study consisted of academic research, documentation research based on the current Canadian defence acquisition system and those of other countries, and interviews with system experts in the defence and industrial sectors in Canada and abroad.



Expectations

5. The capital equipment acquisition process is a complex, multi-variable dynamic that is problem-plagued and which has eluded correction for one reason or another, despite continuous efforts to reform it in many countries. For example, a few years ago the United Kingdom (UK) introduced Smart Acquisition, a process re-designed to overcome the problems of the previous system. This initiative is now at risk.¹ In the US, the initiatives of the Packard Commission and the Goldwater-Nichols Act of the late eighties are currently being re-evaluated to bring the US acquisition system in line with today's realities.² However, given the system inertia that exists, in spite of high-level efforts at reform, change has been slow and difficult. The time frame required to reform the system in the US is estimated as 10–15 years.³ In Canada, continuous efforts over the last 20 years to keep the process relevant and flexible have not reduced the time frames required to obtain new equipment. If equipment is to be responsive to need, reform initiatives must be undertaken so that end products are relevant in tomorrow's environment.

¹ Smart Acquisition still not working, says committee, Jane's Defence Weekly, 19 October 2005.

² Beyond Goldwater-Nichols Phase 2 report, July 2005 www.csis.org.

³ Aerospace Daily and Defence Report, 28 September 2005.



CONSTRAINTS

External

6. The global strategic situation has changed from a bi-polar cold-war-structured defence alignment to that of a more turbulent world with an undefined threat that, by its nature, does not afford the lengthy time taken for equipment acquisition to respond to it. The emerging security environment calls for professional, highly trained armed forces capable of using new technologies effectively in joint, interagency and multinational operations. New technologies offer fast, flexible solutions to such operational problems as delivering force precisely in a war zone, or monitoring the flow of refugees in a humanitarian crisis. What is required is a redesigned acquisition process that is flexible and responsive enough to acquire those technologies in time to handle the evolving threat. In dealing with this situation, the Department has found it necessary to augment the existing acquisition system by treating wartime needs as urgent operational requirements that call for more focused resources and reduced process.⁴

7. In addition, the defence industrial base is changing worldwide. For example, the past years have seen the merging of large defence corporations such as General Dynamics with General Motors Defence division, the development of large consortia in Europe such as those encompassing Westland in the UK and Augusta in Italy, and the creation of transatlantic defence networks. There is increasingly a global defence marketplace supplied by a decreasing number of firms, thereby limiting competition. However, the acquisition system is based on the perceptions, rules and regulations of the mid-eighties, when there were ample suppliers and opportunities for domestic production to ensure sufficient competition of projects, little of which is relevant today.⁵

8. Adding to these constraints are socio-economic pressures manifesting themselves in the form of regional industrial benefits that must be taken into account in any acquisition, coupled with attendant political factors that must be respected. These factors are a reality that have created significant delay, but that are somewhat beyond the control of the Department. Canada does not have a written defence industrial policy or strategy. In the absence of such, regional/economic concerns and industrial benefits become important determinants of equipment selection with subsequent delays that, in turn, can result in degradation of performance and/or cost increase.

⁴ “...if we made everything an emergency we would run out of staff capacity...we offload staff from other work to process it quickly...part of the answer is that it is a capacity issue” MGen D. Dempster, Senate National Security and Defence Committee ADM(PA) transcripts, 5 April 2005.

⁵ Edgar, A and Haglund, D., *The Canadian Defence Industry in the New Global Environment*, McGill-Queen’s University Press, Montreal, 1995 (page 133).



9. While government socio-economic objectives must be an integral part of project design, there is a need to rebalance the military requirements against the industrial economic ones. “The industrial policy should be encouraged to identify those specific areas where Canada wants to maintain specific industrial expertise....We need to identify key defence projects for rapid acquisitions that need to acquire those capabilities almost without reference to many industrial base requirements.”⁶ The balance between support for the troops in the field and support for defence industry needs to be reset in favour of meeting defence objectives, which includes obtaining the necessary equipment in a timely fashion.

Internal

10. The pervading culture and governing structures of the Department also shape the acquisition process. Since the Department is dealing with public monies, it must hold itself accountable to a high level of scrutiny in terms of how the money is spent. This has been translated over the years into the imposition of checks and balances to ensure money is spent wisely. Such checks and balances must of necessity take time and in so doing, act to slow down the process of acquisition.

11. “DND’s approval processes are adversely affected by an unreasonably high aversion to risk.”⁷ In fact, the current culture emphasizes process over end product, relying “...extensively on consensus as a decision-making philosophy.”⁸ There is also a notion that only good news helps projects move forward, as evidenced by the low-risk ratings that have been applied to capital projects that should have been rated as high risk from the outset.⁹

12. Prioritization has become very difficult and tends to be relegated to a “my turn, your turn” approach based on service component. This results in too many projects being approved even though many do not have a reasonable chance of moving forward in a given year. For example, in 2005, the Program Management Board (PMB) was expected to review 59 projects that had been approved by the Joint Capability Review Board (JCRB). The listing of new projects is perhaps twice the amount of what can be achieved. While the culture fosters a lot of effort into planning, the reality is many projects tend to linger on without sufficient allocation of resources, thereby increasing the time required for all projects.

⁶ MGen D. Dempster, Senate National Security and Defence Committee ADM(PA) transcripts, 5 April 2005.

⁷ Report to the Minister of National Defence by the Advisory Committee on Administrative Efficiency, http://www.forces.gc.ca/site/Focus/AE/indexAE_e.htm.

⁸ Wounded Canada’s Military Legacy and Legacy of Neglect, An Interim Report by the Senate Committee on National Security and Defence, September 2005, http://www.parl.gc.ca/common/Committee_SenRep.asp?Language=E&Parl=38&Ses=1&comm_id=76.

⁹ Quick Time Review M113, Chief Review Services DND, 31 October 2003.



13. Although planning horizons for equipment acquisition are, in theory, aimed at the long term, as laid out in the Strategic Capability Investment Plan (SCIP),¹⁰ in practice there has been a tendency to replace what is already in the system rather than focusing on what is required in the long term. This issue has been compounded by an acquisition system that takes 15 years and by the fact that there has been insufficient capital funding to adequately replace ageing equipment and to modernize the forces such that today's demands are often "bow-waved" into the future. Most of our allies have calculated that approximately 30 percent of their budgets should be spent on replacing capital equipment. DND has never been able to achieve this percentage. In 2000, capital spending was 16 percent of defence expenditure. By 2005, the capital program was down to 13 percent and, if one considers only capital equipment, 10 percent. This amount results in an untenable program reminiscent of the early seventies. With insufficient capital funding to replace its inventory, approved projects are often spun out or placed on hold, magnifying the problems outlined in the process issues and resulting in equipment acquired late to need or overtaken by events and technology.

¹⁰ The SCIP is the result of capability-based planning. It describes the investments and capabilities required to meet policy objectives. It has now been set aside pending development of the Defence Capability Plan.



SYSTEM REFORM

First Principles

14. The acquisition process in most defence departments is based on the fundamental principles of having an expression of need followed by some form of selection process to satisfy the need which, in turn, is followed by the acquisition of the selected product (Figure 1). Where differences occur between the various acquisition systems is in the method, oversight and degree of execution of each of the steps.

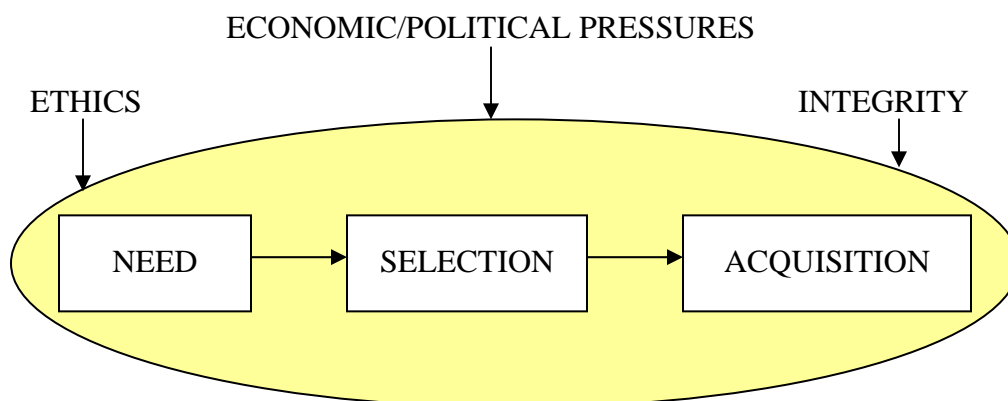


Figure 1—Generic Acquisition Process

15. Reform is under way in DND and in a number of countries to improve the timeliness of current structures. In the analysis of Canadian, US, UK and Australian reform initiatives, the following common ideas were noted, recognizing there are differing socio-economic and political structures in each country.

Expressing the Need (Identification Phase in DND)

16. In developing the needs:

- Adopt capability-based planning;
- Express needs in terms of performance-based requirements;
- Define the project in terms of whole-life costs;
- Express requirements from a joint perspective;
- Allow operational commanders to express near-term and immediate operational requirements while allowing service chiefs to express a more forward, strategic vision;
- Raise the prominence of the science and technology function;
- Raise the prominence of program evaluation as an aid to needs assessment;
- Institutionalize a process for urgent operational requirements definition;
- Streamline the amount of documentation required;
- Maintain single-point accountability throughout the acquisition;
- Advance industry involvement to as early as possible; and
- Balance and prioritize the amount of program with the funds available.

Selection (Options Analysis and Definition Phases in DND)

17. In the selection process:

- Spend up to 15 percent of project funds up front;
- Maintain a strong science and technology component;
- Maintain a strong test and evaluation component;
- Make service chiefs accountable for the entire acquisition process;
- Stabilize funding;
- Write technical, functional and performance-based specifications;
- Minimize modification to equipment;
- Purchase incrementally in terms of both quantity and capability that can be added later;
- Establish oversight mechanisms such as independent management boards;
- Have the required well-trained personnel; and
- Streamline approval levels.

Acquisition (Implementation Phase in DND)

18. In implementation:

- Maintain stable funding; and
- Make the project managers responsible for contracting and directly responsive to the customer.

In the suggested approaches to follow, we have attempted to incorporate as many of the above issues as possible based on the need to reduce cycle time.



PROGRAM DEVELOPMENT

Governance

19. The governance structure for acquisition (shown in Figure 2) has been modified and improved over the past few years. The completion of the current defence policy, the development by the Chief of the Defence Staff (CDS) of a Vision Statement and a subsequent Concept of Operation, the creation of the JCRB and the development of capability-based planning through the SCIP, has meant that projects are no longer pushed from the bottom up to replace ageing equipment, but are now top-down directed and fit within the logical construct as laid out in the above policies and concepts. This infusion of top-down direction in the development of an affordable and achievable program is seen as a key requirement for system reform.

20. Governance of acquisition in the Department is enacted through the three committees of the JCRB, PMB and the Senior Review Board (SRB). Needs are developed as discussed in Annex A with the project sponsor or “customer” residing in the operational Environments or commands. Essentially, the JCRB approves the project on its merits as supporting a given capability deficiency. It is then sent to the PMB, where the project is costed in terms of equipment, infrastructure, information management, human resources and research and development and is cash-phased into the overall program (the SCIP). SRBs provide corporate-level oversight to the management of individual projects.

Requirements Generation System	
Committee	Functions
JCRB	Broad Needs Performance Objectives Requirements/Capabilities
Planning, Programming and Budgeting System	
Committee	Functions
PMB	Costs Resource Requirements Affordability Constraints
Acquisition Management System	
Committee	Functions
SRB	Status of Project Execution Cost, Schedule and Performance Trade-offs Risk Assessment—Off Ramps

Figure 2—Committees¹¹

¹¹ Study Report—Capital Project Oversight and Accountability: The Functioning of Senior Review Boards, 2005-2006.



21. However there remains a disconnect between the approval of requirements at JCRB and allocation of resources at PMB. There is a lack of a realistic integrated investment strategy for weapons acquisitions to implement these plans. This is reflected in the approval at JCRB of 59 projects without the application of funding constraints or by the insertion of appropriate funding to progress all 59 projects. Complicating the matter further is the fact that too often capital funding has been unstable. Capital has always been treated as a “residual” and monies originally allocated are often withdrawn to meet governmental, operational or personnel requirements. This is resulting in too many projects being approved for too few dollars which results in both project and program delay.¹² This situation is not unlike that in the US wherein “Department of Defense (DoD) starts more programs than it can afford and does not prioritize programs for funding.”¹³

22. Currently, proposals are being put forward to modify the mandates of the JCRB and PMB or to replace them with new governance structures, supported by a new Chief of Force Development (CFD) and Chief of Program (CProg) branch and to restructure the SRB. With this initiative in mind, the following is provided to stimulate discussion/consideration as transformation evolves.

JCRB

23. The JCRB has typically been chaired by the Vice Chief of the Defence Staff (VCDS) and can be co-chaired by the Deputy Minister (DM) and the CDS for major Crown projects. Its core membership consists of the three Environmental Chiefs of Staff, what was the Deputy Chief of the Defence Staff (DCDS) and all the level one organizations, resulting in a large and complex board. By contrast, the American equivalent to the JCRB, the Joint Requirements Oversight Council, consists of the Vice Chairman of the Joint Chiefs of Staff, the three Service Chiefs and the Assistant Commandant, U.S. Marines. Recently, the Beyond Goldwater-Nichols report recommended adding in the Commanders of Commands, a member from policy, science and technology and a representative from the program analysis and evaluation group.

24. The implication is that a governance body such as JCRB be kept as small as is practicable with only essential membership. For example, a reformed JCRB with the same mandate as currently exists would include the VCDS, a member of the Strategic Joint Staff (SJS), the Environmental Chiefs and the Assistant Deputy Minister (Infrastructure and Environment) (ADM(IE)). Rounding out the membership would be the Chief Military Personnel (CMP), the Assistant Deputy Minister (Information Management) (ADM(IM)), the Assistant Deputy Minister (Science and Technology) (ADM(S&T)) and the Assistant Deputy Minister (Policy) (ADM(Pol)). The consolidated interests of the operational commanders would be represented by the SJS with a focus on short-term operational requirements (up to five years).

¹² Report to the Minister of National Defence by the Advisory Committee on Administrative Efficiency.

¹³ GAO-06-110, 30 November 2005.



25. ADM(Mat), ADM(IM) and the Assistant Deputy Minister (Finance and Corporate Services) (ADM(Fin CS)), normally seen as key players at JCRB, play an enabling role, are not requirements generators per se and would therefore not be included in the membership. The CDS and the DM would attend and chair as required. In their absence it is proposed that ADM(S&T) assume the chairmanship. This would provide industrial and scientific insight and futuristic expertise as well as ensuring continuity and a non-partisan approach to decision making. Through computer simulation and related techniques, ADM(S&T) can have a significant impact in assisting the development of capability-based requirements, from a whole-life perspective including human resource requirements, operations and maintenance, training and logistics. Presently, ADM(S&T) is running a technology demonstration project, CapDem, exactly for this purpose. In addition, ADM(S&T) is situated to conduct capability trade-off analysis, technological maturity assessments and risk reduction while promoting use of technology insertion to enhance capability and reduce overall costs.

26. The UK, the US and Australia recognize the need for a strong voice from the science and technology community as support to the respective planning organizations. The UK and Australia have a Chief Scientific Advisor and Chief Defence Scientist while the Beyond Goldwater-Nichols report is advocating re-establishing their science advisor as key to identifying future capabilities. According to the report, this will focus on the “what” is being bought rather than on the “how.”

27. The development of capability plans and marrying these up to an affordability matrix is currently conducted under the Director General Strategic Planning (DGSP). This function will likely gravitate to the CFD staff. The CFD can also become responsible for developing performance-based statements of requirement as discussed later. A specialized group with a civilian component for continuity can develop standardized performance requirements for all acquisitions.

28. Presently, as noted above, in the US system there is an Office of Program Analysis and Evaluation that provides the Under Secretary of Defense with independent analysis and sober second thought on the strategic choices facing the DoD. Beyond Goldwater-Nichols is recommending that a representative from this branch sit as a member of the Joint Requirements Oversight Council. The suggestion is that such a group be established in DND for the same purpose. The creation of such a capability would obviate the need for other review groups that currently exist throughout the Department. This group must maintain independence and exercise a challenge function, and can reside within the CProg branch or CRS.



PMB

29. Although there is an initiative to revise the PMB structure and mandate while reducing the rank level of membership, the recent creation of a CProg branch could lead to its elimination. Programming work could be done in the CProg branch and the basic PMB functions of prioritizing and profiling of the program could be approved secretarially or by an ad hoc committee, or revised JCRB. The project management functions of the existing PMB, such as allocation of personnel resources and money, could be dealt with through normal CProg staff work. On the other hand, the creation of a CProg branch could provide analytical and secretarial support to a higher level PMB. This would reduce PMB's current workload and lead to a restructured board centered around program management. In this scenario a revised PMB would include VCDS, ADM(Fin CS), ADM(Mat), ADM(IE), ADM(IM), the Assistant Deputy Minister (Human Resources – Civilian) (ADM(HR-Civ)), CMP, the Environmental Chiefs of Staff and SJS.

SRB

30. The SRB oversees the development of individual projects. CRS published a separate report on the status of SRBs, noting that in many instances they were staffed at the wrong level and attempted to act in both a challenge and an advisory function but were not succeeding in either. In the existing process, SRB endorsement is still required on critical project documents and in the release of contingency funding. Its role as an endorsing body is questionable in its current form and supports the earlier notion of management by consensus. Its removal from the process would reduce cycle time. Instead, in order to effect the function of challenge and advice that is currently lacking, an Australian-style SRB could be considered. In the Australian model, the SRB is a Materiel Governance Board consisting of people with¹⁴ It oversees the project work, provides advice and challenge but reports to the head of the Defence Materiel Organization. Adoption of this Australian-style board by DND would give the level of review and challenge required without impeding project progress, or relieving the responsible organization of its accountability. The challenge will be in finding individuals with the requisite expertise.

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PROJECT MANAGEMENT

Management Structure

31. With the development of a capital program broadly constrained by dollars, individual project development must take place through the selection of a number of options. In general terms, the Canadian model displaying this approach is outlined in Figure 3.

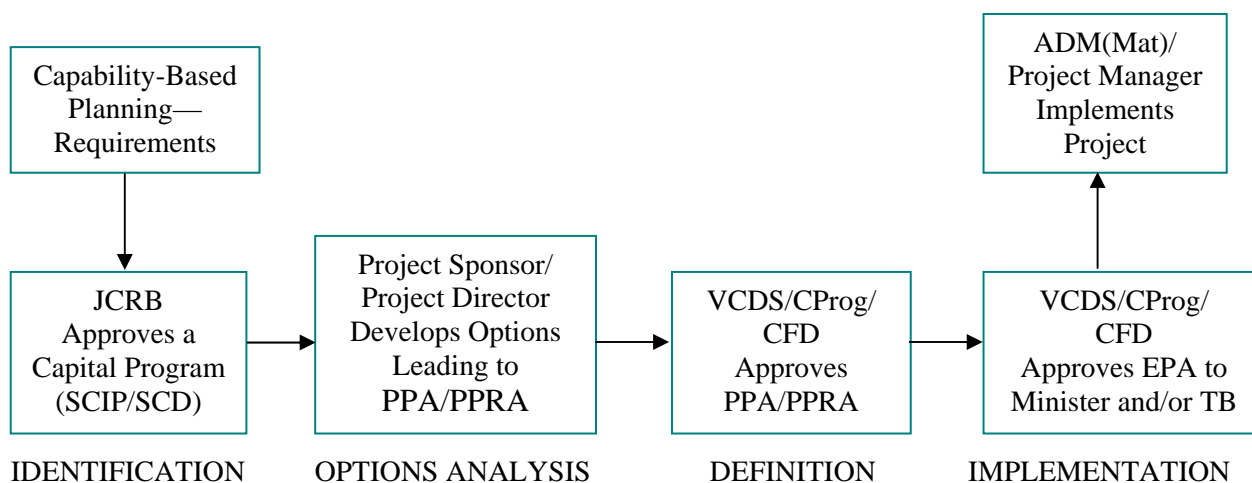


Figure 3—Existing Departmental Approval Process

32. The generic process shown in Figure 1 and adapted for the Department in Figure 3 is a logical building block methodology which is a universal approach to acquisition. The degree of execution is the important variable. The existing acquisition system was originally designed in the US in the 1960s and has over time been the subject of a number of additional reforms. The American system has been described as a “...bewildering complex of procedures and processes...”¹⁵ which require restoration of clarity and timeliness. In Canada, it has been noted, “...Defence’s internal process for defining requirements and approving capital projects takes too long, involves too many authorities and committees, occupies too much senior management time for little added value, and fails to distinguish between processes on the basis of risk and complexity. These aspects of the procurement process are wholly within the purview of Defence to revise....”¹⁶

¹⁵ President and Chief Executive Officer, Center for Strategic and International Studies in the US, Hearings on Problems with and Improvements to Defense Policy, November 15, 2005, http://armed-services.senate.gov/statemnt/2005/November/Hamre_percent2011-15-05.pdf.

¹⁶ Report to the Minister of National Defence by the Advisory Committee on Administrative Efficiency.

Comparative Approaches

33. In moving toward potential solutions, lessons can be drawn from the ongoing allied reform initiatives, as well as drawing from the experience and observations of interviewees within and external to the Department and from studies such as those already quoted.

34. A number of alternate processes have been developed by other countries to manage project acquisition. Under Britain's recently reformed system, each project is assigned a leader from the Defence Procurement Agency, which is similar to ADM(Mat). However, unlike ADM(Mat), this organization executes parts of the identification phase and all of the options analysis and definition phases through to implementation, including contract award under a signed service agreement with the customer. In fact, the Defence Procurement Agency forms an integrated product team that also includes industry participation in these early stages of the project.

35. In the US system, there is no split between the requirements generators and the supplying group; hence, there is no project director. The project manager sits within the service chief arena, but ultimately reports to the Under Secretary of Defense rather than the service chief. Recent attempts at reform in the US are recommending the service chief be put back in the reporting scheme.

36. The Australian model is similar to the DND process wherein there is a handover of project management from the Environmental Chiefs of Staff to ADM(Mat).

The Way Ahead

37. This leaves several options open for DND, two of which are displayed in Figures 4 and 5. In Model A, Figure 4, ADM(Mat) involvement is moved up to include the identification phase and remaining phases, as in the UK. A service agreement is signed with the Environmental Chiefs concerning end product delivery. Presently, ADM(Mat) is becoming more and more involved in these stages so that this approach would not be a radical departure from what exists. ADM(Mat) could also be established as a special operating agency, as is the case in Australia and much like Defence Construction Canada. Advantages to this are in the degree of flexibility in conducting business afforded by becoming a special operating agency. This approach would be consistent with the Report to the Minister of National Defence, which stated "...the Committee found that the business of procuring military materiel is so big and unique in terms of value, complexity and volume as to warrant a dedicated procurement agency or division."¹⁷

38. In addition, the Report to the Minister of National Defence noted the duplication of effort between ADM(Mat) and Public Works and Government Services Canada (PWGSC) with regards to contracting. Specifically, the Report noted that this is "...fundamentally wrong...it weakens accountability and creates inefficiency by creating two departments to work on the acquisition of the same goods and services... Therefore, accountability, responsibility and authority for that activity should more logically be assigned to a single agency... It is certain that significant personnel and time savings will be realized."¹⁸ This single agency, with contracting authority, could be the ADM(Mat) organization as part of its mandate as a special operating agency.

¹⁷ Report to the Minister of National Defence.

¹⁸ Report to the Minister of National Defence.



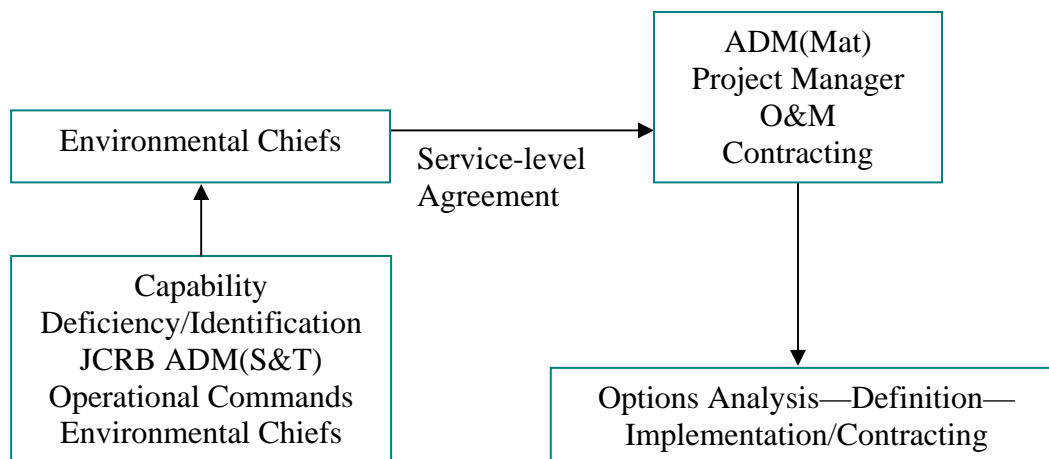


Figure 4—Management Structure Model A

39. A second approach is shown in Model B, Figure 5. Essentially, the project management function for major Crown projects, (historically less than a dozen projects), along with the personnel, is removed from ADM(Mat) and placed with the Environmental Chiefs of Staff as in the American process. This provides a single point of accountability, making the Environmental Chiefs responsible for not only assisting in defining the requirement but in executing the major capital projects acquisition to prescribed timelines and costs. In addition, rather than having all major capital projects effectively reporting to one senior individual or position, it splits them amongst three senior individuals, each of whom has a specific vested interest in seeing the projects come to fruition quickly. Each can devote more personal time to his/her respective major capital project. In this model, ADM(Mat) would continue with operations and maintenance and the management of projects under \$100 million which would be administered by ADM(Mat) life cycle materiel managers. ADM(Mat) would acquire contracting from PWGSC. Adoption of either model or a derivation thereof would lead to increased accountability and decreased time, recognizing the attendant requirements for training and personnel issues that would need to be addressed.

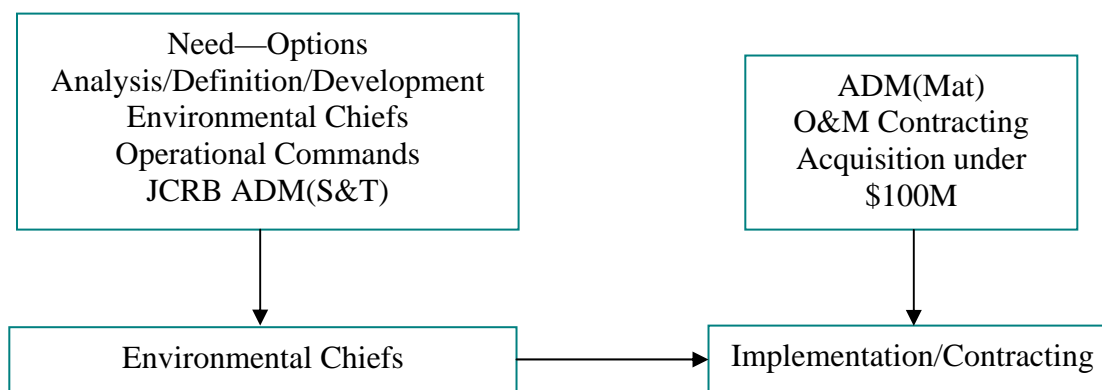


Figure 5—Management Structure Model B

APPROVAL PROCESS

Approval Steps

40. Annex B, Figures 1 and 2, describes the steps and documentation required in order to obtain signed approvals for projects to progress forward. Documentation consists of synopsis sheets, Treasury Board submissions, etc. The Department needs to work with Treasury Board to streamline the documentation to only that which is required and is acceptable to both Departments. For example, the Treasury Board submission document duplicates much of the information provided in the synopsis sheets, but because it is of a slightly different format, can lead to delays in preparation and delays in progression of the project. The Departments should also develop a method for electronic filing of documents.

41. As noted in Annex B, Figure 2, in the existing process, project approval bounces between various organizations but after sign-off at PMB, is once again circulated to the level one organizations. In the new structures, the steps must be revised. For example, if prioritized, initially costed capability requirements would come from the reorganized JCRB; there should be no need for the 15 steps shown in Annex B for initial approval of the SS(ID). The output of the JCRB should form the basis for the SS(ID). Either the project manager within the Environmental Command staff (Model B) or ADM(Mat) would then proceed with the work.

42. As shown in Figure 6, after an options analysis phase, the project would go before PMB, or the VCDS if PMB were eliminated, for preliminary project approval and then after definition, for EPA. Along the way, the project would need to be vetted by the financial authorities and those responsible for editorial formatting if the submission were going to Treasury Board. The SRB would be removed from the approval steps, reflecting the empowerment of those responsible for executing the project.

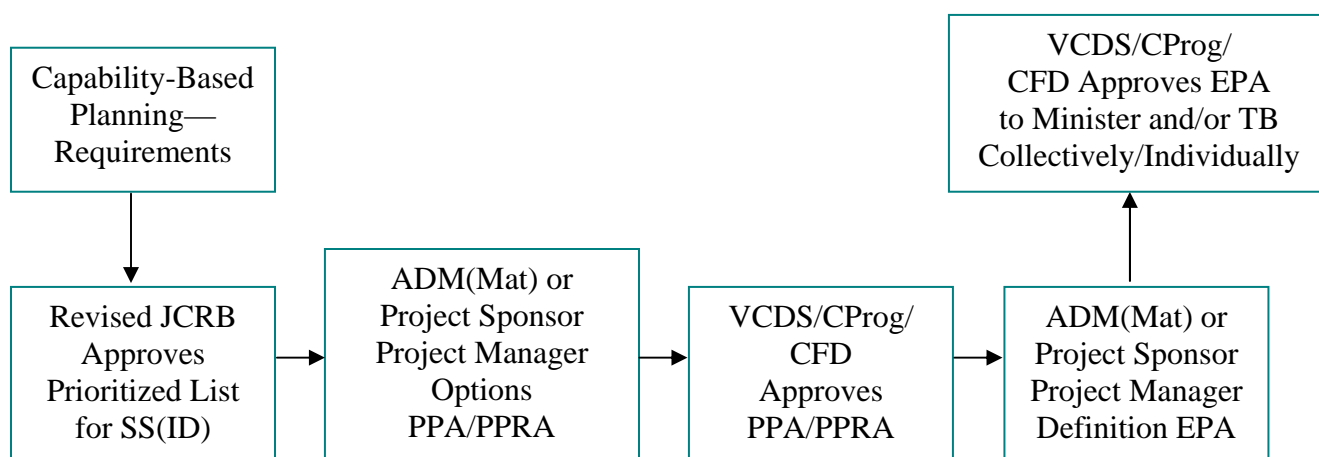


Figure 6—Project Approval Stream

Figure 7 below shows what the revised approval process might look like. This is contrasted with the existing process shown in Annex B.

STEP	OPI	ACTION	APPROXIMATE TIME
1	Project Director/ Project Manager	Draft synopsis sheet with assistance of project team; forward to VCDS staff for review and DSFC for cost validation/DMPD for registering and Treasury Board format check.	Variable.
2	Project Director/ Project Manager	Consult VCDS staff for decisions or amendments requested, forward for sponsor signature.	Variable.
3	Project Director/ Project Manager	Draft letter for DM's signature.	Up to 2 weeks.
4	Sponsor	Sign-off. Forward submission to DMPD for format/language check.	1–2 days.
5	DMPD	Forward submission for CDS, DM sign-offs.	3–4 weeks.
6	MND	Approval/sign-off.	Variable.
7	DMPD	If applicable, forward submission to Treasury Board Secretariat.	Minimum 12 working days prior to meeting.

Figure 7—Revised Approval Process

Annual Capital Equipment Plan

43. On the construction side, the annual plan for new projects is approved and submitted to Treasury Board. If the same could be done for capital equipment, it could eliminate some steps required in sending projects to Treasury Board individually.

Performance-Based Requirements/Bid Evaluation/Capability Development

44. One of the drivers of time is the development and refinement of the Statement of Requirement (SOR), a document that has been known to span several volumes and take years to complete. Recently, in an effort to curtail the process, the SOR written to replace the ageing Hercules fleet was limited to a one-page statement of performance requirements with subsequent time savings. Through discussion with industry and PWGSC, perhaps a standard model for an SOR can be developed in addition to capping the ID phase to two years or less.

45. While the move towards performance-based requirements is necessary, it can make bid evaluation more complex. For this reason, other criteria for proposal evaluation are required. This may include cost, but may also examine past delivery performance on projects of like size and complexity. Further time savings might be achieved if performance-based SORs were written by a specialist group possibly within CFD or in ADM(Mat) as in model A above.

46. Mention has been made of moving towards capability-based planning. This in fact represents a shift in thinking from one of replacing platforms or considering individual projects, to defining complete capabilities which by definition includes detailing the resources, logistics, personnel and like requirements to bring a capability to operational status. As noted earlier, the CapDem project currently under way by ADM(S&T) is focused in developing these concepts.

Minister's Spending Authority

47. The Report to the Minister of National Defence recommended that the Minister's approval authority be raised to \$60 million, up from \$30 million. Raising the limit to \$100 million is more practical given the potential for time savings; this would also allow even faster turn around time on non-major Crown purchases and recognizes the fact that military equipment is a high-cost undertaking.

Budgets

48. One of the key areas that can dramatically affect cycle time lies in budgeting. Budget stability is essential to reduce the turbulence in the system and the constant re-profiling and reprioritizing. Stable adequate acquisition funding using accrual accounting and a rolling multi-year funding approval will produce flexibility and less focus on annual spending. The capital budget must not be drawn upon to fund other areas if at all possible.

49. A number of countries have recommended that more money be allocated up-front in project development to ensure the testing of prototype designs before entering into contracts for production. Both Britain and Australia have attempted to have 10 to 15 percent of project funds allocated to the early stages of options analysis and definition of the system to be acquired. The theory is that up-front expenditures for capability definition would reduce later time delays, cost increases and risk while improving performance. In fact, as cited in Jane's, October 05, one of the key reasons given for the difficulties encountered in Britain's new "smart acquisition" process, is that projects are still not spending this 10 to 15 percent up-front. The difficulties cited have been demonstrated in Canada where problems have occurred when insufficient development was completed before production.¹⁹ DND should institute a pilot study on this issue of allocating 15 percent of the funds to selected projects for up-front development.

Capacity

50. Project management capacity has been reduced from some 2,500 personnel in the mid-eighties to 1,600 in the mid-nineties to less than 800 today. The effects of this reduction will be compounded by the projected increase in the capital budget in 2007/2008. Within the Department and externally in government there is generally limited capacity to handle, process and analyze the work required. Training is also an issue that currently consists of on the job or in-house generic courses rather than specific in-depth degree courses as in the US. In addition to a well-trained workforce, there is a need to ensure continuity of personnel. These issues are not new but until addressed, will affect time, cost and performance of projects. Planning, hiring and training must begin now to allow for the re-equipping of the forces that is projected over the next decade.²⁰

¹⁹ Quick Time Review M113, Chief Review Services DND, 31 October 2003.

²⁰ ADM(Mat) Modern Management Review, 21 April 2005.



OTHER CONSIDERATIONS

Industrial Structure/Policy

51. Canada does not have a written defence industrial strategy or policy. This has led to a case-by-case consideration of economic benefits that have tended to limit the achievement of defence objectives. In Britain, the industrial strategy and Defence Industrial Policy focus on maintaining a healthy and globally competitive defence industry. The thrust of their Defence Industrial Strategy is to establish a clearer understanding between government and industry of essential technologies and capabilities. The tenets of the strategy include adopting a flexible approach to competition at different stages, optimizing contract durations to encourage investment, as well as being more open and transparent. An industrial defence policy for Canada should be considered and integrated with the Defence Capability Plan/Strategic Investment Plan.

52. As part of such a strategy/policy, consideration should be given to leveraging defence contracts to secure opportunities for competitive Canadian companies to obtain a share in the work in an "...identifiable development project..."²¹ as part of industrial offsets. That is, contracts with larger and typically offshore firms should be used to leverage research and development work by smaller Canadian companies. Likewise, if the Canadian acquisition forms part of a larger production run, negotiation should consider securing a share in the operations and maintenance support for the entire production run—not just for the Canadian component. In these ways, Canadian companies not in a position to bid on the main contract can gain a stake in longer-term research and development areas and support contracts. Also, some firms have been concerned at having developed a piece of work only to have production handed to another supplier as a result of the acquisition process. Therefore, an industrial policy could also provide details for the management of intellectual property while allowing for development and production as a single package.

53. In keeping with the previous discussion on budgets, Canadianization of foreign-sourced equipment must be held to a minimum. If not, then simulation, prototyping and/or test and evaluation must be completed up-front with respect to determining the feasibility, risk and cost of Canadianization before the project proceeds.

Rapid Acquisition/Urgent Operational Requirements

54. Urgent operational requirements are dealt with by dramatically augmenting resources applied to them. By definition, urgent operational requirements are unforeseen requirements arising from needs of specific missions. They are not planned for in advance. When such requirements arise, the tendency is to focus effort at getting the urgent operational requirements fulfilled at the expense of other projects in terms of time, money and people.

²¹ Fergusson, J., *The Missing Dimension of the White Paper: A Defence-Industrial Strategy*, Canadian Defence Quarterly, Toronto, June 1995.



55. The study team proposes to institutionalize an urgent operational requirements system that would be responsive to proposals from the commanders of commands and for which there would be a separately funded annual envelope. This would be similar to the US approach of rapid acquisition. In 2004, Congress gave the US Joint Forces Command limited acquisition authority to meet such urgent joint war-fighting needs. ADM(Mat) could be organized to have a small staff specifically designated to the acquisition of urgent equipment purchases.

Incremental Acquisition

56. To cut down on cycle time and keep costs in check, an alternative approach would be to maximize the use of evolutionary and spiral acquisition methodologies. These are methodologies wherein a system or capability is acquired in part and then built up over time. The CF-18 capability was acquired to some extent in this fashion as well as recent software system acquisitions by ADM(IM). The Land Forces are also considering increased use of this approach. The Department should maximize the use of these approaches as they can make a contribution towards time savings while providing a mechanism for continual upgrade of the end product. ADM(S&T) can play a role in assisting in the application of such methodologies.

CONCLUSIONS

57. The existing system of acquisition is too slow and requires redesign. Risk aversion causes much of the delay and, in fact, increases risk when equipment delivery is not timely. Being risk averse contributes to the eight-year cycle time between SS(ID) and EPA, manifesting itself for example in the number of checks and balances currently required. Therefore, systems can be effectively obsolete or suffer interoperability issues. Capability during this period is lost, thereby increasing operational risk. Accelerating acquisition may carry additional risks but equipment delivery will be timely. Given that existing government policy, the CDS vision and ongoing transformation provide a backdrop for change—and given that transformation initiatives have begun—the time is right to consider a number of systemic reforms to the capital acquisition process, particularly in the areas of program development, project management and approval process.

58. Within program development, the governance committee structures (JCRB, PMB) should be refocused, restructured and redesigned. The end result would be a capital program directed from the top, dollar-constrained and focused on prioritized requirements with appropriate funding.

59. With respect to project management, the SRB requires refocusing to reflect its role in providing guidance, challenge and direction. Also, two models for altering the way in which acquisition of equipment is managed are proposed, along with other organizational/structural considerations. The selection of either model would result in a revised approach to program management based on the concepts of responsibility and accountability and increased timeliness.

60. Reform of a number of approval process issues will result in more timely acquisition. The impact would be one of accelerating the process by ensuring that the time for requirements definition is minimized, that redundant or ineffective oversight is eliminated, that documentation is standardized and modernized, that approval steps are minimized, and that accountability is not diffused through committees.

61. Other conclusions are that there exists an imbalance between defence and industrial objectives; involvement of industry occurs very late in the acquisition process; project development and design sometimes occurs during implementation; there is a lack of personnel to prosecute the program; and the possibility exists for greater use of evolutionary and spiral acquisition techniques.

62. Recommendations are provided for further consideration, discussion and debate and to feed into ongoing initiatives, with the ultimate aim of restoring timeliness to the acquisition system. This said, it is noted that some of the recommendations extend beyond the control of the Department, and will of necessity require input and cooperation from other government agencies.

RECOMMENDATIONS

63. Notwithstanding ongoing initiatives to modify or replace the JCRB, consider reducing it in membership size for greater focus and manageability. It would include the VCDS, a representative from the Strategic Joint Staff representing the interests of operational commanders, the three Environmental Chiefs of Staff, ADM(S&T), ADM(IE), ADM(IM), CMP and ADM(Pol). The role of ADM(S&T) should be enhanced in the Department and in such a board. For example, the latter could act as chair or co-chair under given circumstances. JCRB should prioritize and provide SS(ID) approval to projects.
64. SORs should be developed as capabilities as opposed to being platform-centric and should be tied to performance specifications. Their production should be undertaken by a specialist group, perhaps within CFD or possibly ADM(Mat). The Department should begin discussions with industry and PWGSC to develop a standard model for this type of SOR. Given changes to the SOR, a two-year cap should be imposed for the completion of the ID phase. Investigations to shorten this to less than one year need to be examined.
65. Within the new CProg branch maintain a program analysis group to provide independent analysis of requirements. This branch could support a restructured PMB that would concentrate on programming and cash flow management or alternatively, could replace PMB seeking input from former PMB members as required.
66. Stabilize funding for capital projects and prevent this funding from being used for other purposes.
67. Remove the SRB from the approvals/endorsement stream. If required, consider replacing the SRB with Materiel Governance Boards as per the Australian model. These boards would not endorse project planning but could provide a challenge function, guidance and direction to the project managers and sponsor directly.
68. Consider restructuring project management along the lines of either of the two models as developed in the text.
69. Revise the document approval stream with a view towards eliminating duplicative steps (see Figure 7).
70. Provide the Defence Capability Plan/SCIP or related document to Treasury Board with the aim of allowing for annual program approval thereby removing the requirement for individual project approval for PPA. Also, if the Minister's approval level was increased to \$100 million this would further reduce requirements for Treasury Board submissions.
71. Agree with Treasury Board on a common set of documents that would reduce the workload required after departmental project approval. The process could be further improved by e-filing submissions to Treasury Board. Templates for the new documentation should be placed on the capability investment database.



72. Have all internal review completed before obtaining authority from PMB or the VCDS on documents such as the Preliminary Project Approval, Project Profile and Risk Assessment and EPA or their replacements.
73. Create a pilot study on the concept of increasing spending up-front on research and development, test and evaluation, industry-funded studies, etc., in the order of 10 to 15 percent of project costs to provide more rigour and a holistic approach to capability development for future project stability.
74. The Department should consider alternate approaches such as spiral acquisition and incremental purchasing rather than securing the whole capability up-front. This applies to the quantity and to the capability.
75. Consider institutionalizing rapid acquisition/urgent operational requirements with designated personnel and with delegated funding.
76. DND should hire and train additional personnel to ensure there are enough qualified people in place to prosecute the emerging capital program. Personnel should be trained in the writing and preparation of performance-based SORs and capability analysis.
77. The balance between defence and industry objectives needs to be reassessed with the emphasis on defence. An industrial strategy should be created related to the development of the Defence Capability Plan/SCIP.
78. Continue discussions with PWGSC and Treasury Board to place the contracting function within the Department to remove duplication between departments.
79. Work with industry to shift the focus away from the initial capital purchase and place it on efforts to help secure contracts for the life-cycle support of the entire production run or for a share in research and development work in other projects the prime contractor may have.



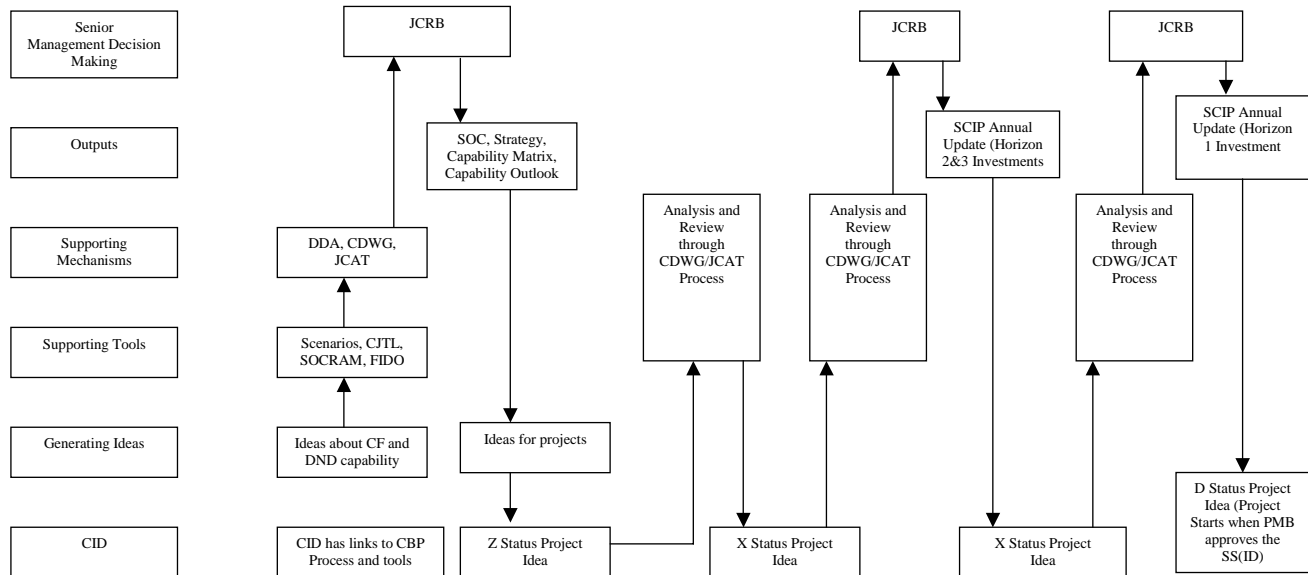
ANNEX A—CAPABILITY DEFICIENCY IDENTIFICATION PROCESS PRE-SS(ID)

1. Attached is a slide titled *A Complicated View*, prepared by Director Force Planning and Program Coordination (DFPPC). This slide shows the step-by-step process of how a given project marches through the system to the point when it becomes an approved Synopsis Sheet Identification (SS(ID)).
2. The project begins as an idea that is placed in the capability investment database. This idea can come from anyone within the Department who has access to the database.
 - The idea is then analyzed by various groups such as the Director Defence Analysis (DDA). DDA uses tools such as the Scenario Operational Capability Risk Assessment Model to provide a preliminary assessment of the idea before it moves forward to the Joint Capability Review Board (JCRB). At JCRB, it is assessed along with other ideas; those deemed reasonable from an operational perspective are processed for further analysis and are given “Z” status, meaning they exist but have no dollar value associated with them.
 - “Z” status project ideas undergo additional review and successful ones are given “X” status.
 - Once “X” status is assigned, project sponsors move the idea to project status by identifying scope, schedule and cost. This eventually leads to the SS(ID) but only after JCRB approval. At JCRB though, projects are not assessed in terms of affordability. This is done at the Program Management Board.
3. Note that this entire process comes before the clock starts ticking in the capital acquisition process. Hence, how it works or does not work will not form part of this study. In fact, there is a Technology Demonstration Project in the Assistant Deputy Minister (Science and Technology) organization that is addressing this aspect.



ANNEX A

A Complicated View Capability-Based Planning Leading to Identified Investment Projects—DFPPC



ANNEX B—STEPS IN THE CAPITAL ACQUISITION PROCESS

- Figure 1 shows the steps involved in the capital acquisition process. When the Synopsis Sheet Identification (SS(ID)) is approved either by the Program Management Board (PMB) or the level 1, the project moves into the Options Analysis Phase. This phase, conducted by the Environmental Chief responsible, involves the development and costing of various options. It is in this phase that the Project Profile Risk Assessment (PPRA) document is prepared, the Statement of Requirement (SOR) is written and the Synopsis Sheet Preliminary Project Approval (SS(PPA)) is signed. The SS(PPA) allows for definition funding to be allocated.
- In the Definition Phase, substantive estimates are obtained for the preferred option, the PPRA is refined, as is the SOR, and the project moves toward obtaining Effective Project Approval (EPA). After EPA the project moves into implementation. Depending upon the amount of work required in the Definition Phase, the project leadership may shift from the Environmental Chief to the Assistant Deputy Minister (Materiel). Typically the shift occurs in the Implementation Phase.
- The period from SS(ID) to EPA takes on the order of eight years to complete and is the period of focus for re-design of the process, though implementation may be impacted as a result.
- Once the work required for sign-off of a given synopsis sheet is completed, the paperwork must move through 16 steps if it is a submission to Treasury Board. The SS(PPA) and Synopsis Sheet Effective Project Approval (SS(EPA)) are documents that go to Treasury Board. The steps, taken from the Project Approval Guide, are shown in Figure 2. This process can take months to years to complete depending on whether or not the documents are completed to the satisfaction of the reviewers involved. Other sensitivities may also play a role. If any one step takes more time than anticipated, it can cause all other steps to slide forward; what may be an initial delay of weeks, can turn into a delay of months if subsequent review teams are unable to reschedule due to full agendas.

IDENTIFICATION	OPTION ANALYSIS	DEFINITION	IMPLEMENTATION	CLOSE-OUT
Identify capability deficiency	Formulate options	Detailed review, risk assessment and costing of selected option	Implementation	Full operational capability
Capability-based planning validation	Discard invalid options		Implementation management	Operational handover
	Assess benefits of remaining options	Implementation planning	Implementation monitoring, i.e., initial/full operational capability milestones	Project completion report
	Examine risk		Procurement/realty strategies	Lessons learned
	Decide which option should be pursued		Reports on status of implementation	
	Definition planning			
	Decision SS(ID)	Decision SS(PPA)	Decision SS(EPA)	

Figure 1—The Capital Acquisition Process



ANNEX B

STEP	OPI	ACTION	APPROXIMATE TIME
1	Project Director	Draft synopsis sheet with assistance of project team; forward to DFPPC for review and DSFC for cost validation.	Variable.
2	Project Director	Organize SRB to endorse synopsis sheet.	Documentation to be available to SRB members 10 working days prior to meeting.
3	Project Leader	At SRB, approve synopsis sheet.	N/A.
4	Project Director	Make SRB-directed amendments; consult DFPPC for "PMB decisions requested;" forward for Sponsor signature; register project with DMPD.	Variable.
5a	Project Sponsor	Sign synopsis sheet sign-off page; forward to DFPPC.	Synopsis sheet and presentation (if required) to be provided to PMB Secretary 15 working days prior to meeting.
5b	DFPPC	Synopsis sheet and presentation (if required) to be provided to PMB Secretary 15 working days prior to meeting.	N/A. See Note 1.
6	Project Director	Consult DFPPC regarding PMB procedures and issues.	N/A.
7	Project Director	Make PMB-directed amendments; re-format Treasury Board documents.	Up to 2 weeks.
8	Project Director	Forward submission to DFPPC.	N/A.
9	DFPPC	Conduct final content check; draft letter for DM's signature; forward submission to DMPD.	1 week.
10	DMPD	Review. Project Director should be available to answer questions. Forward submission to DFPPC.	2–8 weeks depending upon workload.
11	DFPPC	Final content check; forward submission for sponsor signature.	1–2 days.
12	Sponsor	Sign-off. Forward submission to DMPD.	1–2 days.
13	DMPD	Forward submission for other L1, CDS, DM sign-offs.	3–4 weeks.
14	MND	Approval/sign-off.	Variable.
15	DMPD	If applicable, forward submission to Treasury Board Secretariat.	Minimum 12 working days prior to meeting.

Note 1: Analyst is required to confirm project is ready for PMB consideration before the item is published on the agenda.

Figure 2—Guide to Project Approval



ANNEX B

STEP	OPI	ACTION	APPROXIMATE TIME
1	Project Director/ Project Manager	Draft synopsis sheet with assistance of project team; forward to VCDS staff for review and DSFC for cost validation/DMPD for registering and Treasury Board format check.	Variable.
2	Project Director/ Project Manager	Consult VCDS staff for decisions or amendments requested; forward for sponsor signature.	Variable.
3	Project Director/ Project Manager	Draft letter for DM's signature.	Up to 2 weeks.
4	Sponsor	Sign-off. Forward submission to DMPD for format/language check.	1–2 days.
5	DMPD	Forward submission for CDS, DM sign-offs.	3–4 weeks.
6	MND	Approval/sign-off.	Variable.
7	DMPD	If applicable, forward submission to Treasury Board Secretariat.	Minimum 12 working days prior to meeting.

Figure 3—Revised Approval Process

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ANNEX D—LIST OF ACRONYMS

ADM(Fin CS)	Assistant Deputy Minister (Finance and Corporate Services)	DFPPC	Director Force Planning and Program Coordination
ADM(HR-Civ)	Assistant Deputy Minister (Human Resources – Civilian)	DGSP	Director General Strategic Planning
ADM(IE)	Assistant Deputy Minister (Infrastructure and Environment)	DM	Deputy Minister
ADM(IM)	Assistant Deputy Minister (Information Management)	DMPD	Director Management Policy Development
ADM(Mat)	Assistant Deputy Minister (Materiel)	DND	Department of National Defence
ADM(PA)	Assistant Deputy Minister (Public Affairs)	DoD	Department of Defense
ADM(Pol)	Assistant Deputy Minister (Policy)	DSFC	Director Strategic Finance and Costing
ADM(S&T)	Assistant Deputy Minister (Science and Technology)	EPA	Effective Project Approval
CapDem	Collaborative Capability, Definition, Engineering and Management	JCRB	Joint Capability Review Board
CDS	Chief of the Defence Staff	PMB	Program Management Board
CFD	Chief of Force Development	PPRA	Project Profile Risk Assessment
CMP	Chief Military Personnel	PWGSC	Public Works and Government Services Canada
CProg	Chief of Program Branch	SCIP	Strategic Capability Investment Plan
CRS	Chief Review Services	SJS	Strategic Joint Staff
DCDS	Deputy Chief of the Defence Staff	SOR	Statement of Requirement
DDA	Director Defence Analysis	SRB	Senior Review Board
		SS(EPA)	Synopsis Sheet Effective Project Approval
		SS(ID)	Synopsis Sheet Identification
		SS(PPA)	Synopsis Sheet Preliminary Project Approval
		UK	United Kingdom
		US	United States
		VCDS	Vice Chief of the Defence Staff

