DEPARTMENT OF INDUSTRY, TRADE AND COMMERCE

DEFENCE INDUSTRY PRODUCTIVITY PROGRAM (DIPP) EVALUATION STUDY

VOLUME 4

PROGRAM DELIVERY

Peat, Marwick and Partners
Management Consultants

DEPARTMENT OF INDUSTRY, TRADE AND COMMERCE

DEFENCE INDUSTRY PRODUCTIVITY PROGRAM (DIPP) EVALUATION STUDY

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PROGRAM DELIVERY

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DIPP EVALUATION STUDY

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ANNEX VII: PROGRAM DELIVERY

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PROGRAM DELIVERY

This annex presents the results of the examination and evaluation of the program delivery system and the recommendations which flow from them.

OBJECTIVES

The purpose of our examination was to determine:

- how well the DIPP delivery system has performed in terms of effectiveness, efficiency, and control; and

- what changes are required to optimize the delivery of the program.

METHODOLOGY

The Program Delivery Module used the following methodology:

INTERNAL QUESTIONNAIRE

The purpose of the Internal Questionnaire was to assemble expert opinion from the working levels of the Department, relating to their

(a) actual experience with the DIPP program, its purpose, its impact, the departmental delivery system, and its efficiency;

(b) perceptions of the program as to its civil/defence rationale, risk elements, etc.

The target group was principally the officers, junior management, and advisors within the ISB's and the advisory groups. Seventy questionnaires were sent out, with forty returns divided 2/3 ISB's and 1/3 advisors.

INTERVIEWS

The interviews were held to obtain similar information from management, with more emphasis at the program management level. The target group extended to the ADM level, with some overlap at the junior management level with the Internal Questionnaire. Interviews were not restricted to ITC but included those departments (DSS, DND, MOSST) who have interest in or participate in the program.

COMPUTER FILES

Two sets of computer files were used:

(a) Financial Services Branch monthly financial reports (status of contributions and loans, repayments, aged receivables, etc.). This file system is common to all departmental Grants, Loans and Contributions.

(b) Financial Services Branch file GC-154, the DIPP program data base. This file was established to accommodate project data for program data aggregation and analysis.

The computer files were used to generate program/project profiles.

ISB FILE REVIEW

Project files were examined with three principal objectives in mind:

(a) Compliance with directives, goals, regulations;

(b) Quantitative analysis, e.g., delivery process timing;

(c) Qualitative analysis, e.g., quality of project management as a whole/ variations of quality across the ITC system.

In addition, ITC contracted with the Bureau of Management Consultants to study the overall part of the program delivery system. Their report is on file with the ITC DIPP Evaluation Coordinator.

STRUCTURE OF PROGRAM DELIVERY ANNEX

The Annex is structured as follows:

- Annex VII A describes the current delivery system in broad terms, the operational characteristics of the system, and its performance with regard to project processing times and documentation practices.

- Annex VII B focuses in detail on the major phases of project consideration in the current system.

- Annex VII C discusses the management of the Program (in contrast to individual projects).

- Annex VII D deals with underlying themes and issues which cut across the Program and the projects.

- Annex VII E contains recommended remedial actions.

There are two appendices to this annex. The first contains a complete listing of DIPP projects included in the file review sample. The second contains a description of monitoring and control requirements by program component to demonstrate the importance of the monitoring and control function for each component of DIPP.

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ANNEX VII A TO THE DIPP EVALUATION STUDY

PROGRAM DELIVERY: OVERVIEW OF PROJECT MANAGEMENT

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ANNEX VII A TO THE DIPP EVALUATION STUDY:

OVERVIEW OF PROJECT MANAGEMENT

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I - INTRODUCTION

In this part of the Annex on Program Delivery, we provide a statement of the official goals of DIPP and an overview of the DIPP delivery system. Annex VII A also contains an analysis of two aspects of performance which impinge on all stages of project management: documentation and processing times.

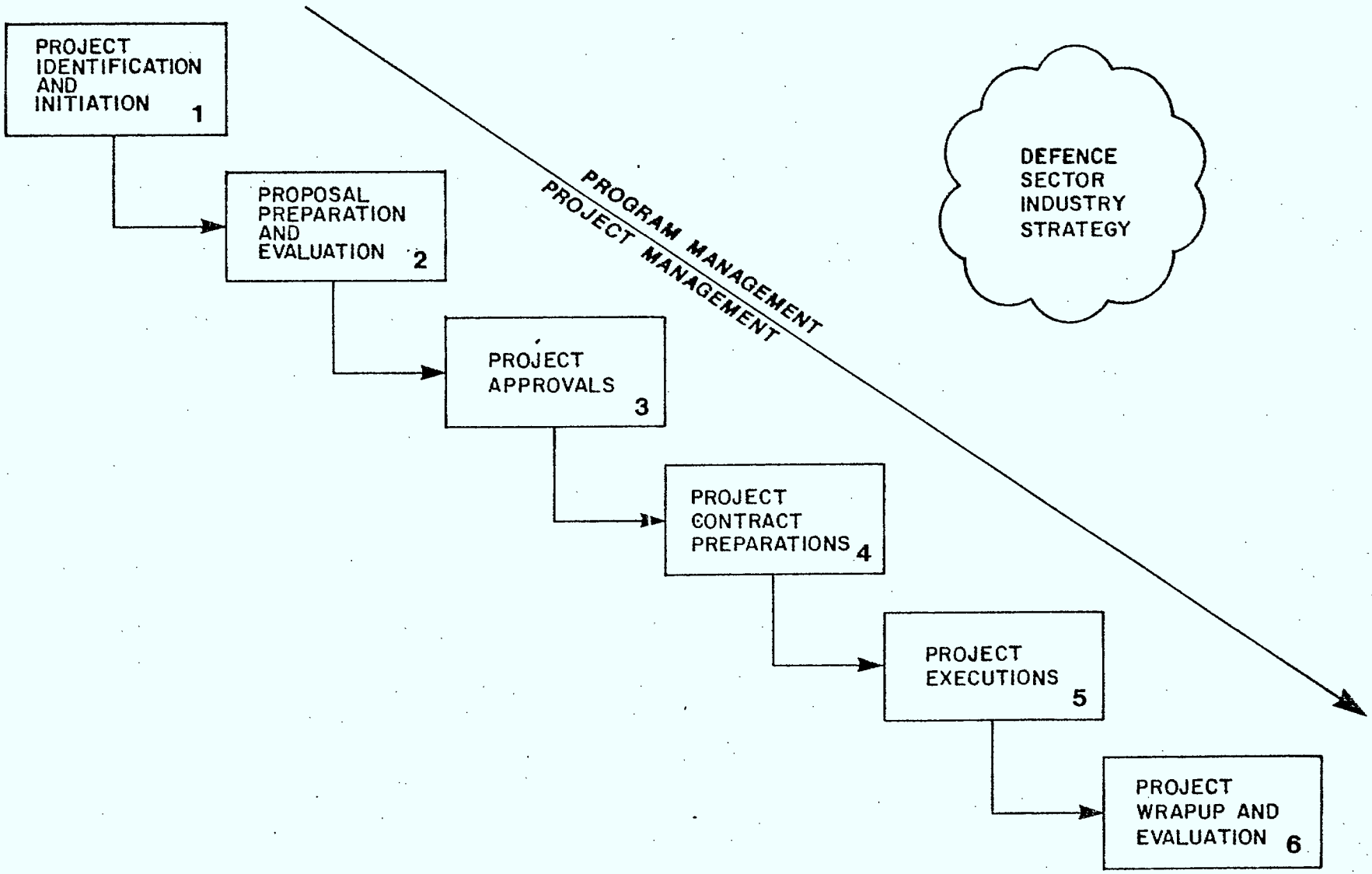
II - OFFICIAL GOALS FOR DIPP

The June, 1977, Policy and Administrative Directive approved by the Treasury Board, contains the following statement which is still in effect:

> OBJECTIVE
>
> "The objective of the DIP Program is to develop and sustain the technological capability of the Canadian defence industry for the purpose of generating economically viable defence exports and related civil exports arising from that capability:
>
> (a) by supporting selected development projects;
> (b) by paying one half of the cost of acquisition of new advanced equipment required for plant modernization; and
> (c) by supporting the establishment of production capability and qualified sources for production of component parts and materials.
>
> In keeping with the Department's roles of promoting export sales and viable industrial growth and efficiency, DIP Program resources are directed to projects that serve the objectives of international defence development and production sharing arrangements, and, in addition, to projects that support industry sector strategic objectives and maximize the potential economic return on the resources employed.
>
> 'Defence Industry', for the purpose of the Program, is defined as those companies or elements thereof which have or which clearly demonstrate the intent

EXHIBIT 1

OVERVIEW OF THE D.I.P. PROGRAM DELIVERY SYSTEM



> to develop a defence-oriented capability or capacity employing advanced management, engineering and technology directed to defence export sales and related civil export sales which arise from that capability or capacity."

A revised DIPP Directive was drafted in September, 1979, and has since been amended. Certain changes have been proposed by the DIPP Office, some of which appear to have Treasury Board Secretariat support. Their outcome will not be known until after the publication of the DIPP Evaluation Report.

III - OVERVIEW OF THE DIPP DELIVERY SYSTEM

STAGES

There are six major stages to the complete delivery system. A summary overview is presented first. Exhibit 1, opposite, shows this graphically.

Stage 1: Project Initiation

Projects are identified as being suitable and eligible for submission. This iniative can be taken by industry or by government.

Stage 2: Proposal Evaluation

This stage covers the preparation and evaluation of the formal proposal. These two activities are grouped together for discussion because sometimes the evaluation produces changes or modifications in a proposal.

Stage 3: Approval of Proposal

This stage includes a series of approvals necessary to enable a contract to be arranged. It includes approvals from ITC and from other departments.

(Page A-3 omitted)

Stage 4: Contract Preparations

The approved projects become subject to a form agreement between the Crown and the applicant. Two departments are involved in finalizing the contracts.

Stage 5: Execution of Project

The project has to be carried out by the recipient firm under the terms of the contract. Monitoring the recipient's progress is important for contractual and for general financial reasons. DIPP projects can extend from 1-10 years.

Stage 6: Follow-Up Activities

Several activities must be carried out after the completion of a project. They arise from the terms of the formal contract and from the general need for proper project evaluation.

DURATION OF STAGES

The duration of some projects funded under this program is short, e.g., Source Establishment projects, but most R&D projects extend over several years. The first four stages can take from six months to a year, with the initiation stage being the longest. The execution and follow-up stages can take several years. Eventual payoffs can be prompt for some projects or long delayed if major research efforts are involved. Thus, the universe is not one of easily comparable, homogeneous projects.

DIPP CASELOAD

At present, approximately 200 active DIPP projects are shared among 5 ISB's

and the Defence Programs Branch. The breakdown is given by program component and by ISB in Exhibit 2, opposite.

CRITERIA FOR EVALUATION

The prime objective of the Program Delivery evaluation is to review the effectiveness of the system, including its procedures, in delivering projects to meet the program goals. A secondary concern is the efficiency of the system. It was expected that strengths and weakness would be identified from which an improved system could be developed. The improved system is expected to lead to greater industrial impact, more efficient use of scarce public resources, and a better accounting of the expenditures of public funds.

The six stages were examined in detail to establish whether projects could become separated from DIPP goals, and, if they had, why they had deviated. The detailed examination of the DIPP delivery system appears in Annex VII B. Findings and the rationale for our recommendations are discussed. A summary of the recommended changes to the system is recorded in Annex VII E.

CHECKS AND BALANCES

One overriding consideration permeates all the delivery system's operations: the Department must provide, and be perceived to provide, proper stewardship of public funds. It must achieve this in a system which involves a matrix organization in ITC and collaboration with other departments. It must also achieve this in its relationship with ITC's industrial clients.

EXHIBIT 2

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DIPP PROJECTS UNDER CONTRACT, FEBRUARY 1980

BRANCH	CAPITAL ASSISTANCE	SOURCE ESTABLISHMENT	R&D	TOTALS
Chemicals	2	1	1	4
Electrical and Electronics	18	16	43	77
Machinery	2	-	-	2
Resource Industries	8	4	1	13
Transportation Industries	44	17	38	99
Defence Programs	1	-	2	3
TOTAL	75	38	85	198

SOURCE: FSB Monthly Report GC-030, Feb. 1980

(Page A-6 omitted)

We recognize it would be possible to cut costs and speed up action by extensive delegation of authority and by reducing project assessment and review, thus reducing the checks and balances. We recognize that there are limits to this philosophy for good and general public reasons.

These considerations were kept in mind during the examination of program delivery.

IV - DOCUMENTATION PRACTICES: REVIEW OF ISB FILES

OBJECTIVES AND SCOPE

A major component of the program delivery module was the review of the documents in ISB files for a sample of DIPP projects. The purpose of the file review was to obtain an indication of the nature, characteristics, and procedural steps of the project approval process and the monitoring and control process. The review also revealed how well the various processing steps actually complied with the requirements set out in the administrative directive. Other information sought pertained to the quality of file documentation, required processing times, and selected project characteristics.

METHODOLOGY

A random sample of DIPP projects was chosen for the ISB file review. The sample was selected from the total population of projects approved during the fiscal period 1969-70 to 1978-79. As Exhibit 3, opposite, shows, 89 projects were selected for the sample from a total population of 805 projects.

EXHIBIT 3 CONFIDENTIAL

SUMMARY STATISTICS FOR THE SAMPLE OF PROJECTS SELECTED FOR FILE REVIEW AND THEIR RELATIONSHIP TO THE TOTAL DIPP PROJECT POPULATION,[1] FOR THE PERIOD 1969-70 TO 1978-79

Program Element	No. of Projects Approved			Funds Authorized			Ave. Funds Authorized Per Project		Range in Funds Authorized for Sample Projects	
	Sample	Total Population	Sample as % of Total	Sample	Total Population	Sample as % of Total	Sample	Total Population	High	Low
				000'$	000'$		000'$	000'$	000'$	000'$
CA	15	341	4.4	5,830(2)	95,370	6.1	389(2)	280	3,300	18.1
SE	16	188	8.5	7,726(3)	91,910	8.4	483(3)	489	5,730	5.7
R&D	58	276	21.0	80,145	349,060	23.0	1,382	1,265	13,300	32.0
TOTAL	89	805	11.1	93,701	536,340	17.5	1,053	666		

1 Total DIPP project population comprises the projects approved during the fiscal period 1969-70 to 1978-79.

2 The largest project in this group received $3.3 million. Excluding this project, the figures are $2,530,000 for total funds authorized and $181,000 average funds per project.

3 The bulk of these figures was accounted for by one project involving total funds of $5,730,000. Excluding this project, the figures are $1,996,000 for total funds authorized and $133,000 average funds per project.

(Page A-8 omitted)

Two-thirds of the sample consisted of R&D projects. The remaining sample projects were split almost evenly between the other two elements of the program: 15 CA projects and 16 SE projects. The 58 sample R&D projects comprise 21 per cent of the total R&D projects approved during the ten-year period. The corresponding proportions were much smaller for the CA & SE elements of the program: 4.4 and 8.5 per cent, respectively.

The selected projects involved authorized funds of $93.7 million. Eighty-five per cent of this total was for R&D projects, six per cent was for CA projects, and the remaining eight per cent was for SE projects. These authorized funds comprised 17.5 per cent of the total for all projects approved during the ten-year period. The corresponding relationships by program element were quite similar to those shown for number of projects.

The average amount of funds authorized per sample project was much greater for the R&D projects than for the other two program elements. This is consistent with the characteristics of the overall population of DIPP projects. The sample averages were $1.4 million for R&D projects, $0.4 million for CA projects, and $0.5 million for SE projects. Each of the latter two groups of projects was significantly affected by one large project; excluding the large project in each case resulted in the average authorized funds being less than $0.2 million per project. There was also a wide range in the amount of funds authorized per sample project, shown in Exhibit 3. A complete list of the DIPP projects included in the file review sample appears as Appendix 1 at the end of Annex VII E.

FILE IDENTIFICATION

Considerable difficulty was experienced in locating the appropriate files for some of the projects which received DIPP assistance during the early 1970's, due largely to departmental reorganizations. In attempting to identify the older files, it was discovered that the ISB quite often did not have a record of the earlier Branch file numbers, nor of the FSB requisition file numbers. The best course of action was first to identify a project by its FSB requisition number and then to obtain the earlier Branch file number from FSB. In most cases, FSB was able to provide such information. A few project files had been lost and/or destroyed after being sent to file storage.

To reduce the problem of project file identification in the future, all Departmental files for a given project should be assigned a common number, such as the number assigned to a project by the FSB #1-000 requisition numbering system. The requisition number could then be used as a common cross-reference for project files which are set up by the various Branches such as Programs Branch (DIPP Office), ISB, CAB, DPB and FSB.

QUALITY OF FILE DOCUMENTATION

The administrative directive of the DIP Program outlines the steps and documentation required during the project approval and monitoring and control processes. Examples of such documents are the project submission, advisors' comments, DIPP Committee minutes, TB submission, DOI85, contract agreement, PRG minutes, and progress payment claims. This material serves as an historical record of the project and provides an indication of how well the requirements of the directive have been adhered to.

The file review exercise revealed that the completeness of file documentation varied a great deal. The variation was especially noticeable between ISB's and between project officers. Statistics on this topic are shown in Exhibit 4, overleaf. The following specific observations on file documentation were made:

Industry Sector Branch

In general, the E&E Branch's project files were relatively well documented in comparison to other Branches such as TIB.

Advisor

Fifty per cent of the Financial Advisors' reports were missing. The marketing report was missing in about one-fifth of the cases. In most cases in which an advisor's report was missing, there was still an indication in the file that the advisor's opinion had been obtained, usually in the form of a comment by the project officer in his reporting on the approval process.

Contract and Final Report

Almost one-third of the project files (31 per cent) did not contain the contract agreement. Another serious omission was the final management report (sometimes referred to as the project status report), i.e., the evaluation report of the project following its completion. One-half of the project files did not contain this document. The extent of file incompleteness, especially with regard to these two important documents, is unacceptable.

DIPP Committee Recommendations

A relatively complete record was found of the appropriate Committee minutes. This document was missing in only 13 per cent of the cases.

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EXHIBIT 4

STATISTICS ON FILE DOCUMENTATION FOR R&D PROJECTS

Item	Advisor Report [1]		DIPP Committee Recommendation[2]	Contract Agreement	Final Management Report
	Marketing	Financial			
Proportion of files which did not contain a copy of the document - per cent	22	50	13	31	51
No. of observations	36	28	54	55	45

1 In the majority of cases, the concurrence or opinion of the advisor had been obtained but a copy of the advisor's report was not on file.

2 The document in this case was a copy of the Committee minute which recommended the project.

(Page A-12 omitted)

Encumbrance Document

The file documentation was also deficient for several other documents, but statistics were not compiled. In the case of the document used to encumber the funds, DOI85, there were instances in which the initial DOI85 was not on file, but the subsequent amendments which altered the encumbrance by fiscal year were on file. The signatures on the ISB copy of this document generally included those of the project officer, Branch director, and Deputy Minister. Signatures of the Comptroller, Minister, and FSB authorized officer generally were absent. However, it could very well be that their signatures do appear on other copies of the DOI85 such as the FSB copy.

Progress Payment Claims

The number of progress payment claims varied considerably between projects from only a few to fifty or more. The file documentation of these claims was somewhat haphazard. In some instances, a complete set of the claims was on file, and if the number of claims was considerable, a separate claims file had sometimes been maintained. In many cases, however, the set of claims was not complete. Only a limited number of the project files reviewed included a summary sheet. A sheet showing claims data, listed in sequence, of the amount, total to date, and outstanding balance of authorized funds, should be used for all projects to provide an up-to-date picture of project financing.

PRG Minutes

PRG meetings generally were held at least twice yearly, although the frequency varied considerably. Some of the relevant minutes and reports were not on file. As in the case of the progress claims, the maintenance of a PRG chronology sheet would aid in monitoring projects.

A particularly notable feature of the ISB file documentation was the absence of any follow-on reports dealing with measures of project success. The file was closed on the completion of the project, and the last document was usually the final management report, if one had been written. The files contained no reports dealing with production, employment, sales and/or exports. The failure to record these matters is a serious deficiency. Such data and reports are essential to evaluating program effectiveness. This deficiency should be corrected. The means of doing so are discussed later.

IMPROVING DOCUMENTATION PRACTICES

A standardized historical summary sheet should be completed for each DIPP project. It should contain the vital statistics of a project and would provide a convenient overview of the project. The form should contain basic project identification information and financial data, including the planned expenditure pattern and a chronology of the principal approval processing operations. The historical summary sheet should be kept at the front of the project file with a progress payment claims record sheet and a similar sheet to record monitoring and control activities. The maintenance of these various summary sheets, or possibly a combined, single document, would ensure that basic project data and information would always be readily available. It would also greatly facilitate future program evaluations. These records should be standardized and used by all officers involved with DIPP projects.

A standardized project progress reporting form should also be completed at regular intervals, e.g., quarterly or semi-annually. This document would briefly report on the present project status (technical and financial),

problems areas and remedial action, proposed project changes if any, and a review of the market position. Its use should also be standard practice for all DIPP project officers.

SUMMARY OF RECOMMENDATIONS

1. File documentation must be greatly improved to ensure that a complete set of documents is maintained in the project file. Of particular concern are such important documents as the contract agreement and the final management or status report.

2. The various file numbering systems being used by the various Departmental Branches for a particular project should incorporate cross-references to facilitate the prompt identification of files.

3. A standardized summary form to record payment claims data should be used to provide a continuing, up-to-date picture of the financial status of a project.

4. Similarly, a standardized form recording activities should be used to assist in project monitoring.

5. A standardized historical summary sheet should be used for each project. Possibly this sheet could be incorporated with the forms recommended in items 3 and 4.

EXHIBIT 5

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PROCESSING TIMES FOR DIPP PROJECT APPROVALS

Program Element	No. of Observations	Ave. time from date of Company Application to date of contract agreement	Standard Deviation	Range in Processing Time	
				maximum	minimum
		- number of calendar days -			
CA	15	241	87	448	152
SE	16	324	174	730	82
R&D	32	377	144	657	87

6. A standardized project progress reporting form should be completed at specified intervals.

V - PROJECT PROCESSING TIMES

A major concern to ITC and the companies in processing a project application is the length of time required to process the project to final approval. This period includes the time from initial company project application through to the DIPP Committee recommendation and on to the preparation of the contract agreement. Once it has formulated an undertaking which is potentially eligible for DIPP support, the company wants to undertake the project without undue delay. It wants a prompt decision on the eligibility of the project for Crown assistance, and, if the decision is favorable, it seeks to have the contract agreement drawn up promptly.

INITIAL APPLICATION TO CONTRACT AGREEMENT

Exhibit 5, opposite, shows the average processing times by program element from the time of initial company application to the date of contract agreement in calendar days. For the largest group of projects, R&D projects, the average processing time for 32 projects was 377 days, or slightly more than one year. This figure compares with an average of 241 days, or eight months, for CA projects and 324 days, or almost eleven months for SE projects. The DIPP approval process is time consuming, even for the CA projects which were processed the most rapidly.

(Page A-17 omitted)

As indicated, we took the starting point of the project processing to be the date of the company's project application. Some variation prevailed between projects as to this initial starting date. We did not count the time devoted to any preliminary discussions. In cases where a second application followed the first after a lengthy delay, we used the date of the second application as the starting point. In cases where there was no application on file or any date reference to such a document, the date of the ISB project submission was used. Thus, there was some variation in the initial starting date of the approval process between projects, but, on average, this was relatively minor compared to the subsequent length of time for processing.

VARIATIONS IN PROCESSING TIMES

The statistics in Exhibit 5 indicate the high degree of variation in the project processing times. Standard deviations and ranges in processing times are shown by program element. The standard deviation for the R&D projects, for example, was 144 days. That is, if the processing times for a random sample of projects were examined, approximately two-thirds of the projects would fall within the average of 377 calendar days $\pm$ 1 standard deviation, and 95 per cent of the observations would fall within the average $\pm$ 2 standard deviations. The standard deviation in this case was almost five months which is quite high in relation to the processing average of 12.5 months. The range in the processing times shown for the R&D sample projects was also quite large, from a maximum of 657 to a minimum of 87 days.

The SE element showed the greatest degree of variation in processing time, although it is recognized that the sample of projects was quite small for the

purpose of calculating standard deviations. In comparison to a processing time average of 324 days, the standard deviation was 174 days, and the range in processing time was from a maximum of 730 days to a minimum of 82 days. The variation for the small sample of CA projects was substantially less, with a standard deviation of 87 days in relation to a project average of 241 days. All these figures indicate that, on average, the DIPP project approval process is a lengthy and time consuming operation that varies greatly between projects. This inefficiency of the program delivery system has caused considerable dissatisfaction amongst the client companies, and a special effort is required to achieve an overall improvement in this aspect of the delivery system. It deserves high priority.

Since R&D projects represented the largest portion of the sample of projects examined, additional details on processing times were compiled and are shown in Exhibit 6, overleaf. The total approval process from the time of project application to contract agreement was divided into five steps, and processing times and standard deviations were calculated for each operation.

INITIAL APPLICATION TO DIPP COMMITTEE RECOMMENDATION (Step 1)

The average time shown for Step 1 in Exhibit 6, which covers the time interval from the date of the company's project application to the date of the DIPP Committee recommendation, was 130 days. The activities included in this stage were the preparation of the project submission by the ISB project officer (once approval had been obtained from Branch management to proceed with the project); obtaining the advisors' opinion and concurrence of the project; obtaining ISB management's final approval; for earlier projects, obtaining the recommendation of the appropriate advisory group such as the EAG; and,

EXHIBIT 6 CONFIDENTIAL

AVERAGE PROCESSING TIMES FOR R&D PROJECTS

Processing Operation	No. of Observations	Average Number of Calendar Days	Standard Deviation - days
1. From date of company's project application to date of DIPP Committee recommendation	38	130	85
2. From date of DIPP Committee recommendation to date of DM/TB approval in principle [1]	45	71	65
3. From date of DM/TB approval in principle to date of DOI85 encumbrance of funds [2]	29	53	58
4. From date of DOI85 to date of ITC request to DSS for contractual action	22	13	15
5. From date of ITC request for contractual action to date of contract agreement	25	110	64

NOTES: Average advisor response time
financial - 20 days
marketing - 28 days

[1] Excluding six projects for which the DIPP Committee recommendation was conditional and hence had a delaying effect on the next stage of approval, the average processing time for step 2 was reduced from 71 to 51 days.

[2] Excluding five projects mainly of a bid support type which experienced processing delays until successful bids were realized, the average processing time for step 3 was reduced from 53 to 31 days.

(Page A-20 omitted)

finally, obtaining the recommendation of the DIPP Committee. A draft TB submission was often prepared to go along with the project submission. As the figures indicate, these activities, which yield the required project information and concurrences and finalize the submission for Committee acceptance, have proven to be time consuming tasks. The variation between projects was also quite high, as indicated by a standard deviation of 85 days. The file information showed an average response time for the Financial Advisor of 20 days, and for the Marketing Advisor, 28 days.

DIPP COMMITTEE RECOMMENDATION TO DM/TB APPROVAL IN PRINCIPLE (Step 2)

The next step in the processing operation was to get DM/TB approval in principle. The average time recorded was 71 days, which is unexpectedly lengthy. A partial explanation was that the Committee recommendation for several of the projects was conditional on certain things happening, such as a more detailed marketing plan being developed by the company or the success of the company in obtaining a related production contract.

Lengthy delays of this kind at the TB approval level were shown for at least six of the R&D projects. When these projects were excluded from the tabulation, the average time between DIPP Committee recommendation and DM/TB approval was 51 days - still a fairly lengthy period. Apparently for projects requiring TB approval, lengthy delays can occur simply because of a heavy backlog of other items on the agenda which take precedence over DIPP project proposals at the TB weekly meeting. Discussions should be held with the Treasury Board Secretariat to permit normal sized projects to receive "Routine" approval.

APPROVAL IN PRINCIPLE TO ENCUMBRANCE OF FUNDS (Step 3)

Following the approval in principle of a project, it was then necessary to obtain an encumbrance of funds for the project. The form used was the DOI 85 which required a series of signatures at the ISB, ADM, and FSB levels. A tabulation of the associated dates for the ISB and ADM signatures showed that it took an average of 40 days to have the DOI85 signed off at the ISB level, following project approval in principle, and another 13 days for signature at the ADM level.

Several lengthy delays were shown at the ISB level. Usually these were in connection with bid support projects for which approval was delayed until the company bid was declared successful. In one case a joint project was delayed because approval was required for the foreign share of financial support. The unusual delays contributed to a high standard deviation of 58 days. Excluding these special cases resulted in an average processing time of 31 days (compared to the previous figure of 53 days) to have the DOI85 signed off at the ISB and ADM levels.

ENCUMBRANCE TO REQUEST BY ITC TO DSS (Step 4)

The encumbrance of funds was followed by a request to DSS from the ITC project officer to prepare the necessary contract agreement. The average time interval for this action request was 13 days.

ITC REQUEST TO CONTRACT AGREEMENT (Step 5)

The remaining element in the approval process was for the drafting, approval, and signing of the contract agreement, undertaken by DSS. The average processing time for the contract preparation was 110 days or slightly more than three and one-half months, with a standard deviation of 64 days.

The elapsed time for this operation, which usually involves a standard contract, has been a continual cause of complaint from the applicant companies. A company is notified once the project submission has received approval in principle. The company expects that the last remaining approval will generally be routine and completed quite promptly. This has not been the case.

FACTORS PROMOTING DELAYS

Several factors were found to affect the time required for contract completion. The DIPP contract agreement differs from the standard DSS procurement contract. Specific instructions apparently have not been given to DSS for preparing DIPP contract agreements. A set of instructions would be a useful guide for the contracting officer. No priority is assigned to the contract preparation of DIPP projects, and this task may be held up indefinitely because of other DSS work. Occasionally the contract has been delayed because of the absence of the company's signing officer, but such delays have been infrequent.

In summary, the statistics in Exhibit 6 show that the beginning and completion phases are primarily responsible for the lengthy time interval required for

DIPP projects to pass through the total approval process, i.e., Steps 1 and 5. Two other steps in the approval process also seem to be unacceptably time consuming. These are the times required to obtain DM/TB approval in principle and to obtain the encumbrance of funds. Although they are shorter than steps 1 and 5, they still appear to be unduly lengthy. In effect, these four stages of approval comprise almost the total approval process; thus the entire approval process requires close scrutiny to improve the efficiency of the program delivery system. Appendix VII B contains a detailed analysis of the approval process, in Section III.

The number of personnel involved in approving projects, both within and outside the Department of Industry, Trade and Commerce, contributes to the elapsed time. They include the applicant company, ISB project officer, ISB management, several advisors (and at one time, also an advisory committee), DIPP Committee and secretariat, encumbrance approval officials, Treasury Board, and DSS. Given this number of participants and the plethora of documents which they must approve, communication is difficult, even with good channels. When the conditions are less than ideal, the approval process will invariably be much slower.

IMPROVING THE EFFICIENCY OF PROCESSING

One approach to speeding up the approval process is to eliminate or combine certain phases and to confine the operations as much as possible to ITC. Some moves in these directions have already taken place or are presently being considered. The advisory committee groups which examined the project submissions prior to DIPP Committee considerations were disbanded some time ago. In

addition, a revised draft Administrative Directive proposes that the requirement to obtain TB approval in principle be reduced from the present level by delegating wider approval authority to ITC (to $5 million). The transfer of the task of preparing the contract agreement from DSS to ITC is also being considered. These latter two proposals appear to offer considerable scope for shortening and tightening the approval process and at the same time for improving program efficiency.

The lack of published guidelines for distribution to applicant companies is a notable weakness. The initial project review phase would probably be speeded up, and the time required for the submission to reach the DIPP Committee would be reduced if companies were provided with information on how to complete applications properly.

Changes recommended later in the report to project and program management should reduce project processing times considerably.

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ANNEX VII B TO THE DIPP EVALUATION STUDY

PROGRAM DELIVERY: DIPP DELIVERY SYSTEM

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ANNEX VII B TO THE DIPP EVALUATION STUDY:

DIPP DELIVERY SYSTEM

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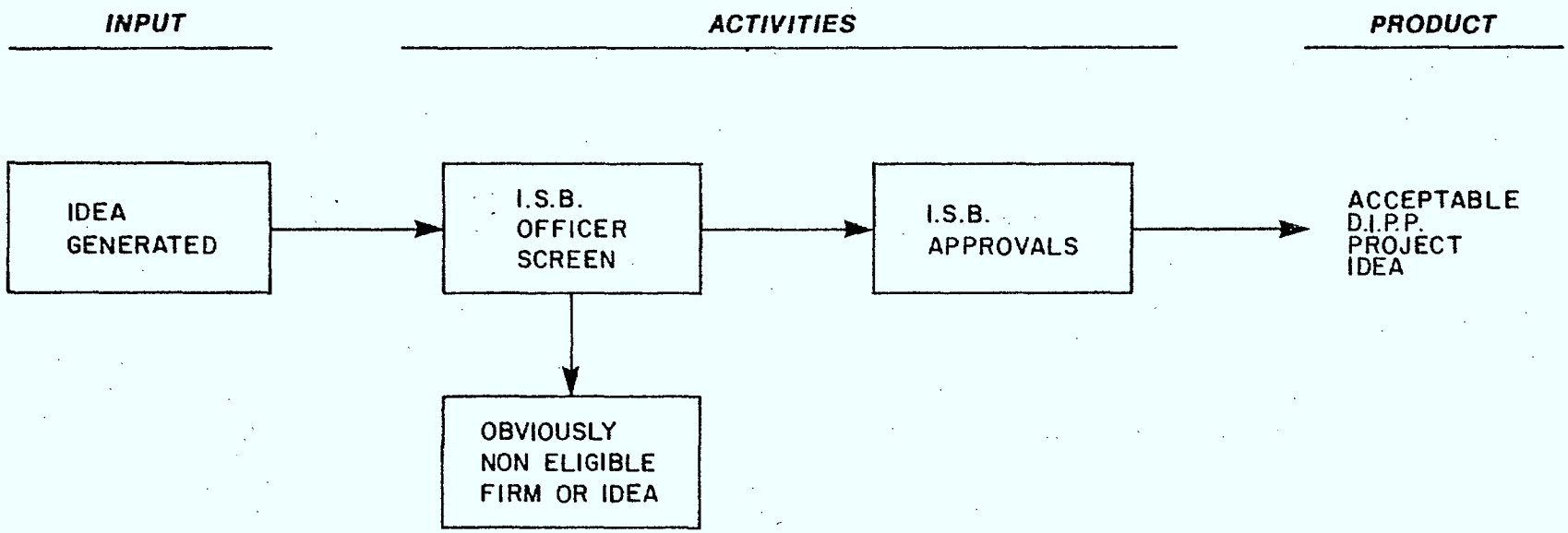
EXHIBIT 1

D.I.P.P. PROJECT INITIATION STAGE



PERSONS	- I.S.B. Officer - U.S. Govt. Liaison - U.S. D.O.D. - D.N.D. - Company	- I.S.B. Officer	- I.S.B Div. Chief - I.S.B. Director - I.S.B. Dir. General

I - INITIATION OF PROJECTS

The general outline of this section is shown on Exhibit 1, opposite. It covers the ISB discussions with industry, and the in-Branch approval to proceed leading up to the Project Submission to the DIPP Committee.

ROLE OF ISB OFFICER

The ISB officer is the principal actor in the program delivery system. His basic mandate is industrial development. He performs several activities to achieve this goal, and he must fulfil other branch requirements. The delivery of ITC assistance programs is only one of his many activities, and all industrial assistance programs (aggregated) account for only 20% of total ISB workload. Since DIPP is one of several ITC industrial assistance programs, there is, in theory, further dilution, but in practice DIPP is concentrated in two ISBs: Transportation Industries Branch and Electrical and Electronics Branch. They accounted for 95% of DIPP expenditures from 1969-1979.

The ISB's do not perceive themselves as serving DIPP; rather, DIPP is a tool that serves them with specific application to high technology industry, both for product development (R&D) and the creation of the necessary advanced production base (CA) to make the R&D product. They view DIPP as serving those Canadian industry sectors which must compete internationally with those countries whose governments are perceived to give similar or greater industrial support. While defence objectives are acknowledged, they generally are ranked

(Page B-2 omitted)

behind the first two. Only in the Defence Programs Branch do the defence objectives of DIPP rate ahead of the industrial development objectives.

We found ISB officers to be competent and dedicated in their government industrial development and in their DIPP delivery roles. Their background is generally technical, with further skills developed in industry before joining government. They are an effective bridge between the government and industry. Yet we encountered, within and without ITC, some skepticism about their role, their suitability, and their professionalism, usually from those with little or no industrial or technical experience. Our conclusion was that DIPP has been better served than the ISB officers have always been given credit for. They have made efforts to protect the public purse, to screen projects as well as they could within the existing system, and to report to their management. The evidence is in the files, in the internal questionnaires, and in interviews.

DIPP COMPANY UNIVERSE

DIPP is used only by some of the technologically advanced companies in Canada. Since it is a defence export program, it is not surprising that only certain companies see themselves as eligible. Other companies prefer the steady commercial environment or dislike being involved with defence. By March 31, 1975, DIPP aggregated 755 projects from a universe of only 206 companies, or 3.6 projects per company, nearly all in high technology development or precision manufacturing.

The promotion of the program is minimal. No brochures exist; the Policy and Administrative Directive is classified as "Restricted"; the program is passive rather than active. In spite of this, the program currently lacks the funds even to meet existing applications. A few promotional attempts to widen the base have been made in the past, such as Enterprise '77, but apparently there were few applicants, and most of them were ineligible.

On balance, DIPP appears to be well known among companies that are naturally eligible, and the universe would not significantly expand if substantial promotion were undertaken.

SOURCE OF PROJECT IDEAS

DIPP projects are initiated principally through:

- Company unsolicited request (70%)

- ISB/Canadian government initiative (15%)

- Other governments, and joint projects with other governments (15%).

These estimates apply to R&D projects. Capital Assistance and Source Establishment projects are almost exclusively industry generated.

The kinds of ideas are also diverse. Some are new projects initiated by the company. A few are technology transfers derived from government laboratories such as NRC or from parents of multinational enterprises as transfers to their

Canadian subsidiaries (Litton, CMC). Quite a number are follow-on projects or projects for repackaging core technology to meet customer needs.

PROCEDURES IN THE INITIATION STAGE

Development of an R&D idea to the stage of company application to ITC is usually a matter of months but may take 1-2 years. The time taken is usually related to company-perceived market opportunities. At first, contacts are usually informal; correspondence, phone calls, and discussion will normally involve ISB's and companies in no predetermined pattern. With respect to CA and SE, the time frame is generally a matter of weeks rather than months. In some SE cases, bid closing dates may shorten this stage to a matter of days.

The two principal ISB's, Electrical & Electronics, and Transportation Industries Branch, require the originating officer to get explicit management approval at Division Chief or Director level before proceeding with a full Company Application and its successor, the Project Proposal preparation, for the DIPP Committee. The files showed that the average length of time from receipt of company application to DIPP Committee is 4 months.

Before submitting a formal application, some companies test their position by a presentation to ITC personnel, then follow up with a formal application. While the Directive requires an "Enquiry Report Form" to be completed for potential submissions, this is rarely done. In a given year, perhaps half a dozen may be issued, whereas 70-90 projects are approved by the Committee. At the ISB's, comprehensive records of enquiries are not kept until the project firms up to the application stage. The "Enquiry Report Form" should be reviewed to cancel it or to rejuvenate it - probably the former.

There are two filtering stages at this point. The ISB officer acts as the primary filter and his management as a secondary filter. The best estimates of this filter effect indicate that, of 100 proposals informally discussed, 33 are removed at the first level and a further 9 at the next. From then on, the turndown rate is very low: of the remaining 58 projects submitted to the DIPP Committee, perhaps 2 get turned down.

A major deficiency at this stage is the lack of published guidelines enabling the company to submit an application in line with program requirements. Guidelines would ensure consistency in company applications and would lighten the task of the ISB officer in preparing the submission. They should specify goals, eligibility, and application requirements to meet the financial, technical, and marketing criteria used by the advisors and decision authorities.

At management levels, there was concern over the quality of the initial analysis of the financial, technical, and marketing aspects of the company proposal. In general, ISB officers felt that the advisors are brought into action at the appropriate time. The advisors felt that they are not brought in early enough; they stated this could result in fast opinions being presented rather than adequate analysis, with the quality impact being most noticeable in R&D projects. Advisors are sometimes brought in at the project start, but there is no consistency from branch to branch and officer to officer. Where the advisors are brought in at an early stage, their inputs usually become part of the ISB management review.

Advisors should be brought in early in the project initiation stage, particularly in projects involving new technologies, companies new to DIPP, and R&D.

For various reasons, discussed later, there is little post project and program analysis and evaluation. (Some information was found to be updated in the Corporate Submissions.) This has led to a general lack of knowledge on the options for investment and a consequent inability to use concrete, historical data in assessing projects at the initiation stage.

QUALITY OF COMPANY APPLICATIONS

It was clear from the file review that the quality of company applications varied from excellent to poor. A few of the excellent proposals came from small, irregular users, and some of the poor proposals came from medium-size regular DIPP users. In general, high quality was associated with regular DIPP user companies and to the ISB sections with the most program familiarity. The lack of consistency in the quality may be partly due to the lack of published guidelines, the lack of familiarity of some ISB sections with DIPP, and the lack of a professional skill development program within the ISB's.

The real point of a company Application may not be so much to meet government regulations as to ensure that the company itself makes the effort to analyse its project and risk and to develop a sound market strategy. ITC should demand the evidence that is needed for sound business judgement. Consistent application of this principle would ensure that the company rigorously analyses its own position for government-assisted projects and, equally important, for its company funded projects.

STRENGTHS OF THE SYSTEM

There are several strengths in a system using a series of project initiators, in-house management checks, and providing the opportunity for extensive preparatory discussion. They include the following factors:

(a) the initiators screen projects and act as a source of planned and potential projects. The budget and forecasting process begins at this level;

(b) the preliminary discussions may save unnecessary work by companies and facilitate faster processing of company applications;

(c) early use of advisors can provide time for improved analysis leading to improved decision making.

WEAKNESSES OF THE SYSTEM

A number of weaknesses were reported during interviews and were noted in file reviews and the internal questionnaire; some of these weaknesses pertain to the system as a whole, but they emerge most clearly in this phase.

(a) Program Delivery is not a dedicated activity, i.e., ISB and DPB officers have numerous other tasks so that a good deal of time and some efficiency is sacrificed;

(b) some personnel fall short in skills and experience. No formal training programs were noted to maintain professional skill levels or to teach them to newcomers;

(c) the system is "passive"; it could benefit from more active information dissemination;

(d) project staff turnover in some sections is sufficiently high that the maintenance of continuity and skills is difficult;

(e) the goals and guidelines relating to DIPP are not always adequately understood*, the rules are not consistently followed, and the goals may be lost sight of. These observations apply both within ITC and to the companies (for example, the lack of published guidelines and the fact that the directive is a restricted document);

(f) past projects have generally not been analyzed or evaluated at the program or industry sector level. Analyses, where they have been performed, have been limited in scope. Information obtained from past projects should form one of the bases for on-going operations.

EVALUATION

The project initiation phase is flexible, informal, and not well defined. It operates through various means of communication. Nevertheless, it appears to

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* It is of interest that in at least one group of companies, the program is seen as being aimed at job creation, not industrial development or economic benefit.

effectively deliver a considerable number of projects for formal consideration.

The project initiation phase can be improved in several ways. They include, in order of importance:

(a) provision of written DIPP guidelines to applicant companies;

(b) the earlier use of advisors;

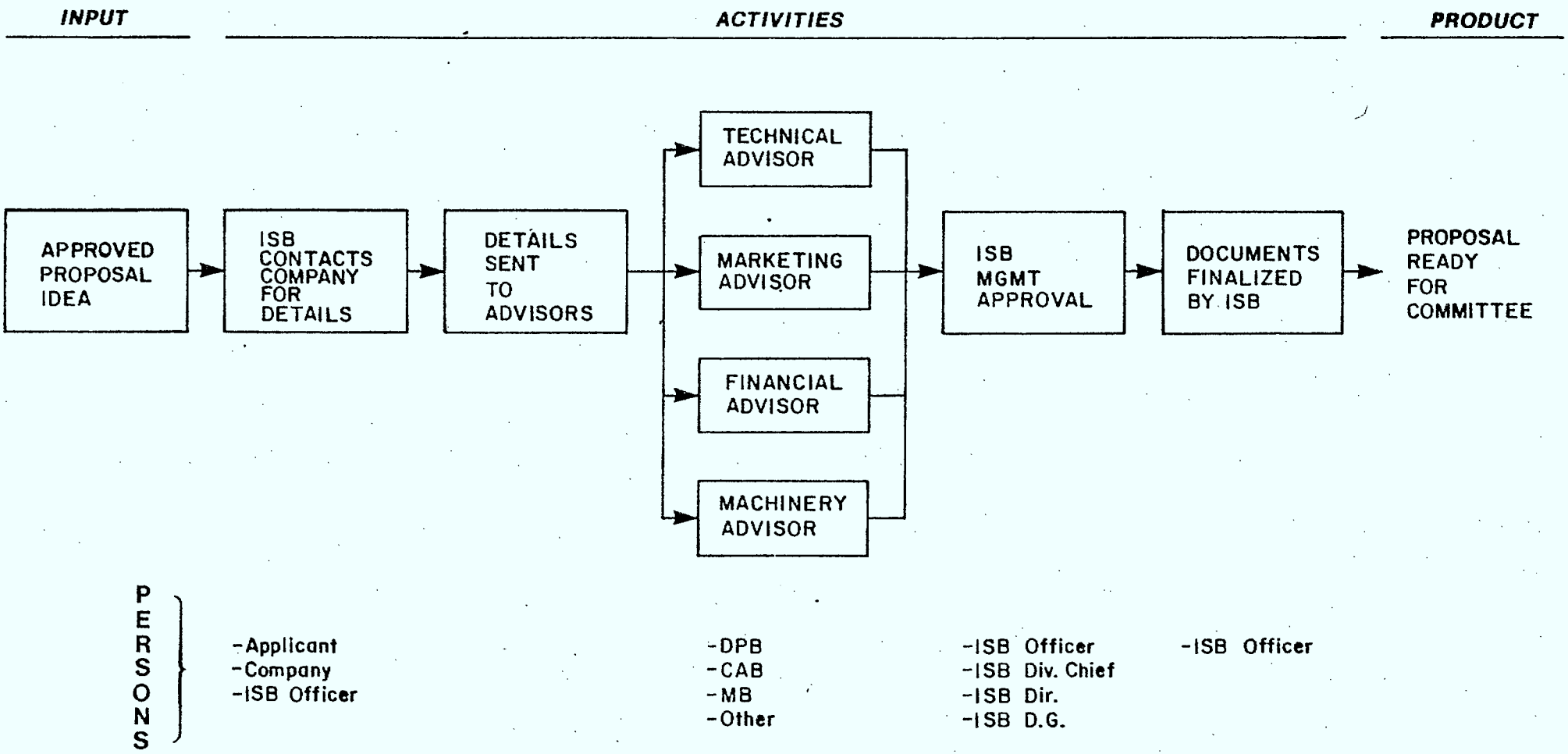
(c) provision of a training program for professional development to maintain and enhance the skills of program delivery officers. Such skills would be equally useful in other departmental industrial assistance programs;

(d) increased analysis of the existing DIPP projects conducted and coordinated at industry sector levels to provide an improved base for on-going operational decisions. (This aspect of DIPP operations is addressed in several places in this Annex.)

That the program delivery is not a dedicated activity, that the program is passive in application, and that there is staff turnover are facts that the Department will have to live with for the time being. The fact of program delivery not being a dedicated system may be an advantage. Correction implies a significant change of organization in the Department; the second item, its passivity, may be partially amended, but with the present excess of planned projects against funds, active promotion would only subject the Program to increased pressures.

EXHIBIT 2

PROPOSAL PREPARATION AND EVALUATION



II - PROPOSAL EVALUATION

INTRODUCTION

The proposal evaluation stage consists of collecting, analyzing, and evaluating information related to a potential project. These steps are shown in Exhibit 2, opposite, and commence once the ISB has decided to pursue a potential project. They continue, according to the file review, for an average of 4 months, until a formal DIPP Committee approval or rejection is made.

The procedures are discussed in some detail because of the sensitivity shown by management, officers, and companies to the impact of project analysis. Obligatory data collected and analyzed at this stage relate to:

(a) the preparation or update by the ISB officer of the company's "Corporate Submission", which is an analysis of the operations and financial structure of the applicant;

(b) the financial implications of the proposal;

(c) technological analysis of the proposal;

(d) marketing analysis of the proposal;

(e) analysis of the machinery to be acquired under Capital Assistance and Source Establishment components.

(Page B-12 omitted)

CORPORATE SUBMISSION

The purpose of the Corporate Submission is to provide a company's past record, an assessment of present capabilities, its financial position, forecasts, and a corporate strategy against which projects can be measured. The DIPP Directive provides 20 pages setting out the requirements that a Corporate Submission must meet. Twenty-five lines are devoted to marketing, and eight lines to technology. Most of the requirements pertain to financial information. Two types of Corporate Submission requirements now exist: the long version as just described and used for most R&D projects, and a shorter version for small business, used primarily for Capital Assistance and Source Establishment projects.

In general, ISB's approve of the concept of the Corporate Submission, and they reject a document such as a Dun and Bradstreet report as "grossly inadequate".

There is, however, almost universal ISB frustration with what they believe is overemphasis on the historical financial analysis and on suspect forecasts rather than an emphasis on the realities of operational requirements. As one officer put it, where the company has been is not as important as where it is and where it can go. The opinion was expressed that the short form is adequate for all companies and that banks and other lending institutions, where innovation is an issue, require less information. Others, frequently outside the ISB's, believe that the information request represents a minimum, and they suggest requiring information as extensive as that for venture capital. The corporate submission does not include a description of the

capability of the company internal accounting system to allocate costs: this shortcoming became apparent during the file reviews, as a result of project audits by Audit Services Bureau of DSS.

The ITC Corporate approach is considered to accent analysis of the corporation at the expense of analysis of the project. (Corporations are somewhat easier to analyze than some of the projects put forward.) Thus, only very sound firms tend to be approved for DIPP. Within industry, there is a tendency to analyze the R&D project as an independent cost centre first, then to relate it to the corporation. The emphasis at ITC is thus the reverse.

We recommend using the short submission for all companies, with suitable adjustments to be made by the Corporate Analysis Branch. They may include deeper probes into new or suspect companies, or they may reduce requirements for funding small amounts to "repeater" companies. Analysis should be focused on the project rather than the company; the project should then be examined in its corporate context, as is done by the company itself.

PROJECT FINANCIAL ANALYSIS AND ROLE OF THE FINANCIAL ADVISOR

Project financial analysis is mandatory. The purpose is to examine the financial capacity of the applicant to execute his share of the contract, to check eligibility, and to examine the contribution of the project to the company sales forecasts and cash flows. The quality of the estimate of the project's financial contribution to company cash flows is highly dependent on the quality of the company sales forecast. In many cases, ITC is skeptical of company sales forecasts and assumptions since the company is believed to adjust these to meet ITC criteria.

Nevertheless, the function is capable of providing valid input to analyses of the economic benefits of projects. The dependence of financial analysis on sound market analysis and real-world sales forecasts makes a quality market advisory service imperative. When reliable sales data (and other benefits) are provided by the company after the project ends, they can be compared with the forecasts and financial analysis on the basis of which the project was approved. Such comparisons can then be fed back to the ISB and the DIPP Office for project, industry sector, and program benefit evaluation.

PROJECT TECHNOLOGY ANALYSIS AND ROLE OF TECHNICAL ADVISOR

Project technology analysis is obligatory. The company is examined to ensure it has the technical capability to execute the project. This analysis is applied principally to R&D projects.

The ISB is not obliged to go to any outside the Branch or Department for a technology analysis. In many cases, this task is performed by the ISB Officer. In some cases reference is made to Technology Branch, ITC, National Research Council, Department of Communications, or Transport Canada. There is a feeling within the ISB's that since the ISB officers are mainly technically trained, with industry background, their capability is sufficient. This view is not shared by technology specialists who respect the ISB officers but point out that the ISB officers do not have much opportunity to exercise their technical skills. The specialists believe that the various responsibilities of the ISB officers, their administrative workload, and resource shortages make it difficult for them to maintain or expand their technology backgrounds. Thus, they believe, it becomes increasingly difficult for ISB

officers to make well-founded technology assessments. They also commented on the mandatory technology inputs by specialist advisors in other countries with similar innovation programs; such specialists complement, rather than replace, the essential skills and industrial interface of the ISB project manager.

There is available to ITC an adequate pool, within and without the Department, of technology specialists who can independently analyze and advise on technology aspects of projects.

PROJECT/INDUSTRIAL MARKET ANALYSIS AND ROLE OF THE MARKET ADVISOR

Project market analysis is obligatory, and the objective is to independently examine and verify the target market in size, the extent of competition, and the probability of achieving the forecast sales. What is not so highly emphasized is the strategy required by the company to achieve its marketing objectives.

In the context of DIPP, we specifically have in mind the practice of industrial market analysis and business planning. (A good example is in Annex VI B, in the section headed "Present Procurement Practices in Large Companies".)

The function of the U.S. Division, Defence Programs Branch, is to provide market advice on all DIPP projects. Two levels of advisory service are provided: a quick assessment of the high volume, low dollar Capital Assistance and Sources Establishment projects, by the U.S. Division; and a more detailed analysis of R&D projects by the Market Research and Analysis Division (MRAD) of DPB, reporting through the U.S. Division.

EXHIBIT 3

CONFIDENTIAL

COMPARISON OF COMPANY AND DPB/MRAD SALES FORECASTS AT THE TIME OF PROJECT APPLICATION, FOR 15 R&D PROJECTS

Project Requisition No.	Sales Forecast		% Difference
	Company	DPB/MRAD	
	- million $ -		
1-529	50.0	28.0	44.0
1-913	22.0	9.0	59.1
1-865	14.0	9.0	35.7
1-701	60.0	41.0	31.7
1-924	24.3	17.8	26.7
1-750	25.0	25.0	-
1-850	1.6	1.6	-
1-477	12.7	5.4	57.5
1-515	33.0	12.5	62.1
1-408-15	9.8	7.8	20.4
1-595	3.0	1.7	43.3
1-408-12	6.8	2.6	61.8
1-647	11.2	8.0	28.6
1-495	41.3	28.9	30.0
1-307	7.0	3.5	50.0
TOTALS	321.7	201.8	37.3

Although there may be some overlap between the types of service, we believe this division is appropriate for the work involved and the level of funds spent. Risk to the Crown for Capital Assistance and Source Establishment projects is low. If Capital Assistance recipients fail to meet repayments, the machinery is repossessed and transferred to other eligible recipients for the outstanding payments. For Source Establishment recipients, payment is made only if the company wins the contract for which the contribution is approved. However, the fewer but larger R&D investments entail more risk to the Crown. Accordingly, it is only prudent to conduct more detailed analysis on the high risk projects and to get the company to optimize the benefits to itself and to the nation.

MARKET PROJECTIONS

When a company prepares a DIPP project proposal, a market projection or forecast is to be included for the expected product(s) forthcoming from the project. This projection is an important part of the information used to evaluate the economic viability and also the eligibility of the project for DIPP assistance. One of the eligibility criteria is that the project must have a favorable ratio of expected sales to Crown assistance. The suggested ratio is at least 10:1 but preferably closer to 20:1. In these circumstances, it would be to the company's advantage to present an optimistic market forecast.

It is part of the Marketing Advisor's task to examine the company's market forecast and formulate an opinion on the validity of the projection. In other words, do the companies tend to overestimate the market potential? A comparison was made in Exhibit 3, opposite, between the company projection and that

(Page B-18 omitted)

of the Marketing Advisor (as represented by DPB/MRAD) for 15 R&D projects of the file sample. The results showed that the DPB/MRAD estimates were 37.3% less on average than the company forecasts. This outcome suggests that the company forecasts are overly optimistic or that the Departmental evaluations are overly conservative (or possibly a combination of both).

Unfortunately, no actual sales data were obtained for these 15 projects either through the company questionnaire survey or from the mini case studies. Thus, no comparison could be made between the sales forecasts and the actual project sales achieved.

INDUSTRIAL MARKET ANALYSIS IN THE DIPP CONTEXT

Although some companies have been identified as strong in marketing, Canadian industrial marketing has generally been found to be inadequate in all phases of the DIPP evaluation. This inadequacy has been reflected in external (company) interviews, internal ITC management interviews, the internal questionnaire, the case studies, and the file reviews. Further, these other components of the DIPP Evaluation Study have established that market risk is greater than technical risk or financial risk.

In 1972, an internal study* was made on PAIT innovation project failures. This study documented modes of failure: low failure values were assigned to finance and technology, and high failure values were assigned to marketing. Some of these problems are general and relate to all ITC innovation. Some extracts are quoted.

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* "A Study of PAIT Failures under PAIT I", 1972, Office of Science & Technology.

> "The marketing category was the main problem area. Unsubstantiated estimates of sales growth, market penetration, user requirements, transportation costs, service networks, tariffs, trade policies, were commonplace ... In general, the companies' market estimates have not been seriously challenged because a company is expected to know the business ... Such estimates demand close scrutiny by the Department using all marketing expertise available ... Such high estimates need some form of tangible corroboration from the company".

These PAIT statements imply that a number of problems can be corrected by improved preliminary analysis, implementation of an effective challenge system, and attention to market strategy. The benefits would be more accurate sales forecasts and products that are likely to sell - not a collection of Edsel or Bricklin automobiles.

STRUCTURE OF THE MARKET ADVISOR SERVICE

First, no amount of market analysis will ever guarantee product success. Market analysis minimizes the chance of something going wrong, better identifies the risks, leading to preventive action, and permits an early start to formalizing the market strategy to reach the objective.

Lower risk, high volume (40-60 per year), low dollar, Capital Assistance/ Source Establishment Projects are processed relatively quickly and efficiently by the U.S. Division of DPB. The officers telephone, telex, and write to Defence Liaison officers outside Canada, to the U.S. Department of Defense and other procurement agencies, and even to the eventual customer, to determine the realism of the applicant's forecast. Some high dollar projects are occasionally submitted to the Market Research and Administration Division.

High risk, low volume (20-30 per year), high dollar, R&D projects have usually been forwarded by the U.S. Division, or in some cases by the ISB, to the Market Research and Analysis Division for in-depth study. These are fundamentally desk studies (MRAD spends around $16,000 per year on information systems), supplemented when possible by meetings with ISB's, company personnel and visits to the applicant's plant. According to one member of the Evaluation Task Force involved with case studies, these ITC desk studies tended to be closer to the project outcome than the company forecast: this in itself is a positive reflection on the quality of past MRAD inputs to ITC.

Where MRAD studies have supported projects, even if subject to certain qualifications, these results have been accepted. In the (fewer) cases where conclusions have been unfavourable, there is evidence that some of these have been ignored. To ensure completeness and consistency of the marketing content of company applications, MRAD established guidelines for use by ISB's entitled "General Outline of a Marketing Plan". It has not been widely used.

We recommend that the Department consider relocating the Market Research part of MRAD outside the Defence Programs Branch but still within the same ADM sector where it can serve both the Enterprise Development Program and DIPP. Three factors lead us to this recommendation:

- In the internal questionnaire, the principal support for the MRAD function came from the ISB's, not from Defence Programs Branch;

- MRAD can service industrial innovation projects generally (DIPP and Enterprise Development Program);

- DIPP is supporting more and more civil related technology.

PROJECT EQUIPMENT ANALYSIS AND THE ROLE OF THE MACHINERY ADVISOR

In Capital Assistance projects, an analysis must be conducted of the proposed capital equipment with respect to company need, the advanced nature of the equipment, Canadian content, price, and "Matching Investment". The service is provided by the Machinery Advisor and is a function of the Machinery Branch.

Matching investment is a directive requirement for leverage, in that the recipient company must invest in its modernization program an amount equal to or greater than the value of the equipment received. Company matching investment may take the form of extra equipment, plant modernization, or plant expansion. According to the internal questionnaire findings, this criterion is most rigidly applied to large companies, with some flexibility exercised toward small business.

The Machinery Advisor maintains a computer record of all machinery items provided under the Program: as new request are received, so the records are checked for the applicant company's past history, and the Machinery Advisor's analysis is modified by his past operational experience. We concur with this practice.

The major question regarding this input relates to the objective of Capital Assistance. The Machinery Advisor leans to an absolute definition of "advanced" machinery, and in doing so, his interpretation appears to be

consistent with the directive. The ISB's lead toward a relative definition: in some cases they believe the term "advanced" should be related to the general level of Canadian production and materials technology, and in this interpretation, the ISB's may have a more effective criterion. It is important that this point be resolved, as the future role of this advisor is strongly affected by the outcome.

Because of a history of the Machinery Branch's coolness towards the DIPP program as an entity, because of its defence orientation, a suggestion was made that the Machinery Advisor might be an independent person from outside the Department. While this suggestion has merit, an overall review of the role and its establishment in the Machinery Branch should be conducted to resolve the problem.

PREPARATION OF THE PROJECT SUBMISSION AND THE ROLE OF THE ISB OFFICER

Because the project is a facet of industrial development within the DIPP criteria, the responsibility for the Project Submission lies with the ISB Officer subject to his Director's approval.

The role of the project officer is to obtain the obligatory advisor inputs, mesh them with the company application, obtain additional data as required, and write the Project Submission. Liaisons are frequently established with the DIPP Office. Experienced ISB officers tend to establish strong working relationships with the Advisors, so that when the Project Proposal goes before the DIPP Committee, there are few surprises. Should the Advisors make strongly adverse assessments, proposals may be withdrawn; in some instances

ISB's who believe that they have a strong case may proceed in the face of an adverse assessment, i.e., they reject the Advisor inputs, since they will have an opportunity to present their case directly to the DIPP Committee.

One subset of R&D projects receives special treatment, namely the joint projects with other countries, specifically those with the U.S. under the Defence Development Sharing Agreement. These are submitted for prior approval to the DIPP Committee for clearance in principle before the Project Submission.

A second subset, mainly Capital Assistance projects, receives special treatment for "Prior Eligibility". In the past companies sometimes commenced work or ordered equipment without benefit of Crown Authority, and their applications for DIPP assistance were made "after the fact". Such applications were loosely defined and treated as retroactive. Retroactivity has also been applied to projects submitted to ISB's but which were delayed in processing at the time the companies were ready to proceed.

Certain delays were attributable to:

(a) delay in receipt of information from U.S. military or prime contractors;

(b) ISB delays in receipt of such information from the companies as a result of (a);

(c) necessity of the company to submit to schedules and standards set by U.S. or NATO agencies or contractors.

In the acquisition of capital equipment, 30 day short term quotations, the long lead time needed to obtain equipment, and the imposition of prime contractor production schedules impose pressures forcing companies to act quickly.

Today, the DIPP Committee no longer accepts projects in which the company has acted unilaterally (for the reasons stated above) for retroactive funding. Where such situations exist, the company can so advise the ISB's and is permitted to submit a request for "Prior Eligibility" to the DIPP Committee. Thus the company can proceed without delay, and when all information is to hand, the formal Project Submission is prepared. At the DIPP Committee, the formal Project Submission is then treated no differently than any other.

This procedure has reduced the submission of retroactive projects to the DIPP Committee, at the cost of providing advance notice of intent. We concur with this practice.

THE ISB OFFICER: THE "COMPOSITE MAN" VS. THE "PROJECT MANAGER" CONCEPT

Early in DIPP history, the concept of the "Composite Man" prevailed. The ISB Officer was expected to conduct financial, technical, and marketing analyses, then monitor and control the project. There were fewer projects, more resources, less technical sophistication, and an ISB system more dedicated to

assistance projects and company development. Officers were selected for technical capability, training was provided in financial analysis, and the Commerce Officer marketing module reinforced marketing skills. To a limited extent, this concept still exists, but since 1970 it has been modified by a project management approach.

The "Project Manager" concept, used in some areas, still requires the ISB officer to have broad financial, technical, and marketing skills. The in-depth analysis, however, becomes the responsibility of the specialist advisors. The breadth of the Project Manager's training should allow him to recognize adequate advisor quality and to compare advisors' inputs against company application inputs. The responsibility for the ultimate Project Submission still lies with the ISB Project Manager, but essentially, the "Project Manager" embodies a Departmental team approach to project analysis and monitoring and control.

We prefer the Project Manager concept for advanced technology industry sectors. It better recognizes ISB officer skills, workload and practice; the existing resource shortages in ISB's; and the availability of specialist advisory resources for financial, technical and market analyses. It permits the ISB officer to concentrate on project management and establishes the nucleus of a team which will later be required for project monitoring, control, and evaluation. According to the internal questionnaire findings, this concept would be enhanced by a professional development program with emphasis on project management, market analysis, and business planning. This is generally consistent with problems outlined in the sub-section entitled "Industrial Market Analysis in the DIPP Context".

THE AEROSPACE, ELECTRONICS, AND GENERAL TECHNOLOGY ADVISORY GROUPS

The current directive describes these groups as responsible for assuring attractive market opportunities, providing interdepartmental co-ordination, reviewing corporate strategy, monitoring and control, and reporting. ISB and Technology Branch Officers noted that the Advisory Groups also reviewed project technology.

The groups no longer exist because they were viewed as providing an extra layer or review, and as having started to pre-empt DIPP Committee functions. Thus they became redundant.

We concur with the abandonment of these groups provided appropriate steps are taken to ensure that the monitoring, control, and reporting functions continue. Such steps do not appear to have been taken. Yet the major part of the monitoring control, and reporting functions fall neatly within the concept of project management using the team approach.

THE CONTRACT "STATEMENT OF WORK" & PERFORMANCE INDICATORS

The Statement of Work (SOW) is the description of work to be performed by the company during the contract. It originates in this project evaluation phase and forms part of the project submission. It is derived from the company application, perhaps modified through discussion; later it becomes an attachment to the DSS contract.

A good SOW identifies the technical, financial, marketing, and time performance indicators and standards for the project. Reporting and Project Review Group controls need also to be specified. We believe that the SOW can usefully be expanded to play a key and continuing role in project management. To do this, it should specify:

(a) technical performance indicators and descriptions, including narrative, bar charts, etc. The end targets need to be clearly identified;

(b) financial performance indicators, contained perhaps in a rate-of-spending chart. This approach provides two control features: budget cash flow requirements, and a standard against which subsequent financial reporting can be measured. The chart shows whether spending is accelerating or slowing down - each of which can be an indicator of technical progress. It can contribute annually to program budget forecasts;

(c) marketing performance indicators. Key milestones will have been identified in the analysis with regard to positioning the company in its ultimate market. These milestones may include refining the original market analysis, establishment of the sales and service network, and a start to implementing strategy. In the process, market shifts and product configurations may be better identified, providing feedback for the technical development. As time goes by, market focus should sharpen. A system should be established to record the economic benefits of the project as and when they materialize;

(d) the frequency and format of reporting. Company progress reports should examine and report on each of the above three areas and measure and compare achievement against the performance indicators. The form of the final project report should be specified in similar terms; however, a final revised sales forecast and market strategy should be included for the following five years;

(e) Progress Review Group frequency and format along similar lines;

(f) the obligation to provide ITC with project benefits data, such as sales, in a suitable form.

All this information is necessary to the company for its own benefit. ITC should not demand information that is not necessary for successful project completion; ITC should require what the company itself needs.

STRENGTHS OF THE SYSTEM

There are distinct strengths to a system in which the ISB Officer is required to obtain extensive advisory assistance:

(a) Skilled, specialized personnel perform specialized tasks better and more efficiently than personnel who do such work only infrequently. This is especially true of the technical, financial, machinery, and marketing analyses;

(b) Technological knowledge is expanding so rapidly that ISB officers cannot be expected to stay on top of it. The system is, in effect, an admission of this fact;

(c) Risks of major errors are minimized, and public investments are protected;

(d) Provided that the goals are uniformly understood, the goals of the project, because of many people in the system, are less likely to be overlooked;

(e) The project is thoroughly screened prior to reaching senior staff on the DIPP Committee.

WEAKNESS OF THE SYSTEM

There are some weaknesses in the system:

(a) The quality of advice depends on the competence of the Advisor;

(b) Organizational changes can affect DIPP without appropriate adjustments being made to the system of delivering DIPP. These include ISB reorganizations, departmental resource shifts, the collapse of the three Advisory Groups to the DIPP Committee, shifts in officer workload emphasis;

(c) The advisors are used at the start of a project but not during the implementation stage when specialist analysis is needed for ensuring the project stays on track.

EVALUATION

The objective of the Proposal Evaluation stage is ultimately the protection of public funds. This is achieved by optimizing project selection through rigorous analysis of the benefits to the company and to the Department. The expectation of certain ISB managers for the ISB Officers to be omniscient is too great when considering the type of high technology projects that are the core of DIPP.

Given the matrix system within the Department and the availability of specialist advisory services, the obligation to use these advisory services is beneficial. They provide extra checks that ensure that DIPP objectives are kept in mind.

The Project Team Management approach should be extended to optimize the present matrix system and to improve inter-branch collaboration. The ISB project manager and the advisors should be viewed as a Project Management Team headed by the responsible ISB officer. The team's function would be to analyze the project, establish the SOW with performance indicators, then monitor, control, and evaluate the project implementation against the approved standards. The team's effectiveness would be enhanced by professional development training programs, by earlier use of Advisors, and by a review of the terms of reference and reporting relationships (location) of the advisors.

The existing procedure is time consuming, so tradeoffs must be considered. Expediting projects may save time and improve accountability but may lead to more errors. Performing more detailed analyses takes more time and diffuses accountability but may lead to better projects.

III - THE APPROVAL PROCESS

The Approval process is the third stage of the DIPP Delivery System, and is described in Exhibit 4, overleaf. It starts at the DIPP Committee, and ends with either Deputy Minister or Treasury Board approval in principle. In the past, the DIPP Committee system had two tiers. The DIPP Committee was the senior committee, and was supported by three Technology Advisory Groups (aerospace, electronics, and general). These Technology Advisory Groups are described in the current DIPP directive, but they have been disbanded.

FUNCTION AND RESPONSIBILITY OF THE DIPP COMMITTEE

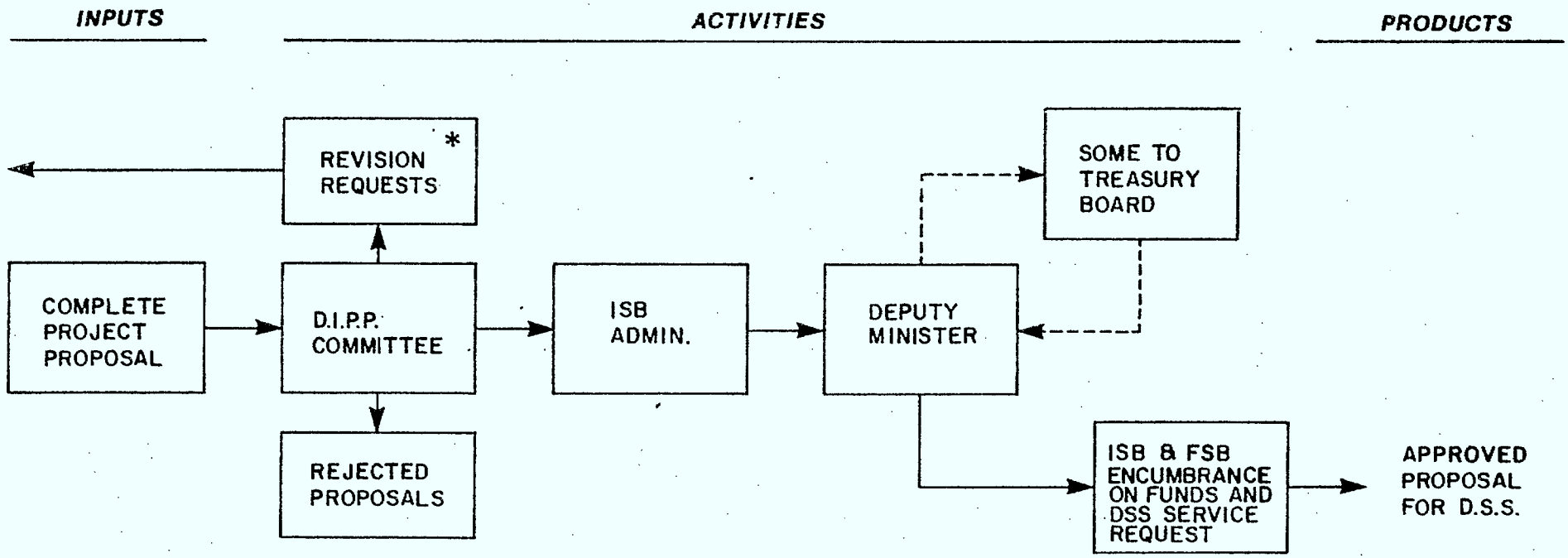
According to the directive, the DIPP Committee is responsible for reviewing proposals and submitting recommendations to the Deputy Minister or to the Treasury Board on the acceptability, terms, and conditions of proposals. Committee functions include:

- establishing guidelines for content of project submissions and company progress reports;

- interpreting policy and directives: advising and recommending policy to the Deputy Minister;

EXHIBIT 4

PROJECT PROPOSAL APPROVAL STAGE



* - *Conditional Approvals*
- *Prior Elegibility*

PERSONS
- D.I.P.P. Committee
- ISB Officers
- Advisors

- DM

- TB

- ITC's Fin. Serv. Branch and ISB Officers

(Page B-33 omitted)

- recommending projects for approval;
- reviewing progess of projects and directing implementation of remedial changes;
- authorizing amendments, except those within Treasury Board authority;
- monitoring the overall performance of DIPP to ensure compliance with directives, ITC policy, priorities, and budgets.

The DIPP Committee has four major functions: policy, project recommendation for approval, program management, and project monitoring and control. The DIPP Committee is not required to account for, or report to, ITC Senior Management on the performance of a program for which it has recommended for approval and accumulated expenditure of $700 million and an annual expenditure of around $50 million. Reporting is assigned to the Program Branch, which submits an annual report to the Minister. There is no specific directive requirement for an annual report, accounting for program expenditures and benefits, to the departmental Senior Management Committee.

Interviews with Committee members indicated that in practice the DIPP Committee has acted primarily as a project approval mechanism for small-to-medium size projects. It has rejected very few of the projects submitted to it, although some members have recently been more critical of submissions. Major projects were taken through an additional route of ITC Senior Management Committee, Treasury Board, and Cabinet Submissions. DIPP Committee recommendations for approval were, in practice, de facto approvals since the

subsequent review by the Deputy Minister or Treasury Board has generally appeared to be pro-forma.

Policy

Minor policy issues, generally relating to interpretation of the directive, were at times decided by the Committee and at times investigated by a working group chaired by a member of the DIPP officer, with the outputs to be tabled before the Committee. At least six group reports were prepared, but the DIPP Committee Minutes do not reflect their discussion or adoption. Major policy issues appear to originate outside the DIPP Committee, within the Programs Branch.

Decisions

Decisions were generally by consensus, without vote. A few contentious projects resulted in votes at the direction of the Chairman. While there have been few project turn downs, nevertheless, the process does result in projects being withdrawn or sent back for further analysis. Since some of these may not re-appear, the net result is an indirect turn-down.

Program Management

Generally these activities comprise a review of the monthly program financial status report prepared by the DIPP Secretariat. Discussions on program forecasts, adjustments, and performance records were not recorded in the minutes. Discussions on the status of Memoranda to Cabinet were minuted. Directions and warnings were given to members on budget limitations, in 1978 and 1979, which created the need to assign priority to projects within allotment ceilings. The minutes did not record the effects of these directions and warnings.

Monitoring and Control

Project status reports and project final reports, were tabled and approved with little, if any, examination. Approximately 1 in 3 R&D reports were submitted and tabled; for Capital Assistance/Source Establishment projects, around 1 in 14 was tabled. With respect to project monitoring and control, the gap left by the collapse of the Advisory Groups did not appear to have been fully closed by the DIPP Committee.

CONSTITUTION OF THE DIPP COMMITTEE

In the past, the DIPP Committee had high ranking members (SX-3), was compact (3-4 voting members), and was well attended (mid-1960's, 87% attendance of ADM's). The current membership, according to the 1977 Directive, comprises 8 voting members:

(a) ITC
- ADM Enterprise Development, Chairman, (now ADM Finance)
- Director General, Office of International Projects (Market Advisor)
- Machinery Advisor, Machinery Branch
- Director General, Office of Science and Technology
- Director General, ISB, (nominated by ADM Industry & Commerce)

(b) DND
- ADM Materiel
- Chief, Research and Development

(c) DSS
- Director General, Science Centre

In addition, according to the minutes, two other ITC members were subsequently included; the Director General Corporate Analysis Branch (Financial Advisor) and the Director General Finance and Administration. This brought the total to 10 members.

Members may attend or send designates (usually subordinates) as replacement. The latter alternative has been common over the past two or three years; the average rank of attendees has declined to SX-1 or CO-4. The Advisors, who have earlier commented on company applications, now return as voting members in the project decision process. Because of the prior consultations, there are few surprises and few project turn downs. The minutes reflect the frequency of Advisor/Members' comments on those aspects of the ISB Project Submissions for which they previously had inputs as advisors. We gained the impression that their participation provided continuous challenge and a measure of quality control.

In the space of one year, each DIPP Committee member position appears to be covered by as many as 3 persons, a strong contrast with the past attendance record of ADM's in the 1960's.

ADMINISTRATION

The Division Chief of the DIPP Office acts as Secretary to the DIPP Committee. Briefing books are conscientiously prepared for the members, with a special briefing for the Chairman.

There were two parallel "DIPP" meetings until early 1978: the DIPP Committee for R&D (the high dollar, low volume, projects); and the IMDE (Industry Modernization Defence Exports) Committee for Capital Assistance and Source Establishment (the high volume, low dollar, projects). Both Committees were combined into a single meeting in April, 1978. The new DIPP Committee meeting is divided into four parts: Administration and Financial Status; R&D; Capital Assistance and Source Establishment; and other business. Meetings are held monthly, invariably start in the early afternoon, average 20 projects, and can last till 7:00 p.m.

OBSERVATIONS ON COMMITTEE OPERATIONS

Several relevant points were made by observers of the Committee's operations, including members themselves:

- Documentation does not reach members in sufficient time to allow detailed scrutiny.

- Non-ITC members have not entered into policy related debates.

- The ISB officers are allowed to make oral presentations of material already in the proposals, thus discouraging members from reading proposals carefully prior to meetings and reducing time for questions and discussion.

- The majority of members are supervisors of the authors of the proposals (including the Advisors) and votes are seldom taken, thus it is difficult to identify real responsibilities.

- The agenda is sometimes too long.

- The Committee lacks incisiveness, particularly when compared to the industry-dominated Enterprise Development Board and Panels.

- The Committee is considered to be only a recommendation-for-approval group, handling projects on a file-to-file basis without regard to wider issues. (This view is general and accounted for one member sending his subordinates.)

- The Committee gives only passing attention to budget, forecasts, operations, and policy issues. This has led some to suggest that the DIPP Committee plays a less significant role in the delivery/decision system than was originally intended.

The sum of these observations indicates change from the original concept through (a) diffusion of responsibilities, (b) weakening of accountability for the program, and (c) weakening of the key management decision and control mechanism of the DIPP delivery system. Whether this change has occurred by design or default, there is no evidence of compensation or adjustment to strengthen the system to accommodate the change.

OTHER COMMITTEE RESPONSIBILITIES

Of the Committee's other duties, the project/program monitoring activities are the most significant.

Several years ago, ISB decisions and reorganizations resulted in the breakdown of the 15 year old systems for collection of project monitoring and evaluation data, and, in one branch, the collapse of the system for budgeting and forecasting data. As a result, the Department and the Committee no longer knew how projects and the program were going. DIPP systems were not adjusted to compensate for the breakdown. Monitoring and evaluation data are still not being collected.

When general government restraints were introduced two years ago, and it was evident that project approvals were starting to increase, the Committee discussed the need to assign priorities to projects. Warnings were voiced at later meetings and although it was agreed to defer the setting of priorities to ISB's, priorities were not assigned to projects.

The foregoing indicates the DIPP Committee did not act strongly to manage the program, and the lack of monitoring and control impaired its ability to anticipate and resolve foreseeable problems.

POST COMMITTEE APPROVALS

The Deputy Minister, the Financial Services Branch, and sometimes the Treasury Board, are all involved in post-committee approvals to meet the program authorities and the requirements of the Financial Administration Act. According to the R&D file reviews, this stage lasts, on average, 137 days. Numerous sign-offs and checks are made at varying points (anywhere up to 6 on financial encumbrance forms; 12 on Treasury Board submissions).

The authors of the 1977 directive tried to simplify this process by designing one document to serve both as the Treasury Board Submission and the Financial Encumbrance (the present encumbrance form is called a DOI85, and originated in in the defunct Department of Industry). This was not accepted by TBS, and the traditional two documents continue to be used today, sequentially, as before.

Up to 1970, all projects, no matter how small, were sent to TB. At that time, the $2 million 50% Crown share delegation of authority was made to ITC; this is in the process of being revised up to $5 million to match inflation. The DIPP Office estimates that if the dollar ceiling is raised to $5 million, 95% of projects might be approved within ITC. Further, the DIPP Office has in mind that one document should serve the three functions of project submission, the in-house Deputy Minister approval, and financial encumbrance.

We concur with the concept, recognizing that careful attention must be given to its design. The 5% balance of projects going to Treasury Board will still require conversion to TBS format. Such projects will include those over $5 million, or those for which the Crown investment exceeds 50% of the contribution, or those for which special terms and conditions might apply, such as joint projects with other nations.

After these checks and sign-offs, the project may be approved, funds may be available, but the project is not in effect until a contract is issued. These closing steps ensure compliance, keep everyone informed who needs to know, and prepare for subsequent project implementation.

A COMPARISON OF R&D PROGRAM APPROVAL SYSTEMS: THE ENTERPRISE DEVELOPMENT BOARD

The Enterprise Development Board (EDB) is the governing body for the Enterprise Development Program (EDP), a parallel ITC program for R&D assistance to industry but with differing goals to DIPP. Their committee structure is commented on for the purposes of simple comparison, subject to the caveat that the EDB has not been examined to the same depth as DIPP. Further, since EDP has components not found in DIPP, only that part comparable to R&D is examined (EDP has no less than 5 Boards, Panels, and Sub-Committees, plus numerous Regional Boards).

The EDB

The full Enterprise Development Board (16 members) is half industry, half government in membership. The Chairman and Vice-Chairman must be from industry; the government members come from 7 federal departments (2 from ITC). EDB functions are somewhat similar to DIPP. It deals with program management and approval of large (greater than $2 million) R&D projects. The operations of the EDB has the following characteristics:

- the industry Chairman of the EDB is able to devote a considerable amount of his time to Board and to other ITC matters, almost as if he were part of government;

- emphasis of the EDB is on operational policy and approval of large projects; the management of projects is delegated downwards;

- the EDB appears to be more penetrating than the DIPP Committee in respect to project examination. As businessmen, they may be very familiar with the industrial implications under discussion and so do not hesitate to debate them; for similar reasons, they may not pay as much attention to the bureaucratic briefing notes as do DIPP Committee members;

- there were no perceived advantages of the EDP Financial Management system over DIPP's. Budgeting and forecasting procedures appear similar in approach. The lack of problems in EDP may well be due to the fact that up till now, EDP funding has been open-ended, and they have not been able to spend the money available. The consequences of DIPP's 1979 financial problems may have put DIPP ahead of EDP in addressing forecasting and budgeting systems;

- there is no comparable EDP function to the DIPP Marketing Advisor. The business experience of industry Board and Panel members may yield intuitive market appreciations, but the more organized DIPP market assessments by Defence Programs Branch and MRAD may be superior;

- according to information provided, the EDP Board and Panel appear to us to devote less attention to monitoring and control than does DIPP, in spite of our criticisms of the DIPP system. This may be due to two reasons: first, the historical requirements for, and execution of, systematic DIPP monitoring and control (the average DIPP ISB/Advisor has 8 years' program experience); second, the added push of the Defence Programs Branch/MRAD marketing services;

- conflict-of-interest within EDB is low. Although EDB includes industry managers who review highly confidential company business planning data, the very large national base of companies (in terms of thousands) applying for EDP assistance has led to few conflict-of-interest cases. Where this has happened, the industry EDB member has properly disqualified himself. DIPP, on the other hand, draws its companies from a very small universe (around 200-250). If industry managers were on a DIPP "Board" like EDB, and came from a similar advanced technology industrial background, conflict-of-interest would probably occur much more frequently.

Innovation Assistance Panel and Innovation Sub-Committee

The Innovation Assistance Panel is subordinate to the Enterprise Development Board, and comprises eight (one-half) of the EDB members, with the same, equal split of industry to government members. It is responsible for approval of smaller projects and for administration of and amendments to the large projects. The present industry chairmen of the Panel has his own business interests and consequently does not devote quite as much time as does the EDP Chairman. While reporting is called for in the program, it is left to the ISB's, and we were advised that it was not provided to any significant extent.

There is a third tier, the Innovation Sub-Committee which has the delegated authority to administer and amend Innovation Panel approved projects.

General EDB Practices

Further items of interest regarding the EDB are:

(a) Authority is delegated to the EDB directly from Treasury Board, not through the Deputy Minister of ITC. When worthwhile projects appear which fall outside the criteria of EDB, they may still be recommended to Treasury Board for approval. While this may be appropriate for EDB, it may be less appropriate in the case of DIPP with its "all government" composition. However, should DIPP have a Board like the EDB, then the question is open to review.

(b) The hierarchy of EDB saves important matters for the senior Board, which is as it should be.

(c) An original function of the Innovation Assistance Panel was to screen large projects for the full Board, prior to an ISB project submission. The practice generally has been abandoned, though specific rulings may still be sought on specific principles. The reason for ceasing this practice was that the Board kept asking for more and more detail until it was getting essentially the full submission anyway. One problem is the selection of members for Boards. It has been said that the full EDB is well staffed; however, the selection of members for regional boards has not always been as fortunate. A compromise for DIPP might be to seek out ex-private industry executives who now work in government, or retired industry executives.

(e) While the EDB is more incisive and policy oriented, its management attention to forecasting budgeting, monitoring, and control does not have apparent advantages over DIPP.

DEPARTMENT OF INDUSTRY, TRADE AND COMMERCE

DEFENCE INDUSTRY PRODUCTIVITY PROGRAM (DIPP) EVALUATION STUDY

VOLUME 4

PROGRAM DELIVERY

JULY, 1980

(f) There is some question over the size of the EDB, at 16 members. Large Boards tend to be cumbersome. DIPP has technically half that number; quality, not quantity, should be an aim.

(g) The number of EDP Boards, Panels, and Sub-Committees, coupled with decentralization to Regional Boards, presents a span-of-control problem. With DIPP, any structure should be simplified as much as possible, consistent with sound management and the protection of public funds.

(h) Should the DIPP committee structure be changed to something between, say, its present structure and the Enterprise Development Board with a government Chairman, consideration should be given to both rank and to the competence of the Chairman. No matter how competent an individual, a Chairman of equal or superior rank is demanded by public service mores to attract and retain Committee members of a particular rank.

(i) There is little doubt that a tiered structure with outside members as in EDP brings strengths to program management and should be examined in any re-organization proposals.

STRENGTHS OF THE SYSTEM

The following were seen to be strengths of the DIPP Committee system:

(a) An interdepartmental committee broadens ITC perspectives, in this case in defence and technology. The original two-tier committee allowed one tier to concentrate on program management and project approvals and the other tier to concentrate on project selection and project management.

(b) The system by which advisors to the ISB's also sit on the Committee ensures that the areas for which Advisors are responsible are considered in the Project Submissions.

(c) The different Branches of the DIPP matrix, by virtue of their membership of the Committee, have an opportunity to raise policy matters pertaining to their Branches or areas.

WEAKNESSES OF THE SYSTEM

Several weaknesses were noted, some direct and others indirect:

(a) Reduced attention to the overall management process, lack of exercise of membership prerogatives by the members, delegation of attendance to subordinates, and lack of continuity of individual membership, appear to have led to a focus on the projects rather than on the program.

(b) Integration of the R&D Committee with the Capital Assistance and Source Establishment Committee may have increased efficiency at the expense of effectiveness.

(c) Elimination of the two tier system (the DIPP Committee supported by specialist sub-groups) appears to have caused the wider issues to be subordinated to matters of detail, leading to misdirected focus.

(d) Some members are in the position of being both advocates and judges.

EVALUATION

The observations on Committee operations listed earlier appear to be valid. They were made by both committee members and observers, and the evidence obtained supports them. The decline of the Committee from its intended role to that of a project approval group has been cited as a reason for the failure of some of its senior members to attend. This change occurred gradually over a 10 year time span. It is a cumulative side effect of numerous changes made within the Department, much of it to optimize personnel, for which little or no compensation was made to strengthen the delivery system.

In any restructuring, two key principles should be considered:

- simplicity of structure for committees and their inter-relationships, should more than one be chosen;

- a consolidation of responsibility and accountability within a single group, which might be a matrix group or otherwise, with clearly defined links to program users, administrators, and decision makers.

Options

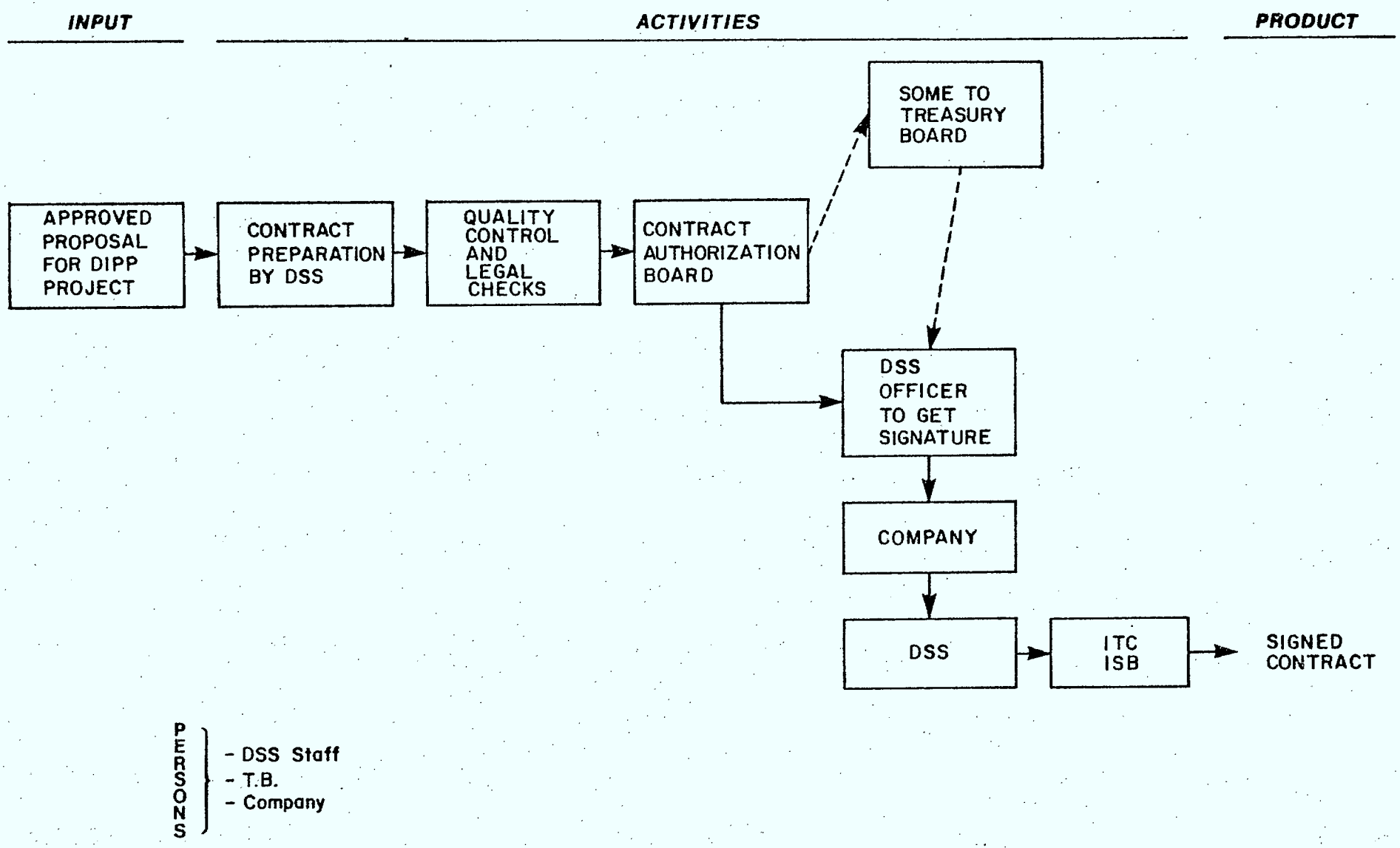
Three options may be considered:

(a) A two-tier system. A compact, senior, DIPP Program Committee comprised of the principal ADM's, perhaps with others, would establish program policy, exercise program management, and review and approve large projects. A compact, junior, Project committee comprised of the principal Directors General would approve average sized projects, administer large and small projects, and exercise monitoring and control. The Project committee could, as once before, be split into R&D and Capital Assistance and Source Establishment. They would report to the Program committee, who would be accountable to and report to the ITC Senior Management Committee. This structure is similar to the Enterprise Development Board and EDP Innovation Panel relationship, without industry participation. It maintains the present matrix system in ITC and preserves the checks and balances.

(b) Delegation of DIPP to a single ADM responsibility. Essentially, this system existed up to 1977 within the responsibility of the ADM Industry and Commerce Development. In such a system, a senior official sensitive to industry, government, and high technology would be made accountable for DIPP. He would chair a simplified DIPP Committee and report to the ITC Senior Management Committee. Accountability would be improved, but the checks and balances might be diminished. The advisors and the DIPP Office might remain in their present location. In this event, there would be a division of responsibilities at the present level. Alternatively, they might be

EXHIBIT 5

THE DSS CONTRACT PREPARATION STAGE



transferred to the designated ADM area, in which event the checks and balances might be further diminished.

(c) A DIPP Board, similar to the Enterprise Development Board, with industry and government members. We would suggest a small Board similar to the senior DIPP Committee outlined in option (a), responsible for policy, management, and large projects, with a supporting junior board which might or might not be all government. The addition of industry members would clearly bring industrial incisiveness to decision-making, as in the EDP. On the other hand, the advanced technology aspects of DIPP and its small company universe might more readily lead to conflict-of-interest situations such as have occasionally occurred in EDP.

The principal intent is to re-focus management of the program, improve accountability, and to raise the profile of the DIP Program within the Department. We have recommended option (a) in our summary or recommended changes in Annex VII E.

IV - CONTRACT NEGOTIATIONS

INTRODUCTION

Subsequent to Deputy Minister or Treasury Board Approval, and the encumbrance of funds consistent with requirements of the Financial Administration Act, the Department of Supply and Services (DSS) becomes involved. The steps are outlined in Exhibit 5, opposite.

(Page B-51 omitted)

The DSS negotiates a contract between the Crown and the recipient company based on the specific terms of an approved submission. For other assistance programs to industry, ITC negotiates contracts directly with the recipient; DIPP is the only exception, and the practice is based on historical precedent when DIPP's and DSS's joint predecessor was the Department of Defence Production. DSS contract services are provided on a fee-for-service basis, with annual costs now running at around $1 million. The work is executed in DSS headquarters in Hull.

Services of DSS covered by the fee are:

(a) Issuance of contracts for DIPP projects, and the provision of necessary contract officers to effect the service.

(b) Rate negotiations with the recipient to determine eligible labour and overhead rates acceptable under the contract. DSS Standards of performance are covered by documents such as DSS.1031 and DSS.1036, which are provided to the company.

(c) Verification of progress claims for payment, against the DSS standards, with certification to ITC.

(d) Inspection services of equipment provided to companies under the Capital Assistance component.

(e) Attendance at Progress Review Groups during the project implementation phase.

(f) Assets Management, i.e., the repossession and storage of capital equipment items when recipients fail to meet payments.

(g) Provision of internal and final project audits by the Audit Services Bureau, in accordance with DSS and Directive requirements and standards.

(h) Acting on behalf of Canadian Commercial Corporation, contract execution of joint projects with other nations.

DSS has contracted all DIPP projects except one, 1-828, Gulf Shawinigan, for a value of $1.39 million. This was approved by a Minister and contracted in-house by ITC with the recipient.

No DSS annual reports are provided to ITC to account for the value of the services rendered; however, project reports, claims, and notices of audits completed are provided from time to time. ITC has not requested DSS annual reports in the past, but DSS advised us that they could be provided.

Enthusiasm for DIPP on the part of contractors was reported by DSS. In fact, DSS were themselves impressed by the program and intend to pattern one of their new programs along the lines of DIPP.

WORK STEPS

Within DSS, there is a series of separate work steps necessary to execute the contract and a series of approval steps that may include a second Treasury

Board approval. Exhibit 5 sets these out in more detail. They follow the standard route for all DSS contracts.

When the ISB officer receives the approved Treasury Board Submission and approved encumbrance of funds he sends a form, "Requisition for DSS Contract Services" with the approved documents to the area of the ADM Science and Engineering Procurement. Depending on the type of contract, the projects are usually assigned as follows:

(a) R&D projects to the Director General Science Procurement

(b) Capital Assistance and Source Establishment to one of the Directors General of the Product Centres.

A DSS officer is at present assigned to co-ordinate distribution of DIPP projects in DSS and to act as liaison with ITC. DSS have indicated that they would prefer to be informed of projects earlier, before the requisition, so that they could prepare for the eventual contract. This does occur from time to time even now.

The assigned DSS contract officer prepares a contract using the ITC project submission, DIPP precedents, and DSS rules and regulations. He will have contact with the company, sometimes through the ISB officer. The contract is checked by his supervisor, then by the DSS quality control unit and then by the DSS legal advisor. It then moves to the DSS Contracts Authorization Board. This body is analogous to the DIPP Committee, with its own approval rules and delegated authorities - which often have required a <u>second</u> DIPP project submission, this time by DSS, to Treasury Board.

The time from receipt of ITC request to receipt of authority to enter into contract is, according to DSS, around 60 days. (Compare this with 110 days for R&D projects, identified by sample file examination.) The contract is then sent to the company for signature: the returns from the company may be fast (usually larger firms) or slow (usually smaller firms). From time to time, companies query the terms and conditions of contract - leading to delay, particularly if significant changes occur, and have to be repeated.

Completed contracts are sent to ITC, with copies retained in the ISB, DIPP Office, and Financial Services Branch.

ITC has never been aware of the level of DSS person-year resources devoted to DIPP contracts, principally because of the distribution of DIPP activity across many DSS offices in many Branches and because DSS has not been asked to account for their annual billing for services rendered. DSS maintain computer records of DIPP contracts and could have provided reports had ITC asked. We did not have time to examine these records and cannot comment on the type of reporting that could have been made.

Joint Program Management by DSS

ITC contracted with DSS for project management services on the two Canadian drone projects, the CL-89 and the CL-289. These are joint projects with other nations, principally the UK and Germany (CL- 89), and Germany (CL-289). These services are paid for separately and amount to around $1 million annually (the original contract was for around $5 million over 5 years). The CL-289 is a $100 million project; Canada provides $25 million cash, plus overall project management.

DEFICIENCIES

Considering that there have been 1,000 projects over 20 years, it is not surprising that certain deficiencies have been observed:

(a) Delays in Contracting: Since 1970, there have been several ITC-ISB studies listing contracts in which delays occurred. While these studies were not independently verified during the DIPP Evaluation, attention was paid during the file examinations to contract times and to reasons for delays. Of the total average time of 377 days for R&D projects, from company application to contract issuance, the average time from ITC request for DSS contract services to contract issuance was 110 days. Delays fell into 3 categories: delays by ITC in initiating the "Requisition for Contract Services" and the provision of necessary documentation; delays by DSS in getting the contract through their system, and delays by the company in the acceptance of contract terms and conditions or in being late in returning the contract.

As indicated elsewhere in this report, rapid processing of contracts is important because of the liquidity position of some companies, for whom the R&D commitment or the requisition of capital equipment may be a significant problem.

(b) Late Stage of ITC Advising DSS: DSS believes better service can be provided if they are advised of projects at an earlier stage than at present, enabling them to assign a project officer ahead of formal

receipt of the requisition. ITC noted that this was tried some time ago, but the DSS response at the time was that the project might not be approved so a possibly unnecessary resource commitment should not be made. Today, however, DSS believes that early warning would improve their contribution, leading, for example, to a better Statement of Work and to preparatory contract initiation. If a DSS/DIPP contract cell were co-located with the DIPP Office in ITC, the collaboration would naturally increase, and these improvements would probably occur without any formal system being introduced.

(c) Lack of DSS Skills and Non-DIPP Standards: ITC believes that not all of its projects, some of which are commercially or politically sensitive (especially joint projects) have always had a suitably experienced DSS officer assigned to the job. Partly, it is said, this is because there is no dedicated DIPP unit, and DSS must assign someone who is available. Not every DSS officer, it is alleged, is familiar with DIPP and may judge DIPP projects by DSS (or non-DIPP) criteria rather than accepting the role of providing simply the contract services. This point should be discussed with DSS.

(d) Lack of PRG Continuity: Private industry noted the lack of continuity of government officers during project execution. This criticism applied to DSS as well as to ITC. Yet claims were sent to ITC for payment.

(e) Incompleteness: DSS occasionally omits to send copies of existing contracts to ITC. In one project file reviewed, two amendments to contract were missing from DIPP Office, ISB, and FSB files.

SYSTEM CHANGES ALREADY PROPOSED BY ITC

Approval in principal has been given to ITC executing DIPP contracts in house. The means by which this will be done has not been decided. Options include an ITC system parallel to Enterprise Development Program contracting; a DSS contract cell in ITC, co-located with the DIPP Office (this system is in effect in some other government departments); and a dedicated DIPP cell in DSS with a coordination function located in ITC. Each of these has advantages and disadvantages. The two DSS options are discussed first:

(a) DSS Contract Cell in ITC, co-located with DIPP Office in ITC. DSS estimates that this would entail about 8 person-years, including Division Chief, officers, and support. Their role would be contract work, with the other services (rate negotiation, assets management, field inspection, audit) still available. DSS would be responsible for expanding or contracting the cell size consistent with workload, ensuring professional development, and providing general headquarters support to the group. Full liaison would exist with DSS Regional Offices, Assets Management, Rate Negotiators, and the Audit Services Bureau. This option seems likely to work well, with good ITC control.

(b) DSS DIPP Contract Cell in DSS. This would comprise a liaison function of 2-3 person-years, co-located with the DIPP Office while the main DSS contract cell remains in DSS headquarters in Hull. This option also seems likely to work well, but ITC control would be reduced.

(c) The ITC option to hire its own staff, with no DSS subcontract. Certain skills would have to be learned, or acquired through hiring, namely, rate negotiation with industry, and military and government procurement practices. Canadian Commercial Corporation acceptance for joint projects contracting would still be required. Failure to recognize some of the military aspects of contracting can, and has been, embarrassing to ITC. ITC would still probably wish to purchase DSS services for Regional Office, Rate Negotiation, Assets Management, Audit Services Bureau. ITC would be responsible for professional development and for expanding or contracting the person-years in accordance with case load.

Until the actual in-house contract experience is gained, ITC will not be certain of person-year and skill level needs. This will take time. This option has the highest risk, but control is entirely in ITC.

A possible solution may be to accept one of the DSS options, gain experience, review the results, and then make a final decision based on facts, not guesses.

STRENGTHS OF THE SYSTEM

The contract negotiations part of the system adds some strengths to the whole process:

(a) The contract is scrutinized by professional contract designers and negotiators, with quality control checks prior to submission to the Contract Authorization Board. Sound protection of Crown funds and Crown assets is assured. (Under the 1953 Department of Defence Production Act, the Crown retains a lien on the assets involved until contract obligations are fulfulled.)

WEAKNESSES OF THE SYSTEM

There are also important weaknesses in the system:

(a) The approval by the DSS Contract Authorization Board appears unnecessary, as does a second approach to Treasury Board. Thus, some of the DSS activities are redundant and wasteful of resources, since Treasury Board either has delegated necessary authority to the Deputy Minister of ITC or has itself approved the same project earlier. The DSS quality control checks, however, are deemed necessary.

(b) DSS view their DIPP mandate as that of "brokers" servicing DIPP purposes. In general, they approve of DIPP goals and believe them complementary to their own but do not concern themselves directly with internal ITC affairs. Thus, what may appear to be an opportunity to provide an extra check on goal achievement is not really so.

If these weaknesses are due to diffusion of DIPP contracts across DSS and their geographical separation from ITC, the problem might be well resolved by a DSS cell in ITC. Negotiation between ITC/DSS should also concentrate on

eliminating redundant steps, while retaining the other benefits of their service.

EVALUATION

The contracting of DIPP projects through DSS has caused concern to ITC and its clients, principally because of delays. Some delays are due to system redundancies, and some are perceived to result from diluted attention to DIPP. The goal in 1977 was to process a contract in 3 months from project submission to contract. This period was also mentioned as acceptable by industry; yet the average DSS time alone is 2-4 months (depending on whether DSS or ITC estimates are used). Early in 1980, joint DSS/ITC discussions commenced to review the situation and decide on a best option.

Our recommendations with regard to contract negotiation are contained in Annex VII E.

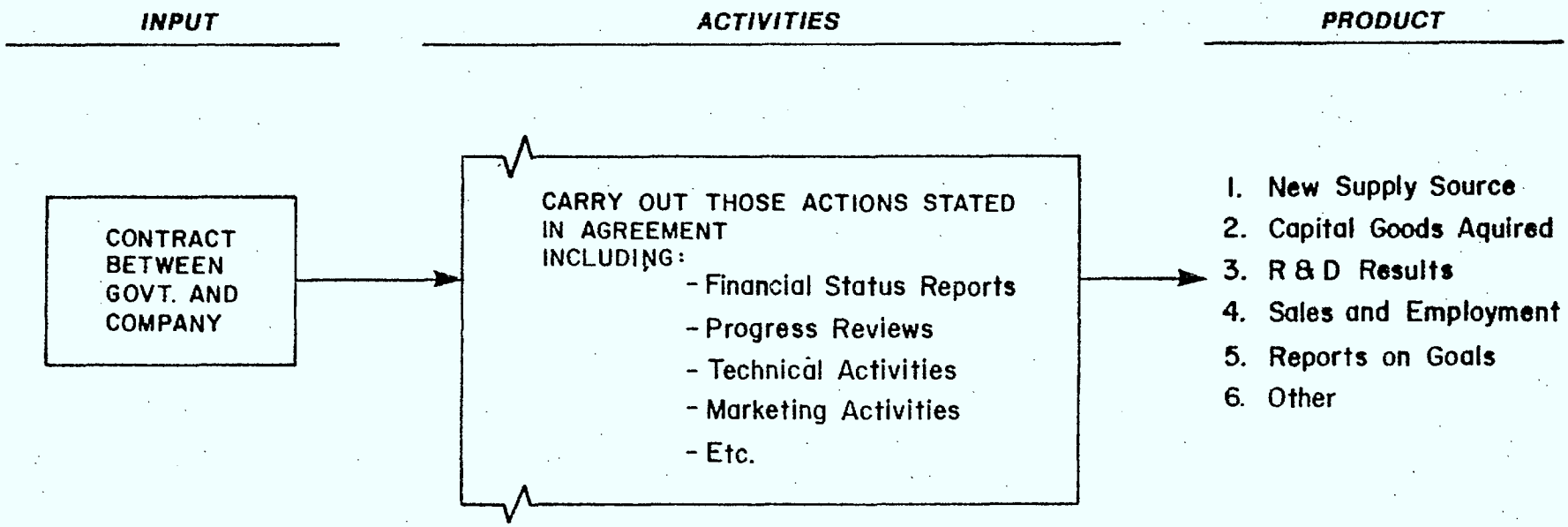
V - PROJECT EXECUTION - MONITORING AND CONTROL

INTRODUCTION

The fifth stage of the delivery process is the execution of the project by the approved company in accordance with the contract. At this stage, the Department's role is monitoring and control to ensure the project is proceedng according to contract and to report accordingly to program management. Later, when the contract is over, the Department will account for the project success or failure. If the monitoring and control have been adequate, a base of sound

EXHIBIT 6

APPROVED PROJECT EXECUTION



data will have been accumulated, leading to good program analysis so that the program may be modified as required. If monitoring and control have been deficient, then a proper accounting may also be deficient. Exhibit 6, opposite, describes this section in graphic form.

The characteristics of the projects reviewed fell into 3 general categories which applied equally for R&D, Source Establishment, and Capital Assistance. They were:

(a) projects that proceeded smoothly from start to finish (some);

(b) projects that encountered problems, principally technical definition of the end product or market shift, or other problems that required a change necessitating DIPP Committee review, change, and re-approval;

(c) projects that got into serious difficulties.

The features of any monitoring and control system should, we believe, be sufficiently sensitive to detect (c), the worst case. Under such conditions, category (a) projects would move swiftly through the system with no alarms and no corrective action. Category (b) projects would move relatively swiftly through the system, but alarms are triggered and appropriate corrective action taken. Category (c) projects would be detected early enough to allow the Department time to review the project and to decide to continue or to terminate it. Early review would minimize the exorbitant demands such projects can make on officers and senior management (for example, Radio Engineering Projects).

(Page B-63 omitted)

Such a monitoring and control system would probably shift some category (b) projects into (a), and some category (c) projects into (b).

For all categories of projects, the monitoring and control system would report back to program management the degree of achievement of the performance indicators specified in the Statement of Work.

DIFFERENCES BETWEEN PROGRAM COMPONENTS

Monitoring and control applies to all three components of the DIPP program. The greatest workload appears to be related to the R&D projects because of the higher dollar value and longer time needed to complete projects. Nevertheless, attention must also be given to Source Establishment and Capital Assistance. The project file reviews revealed certain project characteristics. Monitoring and control as it applies to the three program components is further discussed in Appendix 2 to Annex VII.

SOURCE ESTABLISHMENT PROJECT CHARACTERISTICS

- while such projects appear generally to be straightforward and the outcome relatively free from risk, some projects were not:

- the recipient company did not always secure, at the start, the full order for which they had bid. Some U.S. prime contractors, in dealing with new suppliers, release only trial quantities to the successful bidder. Subsequently, on satisfactory completion, the balance of the order may be released. If performance and time standards are met, further, additional contracts might be let (e.g., Garrett Microcircuits);

- winning a subcontract from a prime contractor is not a guarantee of success. If the prime contractor is unsuccessful in selling his product, the end result could be a loss on the Source Establishment project. At times, therefore, it is necessary to review the prime contractor's position relative to the market, particularly if large expenditures are involved (e.g., the Canadair contract for the French "Mercure" aircraft);

- the Source Establishment project often turns out to be more like an R&D project than a "make to print" project. Excessive expenditures may lead to the collapse of the company or a division of a company, (e.g., the Garrett Marine contract for the Litton LHA ships for the U.S. Navy).

CAPITAL ASSISTANCE PROJECT CHARACTERISTICS

- Capital Assistance projects are intended to improve a company's ability to manufacture an existing product more economically and efficiently within a given market segment, or to enable the manufacturer to enter new market segments, previously closed because of production limitations;

- for 5 years from date of installation, the capital equipment thus purchased is the property of the Crown, not the company, and the company is restricted from selling or transferring the equipment;

- Capital Assistance projects require a company "Matching Investment", and the Department needs to know if this was implemented;

- Companies in this category go bankrupt from time to time;

- The level of Canadian content of large, "high-profile" R&D projects is dependent on CA supporting a competitive, quality oriented, sub-contract, domestic manufacturing base to fully exploit R&D. This characteristic, however, is secondary to the protection of existing markets and the development of new export markets;

- The value of the equipment provided may be significant relative to the net worth of many of these companies.

R&D PROJECT CHARACTERISTICS

- These projects operate over a longer time span. Frequently, such projects call for time extensions to the contract; this affects project/DIPP cash flow forecasts;

- During the process of technical development, market requirements for the end product may become more clearly defined, or the market shifts, or parallel competitive developments occur, all of which may lead to redefinition of the end product;

- Where core technologies are being developed, the end product may require repackaging for different user applications, each of which may necessitate specific development and additional regulatory and re-certification procedures;

- Market segmentation may develop, leading to a situation similar to the previous point: a "family" of products may appear;

- The longer time span may present greater opportunity for the original project to drift off target;

- In joint projects with other nations, the end user himself may change the project direction, resulting in delay, technical changes, and additional unbudgeted expenses;

- Technically successful developments may not be successful in the market for reasons of size, weight, or cost, leading to a "value engineering" project to salvage Crown investments;

- Technically successful developments may not sell well because insufficient attention has been paid to market strategy, marketing channels, after-sales service arrangements, etc.;

- Certain projects have been more of a "bid-support" nature rather than true R&D.

Several of these characteristics would clearly be unforeseeable at the approval stage of a project. Nevertheless, a number could be detected and corrected during the project execution stage by a strong monitoring and control system. Thus, a number of projects that ended in only marginal success or even in failure might have been re-directed so as to reach a more successful conclusion, thereby enhancing the overall benefits of the program.

THE CONTRACT STATEMENT OF WORK - MONITORING AND CONTROL SECTION

The overall requirements for the SOW and the need to establish performance indicators for technical, financial, and marketing activities were discussed in the Proposal Evaluation stage. This section discusses SOW requirements for monitoring and control, in greater detail. It emphasises a shift to a more structured system for company reporting to minimise the burden on ITC resources, while maximising the flow of appropriate information for ITC project execution analysis.

The present SOW's usually specify the frequency of company reporting and Progress Review Group meetings: the latter are required by the directive to be held not less than every six months. We have not found a guideline, however, for the format of company reports and the conduct of PRG meetings. As a result, project files reviewed were full of company reports that covered only technical aspects of the product development. There were industry observations that the ITC-chaired PRG's were not purposeful. Marketing was largely ignored; financial reporting was minimal and was essentially limited to processing claims and re-encumbrance of new year funds for ongoing projects.

The establishment of SOW performance indicators for the technical, marketing, and financial activities would provide yardsticks against which project execution could be measured. Guidelines should be developed for the format for company reporting, and the Project Review Group could use the Project Management Team as a resource in assessing the reports. Thus when a Project Review Group meets with the company to discuss progress, rather than hearing a

detailed description of work that has been accomplished, they could focus on the exceptions, problems, alternative actions, and future project directions.

Currently the company is required to report to the Department prior to a PRG meeting. If they do so early enough, the Advisors can comment on their specialized areas of the report, thereby briefing the Project Manager prior to the meeting. This has been done in some projects.

We believe that all SOWs should specify the frequency of reports and PRG meetings and should attach guidelines for report format, claim applications, and the conduct of PRG meetings.

PROJECT REVIEW GROUP MEETINGS

The Project Review Group comprises the Project Manager and his advisors, although at present, not all the ITC Advisors are included. They review project progress and problems with the company personnel, usually at the factory.

The ISB Officer is PRG Chairman, with selected advisors from a technology area, DSS, DND, and the Defence Programs Branch. According to the respondents of the internal questionnaire, the PRG is a most effective means of monitoring and control, and we concur with this view. The extent of its value, however, may be determined by the amount of preparatory work prior to the meeting and any analysis of results afterwards. Except in a few of the major projects, we did not find much evidence in the file reviews that this preparation and analysis had occurred.

In principle, such a meeting represents an accounting by the company to the Crown for the use of public funds. In practice, we found that PRGs were not always held at the required frequency and in one project not at all. There was no attempt by the ISB's to evade the issue. They openly acknowledged that, due to pressure of other work and to limited resources available, priority was given to getting project approved. Monitoring and control was a second priority, and post-contract sales data collection a third priority. They acknowledged that significance of ensuring that projects stayed on the right track, and, within resource constraints, they attempted to meet their commitments as best they could.

The issue of the variation in ISB resources devoted to program delivery is discussed in Annex VII D on Program-Wide Issues. Some additional detail is given here. In the early 1970's, all ISB's had dedicated program delivery systems for all industrial assistance programs. In the two principal DIPP ISBs, Transportation Industries Branch and Electrical and Electronics Branch, these systems were directorates headed by an SX-1. Subsequent departmental and branch reorganisations, however, led to these directorates being dismantled. With their collapse, the resources were redistributed, reporting systems disappeared, and overall program delivery was subordinated to other branch activities.

Recognising the general pressure to reduce resources within government, we have recommended that the Project Management Team concept be used from the initial project analysis to project monitoring and control in the implementation phase. They would have a role in evaluation of company progress reporting and the PRG. We would recommend the following sequence of

events: the company issues a program report to ITC; the advisors evaluate the report; the PRG meeting takes place concentrating on exception issues; the Project Management Team then reports progress to the DIPP Project Committee. Such a report would provide a measurement of project achievement against the SOW. By these means the PRG could perform monitoring and control functions purposefully, and company accountability to the Crown would be strengthened.

POST PROJECT SALES REPORTING

The basis of post-project sales reporting needs to be established during the project execution stage by the Project Manager and the PRG. This activity is further discussed in the sub-section entitled "Post-project Benefits Monitoring" of Section VI of this Annex.

The onus for providing post-project benefits data (sales, employment, achievement of qualitative goals) should be shifted from ITC to the company. The company's obligation to provide this information should be stated in the contract.

However, the kind of information and methods for collecting and recording it may best be covered during the PRG meetings. An acceptable system, with guidelines, should be made known to the company well in advance of contract completion. The quality of post-projects benefits data may be assured by requiring the company officials who signed the contract to obtain the data, and to sign the annual statement of sales or outputs accruing from the project.

Statements of benefits are not always useful if expressed only in dollars: for many products, it is more helpful to specify units of production (engines, simulators, aircraft navigation products) and to identify major contracts won or lost. The purpose is to eliminate or lessen the double counting which appears to have occurred in some projects.

STRENGTHS OF THE SYSTEM

The directive provides for monitoring and control. Strengths are identified as follows:

(a) Three activities are required to ensure compliance and to provide information to the Department. They are company progress reports, Progress Review Group meetings between ITC and the company, and ISB reporting to ITC Program Management. Properly executed, these activities should provide ITC with adequate control over the project and an ability to take amending action if needed. The Project Management Team approach should ensure that these activities are carried out.

WEAKNESSES OF THE SYSTEM

(a) The Statement of Work should state clearly the company's obligations for reporting and should establish guidelines defining ITC requirements in terms of content. The role of the PRG needs similarly strengthening and should be made a priority. Company reports are not reviewed; ISB reports to DIPP Committee are infrequent, and those

received at DIPP Committee are accepted as tabled. Both DSS and Technology Branch commented on the need to strengthen the technical part of the SOW.

(b) Resource constraints in the ISBs impede both the continuity and the frequency of Progress Review Groups, often to levels below the minimum standards required by the directive. ISB's presently concentrate on obtaining project approvals; monitoring and control activities recieve low priority.

(c) Companies are not obliged to report sales or other measurements of economic benefit. No systematic measurement of benefits is in effect and has not been since 1975.

EVALUATION

As set out in the DIPP directive, the company progress report, PRG, and the ISB management reporting system, are sound and effective methods for monitoring and controlling projects. The authority of the ISB project officer and PRG is wide enough to permit them to perform monitoring and control effectively. However, reports, internal questionnaires, interviews, and file reviews all provide evidence that these functions are not being carried out effectively or regularly. ISB's have, between 1973-1978, reduced both the person-years and authority levels of all program delivery functions. At the same time ISB officer caseload was increasing. Since ISB's stated that priority is given to project approval, the implication is that fewer resources are devoted to project monitoring and control. The quality of program management data and

analyses presented to the DIPP Committee must by implication be adversely affected.

If this activity is deemed important, then management must take steps to reinstate it; if not, then the directive should be modified accordingly. Effective monitoring and control is in accordance with senior management and central agency requirements and is imperative for the effective and efficient management of the DIP Program.

VI - FINAL EVALUATION AND POST PROJECT BENEFITS MONITORING

Introduction

This section discusses the final stage in a project, which consists of a summary evaluation and final management report at completion of the contract and the provision of information on ongoing benefits after the completion. The quality of the project data base is also considered.

FINAL MANAGEMENT REPORT

This report, called a Final Management Report by the E&E Branch, is a final progress report, made at contract completion to DIPP management. It may or may not be based on a similar report prepared by the company. In the case of TIB, it appears to be based on an end-of-project PRG meeting.

While the directive clearly requires progress reports by ISBs, it is less clear with regard to final project reporting by either the company or ISB.

First, we recommend that the company should provide an end-of-project report which measures its technical, financial, market, and time performance against the objectives for the project originally approved by the DIPP Committee. An updated market assessment should be provided stating the company's position relative to the market and its competitors and the strategy it has implemented or will implement to secure the market. A provisional assessment of success or failure should be made.

Second, a final PRG meeting should be held.

Third, the ISB should produce a Final Management Report which would represent the Project Management Team assessment of the overall achievement of the objectives, the perceived level of success or failure, and prospects for the future.

In practice, a report for every completed project has not been submitted to the DIPP committee. It may be that reports are compiled for some projects but are not presented to the DIPP Committee. From file reviews of completed projects, it is clear that Final Management Reports have not been written for every completed project.

POST PROJECT BENEFITS MONITORING

This phase is the post project retrieval of quantitative benefits such as sales and employment, and qualitative benefits such as technological capability generated by the project in line with its goals. In the directive, the documentation of this phase is called the Status Report. We have

recommended that this requirement be made part of the contract Statement of Work and that the onus be shifted from the Department to collect it to the company to provide it. A system must be put in place to assess the economic benefits of the project as and when they materialize.

The directive requires that the Status Report provide statistical information on sales (domestic/export, cost of sales, profits); breakdown of cost of sales (Canadian content); and employment benefits (person-years, breakdown by skilled/unskilled, labour rates, technical/production/other). A brief reference is made to marketing. No reference is made to other program goals achievement such as defence.

A shift of emphasis away from purely financial reporting may be in order. Many DIPP products are discrete units, such as aircraft, simulators, radios, etc. Quantities are relevant since many of the company forecasts for which projects were approved, are based on unit numbers, unit prices, named customers, specific contracts, or market segments. Reports should be made in a form comparable to the forecasts so that the accuracy and reliability of forecasts could be verified.

The benefits reported should also be expressed in terms of the qualitative goals of the project and the DIP Program, which includes defence related technological capability.

POST PROJECT EVALUATION

There is no program requirement for analysis of downstream project success.

The regular provision of input data (Project Submission) and output data (Financial Management Report, Status Report) would enable ITC to evaluate projects after the project contract ends, and at appropriate later dates at the project level, the industry sector level, and the program level.

This would require some resources, perhaps in areas such as Corporate Analysis Branch or the policy planning and analysis divisions in ISB's. The task would be simplified by the use of standard planning tools (performance indicators) previously mentioned. Such an instrument would facilitate comparisons between expectations and realities.

The guiding principle should be simplicity. A practical, evaluation mechanism which does not make excessive demands is preferable to an exhaustive evaluation that requires extra effort from everyone.

If it is decided that the Corporate Analysis Branch should execute this evaluation, then the system must be designed in collaboration with the ISB's who deal with the program user companies. The results of such evaluations should be of considerable interest to the ISB's.

PROGRAM SALES DATA: EXISTING AGGREGATIONS

Until 1975, the ISB's annually retrieved, at DIPP Office request, sales data related to individual projects. These data are no longer collected. The Financial Service Branch annually retrieves similar data for excess profits calculations related to potential repayments to the Crown.

It was assumed within ITC that the outputs from these two data collection systems were similar, but, in fact, there were enormous differences. Exhibit 7, overleaf, shows the comparative data accumulated for the same groups of companies for the same year.

The variance between FSB and ISB data for 6 large companies amounted to $2.6 billion (a factor of 3) and for 25 medium companies amounted to $1.3 billion (a factor of 13). The reasons for variance were examined, and we found:

(a) ISB data included all 3 components of DIPP (R&D/CA/SE), whereas FSB data included only 2 components (R&D/SE).

(b) FSB data did not include the sales values of those products for which it collected royalties against units of production, in lieu of excess profits. For example, for an aircraft, a flat fee may be repayable per unit sold. In the case of the de Havilland Buffalo, FSB collected the royalties due per aircraft sold but had no need to include the $333 million sales value for its data base.

(c) FSB does not have follow-up records on all projects. Of the 350 open files, it was reported that some companies respond regularly, some responded intermittently (one year, but not the next), and some never at all.

At best, (a) and (b) accounted for 50% of the variance, and (c) for perhaps another 20%.

EXHIBIT 7 CONFIDENTIAL

COMPARISON OF AGGREGATED DIPP SALES TO 1975, ISB VS FSB DATA

Size of Company	Number of Companies in Group	Vote Expenditure $million	(%)	Accumulated Sales, $million ISB reported	(%)	FSB Reported (%)
Large (Group I)	6	191.77	(53)	3,801.45	(67)	1,199.68
Medium (Group II)	25	125.28	(34)	1,456.64	(26)	112.08
Small (Group III)	175	45.51	(13)	414.45	(7)	Did not assemble
	206	362.56	(100)	5,672.54	(100)	-

(Page B-79 omitted)

It is clear that any system for collecting data on benefits must be reasonably complete to be of value and, in the case of the present program, must be able to satisfy more than one ITC branch. Redundancy should be eliminated. Both systems are suspect. The ISB system had better overall coverage for program purposes, but it is now defunct.

PROGRAM GENERAL DATA BASE

The program general data base is Financial Services Branch Computer Report, GC154. This data base is not printed at regular intervals but as required because it is very large. Also, it may be accessed in many ways. Its present major use appears to be to advise Members of Parliament of the use of DIPP funds in their constituencies. This computer file has, however, the makings of a very useful program data base if some improvements are made.

Report GC-154 was the main data base used for certain purposes of the DIPP evaluation. In the process of using this file, some deficiencies were noted in completeness and accuracy. They included the following:

(a) File GC-154 was incomplete. Between June, 1971, (project 1-456) and November, 1978, (project 1-926) there were 470 DIPP projects, but 91 (19%) are missing from this file. In December, 1979, we checked and found that of a further 63 projects (November, 1978 to November, 1979) which had been put into effect, 60 had not been entered on the computer.

(b) Projects were hard to identify either by description or by number. Project titles were unintelligible in many cases, non-existent in others. Projects selected for file review were difficult to identify against ISB project file numbers but easy to identify against DIPP Office and FSB project files because of the FSB 1-000 code number.

(c) Completed projects were not so identified. In the course of the evaluation, we wanted to profile the caseload, the number of new projects a year, the number of completed projects a year, and the number of projects that overran scheduled contract times. The data base was unable readily to provide these answers.

(d) Certain dates and contract numbers were wrongly recorded. In some cases, contract amendments were entered in place of the original project contract data and number, which did not appear at all.

In spite its present shortcomings, such a file, with some additions and changes to improve accuracy and completeness, could be a valuable analytical tool for the ISB's and the DIPP Office. Several items could be entered as performance indicators in the data base.

EVALUATION

The intent to summarise long term DIPP benefits by maintaining a follow-up system to retrieve sales for program evaluation is indeed laudable. The system as currently designed would allow program managers, senior officials, Ministers, and others to keep track of the program.

However, several improvements are needed:

- Specific data requirements need better definition.

- Data should be obtained for all projects.

- One system should be used for the two major end users (the program evaluation/the excess profits calculation).

- Post project data should be collected on a obligatory, systematic, and regular basis. Quality control of these data may be improved by requiring the company officers who signed the contract in the first place to sign the company returns.

Weaknesses of the wrap-up phase amplify the weaknesses noted for regular monitoring in Section IV of this Annex. Together, they vitiate the final stage of the DIPP delivery system to the point of being useless for management or evaluation purposes. Only determined action by DIPP management can correct this situation.

It is clear that such weaknesses can be corrected. An improved data base would provide DIPP Management and the ISBs with a valuable tool to keep the program in line with user needs, and to measure its effectiveness as an instrument of industrial development.

CONFIDENTIAL

ANNEX VII C TO THE DIPP EVALUATION STUDY

PROGRAM DELIVERY: PROGRAM MANAGEMENT

CONFIDENTIAL

ANNEX VII C TO THE DIPP EVALUATION STUDY:

PROGRAM MANAGEMENT

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EXHIBITS

In Annex VII B, we dealt with management at the project level. Annex VII C examines the broader aspects of management at the program level.

I - PROGRAM AUTHORITY

For the DIP Program, Treasury Board vests overall management authority in the ITC Deputy Minister, with approval authority to a current ceiling of $2 million per project provided the Crown share of the project is 50% or less. Program policy and decision is entirely in the hands of government officers.

In comparison, authority in the other ITC innovation program, the Enterprise Development Program, is vested in the Enterprise Development Board (a combination of private industry personnel and senior government officers), not in the Department. Project ceilings are determined by the EDB, but criteria are the prerogative of Treasury Board. Certain procedures are shorter and less complex than those in DIPP.

All projects which the DIPP Committee recommends for approval, no matter how large or small, must ultimately go to the DM for approval; or, if outside his authority, for his (Minister) recommendation for approval to the Treasury Board.

The program authority is described by two documents: the DIPP Policy and Administrative Directive, and the Treasury Board Minute approving the directive. The present directive in effect is dated June 1977. It is a long,

detailed, and cumbersome document, which, when it conflicts with minor change, creates constraints and irritations to Treasury Board and ITC. A new DIPP Directive is being prepared with the assistance of ITC Legal Services, and it is intended to be substantially shorter and simpler. The DIPP Office plans to issue "guidelines" to buttress the directive by providing further direction to the program actors. Such guidelines may be readily adapted to change dictated by policy and operational improvement. We concur with this approach, and have referred to several activities which might be covered by such guidelines.

The ITC options are to:

(a) retain the existing authority which Treasury Board delegates to the Deputy Minister, but to simplify the procedures as far as possible, and maintain the all-government decision process;

(b) change to an external board, with Treasury Board delegating authority to a joint industry/government decision-making Board whose industry members are appointed.

The pros and cons will be considered later in the section called "Committee Structure".

LEVELS OF AUTHORITY

Program administrative authority is delegated by the Deputy Minister through several levels: the ADM Finance, the Director General Programs Branch, to the DIP Program Office, who administer the program and provide DIPP Secretariat Services.

Decision authority, while formally vested in the Deputy Minister or Treasury Board, rests in practice with the DIPP Committee. In theory, the DIPP Committee has no decision authority but merely the power to recommend for approval; in practice, it has decision-making authority since its decisions are rarely, if ever, challenged, let alone overturned.

II - DIVISION OF RESPONSIBILITY

Program administrative authority is located vertically in the area of the ADM Finance. The present responsibility for delivering the program, however, is vested horizontally across three ADM areas in the manner of a matrix. The program used to be under the principal control of the ADM Industry, and, prior to that, of the International Defence Programs Branch (the predecessor of Defence Programs Branch).

USERS

The principal operational user is the ADM Industry and Commerce Development. This is the group that matches the ITC assistance program to an industrial company, consistent with the program goals and the ADM Industry's mandate. They convert the program into a tool for use in the national interest. Within this ADM's area, some 5 Industry Sector Branches use the DIP Program. Transportation Industries account for 68%; Electrical and Electronics for 27%; Resource Industries, Chemicals, and Machinery Branches account for the remaining 5%. They have spent some $710 million to 31 March, 1980.

The secondary, and somewhat indirect, operational user is the ADM Trade Commissioner Service and International Marketing, who is responsible for the Defence Programs Branch. In this ADM area, DIPP is a tool with two functions. First, it supports development of military products jointly with other nations under bilateral treaties. Second, any military product produced in Canada is part of the marketing mandate of Defence Programs Branch; thus DPB supports the development of military products. Joint projects with the US have amounted to some $70 million (10% of DIPP expenditures); joint projects with NATO allies have amounted to over $40 million (5% of DIPP expenditures) over 20 years. The DPB have been the Program Market Advisors since 1959.

CONTROL

The administrative responsibility is in the ADM Finance's area.

When DIPP was under the control of the ADM Industry, from 1968-1977, the only external check and balance was Defence Programs Branch with the Market Advisory function. From time to time, Treasury Board Secretariat perceived difficulties with ITC management of DIPP. ITC senior management was restructured with a Minister, Deputy Minister, and ADM, all of whom arrived from Treasury Board and TBS in 1976-77. Organizational changes occurred, and DIPP was firmly established within the present matrix management system. This strengthening of the checks and balances has been perceived to lead to increased conflict within the system, with a diffusion of accountability paralleling the increased division of responsibility.

This conflict has been felt particularly within the area of the ADM Industry and Commerce Development. At the same time that ISB control over program management was shifted to the ADM Finance, the ISB's also lost control over the Regional Offices - their regional contact mechanism with Canadian industry - which were shifted to the ADM TCS and International Marketing. The ISB's perceived, within a single year, that their awareness of the industrial assistance needs of their clients, and the means to assist those needs, was weakened.

During the interviews and in replies to the internal questionnaire, there were several suggestions for a move back to the single ADM concept. Within the ISB's, the opinion was expressed that the ISB's would be the logical choice for the assignment of responsibility and accountability. Others saw no reason why the matrix system could not be made to work better than it has: the key to improvement lay in better communication and collaboration than has existed over the past three years.

The options available to departmental management are:

(a) continuance of the matrix system, with improved collaboration, and maintenance of the checks and balances;

(b) a return to the old system, with centralization under a single ADM with reduced checks and balances.

We have a mild preference for the option (a).

III - GOALS AND POLICY ESTABLISHMENT

A review of the DIPP goals, from the start of the program, indicated that in essence there had been little change in written form. The 1959/60 policies emphasise the maintenance of technology to be achieved by product innovation for defence export sales, and similar words are used today. What has changed significantly is the organizational environment and external environment within which the DIPP program operates; this has changed perceptions and expectations. Today, a much stronger emphasis exists on the economic return aspects of DIPP, while organizational changes have affected the way in which goals and policy are set.

Up to 1976, DIPP policy was established by the DIPP office in close collaboration with the Industry Sector Branches and Defence Programs Branch who were the principal program users; such collaboration, while sensitive and pragmatic between the participating groups, was perhaps somewhat "cosy". After the 1977 departmental reorganisation with the centralising of program management, there was a marked difference. Assignment of the program responsibilities was to the Program Branch (actually, the Enterprise Development Branch in 1977), not to the DIPP Office - this is in noted contrast to the Enterprise Development Program, where responsibility is assigned to the Program Office.

Today, within the Programs Branch, DIPP directives, cabinet memoranda and Treasury Board submissions are essentially written outside the DIPP Office. At the same time, the ISBs and Defence Programs Branch have commented on their reduced input to the process. The DIPP Office, under its new management, was reduced in staff and officer positions to essentially an administrative unit.

While this newer process provided fresh insights to DIPP, it also increased the separation of the participants and reduced the sensitivity of the program to its end users.

A review of the DIPP directive, to note the mechanism by which program policy was to be established, revealed that no coherent mechanism existed for such an important aspect of a program spending upwards to $50 million per year. Program policy establishment, while addressed in the current 1977 directive, is at no place considered in its entirety but in sentences here and there in several sections of the directive. Project policy is specified as being determined by the ADM Enterprise Development and ADM Industry Development.

Program goals and project policy appear closely inter-related. Within the old defence oriented Department of Defence Production, with its compact DIPP management structure and compact ADM Committee, the goals and policy interpretations were clearly understood. As the organizational structure changed, first with DIPP's transfer to the Department of Industry (DOI), then with DOI's merger with the Department of Trade and Commerce, departmental mandates were widened, and more people became involved who were not familiar with the program. These changes have contributed to a lack of focus on, and understanding of, goals.

The adoption of the matrix system, the transfer of program management to the ADM Finance, the decline of the DIPP Committee, the lack of a formal feedback mechanism from operations to policy, and a decline of program focus within ISBs and DPB appear to have weakened co-ordination, communication, and collaboration. Again, these conditions create the potential for conflict where conflict should not be occurring.

Bringing together the principal ADM's in the matrix system would provide a focus and compactness similar to that which existed at the start of the program in DDP. However, if this course is followed, their time constraints and other responsibilities suggest that they should address only the major issues.

IV - ACCOUNTABILITY

Accountability is related to the responsibility for implementing and achieving program goals. It is the systematic measuring and reporting of the results obtained for the resources expended. The concept of accountability applies regardless of the nature of the organization structure.

We experienced great difficulty in addressing this subject during the DIPP Evaluation. Everyone accepted that they must be answerable for the conduct of their work, but the expression of accountability was frequently unclear and, while correctly connected with division of responsibility, there were persons to whom it appeared synonymous with spending authority.

We considered two main aspects of accountability:

- what the Department and the program might reasonably be accountable for;

- who and which positions or functions might be held accountable, to what degree, to whom, and how.

WHAT THE DEPARTMENT/PROGRAM IS ACCOUNTABLE FOR

There are certain matters for which the Department/Program is clearly accountable or not accountable for:

(a) the Department/Program is accountable to Parliament for expenditures of public funds in accordance with goals of an approved industrial assistance program. It is also accountable for the provision of measures to ensure reasonable and acceptable levels of stewardship of those funds;

(b) the Department/Program, since it neither controls the companies nor can it assure the success of numerous risky projects, cannot be held accountable for the specific success or failure of a risky Research and Development project. However, the Department can be held accountable for overall levels of program performance and for exercising sound judgment in the selection of projects to be funded.

In essence, we have to protect the public purse while in pursuit of risk ventures. This divergency can be accommodated through DIPP system design, analysis, and reporting. Design means a suitable program structure, checks and balances, and the right skills in the right place at the right time in the right amount with due regard to efficiency/effectiveness trade-offs. Analysis means examining what is happening. Reporting means telling what happened.

WHO IS ACCOUNTABLE FOR WHAT TO WHOM

There are two significant aspects: accountability of the position, and accountability of the incumbent. Many persons who raised the topic had no difficulty with the concept of position accountability, but, in practice, the concept was perceived to break down because of the turnover of incumbents. All persons interviewed accepted responsibility and accountability for their present activities.

In one ITC program, not DIPP, we heard of a disclaimer on accountability for problem projects initiated by predecessors. In another case, the ISB was responsible for company development, but activities by other officials (in other programs of ITC, in conjunction with provincial authorities, and without the collaboration of the ISB) left them in a difficult position. The ISB felt accountable and would be held accountable, but was not always consulted.

Positional accountability, in theory, is generally easy to determine. In practice it is difficult to assess without adequate and regular analysis and reporting. To improve accountability, the following measures of effectiveness and efficiency in DIPP performance should be instituted, with guidelines for establishing them:

(a) accounting for the ultimate success/failure of the individual project, by comparing actual performance with the goals and the performance standards originally approved by the DIPP Committee. The account could be provided by the ISB officer for the DIPP Office and his ISB management;

(b) accounting for the industrial benefits derived from the use of DIPP as an industrial development tool (some 20% of the total ITC budget) within each industry sector. These accounts could be provided by ISB levels, such as Division Chief/Director/Director General/and ADM. The final report should be made to the Senior DIPP Committee, or to ITC Senior Management. As an example, between 1969 to 1979, the Electric and Electronics Branch spent $117 million; how much better off is the Electrical and Electronics industry sector as a result of this Crown investment?

(c) accounting for the extent to which DIPP-supported joint projects with other nations have brought benefits to Canada. This account would be undertaken by Defence Programs Branch/ADM TCS and International Marketing.

(d) accounting for the operations of the DIPP Office and its administration of the program.

(e) accounting by the DIPP Committee for its decisions on program management, program monitoring, and control.

These are the principal accountings. Subsidiary accountings may include:

(f) the Advisory Function - to the extent these groups are held accountable for their standards and the quality of their advice, on which decisions ultimately rest;

(g) Financial Services Branch - to the extent FSB is accountable for the accuracy, timeliness, and completeness of its outputs

Accounting for the performance of these services should be to the DIPP Committee, who in turn would account to ITC Senior Management directly or through the ADM Finance, depending on the final management structure.

INDIVIDUAL/PERSONAL ACCOUNTABILITY

Individual accountability was the most difficult and sensitive area to address. Accountability was frequently discussed, but interpretations varied. One ISB manager noted that it had been made clear by his superiors where the responsibility and accountability lay for projects that went astray, namely, with his branch. In general the acceptance of accountability was stronger among ISB officers and less strong among those participated peripherally and infrequently.

Staff turnover affected the acceptance of accountability. Managers turned over twice or three times as often as officers, but officers with a Branch were reassigned by their managers at frequent intervals from company to company. For example, a single Capital Assistance project had five ISB officers working on it over 2-3 years. Another officer of several years' experience noted that he had never been on a project long enough to write a Final Management Report.

ISB officers were not alone in work reassignments. In the DIPP Office, work previously handled by the division was reassigned elsewhere: the writing of

directives, preparation of Memoranda to Cabinet, etc. This reassignment of workload can only minimise the sense of accountability for specific activities. We believe that turnover did much to contribute to the decline of the strength of the DIPP Committee.

One senior manager suggested that a senior departmental official be made accountable for DIPP. We could not identify an ideal person, however, in the present structure. It was thought that the person should be familiar with technology, industry and the program. The concept is attractive, but such an individual's strengths, location, and permanence in a changing department was not easily perceived at this time, thus this option was rejected.

EVALUATION

While certain functions were identified as being capable of being accounted for, and while certain positions could be held accountable, we have not resolved all the issues pertaining to accountability.

In addition to the specific accountings discussed above, the following general recommendations will improve accountability:

- refocusing program management. This is discussed in the section III of Appendix VII B;

- strengthening the reporting system, in which achievements are measured against goals by the principal program users;

- improving continuity in incumbency.

V - THE ROLE AND ORGANIZATION OF THE DIPP OFFICE

Prior to 1977, the DIPP Office assumed full responsibility for program administration under the ADM Industry, and there was a certain separation from the other departmental industry assistance programs. These responsibilities included preparation of the policy and administrative directive, Treasury Board submissions, memoranda to Cabinet, some analysis, program fiscal management, preparation of budgets and forecasts, provision of secretariat services to the DIPP Committee, maintenance of standards, and program reporting. Staffing of the DIPP Office was at the level of 7 PY, amounting to 4 officers (3 SPA's) and 3 support staff. The organization was headed by a Division Chief with workload divided into two sections, namely R&D and IMDE (Industry Modernisation for Defence Export, comprising Capital Assistance and Source Establishment). This division of workload was designed to match the then existing Committee structure.

After 1977, the centralisation of departmental industrial assistance programs resulted in a more streamlined operation. According to the current DIPP directive, the responsibility for the program is vested in the Enterprise Development Branch (now the Program Branch) with no mention of the DIPP Office. (A check with the Enterprise Development Program directive notes that administrative responsibility for EDP is vested in the Program Office as opposed to the Branch). In practice, the lead role for preparation of the directive, Treasury Board Submissions, and memoranda to Cabinet remain with the Program Branch but outside of the DIPP Office; the other functions remain with the DIPP Office.

With the elimination of the two separate R&D and IMDE Committees, a new joint DIPP Committee was established in 1978, and some adjustments were made to DIPP office staffing levels. Person years were reduced from 7 PY to 6 PY (-15%); the officer/support ratio reversed to 2 officers and 4 support, and the Senior Personnel Authorities reduced from 3 to 2.

The result of these changes are perceived as follows:

- the overall coherence of industrial assistance program policy is established at the Branch level, but an unintended effect is a diffusion of responsibility from the DIPP Office itself;

- the DIPP Office, as a corollary, became an operations oriented group;

- there was a reduction in the ability of the DIPP Office to analyse the program at a time the program was being subjected to increasing external pressures.

VI - REPORTING

The directive calls for obligatory project reporting. Requirements exist for operational reporting for management purposes. Examples found included officer reports to Division Chiefs, officer program reports to DIPP Committee, and the DIPP Office Annual Report. Also, financial reporting is obligatory for financial management purposes. Examples include many Financial Service Branch computer reports and monthly forecasts prepared by DIPP Office for the DIPP Committee. We did not discern, however, an overall, coherent plan for

program reporting, and we can only ascribe this to the division of the program across so many branches of ITC. Those reports we did examine needed improvements.

In order to establish a coherent reporting mechanism, the information management requires must be reviewed. While some of the needs can be established now, some needs will be determined by the final structure of the DIP Program.

Improved reporting would benefit three levels. First, the ISBs could see what they have achieved against their sectoral objectives from an aggregation of project reports, which would assist in assigning priority to subsequent projects. Second, an aggregation of Branch reports would, at the program level, enable ITC management to assess DIPP vis-à-vis other departmental assistance programs. Program accountability across user branches would probably improve. Third, an improved knowledge of program benefits would enable the Department to argue authoritatively at the level of the Ministry of State for Economic Development for funding for its own program.

Since the directive and branch management already require reporting, and since a considerable amount of reporting is in effect at the project level, the additional work entailed is likely to be marginal.

In general, we found DIPP reporting lacks co-ordination, completeness and consistency.

COORDINATION

The existing operational and financial reporting systems are not co-ordinated, and there are information gaps.

Operational Reporting

The DIPP Office prepares annual reports for departmental management which describe the financial status of the program. The information is generally aggregated, with little analysis of the preceding year's specific activities, and no measurement of the current relationship of program benefits to program inputs. The measurement of benefits has been limited to a measure of sales; qualitative analysis of achievement of the other goals has been missing. (It should be noted that, because of the long term nature of DIPP projects, the time between dollar input and dollar payback may be as long as ten years). In addition, the DIPP Office prepares monthly reports, chiefly financial, for presentation at each DIPP Committee meeting.

Within the ISB's, officers report their regular activities, of which DIPP is but one, and such reports are made to internal management at the Division level. DIPP reporting to ISB management is generally on an exception basis, though major DIPP projects are monitored more closely. For the DIPP Office, progress reports are usually generated by DIPP directive requirements for Progress Review Groups; and end of contract Final Management Reports may be provided by the ISB officer to the DIPP Committee. In the Electrical and Electronics Branch, the present management plans to improve the input to the project data base to obtain a better grasp of the benefits of the program, with a view to optimising DIPP as an industrial development tool.

Defence Programs Branch reports on the discussions at the Canada-U.S. Defence Development Sharing Agreement meetings related to shared projects, with copies provided to the DIPP Office. The reports are limited to a description of activities and do not measure the quantitative and qualitative benefits of DIPP projects. Comparable reports of DIPP as an instrument in other Research, Development, Production (RDP) bilateral treaties do not appear to exist. Since the opening sentence of the DIPP directive reads, "The Defence Industry Productivity Program operates in support of Canadian international defence co-operative agreements for research, development and production", it is clear such reporting would be appropriate.

FINANCIAL REPORTING

There are two levels of financial reporting: the DIPP Office Financial reporting for DIPP Committee and Annual Reports, and the Financial Services Branch monthly computer reports on a variety of topics, such as status of contributions by project (expenditures, commitment, available balance), repayments to the Crown, repayment of the loan vote on Capital Assistance, etc.

Taking the second item first, there have been deficiencies of timeliness and accuracy in the FSB monthly reports: the most serious deficiency has been the report on status of contributions and commitments. Reporting delays of 2-3 months occur at the end of the fiscal year. These delays prevent the DIPP Office from ascertaining precisely the funds needed for projects carried over from one year to the next. They also impede the DIPP Committee in allotting the balance of funds against new year projects. Delays, errors, and omissions by ISB's in re-encumbering new year funds for ongoing projects immediately at the start of the new year has led to overestimating the funds available for

new project authorisations. In fiscal year 1979-80, the funds required for no less than 48 ongoing contracts were underestimated or delayed in re-encumbrance by a value of $16.5 million out of a program allotment of $46 million. This error, coupled with the delay of the 1978-79 Final Financial Status Report, put the program in jeopardy. The authorized allotment of funds was exceeded by approvals granted to new projects. The result was that new project approvals were suspended until the project backlog could be cleared.

The DIPP Secretariat prepares monthly program status reports for the Committee, based on FSB Financial Reports and in-house data. A review of these DIPP Committee financial status reports clearly indicated that, over a three-year period, the rate of applications for new DIPP projects was increasing faster than the allotment of funds to finance them. The Chairman noted these warning signals and pointed them out to the Committee, but little action was taken, and since mid-1979 no new projects have been approved. To prevent a recurrence of the problem, two actions have been taken. First, the DIPP Office began to keep manual records to verify the FSB computer reports. After several months of verification, they state that FSB expenditure data are now accurate within ½%; the accuracy for data recording the commitment of funds has yet to reach that level. Second, the ADM Finance is instituting a new DIPP financial reporting system to prevent the recurrence of overspending.

We recognise that financial reporting and monitoring and control are of fundamental importance to proper program management. Due to lack of resources, we note their impact without being able to comment on the reasons why they occurred. In setting up the new DIPP financial reporting system, we recommend that:

EXHIBIT 1 CONFIDENTIAL

A. ACCUMULATED DIPP PROJECT SALES AND CROWN EXPENDITURES 1972-3 TO 1977-8, COMPLETED PROJECTS ONLY

$ million

Year	# Projects Completed	Crown Expenditures	Reported Company Sales	Ratio of Sales to Expenditures
1972-73			3,699.0	
1973-74	344	332.2	4,386.4	13.2
1974-75	419	362.6	5,672.4	15.6
1975-76	396	363.0	5,673.0*	15.6
1976-77	423	398.0	4,620.0*	11.6
1977-78	469	442.0	5,615.0*	12.7

*Estimated accumulated sales

B. 1975 DIPP AGGREGATED SALES

	FSB Data ($ million)	ISB Data ($ million)	Variance
6 Major Companies	1,199	3,801	2,602 (x3)
25 Medium Companies	112	1,456	1,344 (x13)
58 Canada-US Joint Projects	496	938	442 (x2)

(a) increased attention be paid to re-encumbrance of funds for ongoing projects from year to year; this impinges on the Program Budgeting and Forecasting Procedures;

(b) increased attention be given to producing timely FSB Financial Reports;

(c) a review be undertaken of the computer entry and verification procedures for such reports.

The problems which give rise to these recommendations affect the approval of new projects. Scarce resources are being devoted by the DIPP Office to verifying work that should be done properly by another Branch.

COMPLETENESS

Some of the deficiencies in completeness of reporting have been indicated above. Three other areas of incomplete reporting are discussed below.

Program Benefits - Project Sales Reporting

DIPP projects' sales reporting occurred regularly for 15 years, up to March 31, 1975, when the last systematic, accumulated record of DIPP project sales was published. Since then, annual sales have been estimated. According to the DIPP Office, the sales curve has been extrapolated from previous years; the reported and estimated sales from the annual reports are given in Exhibit 1, opposite.

(Page C-21 omitted)

Instead of increasing every year, the aggregated sales figure are recorded as having stayed level for two years (inference: zero sales over 12 months), as having declined the following year; then as having begun to increase again. While we cannot explain this incongruity, we can explain the reason for the ISB's no longer collecting project product sales data.

From the start of the program, companies completing DIPP projects were requested to provide a record of annual sales for purposes of measurement of economic benefit. The DIPP Office annually requested ISB's to write to the companies for such material. Around 1976-7, the two major user branches ceased to provide such data. The Electrical and Electronics Branch was reorganised; a side effect was that the system for sales data retrieval was destroyed, and no compensating system was re-established. Transportation Industries Branch received complaints from industry that too many ITC Branches were asked for similar data, so the TIB opted to discontinue collecting such sales data. The DIPP Office protested to its management; no action was taken, and DIPP continued to disburse funds without accumulating benefits data. The DIPP Office, after 5 years of no sales data, plans to insist in the new directive that companies receiving DIPP contributions will, as part of the contract, also report sales.

Financial Services Branch - Project Excess Profits Calculations

FSB operates essentially a duplicate system to retrieve the same sales data for the same projects from the same companies. The purpose is to calculate, from the sales data reported, whether excess profits (windfall profits) accrued to the company as a result of Crown investments; if so, then repayments are due to the Crown. In theory, this system should produce results compatible with the DIPP-ISB system described. We found that it did not:

there were significant variances between the results of the two parallel systems for the same year of 1974-75.

The reasons for variance were examined. It was suggested that some of the company reported sales to ISB's for the DIPP Office may have been inflated (to get new projects), and the reported sales to FSB were deflated (to avoid paying excess profits). This suggestion could not be verified. In numerous individual projects, the figures were consistent though not necessarily equal.

The major factor appears to be the completeness of the FSB data base. We verified that the FSB retrieval system is incomplete. The FSB is not concerned with total dollar sales values and does not include them in its data base. Another variance lies in the fact that the DIPP Office system includes benefits from the Capital Assistance component of DIPP: the FSB system does not. While these factors account for a large part of the variance, significant residual variance still exists. Reasons for the residual variance include lack of completeness in ITC requesting the data, irregularity in company response, and lack of ITC follow up.

Project Status Reports, and Project Final Management Reports

Review of the DIPP minutes, revealed only 1 out of 3 R&D projects, and 1 out of 14 Capital Assistance/Source Establishment projects, is reported to the DIPP Committee for ongoing monitoring and control. The Minutes show that they are tabled and, to speed up proceedings, are often taken as read.

This lack of attention by the DIPP Committee is likely to discourage ISB's from producing reports. It is also likely to discourage ISB monitoring and control.

CONSISTENCY

Good operational reporting with performance indicators and analysis requires a complete and accurate data base. The two previous systems (the DIPP Office/ ISB system for sales reporting; and the FSB system for excess profits) do not meet this criterion. Two other systems were encountered during the evaluation, and are briefly described below.

First, Transportation Industries Branch, with the assistance of the Air Industries Association of Canada, collects import and export statistics for aerospace trade. The reason for having this system is increased timeliness over the StatsCan data. Both DIPP and non-DIPP products are included; for those DIPP products that are exported, no attempt is made to relate them to the contracts under which they were funded.

Second, Defence Programs Branch collects import and export statistics for defence trade. This system deals with DIPP and non-DIPP products, and excludes commercial DIPP sales. Again, no attempt is made to relate such sales back to the contracts under which they were funded.

These last two systems would not meet DIPP needs since they do not capture appropriate DIPP statistics. The first two systems do not meet DIPP needs because their data bases are incomplete.

EVALUATION

Although program and project reporting exists, it is neither complete nor is

it given high priority. Nevertheless, most of the base systems for reporting are, with one exception, in place; the missing system is ISB and DPB reporting at the branch level. The quality of the reporting is adversely affected by data limitations; the completeness of reporting is deficient because reports are not demanded.

Improving the coordination, completeness and consistency of reporting will assist ISB managers and the management of the program itself.

VII - PROGRAM DATA BASE FOR OPERATIONAL REPORTING

The main FSB general data base is File GC-154. It was found to be incomplete with regard to projects (only 80% of projects listed; project data missing; lack of project descriptions), and some of the data on file were inaccurate. Certain information items had never been required, and were not included: whether the project was defence, commercial, or joint project; whether the project had been completed; or whether the project was involved in time or cost overruns.

Much of the basic information needed for program management exists in this file. With some additions, it could be used to develop acceptable sets of performance indicators and could be used as an evaluation tool. Such mini-evaluations might, for example, be carried out by Corporate Analysis Branch.

Regular use of this file would tend to improve quality, as many of the deficiencies are obvious and regular users would demand improvements.

CHANGES AND ADDITIONS TO THE DATA BASE: PERFORMANCE INDICATORS

A list of recommended additions and changes is given below. Those items marked with an asterisk are additions to File GC-154.

- Company name, address, and postal code. The postal code is used to provide listings by Parliamentary constituency;

- Program description. This is frequently missing or so vague that it is difficult to discriminate between projects where companies have several projects;

- Financial Services Branch 1-000 project number. This number is used by several branches, but not all, for project identification. It is the most widely used identifier and should be common to all file systems;

- ISB identification code number, e.g., TIB, E&E, RIB;

- Project component identifier, e.g., R&D, CA, SE;

*- Projects to be identified as defence, commercial, or joint project;

- Original contract number, authorised expenditures, contract date;

- Annual contract expenditures;

*- Original project start date, project completion date;

*- Company size (small, medium, large);

*- Is company still in business (bankruptcy);

*- Annual sales for project (or employment generated).

This listing is capable of providing numerous operational indicators. They include:

- Investment/Sales Ratios by program component (R&D, SE, CA); ISB; market (defence, commercial, joint project); company size;

- Actual sales for comparing against forecast sales;

- Accumulated project sales benefits;

- Project cost and time overruns (this could assist in forecasting and budgeting);

- Project starts, completions per year (case load).

VIII - PROGRAM FORECASTING AND BUDGETING

The DIPP forecasting and budgeting system, described as satisfactory by several branches, failed under the cumulative pressure of several of independent factors. They included an upsurge of company applications, a radical

EXHIBIT 2

CONFIDENTIAL

COMPARISON OF DIPP PERFORMANCE INDICATORS, AND ANNUAL FINANCIAL STATUS FY 1976/7; 1977/8; 1978/9

PERFORMANCE INDICATOR	1976-77			1977/78			1978/79		
1. # Projects & $ Approved (million)	74		57.452	80		64.733	92		70.755
# R&D, %, (Ave. Size $ million)	23	31%	(1.8)	32	40%	(1.21)	22	24%	(1.40)
CA, %, (Ave. Size $ million)	18	24%	(0.22)	26	33%	(0.45)	49	53%	(0.43)
SE, %, (Ave. Size $ million)	33	45%	(0.35)	22	27%	(0.62)	21	23%	(0.84)
2. Carry Over from Previous FY-$million		87.546			87.598			105.834	
DIPP Committee Approvals in FY "		57.452			64.733			70.755	
DIPP Expenditures		44.900			43.209			52.200	
Carry Over to Next FY		87.598			105.834			117.543	
Wastage (cancellations, deferments) $million/%Expenditure		12.500	(28%)		3.288	(7.5%)		6.846	(13%)
3. DIPP Initial Allotment $ million Contributions, Loans		44.9			44.2			44.2	
Allotment Transfers, Additions Contributions, Loans		Nil			Nil			+12.2 (Note: Allotment cut, then increased)	
Total for FY, Allotment		44.9			44.2			52.2	
4. Shift of Program Mix from one Element to Another									
R&D $ million, % Approvals		41.746	(71%)		39.092	(60%)		31.401	(44%)
CA/SE $ million, $ Approvals		15.706	(29%)		25.641	(40%)		39.354	(56%)
		57.452			64.733			70.755	

SOURCE: DIPP Committee Meeting Minutes

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change in the mix of program components (R&D/CA/SE), the addition of unbudgeted projects at Ministers' encouragement, lack of timeliness and accuracy of financial reporting, reduced program resources, partial disappearance of traditional forecast and budget mechanisms due to branch reorganizations, and management inattention. Exhibit 2, opposite, comparison of DIPP Performance Indicators and Annual Financial Status, shows some of the effects of the above factors.

UPSURGE OF PROJECT APPLICATIONS

In 1977, both ISB's and the DIPP Office forecast a rise in project demands. The demand was predicated on visits of U.S. and German industrial teams looking for offset and product sourcing opportunities in Canadian high technology industries; the U.S. teams noted that Canadian industry, in general, was some 10 years behind in manufacturing technology and production facilities. Between 1976/7 and 1978/9, the total number of approved DIPP applications rose from 74 projects to 92 projects (+24%); funding approvals in the same period by the Committee rose from $57 million to $64 million (+12%).

CHANGE IN MIX OF PROGRAM COMPONENTS (R&D/SE/CA)

The program component most affected by the external business increase was Capital Assistance. With business obviously available, Canadian manufacturing companies rushed to install modern machinery so that they could better exploit U.S. opportunities by improving quality and price competitiveness. The number of Capital Assistance projects increased, while Source Establishment projects declined. According to the DIPP Office, this pattern is not new: when

(Page C-29 omitted)

business is strong, Capital Assistance projects increase, and Source Establishment declines; the reverse is true for a weak business cycle. Capital Assistance projects, because they require immediate financing and are not deferred payments over time like R&D, tend to reduce any "stretch" in the annual DIPP budget when they increase as rapidly as they did in this instance. In Exhibit 2, Wastage is seen to decline from 28% in 1976/7 to 13% in 1978/9. ("Wastage" is a term used by the DIPP Office to describe "de-committed" funds due to project deferrals or cancellations. Such funds are, of course, not "wasted" but re-applied against other planned projects.)

ADDITION OF UNBUDGETED PROJECTS

Between 1976 and 1979 several projects, not planned for in the DIPP Forecast and Budgeting process, were added to the program at the ministerial level. The effect of these projects was to increase the financial pressure on DIPP, which was already rising from normal business activities. Three of these projects incurred an expenditure of $13.6 million of Crown funds; a fourth project went over budget by $1.6 million on the commitment of a minister of another department of government.

LACK OF TIMELINESS AND INACCURACY OF FINANCIAL REPORTS

While this has been an ongoing problem, the crucial impact occurs at year end. The finalisation of one year's expenditures and the re-encumbrance of new year funds against the ongoing projects determine the level of funding for new year projects once the allotment is known. Delays in re-encumbrance (by the ISB's), and errors in entering data (FSB) can produce misleading figures.

In 1979/80, such delays and errors were significant and apparently contributed to an overstatement of funds available for new year projects.

REDUCED PROGRAM RESOURCES

The ISB's and the DIPP Office have been operating with reduced staff compared to a decade ago or even 5 years ago, yet projects are increasing in number and complexity. In some cases, additional functions have been assigned. In the Electrical and Electronics Branch, Avionics Division, Industrial Benefits, the work has been increased with no increase in personnel. Similar situations occur in Transportation Industries Branch. In the DIPP Office, the backlog of projects completed has increased, but no analysis of past achievement is available even at the limited analytical levels of 1975. Scarce resources are being used, for example, to verify FSB Monthly reports to save financial embarrassment.

The result is that resources which might be dedicated to management, at program and project level, are not available. The shortage reduces the Department's ability to detect and correct incipient problems.

PARTIAL DISAPPEARANCE OF ISB PROGRAM DELIVERY MECHANISM

As recently as 1973, all ISB's had dedicated program delivery divisions or directorates. In Transportation Industries Branch, an SX-1 managed a Programs Directorate: shortly after, a reorganization dismantled the directorate and the function was spread across the divisions. In Electrical and Electronics Branch, there was a strong company development directorate with dedicated

EXHIBIT 3

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COMPARISON OF DIPP FORECASTS, ALLOTMENTS, EXPENDITURES
FY 1967/68-1977/78 in $MILLION

YEAR	FORECAST	ALLOTMENT*	EXPENDITURE	VARIANCES ISB FORECAST VS EXPENDITURE		VARIANCES DIPP ALLOTMENT VS EXPENDITURE	
1967/8	53.6	37.0	33.5	20.1	+ 60%	3.5	+ 9%
1968/9	43.0	32.0	29.6	13.4	+ 45	2.4	+ 7%
1969/70	79.5	37.0	48.5	31.0	+ 63	-11.5	-31%
1970/1	91.4	42.3	45.2	46.2	+102	- 2.9	- 6%
1971/2	68.0	42.3	48.8	19.2	+ 39	- 6.5	-15%
1972/3	65.5	43.5	48.3	17.2	+ 35	- 4.8	-11%
1973/4	66.8	44.5	57.5	9.3	+ 16	-13.0	-29%
1974/5	80.5	45.5	48.4	32.1	+ 66	- 2.9	- 6%
1975/6	65.3	46.0**	39.0	26.3	+ 67	nil	nil
1976/7	67.2	44.9	44.9	22.3	+ 49	nil	nil
1977/8	59.7	44.2	43.2	16.5	+ 38	+ 1.0	+ 2%
1978/9	76.8	44.2	52.2	24.6	+ 47	- 8.0	15%

SOURCE: DIPP Office Forecasts of Expenditures FY 1977/78 and 1978/9.
*Main Estimates

NOTES: Up to 1977/8, DIPP in ISB Program Services (External) Branch.
For 1977/8 and onwards, DIPP under ADM Enterprise Development.
**Reduction from $46.0M to $39.0M by ADM Industry.

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resources for program delivery and management, including two DIPP coordinators for forecasting, budgeting and data sales collection. Again, a reorganization dismantled this system. The unintended result of these changes was that program delivery was de-emphasised, and DIPP suffered.

At the Branches, an increasing need is being felt to improve program delivery control, and a move to increase resources is in effect. Such initiatives are commended and require support.

MANAGEMENT INATTENTION

Perhaps program delivery was taken for granted as a stable departmental activity. Over the past decade, numerous departmental management changes have been made such as additions of new policy initiatives on sector profiles and strategies and the ceiling on government resource allocation. All of these have occupied management attention. At the same time, many of these same changes were gradually affecting other activities of the Department.

In the case of program delivery, there was no adjustment of the system to meet such changes. It was not until the DIPP forecasting and budgeting system broke down that renewed management attention was paid to the program delivery.

THE FORECAST AND BUDGETING SYSTEM

Forecasts, allotments, and expenditures were examined over the past 12 years and are recorded, with variances, in Exhibit 3, opposite. There are two points of interest. First, the Industry Sector Branch forecast of required funds has traditionally exceeded expenditures in amounts varying from 16% to

(Page C-33 omitted)

102%. Second, in 7 of the 12 years, the expenditures exceeded the allotment, the balance being made good by allotment transfers of supplementary estimates: only in 3 years did the allotment exceed the expenditures, while in 2 years the program was in balance.

The DIPP Office calls ISB for 5-year forecasts in the fall. The new year forecasts are provided in detail, based upon existing and planned projects. Each officer prepares a forecast based on his caseload and his portfolio of new projects. These are assembled by Branch coordinators, approved by Branch management, and were then forwarded directly to the DIPP Office. Recently, changes have occurred.

Within the E&E Branch itself, problems encountered in revising their forecast and budget led to an internal requirement to strengthen their coordination by the use of their Planning and Analysis Directorate. Within the ADM Industry and Commerce's Secretariat, a decision was made to centrally coordinate all ISB forecasts for DIPP, prior to issuing a revised forecast.

The DIPP Office, on receipt, would then make downward adjustments to these forecasts, based on experience. This involved analysis on a branch by branch basis, with ISB coordination on specific projects. The resultant DIPP Office forecast, with analysis, would then be forwarded to Programs Branch management.

We have been unable to assess the extent to which these forecasts have been taken into account by senior management at the time of the ITC resource allocation. The possibility that forecasts are ignored is raised by the frequency

with which DIPP annual expenditures have exceeded the initial allotment and the subsequent frequency of supplementary estimates and allotment transfers.

EVALUATION

From now on, ITC can expect funding ceilings for contribution programs. Changes are being made to improve the forecasting and budgeting system. Top priority must be given to this activity within both the ISB's and the DIPP Office, and their efforts must be closely co-ordinated.

IX - PROGRAM COSTS

Introduction

This section sets forth an estimate of the cost of administering DIPP. The estimate has been based on the current year's costs (79/80) because the reduction in resources which has taken place ensures that this estimate provides a conservative value.

Component Costs

Using a time budget survey, the following Person-Years were classified as being devoted to DIPP in the organization shown:

Organization	Person-Years Officer	Person-Years Support
DIPP Office	3.0	3.0
EDP Evaluation Group	3.5	1.0
DPB	2.0	1.0
MRAD	1.5	1.0
FSB	2.0	2.0
ISB	14.0	5.0
	26.0	13.0

Each officer year was valued at the average charge of $33,200, and each support-year was valued at an average charge of $13,300.

Additional charges of about 60% were then made for overhead costs in accordance with standard practice.

Finally, a charge of $1,000,000 was made for the DSS Contracting Service. The total 79/80 bill thus amounts to $2.65 million.

A factor of 0.55 was applied which represents the average constant '69 dollar cost for the program over each of its 20 years of life.

The resulting lifetime total was $29 million ('69$).

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ANNEX VII D TO THE DIPP EVALUATION STUDY

PROGRAM DELIVERY: PROGRAM WIDE ISSUES

ANNEX VII D TO THE DIPP EVALUATION STUDY:

PROGRAM WIDE ISSUES

TABLE OF CONTENTS

TABLE OF CONTENTS (cont'd.)

EXHIBITS

I - INTRODUCTION

Annex VII D deals with several topics of a general nature that cut across DIPP program delivery and management. They include:

- Differing perceptions of DIPP and how these differences affect program operations;

- Vertical ISB section strategies and how DIPP, as a horizontal program, relates to these;

- Priority setting: the reality and the potential;

- Conflicts in the system: their characteristics and ways of reducing conflict;

- Resource levels: their changes and effects;

- Incrementality: the concept and its application;

- Large vs. small Projects: their differing treatment;

- Capital Assistance loans vs. grants;

- Repayment: present practices.

II - DIFFERING PERCEPTIONS OF DIPP

The aims of DIPP and the esteem in which it is held naturally varied from one group to another. The question of esteem is interesting though not critical; however, the difference in perceived aims may be a factor in the operational effectiveness of the program.

The following paragraphs describe the perceptions of:

- Companies;
- ITC officers concerned with DIPP operations;
- ITC managers;
- Other government personnel associated with DIPP.

COMPANY VIEWS

The companies were strongly positive about DIPP. They supported its continuation. They liked the program flexibility, particularly when compared to the Enterprise Development Program, towards which there was a clear hostility and a fear that DIPP might be shifted in the same direction. They perceived the program to be successful, and they attributed the present strength of Canadian aerospace to support received in the early 1970's.

Their dissatisfaction lay with:

- Program Delivery: processing delays, paperburden, contractual rigidity, lack of ISB officer continuity on a project and the "fuzziness" of ITC monitoring and control;

- DSS Costing eligibility: the DSS rules for allowable costs and expenses. The principal complaints came from companies that have obtained more generous allowances under US government procurement regulations;

- Program Design: they recommended the inclusion of an "applied research" component similar to the now defunct Defence Industry Research Program (DIR), which was originally part of the DDP-DIPP package and which ceased in 1975.

Goals were not always clear to the companies: from their point of view, if they did certain things, money appeared. There were some strong perceptions that DIPP was intended to support a defence industry mobilization base.

VIEWS OF ITC OFFICERS CONCERNED WITH DIPP OPERATIONS

Within ITC, two groups were solicited for views: officers and division chiefs, who responded to the internal questionnaire management, and division chiefs to ADM's, who were interviewed.

The comments from the internal questionnaire respondents, some of whom were also interviewed, were almost identical to the company responses, both in

positive support and criticism. The principal differences were that their comments on DSS costing eligibility were less strong, and their views on the causes of program delivery problems were more specific. This group of responding officers had an average of eight years' continuous experience in delivering the DIP program, including the time when program delivery was a higher profile, more organized ITC activity.

With regard to DIPP goals, this internal group was very explicit. Generally, they viewed DIPP as an industrial development tool, oriented towards exports, within the advanced defence and civil related technology area. Within Defence Programs Branch, the defence base concept prevailed.

The management interview respondents generally shared strongly positive views about DIPP as a program, were more detached, and were more concerned with industrial development within the framework of sector strategies and the financial paybacks. Criticisms were expressed concerning policy co-ordination, the effectiveness of the DIPP Committee, and the matrix structure of DIPP, which was seen as a hindrance. In this group, there was generally higher turnover and shorter tenure compared with the program delivery officers, perhaps by a factor of two or three.

As to DIPP goals, this latter group was more concerned in the broad application of their own mandates and the ways in which DIPP might be tailored to support them.

EXTERNAL AND PERIPHERAL ITC PERSONNEL

External personnel, and those in ITC but peripheral to program delivery, had less positive views about DIPP. Some viewed DIPP as a good program structurally, but they did not agree with the goals (for example: "Money into DIPP is money down the drain"; "Merchants of death"). Some agreed with its goals, but felt that it did not examine the technology spectrum adequately and consistently. There was concern over the advocacy role of the ISB's, although these tended to be oblique references. This group had the least exposure to DIPP, with perhaps two or three exceptions.

DIPP goals were not always clearly understood, though DND and DSS did feel that DIPP goals and their own departmental goals were in accord. At MOSST, there was a preference for the use of funds in other activities - housing, health, energy research.

Some further comment is made on ITC officers who are directly concerned with DIPP.

On the one hand, ISB officers tend to have an industrial/technological background drawn from the industry they serve. They are familiar with the industrial environment to which their careers have been devoted. It is clear that they are highly motivated and are dedicated to maximizing the opportunities for their industry subsectors; industrial growth benefiting the nation is their aim. The DIPP system places them in the role of acting as advocates for projects and rewards them for presenting many well designed projects. They are not, however, expected to consider inter-industry priorities.

On the other hand, the administrative and advisory personnel possess a diversity of backgrounds: economists, financial managers, engineers, and scientists. There is less experience of the physical technologies in the industrial environment. The optimisation of returns on investment is of greater importance, and so are inter-industry comparisons.

Differing outlooks are not a bad thing, but, in our view, program operations may be improved by a clarification of goals and strategies.

Both sets of skills are vital to successful government/industry interaction: the overriding need in order to have successful program delivery is the effective bridging of this interface. Both groups comprise competent, honest persons. In the same way as it is necessary to bridge the government/industrial interface, it is equally necessary to bridge the internal interfaces within the department.

III - HORIZONTAL PROGRAMS AND VERTICAL SECTOR STRATEGIES

DIPP is described as a horizontal assistance program to industry; that is, it is applicable to any company in any industry sector that meets its eligibility criteria. In practice, its eligibility criteria bias the program towards the aerospace and electronic sectors.

Vertical industry sector strategies have existed for some time in ITC. However, in 1977, emphasis on vertical sector strategies was increased with the call for 23 sector profiles which could lead towards vertical sector strategies.

Understandably, in creating and implementing these strategies the management and officers use the tools at hand; DIPP is one such and, moreover, a highly flexible one. The process of adaptation causes tensions. The question arises of whether DIPP should continue to be a horizontal tool or whether it should be re-directed to support vertical strategies. This issue is of particular importance to DIPP because of its 95% orientation towards the aerospace and electronics sectors. The question is beyond our terms of reference.

What may have also added to the pressure on DIPP is that, when the Program for Advancement of Industrial Technology (PAIT) was converted into the Enterprise Development Program in 1977, many PAIT and DIPP companies became ineligible for EDP funding. Thus the pressure on DIPP increased.

A parallel development to the vertical-horizontal issue has been the recent formation of an ADM level Committee, under the guidance of the ADM TCS and International Marketing, with members from ITC, DND, DSS, and External Affairs. The aim is to improve access to defence export markets. The means may be a combination of increased DND support with relaxed External Affairs criteria for export permits. These steps are expected to lead to increased demand for new military products and increased collaboration with other nations, and DIPP is envisaged as the tool to develop them.

The resolution of the relative emphasis to be given to a horizontal program approach or to the support of a vertical sector strategy is an important issue. The detailed re-design of the delivery system will require such a resolution.

EVALUATION

At the time when DIPP is under pressure from the current level of applications, the addition of either one or both of the above orientations will place the program under increasing strain. Co-ordination and resolution of the situation will need top level management consideration, which would be aided by a general review of existing and potential policies towards departmental assistance programs.

IV - PRIORITY SETTING

DIPP has operated for 19 years on a largely non-priority basis. Now, a backlog of eligible projects has developed that exceeds available funds. Beyond this, the current climate in government is increased concern with "value for money". Both developments increase the need to set priorities.

Several people have said that priorities could not be set in the DIP program. Some felt that priorities should not even be expected. Others tried priorities at one time or another, but found that all systems had drawbacks. For example, how do we know that this project will turn out better than that project or be better than the project coming in next week? At DND Research and Development, where they can call on some 500 engineers, scientists, and technical staff, attaching priorities to R&D projects was attempted to ensure that DND needs were met and that technology gaps were covered. It was found to be difficult, and it was found that initial priorities were not always confirmed in project execution. Further, external factors could alter priorities during the time it took to execute a chosen project.

Priorities could be set for DIPP. Annex VII E, section VII describes a project scoring system and a means to handle the "first in, first out" problem. The project scoring system is designed to have the flexibility to handle objectively and subjectively assessed project characteristics as well as broader departmental strategy concerns. It would, of course, require good quality input information, part of which would come from the Advisors' inputs, described elsewhere.

V - CONFLICTS IN THE SYSTEM

INTRODUCTION

One DIPP participant described the DIPP system as a great system when everyone agrees but a poor system for resolving even "normal" conflict. We partly agree. Management must certainly pay attention to conflict, since it can lead to delay, duplication, inefficiency, and even the subversion of program goals. Also, when people describe the system, it is the conflicts they remember, even though real conflicts may be few in number.

Despite the conflicts which were often referred to in discussion, there is considerable mutual respect among the various branches, and on the part of the branches for the DIP program.

At the same time, it is noted that senior departmental management deliberately adopted a matrix system for DIPP delivery. Along with its virtues, a matrix system inevitably creates opportunities for friction. These must be noted, since proposed solutions will affect relationships within the DIPP system.

FIRST LEVEL CONFLICTS

The first set of conflicts can emerge at the project submission preparation stage over facts and interpretations.

In preparing project submissions, ISB officers must obtain advisory responses from the Marketing, Financial and Machinery Advisors. Conflict can arise over the amount of financial data required, or over the interpretation of future projections (always open to question) and strategies, or over the eligibility of equipment. While serious attempts are made to resolve problems at this stage, it is not always possible to do so, and the Advisor can come back at the DIPP Committee stage to veto the project.

Part of this conflict arises from the expected advocacy role the system places on the ISB officer: once decisions are made to proceed, a momentum may build up. This can provoke the Advisors to assert themselves as a countervailing force if they believe that insufficient heed is paid to their inputs. Several people have suggested a realignment of the division of responsibility; the most commonly proposed solution was that all advisors should report to the same ADM. Conflicts could then be resolved before the proposal reached the DIPP Committee.

There is also a perceived conflict forced on the ISB officer. The ISB officer will inevitably be involved in the "acceptance" of a project; he must then fulfill the difficult role of project monitoring and control: the payment of claims and progress reporting. This has been interpreted as conflict of interest for the ISB officer. We see no better way of executing these

functions, subject again to checks and balances system (which may lead to additional conflict). Nevertheless, the professional responsibility of the ISB officer should be emphasized. He must ensure that "value for money" is being received, and that responsibility makes monitoring and control imperative.

CONFLICT AT DIPP COMMITTEE

Historically, there appear to have been few conflicts at the DIPP Committee, mainly because contentious issues have been resolved earlier. kWhen conflicts have occurred, the proposed projects have been held in abeyance pending adjustments. On the one hand, such decisions have led to ISB criticism of the Advisor having a veto; on the other hand, the Advisors claim that the system ensures that the ISB officer uses the advisor properly.

There are bound to be occasions when projects must be questioned for reasons of policy, goals, eligibility, or on technical, financial, or marketing grounds. The DIPP Committee was intended to be the focus for resolving conflicts on these projects. Our strong impression is that this role has been minimized. The Committee, in the eyes of its members, only recommends projects for approval, with formal approval resting with the Deputy Minister or with Treasury Board. But, as we have described earlier, no projects are known to have been turned down by the formal "approvers", the Deputy Minister or Treasury Board.

There is an implication that the DIPP Committee avoids conflict, that it has lost some of its capacity to resolve real and crucial conflicts.

LATER CONFLICTS

There was little information on post DIPP Committee conflict and very little relating to the roles of the Deputy Minister or Treasury Board. Conflict was noted at the ITC/DSS and ITC/company interface. The DSS situation has already been described.

ITC/company conflicts have arisen in various ways. One example is the company complaints concerning ITC demands for statistics relating to DIPP. The ITC resolution of this conflict - ceasing to demand statistics - led to the drop in the quality of program benefits measurement. In our opinion, companies are just as accountable to ITC and the Crown for use of public funds as ITC is to central agencies and Parliament.

EVALUATION

In summary, the DIPP program delivery system contains conflict points in its basic design. They were placed there deliberately to improve decision making and to protect the use of public funds. However, their existence can cause delays and some rivalries. Responsibility for resolving conflicts apparently has been given to the Committee, but it has tended to deal with only some and has avoided certain key issues, e.g., program priorities. The Committee members have downplayed the importance of the Committee; its the original function has not been picked up elsewhere in the system. The outcome is an operational weakening of the overall delivery system.

EXHIBIT 1 CONFIDENTIAL

A. DISTRIBUTION OF DIPP PERSON YEAR RESOURCES IN ITC (1978/9)

Branch	Person Years	Cost $000
DIP Program Office	6	232
Industry Sector Branches	19	824
Defence Program Branch	3	127
Market Research Analysis Division	2.5	102
Corporate Analysis Branch (DIPP Division)	4.5	202
Financial Services Branch	4.0	154
	39.0	1,661

B. VARIATION OF DIPP OFFICE PERSON YEARS

Year	Support	Officer	Total
1965	2	4	6
1975	3	4	7
1979	4	2	6

C. CHANGES IN ISB RESOURCE ALLOCATIONS IN PERSON YEARS, 1976-1978

ISB Activity	1976		1977		1978		Change	
	PY	(%)	PY	(%)	PY	(%)	PY	(%)
Program Delivery	119	(21)	106	(19)	87	(16)	-32	(-27)
Policy and Analysis	91	(16)	100	(18)	145	(27)	+54	(+60)
International Service	82	(14)	89	(16)	75	(14)	- 7	(- 9)
Service	154	(27)	149	(26)	133	(24)	-21	(-14)
Sector Specific Programs	59	(10)	60	(10)	50	(9)	- 9	(-15)
Management	73	(12)	62	(11)	53	(10)	-20	(-27)
TOTAL	578	(100)	566	(100)	543	(100)	-35	(- 6)

VI - RESOURCES

Because DIPP is centralized, resources are located principally in ITC headquarters, with additional services provided by DSS. Resources are currently distributed as shown in Exhibit 1A, opposite.

The DSS resources cost an additional $1,000,000 per year. No person year estimate has been provided by DSS, but it might be around 10 person years, based on an estimate for a DSS cell in ITC of 8 person years plus other DSS services at an extra 2 PY.

VARIATION OF DIPP OFFICE RESOURCES OVER TIME

It will be noted from Exhibit 1B that person years have not increased over the last 15 years, although workload has increased in complexity, and projects in progress have increased substantially. At the same time, the ratio of officers to support has reversed. Further, the number of Senior Personnel Authority positions (i.e., CO-4, CO-3) has also been reduced. The DIPP Office has complained that its capacity to analyze the program has diminished.

Further, some DIPP Office related activities have been transferred from the Office to other areas of responsibility within the Programs Branch. Examples include the writing of the proposed 1979 Revised Directive (by the Division Chief, Enterprise Development Innovation), and Memoranda to Cabinet (first by the Economic Analysis Group, now by the Financial Policy and Liaison Branch).

The quality of resources available to the DIPP Office was reduced at the very time the program was coming under increasing pressure. The accountability of

the DIPP Office has been diminished by the transfer of functions of major to the importance program elsewhere.

VARIATION OF ISB RESOURCES OVER TIME

The history of ISB resources devoted to DIPP is not so extensively documented. What is clear is that program resources have declined overall by 25%. Using data from the 1978 ISB Survey, ISB resources were distributed as shown in Exhibit 1C.

Aggregated ISB Program Delivery resources declined by 32 person years (27%) in just 3 years. As an overall proportion of ISB resources, Program Delivery fell from 21% (1976) to 16% (1978). At the same time, there was a major shift of resources to Policy & Analysis.

Of the 1978 Program Delivery resources, DIPP accounted for 19 out of the 87 person years, or 21%. This is equivalent to 3.5% of total ISB resources (19 out of 543).

Reviews of 1979/80 departmental Work Programs for the Industry Sector Branches confirmed the pressures for change from Program Delivery to Policy and Analysis.

Examination of the 1979/80 departmental Work Programs confirmed that both Transportation Industries Branch and Electrical and Electronics Branch were consciously building up policy staff. TIB noted that reassignments to policy task forces "created..bottlenecks in the processing of applications" and that recruiting policy would shift from persons with industry program backgrounds

to those with policy backgrounds. E&E Branch oriented its Work Program summary almost exclusively to policy; in 8 pages, DIPP rated barely one line. Extra resources were to be dedicated to policy, not programs. In the Avionics Division of E&E, resources fell 25%, and extra functions were assigned. The collapse of the E&E Branch ISA system with its two DIPP Coordinators has been discussed elsewhere.

Reasons for Decline

Why were program delivery resources reduced so drastically and so quickly? As far as we can determine from the evidence, the reduction was related to two principal events: first, the transfer of program control from the ISB's to the ADM Finance; second, the ITC decision to establish task forces for sector profile strategy work. In the first instance, about 10 ISB program delivery person years were moved as program workload was transferred. In the second instance, we believe that there was no countervailing pressure, such as accountability, to protect the low profile program delivery resources from being transferred to work on the higher-profile sector strategies.

Allocation

Of those 19 ISB person years that are devoted to DIPP, the ISB's clearly give precedence to the approval of company applications, which is immediate rather than to monitoring and control, which are deferable. There are few demands by departmental management for reporting of ongoing projects, and those few are made principally at the ISB Division Chief level. Large projects receive more attention, and problems are reported upwards. The Advisory Technology Groups' requirement for regular DIPP project reporting disappeared with their collapse, and minimal attention is given to monitoring and control by the DIPP Committee. Thus, reduced attention by management to monitoring and control

overall has probably contributed to the emphasis on approval of company applications.

Joint Projects

There is also some reluctance to undertake joint projects with the US; it has nothing to do with the quality of project but with the extra demand that these projects place on scarce ISB resources. According to the internal questionnaire, ISB respondents estimate that joint projects require 240% of the resources required by a standard DIPP project. Joint projects, by their nature, increase workload, the obvious increase being the additional co-ordination required. In one project relating to the Canadair drones, the UK asked for a 25% contingency to cover extra cost of joint projects. If this amount is realistic, then perhaps of the extra 140% estimated, 60% may be due to the added dimensions of co-ordination, and 80% due to the need for the closer monitoring, control, which joint projects demand.

Defence Programs Branch

DPB person years declined 30% between 1973/4 and 1978/9. The decline appeared to be more than 50% - from a high of 82 (1973) to a low of 39 (1978/9) - but part of this apparent decline represented the conversion of 25 officers and positions to the Trade Commissioner Service in 1975.

Nevertheless, the 30% decline represents significant pressure on the Branch in the execution of its normal activities, including provision of the DIPP Market Advisory Service. Also, the conversion of 25 defence specialist positions to generalist TCS positions reduced the depth of defence industry skills available to the Branch.

MARKET RESEARCH & ANALYSIS DIVISION (MRAD)

Person years in this division have remained constant at 10 between 1973 and 1978. Only half of this division's activities (5 PY) actually relates to DIPP R&D market analysis and related work; the other half (5 PY) relates to maintenance of Defence Import-Export Trade Statistics for the Defence Programs Branch. Skills available in the market analysis function, however, have gradually declined since the mid-1970's through turnover.

The general decline in MRAD capability to service the DIPP industrial market analysis function is the reverse of what we believe should be happening.

A fuller discussion, with a recommendation for relocating this function, appears in Annex VII B, section II, sub-section entitled Structure of the Market Advisor Service.

FINANCIAL SERVICES BRANCH & CORPORATE ANALYSIS BRANCH

Up to the 1977 ITC reorganization, Financial Services Branch executed both the financial advisory and the analysis function, along with other duties. In 1977, the DIPP/PAIT financial advisors were transferred to the newly formed Enterprise Development and subsequently became a strengthened financial analysis function called the Corporate Analysis Branch. In 1980, the two areas were merged under the ADM Finance.

There has not been a significant change in resource allocation dedicated to DIPP. The general level of Financial Analysis is stated to have improved with the transfer of this function to a specialist group.

EVALUATION

There is overwhelming evidence that, during the 1970's, the Department dedicated fewer and fewer resources to Program Delivery. The principal decline occurred among the Operational User groups. At the same time, workload increased, and the external environment changed.

The reduction in resources has apparently led to emphasis on getting projects approved rather than on monitoring, control, and evaluation. We believe that project execution and its subsequent evaluation is as important as project approval.

While efficiencies can be introduced to the total Project Delivery System, and have been recommended in Annex VII E, increased monitoring and control will require extra resources in terms of person years and travel budget. The necessary increase in person year resources, to meet even current directive requirements for monitoring and control, cannot be precisely estimated - but our rough estimate is that the proposed system would require an additional $1 million/year in the Administrative Budget.

A review of extra resource needs, based on the final DIPP delivery system selected by management, should be undertaken. Such a review should consider the person years, travel budget, and skills (training) based on normal DIPP project workload. Special projects, large projects, and other non-standard requirements would increase the resources required.

VII - PROJECT INCREMENTALITY

Incrementality, defined as the measure of whether a project would have gone ahead without DIPP assistance, is discussed elsewhere in the DIPP Evaluation Study. There are certain aspects, however, which are relevant to program delivery.

First, if non-incremental projects are eliminated, resources to fund other projects deemed incremental will become available.

Second, the evidence from the Program Delivery module shows that some non-incremental projects have been supported, from a minimum of 5% (measured in project file reviews) to a maximum of 20% (internal questionnaire). The project files, however, tend to be neutral with respect to incrementality because incrementality was never a criterion for DIPP. The 5% lower limit represents those projects which would probably have gone ahead without DIPP funding, based on the file evidence. The internal questionnaire respondents, principally an expert opinion poll of ISBs, provided an estimate of the upper limit. The User Survey, an expert opinion poll of companies, gave an intermediate figure of 9%.

Third, it is clear from the DIPP evaluation that there will be a pressure to create an incrementality criterion. The pressure will arise from the shortage of funds and the consequent need to assign priorities. Such a criterion would be supported by improved and more rigorous preliminary analysis.

Fourth, there is a danger that in the search for incremental projects, a formal, written criterion might be developed that is difficult to apply, leading people to try to beat the system. Further, such a criterion would introduce a bias in project selection.

Certainly, ITC's incremental approach to R&D projects appears to differ from the practice of other countries. In the U.S. Department of Defense, closing gaps in defence technology is the objective, and the most efficient means is selected. In Japan, an industrial strategy such as equalling or surpassing the U.S. in microelectronics or computers is selected, and again the most efficient means is employed, even if it entails giving hundreds of millions of dollars to their industrial heavyweights.

VIII - LARGE VS SMALL PROJECTS IN DIPP

A large project is defined as one that exceeds the delegated authority to ITC in terms of dollar amount. While this is currently $2 million, we specifically refer to the $5 million now under discussion as a replacement limit.

Over DIPP's first 20 years and 1000 projects, some 25 projects or core technologies exceeded this limit of $5 million: of these, 10 major projects - 1% - were of the order of $25-100 million. By projects and core technologies we mean projects that in themselves exceeded the $5 million limit, or the aggregation of phased projects for an end product, or the development of a technology which by its repackaging, or product cycle, incurred aggregated Crown investments of this amount. Such projects, while few in number, account for the bulk of DIPP expenditures. The major projects which comprised this 1% account for some $350 million or 50% of expenditures.

The DIPP directive and the DIPP delivery system are oriented to processing normal size projects. When the few large projects have arisen, their size has been such that they have been treated as matters of national concern, resulting in presentation to the ITC Management Committee, Treasury Board, and eventually to Cabinet. From the DIPP evaluation, there appears to be a trend towards more, and potentially larger, projects in aerospace. Other large projects, non-DIPP, have also appeared before the Department over the past two years. Should this trend continue, the Department may wish to develop a general approach and methodology for handling such projects which are not limited to DIPP. Such a concept was first mooted in the Sharwood Report, five years ago.

These large projects create special resource demands. The de Havilland DASH-7 had its own project office within the Transportation Industries Branch. The CL-89/289 is contracted to DSS for Project Management at a total cost around $5 million. The market assessment for the DASH-7 was undertaken by a special team with ITC and with external assistance from consultants. Other special arrangements have been made, such as special meetings of the DIPP Committee to consider a single item, for example, the Augmentor Wing aircraft. In each case, review, assessment, decision, funding, project management, and evaluation have been undertaken, but procedures have differed. Without establishing restrictive procedures, the senior DIPP Committee might establish guidelines for general program management which would include the following:

- consideration of the relationship of large projects to normal-sized DIPP projects and to the standard DIPP allotments. Should large DIPP projects be included in the DIPP envelope or be separately funded? To define the

size of a very large project for full processing, should all projects over $10 million, or over $25 million be considered very large?

- development of procedures to handle large projects in ITC; the appointment of a responsible "Project Team" manager; the authorisation to negotiate; and selection of appropriate skills. Procedures would be based on the size, complexity, and international impact of the project. (Even today, for example, potential U.S. joint projects are submitted to the DIPP Committee for approval to negotiate);

- development of requirements for the management of the project negotiation; policy and business criteria (financial, technical, marketing); finally the contract and project management process;

- development of decision, accountability, and reporting mechanisms;

- establishment of project termination criteria.

These matters are fundamental to any project, but in large projects other factors, such as political processes, interdepartmental collaboration, national interest, project complexity, and levels of departmental resources and skills (and their limitations), assume increasing importance. Since projects will vary from sector to sector, flexibility is needed, but there must be sufficient control for senior DIPP Committee officers to participate without being overburdened. Such an approach is intended to assist participant branches carry out their duties and help them protect the public purse. Options would be determined by ITC prior to presentation to the Minister for a decision.

Special reviews for very large projects may be organized as follows:

- the appointment of the responsible ITC Project Team manager by the DIPP Program Committee; terms of reference provided; assembly of a suitable team; designation of reporting lines and accountability;

- the project, depending on its size, may be directly handled by the team, or if extremely large, recommendations may be made by the team as to its handling;

- the preliminary findings are reviewed by the ISB's and Advisors prior to submission to the Senior DIPP Committee;

- the DIPP Program Committee establishes priority and decides on further processing;

- the project, if accepted by the DIPP Program Committee, is then returned with guidelines for a Cabinet or Treasury Board Submission. Prior to forwarding to the Minister or Treasury Board, the Management Program Committee would review the submission and approve it.

The intent is to ensure the participation of senior ITC management, to ensure control, to minimize the burden on senior officials, and to specify delegation of authority and accountability.

Normal sized DIPP projects will continue to be approved under the delegated authority to ITC. Procedures would automatically be simplified if these

projects were approved by the DIPP Project Committee since 95% of DIPP transactions are anticipated to be "normal", i.e., less than the $5 million delegated authority.

In the past, large DIPP projects have not been separately reported on to management. Since the few large projects account for such a large proportion of expenditures, they tend to distort the overall picture of investments. Analysis of DIPP with the distortions minimised may provide fresh insights and lead to an appropriate balance between the choice of a few large projects, or of many small projects, or of a balance between them, for the same amount of funds.

Generally, larger companies are more efficient in converting Crown assistance dollars into sales, certainly in the innovation programs of DIPP and PAIT. Large companies can organise and marshal the financial, technical, and marketing resources to attempt large and costly projects. Such projects may in themselves be large (aircraft), or complex (aircraft engines). In either case, a broad sustaining industrial base is required to support the projects, but a problem arises in that where the product itself is large and expensive (aircraft), the production volume is low. Thus, the broad, sustaining industrial base needed requires other markets to maintain volume to remain competitive. Overall, small companies grow with success into large companies. Although large projects may be more appealing, attention should always be paid to smaller companies and lesser projects so that an industrial balance is maintained.

IX - DOUBLE FUNDING OF PROJECTS

Early in the evaluation, management expressed concern over the possibility of Canadian double funding in DIPP projects, principally through the "addition" of offset funds to Capital Assistance projects. We examined this topic during the file reviews and in our analysis of the User Survey results. Our findings were as follows:

- The files showed no evidence of double funding by the Crown. In one aerospace project, the topic was addressed, and a ruling was given that ITC would not support double funding. The specific project did not materialize, and we were unable to determine the outcome;

- In the User Survey, 18% of respondent companies had received DIPP funds and had also participated in offset contracts. In one case, the respondent clearly stated that it was the capability generated by an earlier DIPP project that had enabled it to subsequently participate in offsets. We would not regard such a case as evidence of Crown double funding;

- In the material reviewed, we did not find any management guidelines on the topic. In the one case that did arise, the officer responsible raised it with his superiors.

X - CAPITAL ASSISTANCE LOAN VOTE

Capital Assistance within DIPP has two components: the 50% non-repayable contribution and the 50% repayable loan. At issue is the elimination or curtailment of the loan vote, which has been recommended by Treasury Board.

The Treasury Board position is based on the view that in comparison with R&D funding, the Crown's contribution in Capital Assistance projects is too high. Capital Assistance is devoted to low-risk business opportunities, yet it has a 50% contribution, plus a 50% interest-free loan, which, at today's interest rates, yields an effective contribution of closer to 65%. R&D is allegedly high risk, yet it gets only 50%.

The DIPP Office position is that Capital Assistance funding requires a matching investment equal to the contribution plus the loan, thus reducing the relative size of the Crown contribution to less than that for R&D.

The DIPP Office reviewed options for the Loan Vote. They recommended that the loan vote might be collapsed provided that equivalent funds were added to the Contribution vote. DIPP would then fund companies to purchase equipment with a 100% contribution, of which 50% would be repayable at no interest, with the matching investment criteria still in effect. Treasury Board Secretariat resisted the idea of transferring the full loan vote to the contribution vote, but might consider a portion transferred equal to the loan interest.

From a program operational viewpoint, there is a distinct advantage to a single contribution vote. The annual volume of Capital Assistance and Source Establishment funding can vary widely, based on the external business cycle. A single vote could meet these swings more easily.

As to the relative "generosity" of the Capital Assistance component vis-à-vis R&D, we identified the following general factors:

(a) the majority of Capital Assistance projects are undertaken by small businesses. The average contract dollar value may be distorted by some of the infrequent user companies which are larger. However, in some instances these larger companies must meet more stringent conditions; for example, McDonnell Douglas must pay back 100% of the Crown investment on a current major project;

(b) the requirement of a matching investment reduces the relative generosity;

(c) risk is still inherent in both large (the Canadair "Mercure" contract) and small (the Garrett "Chaparral" contract) Capital Assistance projects. Although a contract may exist, marketing and technological risks are still incurred because the needs of the end user may change.

EVALUATION

We have made proposals in the Covering Report regarding the future structure of program funding. These proposals centre on the use of repayable grants and loans. If these proposals are not accepted, we would support a full conversion of the loan Vote to the contribution vote, subject to improved departmental analysis and evaluation of DIPP components on an on-going basis. A suitable ratio of non-repayable and repayable contribution could be developed to meet future requirements if this course is followed. This could be 50:50 as before, or 40:60, with perhaps special arrangements for large projects.

XI - EXCESS PROFITS REPAYMENTS TO THE CROWN

There is a clause in DIPP R&D and Source Establishment contracts calling for repayments of excess profits to the Crown. There are two main categories: first, repayments of excess profits obtained from projects in which the Crown investment exceeds 50%; second, on regular projects where post-tax profit levels exceed "fair and reasonable" levels. (This amount has never been a fixed percentage in practice but has generally been related to the net cost of money). The first is a recoupment of Crown funds to meet the 50% funding level; the second category is to protect the government from the embarrassment of "windfall profits". No other ITC program (PAIT, EDP) requires excess profits repayments. No case of windfall profits has yet been detected in the 1000 projects funded by DIPP.

To date, repayments total $13 million against completed project expenditures of $444 million over 20 years. Some 355 project files are currently open in Financial Services Branch. Projects which have failed or terminated are closed; projects such as Pratt and Whitney's original PT-6 project of 1961 are still open.

The Financial Services Branch sends out letters every year requesting companies to give the past year's sales for products under specific contracts. The data received is passed to the FSB Project Audit Division, which calculates the profit levels and the amount, if any, to be collected. Invoices are then sent to the companies.

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There appeared to be a number of gaps in this system. Some companies reported regularly, some intermittently, and some not at all. There was no evidence of real follow-through on delinquent companies. This retrieval system, it will be remembered, is a duplication of the earlier ISB sales retrieval system.

Two exceptions exist to the Excess Profits rule. First, some projects have repayment clauses based on a fixed levy per unit sold; an example is the de Havilland Buffalo aircraft. In these cases, dollar sales volumes are large, but such information is neither collected nor recorded. What is checked is the number of units (aircraft) sold and the number of royalty cheques received. Second, some companies elect the contract waiver option; that is, excess profits are plowed back into further R&D. This is called the Reinvestment Option. We have no data on the level of such activity because it is not collected.

Two companies, de Havilland and Pratt and Whitney, account for 80% ($10.6 million out of $13 million) of all repayments. Based on estimates of Pratt and Whitney's future sales, $30-35 million may eventually be recovered; further repayments are also expected from de Havilland.

Conflicts arise in Canada/U.S. joint projects because the U.S. Department of Defense regulations permit profits to accrue to the company, and DOD does not require repayment of contributions for R&D.

A second problem exists with the completeness of the FSB data base. FSB data have been compared elsewhere with the sales data retrieved by the ISBs; all we need say here is that very large variances have been noted for essentially the same data, and not all of the variances can be accounted for. However, the accumulation of conflicting data for the same project base requires corrective action.

Advantages

- Reduction of program cost to the Crown;

- Political, in that companies who do well are perceived to repay the Crown; avoidance of countervail; avoidance of possible embarrassment of windfall profits.

Disadvantages

- Increases program complexity and absorbs scarce resources (estimated 1 person-year);

- Conflict, in U.S., German, and UK Joint Projects, with the practice of these other countries;

- Company dissatisfaction, through inconsistency with other ITC programs and other country practice.

Options

- Eliminate repayments totally;

- Increase level of recovery;

- Simplify the existing system to a simple royalty mechanism. This could be based on units of production, for large items such as simulators, aircraft, engines etc.

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ANNEX VII E TO THE DIPP EVALUATION STUDY

PROGRAM DELIVERY: REMEDIAL ACTION

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ANNEX VII E TO THE DIPP EVALUATION STUDY:

REMEDIAL ACTION

TABLE OF CONTENTS

EXHIBITS

I - INTRODUCTION

The strengths and weaknesses of the existing DIPP delivery system were noted during the course of the evaluation. The significance of the delivery system can be gauged by the fact that Grants, Loans, and Contributions represent 65% of the ITC Parliamentary Vote, but all the activities funded by Grants, Loans, and Contributions (DIPP is one of these activities) are delivered by only 20% of ITC person-year resources. By their very nature, these projects require complex skills and sensitivities.

Annex VII E outlines a proposed delivery system which incorporates existing strengths and seeks to overcome existing weaknesses. Three guiding principles have been kept in mind: first, to keep the system simple while improving its quality; second, to accommodate the realities of the existing ITC organisational structure; third, to incorporate a self-monitoring function which will improve management's capability for analysis and, if necessary, enable them to make changes.

We cannot overemphasize the need for simplicity in Program design and Program Delivery design. ITC has 20 years' experience over a dozen industry assistance programs, and simple design coupled with good management practice can yield effective results at acceptable cost. Where special complexities, or "tilts", have been built into program design, not only do they affect program delivery directly and add to resource needs, but they also may introduce unintended side-effects which distort the goals of the program and

create significant downstream workloads. PAIT I is an example. Therefore, in any program delivery design when special hurdles, complexities, or orientations are suggested, great attention must be paid to intended and possible unintended effects.

Major objectives of the modified system design are to:

- Permit selection of, and ensure delivery of, more effective projects;

- Reduce delivery time;

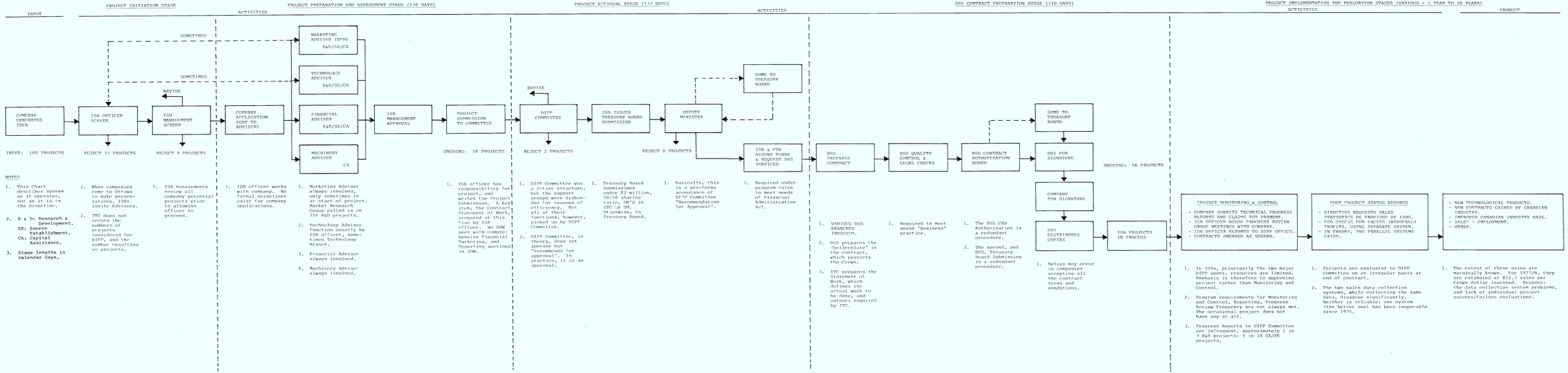
- Clarify accountability, responsibility, and authority;

- Improve project and program monitoring and control.

The strengthening of the system is aimed at eliminating the shortfall between directive requirements and current practice rather than increasing the system requirements. The proposed system, therefore, is similar to the present system. The current and proposed DIPP delivery systems are graphically represented in Exhibits 1 and 2, opposite.

The project delivery system is described first, following the course of a project moving through from system start to finish. The more general functions of program management are then described.

CURRENT DIPP DELIVERY SYSTEM



NOTES

1. This Chart describes system as it operates, not as it is in the directive.
2. R & D: Research & Development.
   SE: Source Establishment.
   CA: Capital Assistance.
3. Stage lengths in calendar days.

1. When companies come to Ottawa to make presentations, ISBs invite Advisers.
2. ITC does not record the numbers of projects considered for DIPP, and the number resulting as projects.

1. ISB managements review all company potential projects prior to allowing officer to proceed.

1. ISB officer works with company. No formal guidelines exist for company applications.

1. Marketing Adviser always involved, only sometimes in at start of project. Market Research Group called in on 75% R&D projects.
2. Technology Adviser function usually by ISB officer, sometimes Technology Branch.
3. Financial Adviser always involved.
4. Machinery Adviser always involved.

1. ISB officer has responsibility for project, and writes the Project Submission. A key item, the Contract Statement of Work, prepared at this time by ISB officer. NO SOW seen with comprehensive Financial Marketing, and Scoring sections in SOW.

1. DIPP Committee was a 2-tier structure, but the support groups were disbanded for reasons of efficiency. Not all of their functions, however, picked up by DIPP Committee.
2. DIPP Committee, in theory, does not approve but "recommends for approval". In practice, it is an approval.

1. Treasury Board Submissions under $2 million, 50:50 sharing ratio, OK'd in ITC by DM. Otherwise, to Treasury Board.

1. Basically, this is a pro-forma acceptance of DIPP Committee "Recommendation for Approval".

1. Required under program rules to meet needs of Financial Administrative Act.

1. VARIOUS DSS BRANCHES INVOLVED.
2. DSS prepares the "boilerplate" in the contract, which protects the Crown.
3. ITC prepares the Statement of Work, which defines the actual work to be done, and outputs required by ITC.

1. Required to meet sound "business" practice.

1. The DSS CAB Authorisation is a redundant procedure.
2. The second, and DSS, Treasury Board Submission is a redundant procedure.

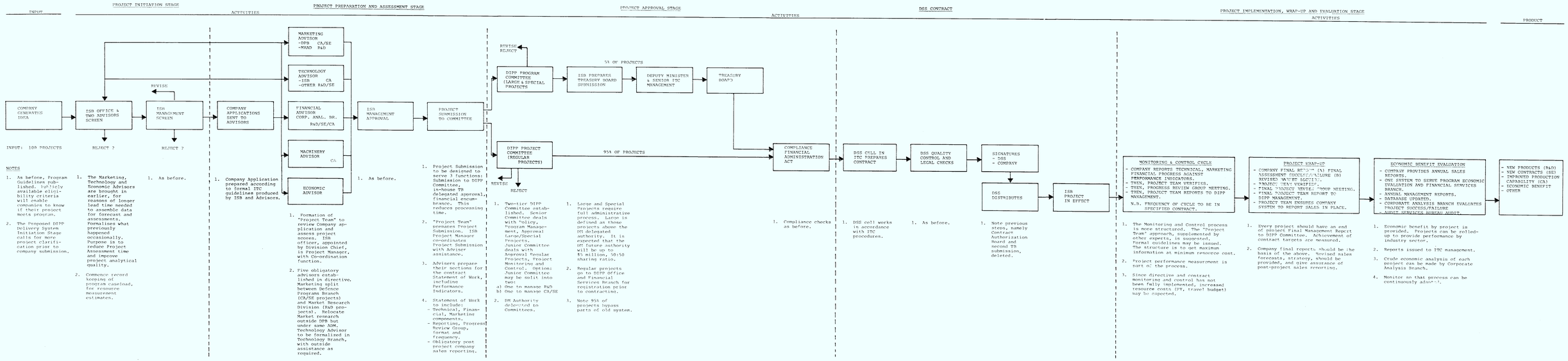
1. Delays may occur in companies accepting all the contract terms and conditions.

1. In ISBs, principally the two major DIPP users, resources are limited. Emphasis is therefore to approving project rather than Monitoring and Control.
2. Program requirements for Monitoring and Control, Reporting, Progress Review Frequency are not always met. The occasional project does not have any at all.
3. Progress Reports to DIPP Committee are infrequent, approximately 1 in 3 R&D projects; 1 in 14 CA/SE projects.

1. Projects are evaluated to DIPP Committee on an irregular basis at end of contract.
2. The two sales data collection systems, while collecting the same data, disagree significantly. Neither is reliable; one system (the better one) has been inoperable since 1975.

1. The extent of these gains are marginally known. For 1977/8, they are estimated at $12.7 sales per Crown dollar invested. Reasons: the data collection system problems, and lack of individual project success/failure evaluations.

PROPOSED DIPP DELIVERY SYSTEM



NOTES

1. As before, Program Guidelines published. Publicly available eligibility criteria will enable companies to know if their project meets program.

2. The Proposed DIPP Delivery System Initiation Stage calls for more project clarification prior to company submission.

1. The Marketing, Technology and Economic Advisors are brought in earlier, for reasons of longer lead time needed to assemble data for forecast and assessments. Formalises what previously happened occasionally. Purpose is to reduce Project Assessment time and improve project analytical quality.

2. Commence record keeping of program caseload, for resource measurement estimates.

1. As before.

1. Company Application prepared according to formal ITC guidelines produced by ISB and Advisors.

1. Formation of "Project Team" to review Company application and assess project scores. ISB officer, appointed by Division Chief, is Project Manager, with Co-ordination function.

2. Five obligatory advisors established in directive. Marketing split between Defence Programs Branch (CA/SE projects) and Market Research Division (R&D projects). Relocate Market research outside DPB but under same ADM. Technology Advisor to be formalized in Technology Branch, with outside assistance as required.

1. As before.

1. Project Submission to be designed to serve 3 functions: Submission to DIPP Committee, in-house TB delegated approval; financial encumbrance. This reduces processing time.

2. "Project Team" prepares Project Submission. ISB Project Manager co-ordinates Project Submission with Advisor assistance.

3. Advisers prepare their sections for the contract Statement of Work, including Performance Indicators.

4. Statement of Work to include:
- Technical, Financial, Marketing components.
- Reporting, Progress Review Group, format and frequency.
- Obligatory post project company sales reporting.

1. Two-tier DIPP Committee established. Senior Committee deals with "policy, Program Management, Approval Large/Special Projects. Junior Committee deals with Approval Regular Projects, Project Monitoring and Control. Options: Junior Committee may be split into two:
a) One to manage R&D
b) One to manage CA/SE

2. DM Authority delegated to Committees.

1. Large and Special Projects require full administrative process. Large is defined as those projects above the DM delegated authority. It is expected that the DM future authority will be up to $5 million, 50/50 sharing ratio.

2. Regular projects go to DIPP Office and Financial Services Branch for registration prior to contracting.

1. Note 95% of projects bypass parts of old system.

1. Compliance checks as before.

1. DSS cell works in accordance with ITC procedures.

1. As before.

1. Note previous steps, namely Contract Authorization Board and second TB submission, deleted.

1. The Monitoring and Control process is more structured. The "Project Team" approach, supplemented by other experts, is suggested. Formal guidelines may be issued. The structure is to get maximum information at minimum resource cost.

2. Project performance measurement is part of the process.

3. Since directive and contract monitoring and control has not been fully implemented, increased resource costs (PY, travel budget) may be expected.

1. Every project should have an end of project Final Management Report to DIPP Committee. Achievement of contract targets are measured.

2. Company final reports should be the basis of the above. Revised sales forecasts, strategy, should be provided, and give assurance of post-project sales reporting.

1. Economic benefit by project is provided. Projects can be rolled-up to provide performance by industry sector.

2. Reports issued to ITC management.

3. Crude economic analysis of each project can be made by Corporate Analysis Branch.

4. Monitor so that process can be continuously improved.

(Pages E-3 and E-4 omitted)

II - ASSUMPTIONS

The proposed system is based on both government-wide, ITC, and DIPP-specific matters:

(a) DIPP will remain in operation as an innovation assistance program. The system can accommodate a shift of emphasis in goals, as long as the program elements of innovation, capital assistance, and source establishment remain;

(b) Public funds and person-years will continue to be constrained throughout the 1980's. The envelope financing system will remain, and ITC will have to compete for its share. Value-for-money will continue to be emphasised, and a mechanism to compare the forecast results against the actualities will be required;

(c) There will be continuing emphasis on increased accountability. Departmental management will be held accountable, from the Deputy Minister down. There will be an increasing need to ensure that recipient companies are also accountable for the expenditure of public funds;

(d) Programs will be subject to the regulations of the central government agencies and will be monitored by them;

(e) The general structure of the three ITC ADM areas involved with DIPP will remain essentially unchanged;

(f) The evaluation of individual projects will continue to need specialist assistance, particularly for the financial, technical, and marketing analysis;

(g) Improved specification of responsibilities and guidelines is needed for individual projects and for program management;

(h) More of the workload and responsibility with regard to proposals, progress reporting, and benefits reporting should be transferred to the companies who are the beneficiaries of the program.

III - NEW FEATURES AND THEIR EFFECTS

The principal new features of the Proposed DIPP Delivery System are intended to address efficiency, economy, and effectiveness. They include:

(a) Quality of the System. Increased emphasis is given to the role of the specialist advisors (Economic, Financial, Technical, Marketing, Machinery), not only for initial project analysis, but also for establishing the Statement of Work as a performance indicator mechanism, and for subsequent monitoring, control, and evaluation. This emphasis recognises the reduction in the resources that ISB's have allocated to program delivery. The formation of a Project Management Team, with the ISB officer as Project Manager and the advisors as part of the team, would improve processing from project start to finish.

(b) Speed of Project Delivery. Earlier use of the advisors, elimination of little used forms, parallel processing of the Project Submission/ ITC Treasury Board in-house submission/and DOI 85 financial encumbrance for 95% of projects, co-location of a DSS contract cell with the DIPP Office in ITC with elimination of redudndant DSS procedures, and the shift of some workload from ITC to the companies should improve both economy and efficiency. A target is to reduce the processing time of an R&D project, for example, from 12 months at present to 5-6 months in the future.

(c) Effectiveness. Improvement of the quality of analysis in (a) above, coupled with a system for determining priority among projects, a better specification of work standards through ITC guidelines, increased professional development, and an improved program data base with appropriate analysis and feedback, should provide more in-depth project and program analysis leading to more effective projects and a more satisfactorily oriented program.

(d) Management of the Project Decision Process and of the Program. A return to a two-tier DIPP Committee system is proposed. The senior DIPP Program Committee, a compact group of participating ITC ADM's would be responsible for co-ordination, policy, program management, and the review and decision of major projects. The DIPP Project Committee, a compact group of participating Directors General would be responsible for normal sized projects, and monitoring, control and evaluation of all projects. They would be delegated appropriate responsibility and authority by the Deputy Minister. There would be

an appropriate reporting structure to ensure accountability through the Committees to the Departmental Senior Management Committee and Deputy Minister. Secretariat services would be provided by the DIPP Office.

Program forecasting and budgeting would be co-ordinated within the ISB's prior to submission to the DIPP Office; forecasts and budgets would be approved by the Program Committee.

(e) Program Evaluation and Feedback to Committees. A simple economical mechanism is to be instituted at the project level to evaluate success or failure. The original projects and the performance indicators for which projects were approved would be compared quantitatively and qualitatively with the results. A summary comparison by user industry sectors, and subsequent analysis, would profile performers and non-performers, leading either to remedial action or to re-priorisation by the Committees and the program users.

(f) The program data base for operational and financial management is to be strengthened to meet current information requirements for program management, with appropriate levels of timeliness and accuracy and the provision of suitable formats. Performance indicators should be built into the system. Data not currently available is to be added to the main program file.

(g) Information on benefits arising from successful projects is to be retrievable from a single system, able to meet the needs of several end users.

Implementing these changes will strengthen the system. The net cost, after considering both the savings attained through improved efficiency and the extra expenditures needed to make improvements, is expected to be in the order of $1 million.

IV - PROJECT DELIVERY SYSTEM, STAGE-BY-STAGE

This section of Annex VII E outlines the changes recommended at each stage of the DIPP delivery system. It parallels the structure of Annex VII B which contains a detailed account of the present operation of the DIPP Delivery System.

STAGE I: PROJECT INITIATION

Currently, company applications for assistance exceed the funds available. Should the program be extended to encompass more commercial advanced technology products, then the number of applications will probably increase.

The changes proposed at this stage are:

- provision of guidelines to companies enabling them to present project applications fully in line with departmental needs for review. The guidelines would incorporate sections prepared by the advisors, stating

precisely what information is required. More of the onus for preparing applications would be shifted to the applicants, and the quality of applications would be uniformly higher;

- introduction of the advisors, particularly the Marketing and Technology Advisors, at an earlier point. This will allow them more time to prepare their assessments and to provide assessments of greater depth. Some time may be saved, but, the real impact will be on the quality of the preliminary analysis, particularly the forecast data, which will later be used in the "scoring system" to assign priority to projects;

- more effective and objective discussion at this stage, the first "filter" level for projects. Because of preliminary advisor input, ISB management will be better informed when deciding whether the company should submit a formal application.

These changes should provide the Department with a better understanding of the industrial opportunities available for support. Companies would have a better appreciation of the program goals and requirements. The changes should also increase the sensitivity towards program forecasting and budgeting and towards the establishment of project priorities.

STAGE 2: PROPOSAL EVALUATION AND PREPARATION OF PROJECT SUBMISSION

The formal company application has been received: the project is reviewed, and then submitted to the DIPP Committee after clearance by ISB Management.

The changes proposed at this stage are:

- The use of the short form of corporate submission for all companies with suitable adjustments to be made by the Corporate Analysis Branch.

- The ISB officer in charge of the project and the advisors would be considered as a Project Management Team with the ISB officer as Project Manager. The specialist advisors would provide independent, obligatory, formal analyses of the economic financial, technology, marketing and machinery aspects of the project. The ISB officer would act as co-ordinator. Note that a technology analysis is one of the independent analyses: this recognises the resource constraints in the ISB's. The marketing forecasts would be one of the inputs available to the Financial Advisor. These changes would ensure that increased analysis is conducted and coordinated at the industry sector levels.

- The Project Management Team would conduct the ongoing analysis and review of the project from start to finish. It would review the initial company application; prepare the contract Statement of Work; participate in PRGs; provide progress reports to the DIPP Project Committee; and finally, evaluate the project as a success or failure against the goals for which it was approved. The project manager and co-ordinator role must lie with the ISB's, since they have the responsibility or industrial development: this is consistent with normal business practice.

- Normal sized project submissions - the estimated 95% of projects which are less than $5 million - would proceed directly through the streamlined system to the DIPP Project Committee.

- All projects over $5 million would go to the DIPP Program Committee, and all of these would subsequently go to Treasury Board for approval in principle. Large projects, over $10 million, would have an additional step: the proposed project would be presented to the DIPP Program Committee for negotiating instructions prior to a final company application. A senior manager would establish an appropriately qualified review team, since all the necessary expertise for such projects may not be available within the Department. Negotiating guidelines would be established and the impact on the national interest studied. In effect, large projects would be subject to more extensive ITC review and management involvement.

- A project "scoring" system would be used as a guide in assigning priorities for normal-sized projects. It should be noted that the scoring system addresses only the economic (quantitative) benefit, and not the other program goals that may be determined by the Department. Individual projects and company positions would need to be considered on both a quantitative and a qualitative basis against program criteria. The value of such a scoring system is dependent on the quality of the preliminary analyses, particularly the market forecasts.

- Records of projects presented and rejected would be kept.

- The Project Management Team prepares the Statement of Work, ensuring that appropriate performance indicators for the technical, financial, marketing, and other aspects of the project are in place. The performance indicators represent yardsticks against which project progress, and its ultimate success, would be measured. The requirements for reported comparisons with these indicators, frequency of monitoring and control, and the post-project obligations of the company to report subsequent sales would be incorporated in the SOW.

- The Project Submission would then be presented to the DIPP Committee by the ISB officer after receiving his management's approval. The Project Submission would replace three currently used, sequential documents: the present Project Submission, the in-house departmental Treasury Board Submission, and the financial encumbrance (DOI 85). This document would be used for normal-sized projects (95% of total); large projects would follow the current procedures.

- The advisor groups would be separated from the user groups. The Market Research and Analysis Section should be located outside Defence Programs Branch but should still report to the same ADM.

These changes would lead to a more systematic approach to project analysis; better division of responsibility for analysis leading to improved quality; laying the foundation for subsequent monitoring, control, and evaluation; more efficient use of ISB human resources and advisors' expertise; and better information for the decision and approval stage.

STAGE 3: THE APPROVAL PROCESS

Currently this stage commences with the project submission being reviewed by the DIPP Committee, who accept, reject, or defer the submission pending revision or further information. In the current procedure, approval in principle is given; a Treasury Board submission is raised; the expenditure is authorised for the project by means of a financial encumbrance. Once this is completed, the project is ready for contract.

The changes proposed at this stage are:

- Reinstitute a two-tier DIPP Committee system, comprised of a Program and a Project Committee. The DIPP Program Committee would include the three principal ADM's involved in DIPP delivery. This Committee would be responsible for the major issues of the program:

  . establishment and interpretation of policy;

  . program operational and financial management (guidance to the DIPP Project Committee, setting priorities, budgeting, and forecasting);

  . the recommendations for approval on all projects over $5 million (proposed) and more than 50% Crown investment, i.e., outside ITC's delegated authority, with particular attention to the negotiation and conduct of large projects (over $10 million).

The Deputy Minister's authority would be delegated to this Committee. The DIPP Program Committee would submit an annual report to the departmental Senior Management Committee accounting for the performance of the program.

- The DIPP Project Committee would be limited to the principal Directors General involved in DIPP delivery (approximately five). Again, the emphasis should be on compactness. The Committee would review and approve projects within ITC's delegated authority ($5 million proposed). The approval step by this group would constitute agreement that the Project Team's analysis has been well and consistently done; accountability still rests with the Team. The Committee would also be responsible for all project monitoring and control, receiving such progress reports, requests for project amendment, etc., as may be necessary. This Committee would report to the DIPP Program Committee.

With the renewed requirement for project monitoring and control, it would be advantageous to split the DIPP Project Committee once again into its two original components: R&D on the one hand; Source Establishment and Capital Assistance on the other hand, with a Committee for each. This represents a return to the system generally in effect prior to 1977, but with a re-alignment of junior/senior responsibilities. It would also reduce the length of meetings to a manageable time.

- The Treasury Board Authority delegated to ITC, for in-house approval in principle, should be increased from $2 million, 50:50 Crown sharing with industry, to a minimum of $5 million 50:50 Crown Sharing. An upper limit

of $10 million could be considered, to align the Treasury Board delegated authority with the full project review process recommended for the Senior DIPP Committee handling of large projects.

- The Treasury Board Authority should be delegated by the Deputy Minister to the DIPP Program Committee, which in turn may wish to delegate certain authority to the Project Committee.

The effect of these changes is to strengthen the program focus within the Department, providing improved management control over policy and operations. Accountability would be clarified by a hierarchical reporting structure; program operational personnel and users (departmental branches, project management teams, recipient companies) account to program management which in turn accounts to departmental management. The proposed structure of a senior committee with one or two supporting committees, is intended to provide a suitable division of responsibility and workload appropriate to their seniority. The need to use procedures for large projects that differ from those used for normal sized projects is systematically accommodated.

Delegation of authority from the Deputy Minister to the DIPP Program Committee and the compression of three sequential documents (Project Submission, in-house Treasury Board Submissions, and financial authorisation and encumbrance - the DOI 85) into one document should substantially reduce the time required for this stage of the process. Currently, for R&D projects, this stage in program delivery takes the most time (137 days) and offers the greatest opportunity for improving efficiency.

STAGE 4: CONTRACT NEGOTIATIONS

This stage involves the preparation, by DSS, of the contract between the Crown and the industry recipient. While this is the shortest stage, at 100 days, it is inordinately long compared to the workload involved. Changes are currently being negotiated between the DIPP Office and DSS to improve this stage. Our recommendations are as follows:

- Establishment of a DSS contract cell in ITC, co-located with the DIPP Office.

- Elimination of redundant DSS procedures (Contracts Authorisation Board approval, secondary submissions to Treasury Board), while maintaining the appropriate contract quality control checks.

- Maintenance of other DSS services, such as rate negotiation, standards, assets management, inspection services, audit services, etc.

- Recording of contract information in the main DIPP computer file. Data requirements are noted elsewhere in this annex. In general, the project should be clearly identified, with project inputs capable of being related to project outputs.

Several administrative benefits should flow from these changes. While retaining DSS skills and resource flexibility against program caseload, the Department would improve its control over the contract process. Other benefits include improved ITC-DSS collaboration; reduced time to complete the

formalities of the contract; and avoidance of starting up costly ITC services that can be economically acquired from DSS (e.g., assets management by DSS regional offices).

STAGE 5: PROJECT EXECUTION - MONITORING AND CONTROL

In this stage, the company executes the project in accordance with the contract Statement of Work, while the Department, by means of the Project Management Team, monitors that this is happening. Monitoring comprises periodic reports and meetings with the company. If deviations have occurred, corrective action is considered which, if significant, would require departmental approval with amendments to the contract.

The changes in this stage include:

- Specifying, in the Statement of Work in every case, the frequency and format for company progress reports (to cover technical, financial and marketing performance), and the frequency of Progress Review Group meetings.

- Continuing Project Management Team review of company progress reports and PRG's.

- Issuing guidelines to cover the content of company progress reports (measurement of progress against SOW performance standards); standards for ITC Project Management Team review of such reports; standards for conduct of the PRG; standards for requirements for contract change;

frequency and standards for Project Management Team reporting to program management.

- The sequence of events should be: company progress report, ITC review of progress report, PRG, and progress report to program management.

- Establish, during the course of the contract, the procedures for post-project company benefits reporting.

The purpose of these changes is to shift the onus of accountability reporting more clearly to the recipient company and to establish standards to simplify and standardize departmental review of projects. By increasing ITC awareness of project progress, problems should be identified and corrected sooner. Reporting should consistently aim at measuring progress against the established performance indicators of the SOW. Thus, ISB accountability reporting to program management is established. Emphasis is placed on quality rather than quantity of monitoring and control.

STAGE 6: FINAL EVALUATION AND POST PROJECT MONITORING

The end of the contract requires a final project assessment and report to program management. After the end of the contract, the company reports on sales generated during the product cycle, and other benefits accruing from the project. The changes in this stage are similar to those in the previous stage; however, they are discussed separately to emphasise the importance of the need for the final project assessment. The changes include the following:

- The SOW should call for a final company report, which clearly describes achievement against the performance indicators established in the SOW. After a final PRG, the Project Management Team reports to program management the relative success of the project against the standards for which the expenditure of public funds was approved.

- The company should report to the Department the benefits accruing from the project annually. The benefits would include both economic (sales, units of production, employment), and qualitative (achievement of other program, company goals) measurements. The SOW would specify the requirement for such reporting. These reports would be signed by the official(s) of the company who signed the contract in the first place.

- The economic benefits of projects should be assessed as and when they materialise. The results of the project are entered in the DIPP master computer file. A single system should exist, capable of servicing program analysis and management and the calculation of excess profits.

- Annual program reports should be issued, based on projects aggregated by division, directorate, and branch, with analysis for program management.

- Project/program inputs should be analysed to compare forecasts with actual results.

High priority must be given to these activities. The purpose of these changes is to measure program operational performance, starting at the individual project level, and gradually aggregating the projects by industry sectors.

Not only is the impact of the program measured, but appropriate analysis may detect gradual shifts and patterns permitting program management to optimise the use of funds.

This program self-monitoring function is new. Before, only benefits were measured; the process should be extended to upgrade the data base thus permitting ongoing analysis leading to program self-monitoring and operational feedback.

V - PROGRAM MANAGEMENT SYSTEM

The contents of this section are drawn from Annexes VII C and VII D and address issues that are specific to the program and those that are general to the Department. While DIPP is an entity in itself, it is used by diverse branches in the Department; in turn, DIPP uses centralized departmental systems and services in its operation. This interaction affects the overall program management structure, and we have considered these realities in the proposed changes.

The present system of Treasury Board delegation to the Deputy Minister is satisfactory, and no changes to this structure are presently proposed. Changes proposed are that:

- The formal program Policy and Administrative Directive be reviewed and simplified. In support of the directive, a series of operational guidelines should be prepared to clarify requirements to industry, the departmental user branches, and to describe the functions and standards for certain activities.

- Authority currently vested in the Deputy Minister be delegated to the DIPP Program Committee with authority to be delegated as required to the DIPP Project Committee.

- The current in-house ITC authority to approve projects be increased from $2 million 50:50 sharing ratio, to a minimum of $5 million, perhaps $10 million, 50:50 sharing ratio.

Should the Department wish to move eventually to a joint industry-government board, with authority delegated to the Board, the structure described in the two preceding recommendations may prove valuable as a transition phase.

DIVISION OF RESPONSIBILITY AND ACCOUNTABILITY

Responsibility is currently divided between three ADM areas within the Department: the ADM Industry and Commerce (program delivery); ADM TCS and International Marketing (indirect program delivery and military export marketing); and ADM Finance (program management). These three areas are also responsible for all the principal advisor sections.

The one major change proposed is:

- A forum should be established in which the principal program users and operators would meet on a formal, systematic and regular basis. Such a forum for the ADM's would usefully be provided by their membership of the DIPP Program Committee.

In the present matrix organisation of the Department, the responsibility for the major functions of the program is divided, and there is no mechanism to bring the areas together to provide a focus for the program. The focus provided by the DIPP Program Committee is needed so that reporting from the differing sub-functions may be appropriately directed, and in turn reported to the department Senior Management Committee.

Positional accountability would be established by a structured reporting system, designed to ensure that the operating sub-functions of the program report systematically on their activities. Considerable staff turnover may occur between the date of starting a project and the date of its completion, when its success or failure can be determined. Thus, individual accountability is difficult to establish. Also, true accountability provides rewards as well as penalties; such a system is easier to implement in a commercial than in a civil service environment.

REPORTING - FINANCIAL AND OPERATIONAL MANAGEMENT

The quality and frequency of reports for financial and operational management purposes have declined substantially over the past ten years. Accountability reporting was not in evidence. By order of the ADM Finance, a new financial information system is to be instituted.

Changes include the following:

- A simple, systematic reporting system should be designed and implemented to collect appropriate financial and operating information for program

management purposes. Characteristics of such a system are described in Annex VII C, section IV, V, and VII.

- In order to meet the requirements of the reporting system, the program data base should be redesigned to incorporate information which will permit comparison of selected performance indicators at project and program level.

- The completeness, timeliness, and accuracy of the reporting and data base system should be periodically tested.

- Accountability should be made a feature of the reporting system through the use of forecasts, performance indicators, and results measurement.

- The information, after analysis, should be presented to management in such a form that action can be taken.

The actual topics covered by the financial reports would include project status reports, repayments, program forecasting, and budgeting. Operational reports would include project progress reports, final reports, evaluation reports. They would also include annual accountability reports summarized by ISB division, directorate, branch, and the other functional areas of DIPP such as Defence Programs Branch and the advisors.

RESOURCES AND RESOURCE ALLOCATION

Examination of DIPP Person-Year resources indicated a current (1979/80)

estimate of 39 PY (offices, management, support) not including the DSS contract activity. The level of 39 PY is estimated to represent a 25% drop from staffing levels of 5-10 years ago; at the same time, systems used to deliver DIPP have changed, principal branches involved with DIPP have undergone major organisational change, and the external environment has also changed.

To compensate for the above, changes are proposed as follows:

- The adequacy of resources allocated to DIPP should be reviewed, with specific attention to monitoring and control requirements, for both PY and budget.

- Professional development programs should be instituted, to maintain and enhance existing skills; particular attention being paid to project/program management, market analysis and business planning.

The purpose of the above is to assure that the appropriate level of resources and skills are available for efficient and effective program delivery.

OTHER OPTIONS

Several options were discussed at various stages of the evaluation. The final selection of recommended changes represents a continuance of the present system with appropriate adjustments. The changes proposed are workable and relatively simple to implement within the existing framework of the Department.

Implementation of the recommended changes will greatly strengthen overall program management. Given this improved operating posture, it will be possible to identify with more confidence further and perhaps more radical changes that might profitably be made.

VI - OTHER RECOMMENDATIONS

A summary of other recommendations incorporated in this Annex is given below:

Documentation Practices

A summary of recommended changes, including a description of new forms needed, appears at the end of section IV, in Annex VII A.

Contract Preparation

A set of instructions should be given to DSS officers for preparing DIPP contract agreements.

Professional Development Program

A training program should be instituted to maintain and enhance the skills of program delivery officers.

Capital Assistance Objective

A universally accepted definition of precisely what constitutes "advanced" machinery must be arrived at in order to have a consistently applied criterion for Capital Assistance projects.

Accountability

A set of recommendations to improve positional accountability is included in section IV of Annex VII C.

Financial Reporting

Increased attention must be given to re-encumbrance of funds for ongoing projects from year to year and to producing timely and accurate financial reports.

Improvements to the Data Base

Detailed recommendations for upgrading and expanding the computerized data base are included in section VI of Appendix VII C. These changes are of critical importance to the improved management of DIPP.

Horizontal vs. Vertical Sector Strategies

The resolution of the relative emphasis to be given to a horizontal program approach as to the support of a vertical sector strategy is an important issue. The detailed re-design of the program delivery system will require such a resolution.

Large and Very Large Projects

Recommended approaches for handling large and very large projects are contained in section VIII of Annex VII D.

Loan Vote

In the event that the funding approach discussed in the Covering Report is not adopted, it is recommended that the Loan vote be collapsed into the Contribution vote.

VII - PROJECT SCORE ASSESSMENT

Introduction

This supplementary note outlines a quantitative project assessment process for DIPP. It is judged, based on historical data, that this process would yield a set of projects which would result in an ROI for DIPP of about 10%.

The process is intended to bring to bear the quantitative results of this study but is intended also to have sufficient judgemental flexibility to ensure that it is not a strictly mechanistic process.

The process consists of two phases:

- the first is intended to identify those projects with the highest expected NPV's;

- the second phase would "filter" from these high NPV projects those which have the greatest probability of being incremental.

The process makes a distinction between R&D projects and CA/SE projects. The overall process as described is static in operation, in the sense that it would be applied to the submitted projects with fixed values by which to judge the acceptance limits. The process is also dynamic, however, in that these values would be updated periodically so that on an annual basis the project acceptance level would match the budgetary level.

Note that this discussion does not comprise a definitive manual; it does, however, set forth sufficient information to enable a trained analyst to create such a manual.

NPV SCREENING: R&D PROJECTS

This phase of the assessment process identifies those R&D projects which have NPV values above a certain pre-determined acceptance level. It does this by aggregating scores for each project based on:

- those factors which the study's statistical analysis has indicated are efficient predictors of a high NPV;
- the results of at least a rudimentary objective economic analysis;
- those factors which observations from the study indicate are best applied on a subjective judgmental basis;
- additional priority factors to reflect concerns such as the support of vertical sector strategies.

The weights of these (foregoing) individual component values in the total score are divided as follows:

Correlated Factors	40
Economic Analysis	25
Judged Factors	15
Priority Factors	20

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Correlated Factors	40
Economic Analysis	25
Judged Factors	15
Priority Factors	20

Correlated Factors

It is assumed that assessments are available of the Risk, Technology (Maturity) and Civil Market characteristics of a project on the 1-5 scale used in the study. Using these assessed characteristics and the results of the study's regression analysis in a slightly simplified form, the score for this component would be calculated by the following expression:

Correlated Factors Score (C) = 12 X (Commercial Risk Value)
+ 9 X (Maturity of Technology)
+ 6 (if project is for Civil Market)
or 3 if for both Civil and Defence

Additional marks would be awarded if the projects were judged to be adequately funded according to the following scale:

Level	Points
- Proposed funding is well able to handle unexpected problems	5
- Proposed funding is able to meet normal contingencies	3
- Proposed funding is barely adequate	0

The full Correlated Factors score would be assessed as follows:

$$\text{Full Correlated Factors Score} = \frac{C + (\text{Adequate Funding Score})}{111} \times 40$$

Economic Analysis

In this component it is assumed that a rudimentary economic analysis has been done based on market analysis and on estimated production costs. The score would then be associated with the estimated ROI according to the following table:

Estimated ROI	Score
> 30%	25
21-30	24
16-20	22
11-15	20
8-10	16
6- 7	8
4- 5	2
< 4	0

Judged Factors

Key factors in this component are the perceptions of:

- Reliability of firm: does it have a history of doing what it says it will?

- Competence of the firm in Marketing: does it do good market analyses which relate product characteristics to market preferences and to price? Can it sell and service?

- Competence of the firm in technology: does it have the facilities and personnel to execute the project in a timely fashion?

The foregoing does not, of course, capture all of the factors that a knowledgeable ITC officer will bring to bear; it is far more indicative than definitive.

In any case, it is envisaged that the responsible ISB officers would allot the appropriate portion of the possible 15 points according to their judgement.

Priority Factors

The remaining 20 points would be allotted by the project team using guidelines provided from the ADM-level committee to reflect the importance of a given project for the support of governmental and/or departmental goals beyond the project's immediate economic worth. A scale which could be considered for this purpose is:

Level	Points
- Support is critical for a priority sector	20
- Support is highly important for a priority sector	15
- Support is important for a priority sector	10
- Support would improve productivity in a priority sector	5
- Project is not significant for a priority sector	0

DISCUSSION OF NPV SCORING

The weight assigned to the Priority factors represents the study's perspective on the relative importance as between attaining a positive incremental NPV with a DIPP project and support for a strategy per se. On this basis, it is, of course, a judgement and thus naturally open to change.

If it is not wished to apply (outside) priority factors, the scores for the other components can be adjusted by multiplying by 1.25. Similarly, if an economic analysis is impractical, the other scores should be adjusted by multiplying by 1.33.

In an ideal world, there would not be any need for the Correlated Factors and Judged Factors components; a comprehensive economic analysis would encompass these aspects. It is doubtful, however, whether the time, human resources, and information required by such an analysis will be available. This assessment process has been deliberately developed, therefore, on the assumption that the economic examination will be rudimentary.

INCREMENTALITY SCREENING: R&D PROJECTS

The second phase of the process calls for those R&D projects which have acceptable NPV scores then to be assessed for incrementality.

The incrementality score has two components: the first reflects the findings of the regression analysis; the second represents reasoning which entered into the study's judgements regarding incrementality, and which, it will be recalled, gave an 80% overlap with the views of the firms.

The first incrementality component score then is given by the expression:

$$I_1 = 2.2 - .3\ (\text{Commercial Risk}) - .1\ (\text{Maturity of Technology}).$$

The second component reflects the following factors:

- Market Assurance: is this prospective market a "captive" one; one over which the firm has a strong grip; or is it absolutely open?

- Availability of Funds: if DIPP did not provide funds would they be fully available elsewhere?

- Corporate Options: does the firm have any option but to go ahead with the project?

In each case, a judgement is to be applied as to the appropriate level of factors M(Market Assurance), F(Availability of Funds), C(Corporate Options) according to the following scales:

M	F	C
- Fully Captive Market - 0.2	- Fully Available - 0.2	No Option foreseen 0.2
- Strong hold on Market - 0.15		
- Absolutely open Market - 0	- Absolutely unavailable 0	No Constraints 0

These factors would then be combined with the I_1 value as follows to find the Incrementality Score, I_2.

$$I_2 = I_1 (1-m)(1-f)(1-c).$$

INITIAL VALUES: R&D PROJECTS

Our examination of the historical data leads us to propose that, to yield the average 10% ROI on incremental R&D projects, the following would be the values initially applied to filter out low worth projects:

NPV Score - 50

Incrementality Score (I_2) - 0.7

UPDATING

We are not aware of any "seasonal variation" in DIPP aplications. If such exists, a compensating factor could be applied. On the assumption that they do not exist, then the average approval rate for DIPP funds should be $4 million/month. Based on the statistics of the project application scores, the "pass" levels should be adjusted, say, quarterly to ensure that the flow of funds matches the budget.

This does not mean, of course, that projects could not be held over and re-submitted against the possiblity that later projects might have lower averages.

CA/SE PROJECTS

There were not a sufficient number of CA/SE projects for which NPV/ROI information was available to support a regression analysis. Consequently, coefficients or weights could not be developed.

For these types of projects it is judged that a fair estimate of the economic benefits could be obtained using the other portions of the scoring model as described, i.e., the Economic Analysis, Judged Factors, and Priority Factors.

This type of analysis should yield also sufficient insight into the project to permit a reasonable judgement to be made on incrementality, particularly in the light of the already high level of incrementality associated with these projects.

Discussion

The scores and individual component assessments should be retained by the DIPP Secretariat for later accountability and project monitoring.

APPENDIX 1 TO ANNEX VII

LIST OF DIPP PROJECTS INCLUDED IN THE FILE REVIEW SAMPLE

LIST OF DIPP PROJECTS INCLUDED IN THE FILE REVIEW SAMPLE

COMPANY	PROJECT NAME	PROJECT REQUISITION NO.	CONTRACT AGREEMENT		AMOUNT OF FUNDS AUTHORIZED - $
			SERIAL NO.	YEAR	
Program Element - R&D Research & Development					
Bristol Aerospace	Upper Atmospheric Research	1-71	9MO-12	1960	3,142,000
Bristol Aerospace	Parachute Recovery System	1-421	9BAO-0016	1971	70,000
Canadian Marconi	Satellite Position Fixing Equipment	1-865	9ST77-00009	1978	291,128
Canadian Marconi	Satellite Navigation	1-729	9ST5-0003	1975	360,000
Canadian Marconi	Aerospace Ground Equipment	1-595	OPD3-0036	1973	145,000
Canadian Marconi	Radio Altimeter	1-408-12	9PHO-0012	1971	402,000
Canadian Marconi	Aerosat CMA 736/742	1-754	9ST5-0013	1975	168,000
Canadian Marconi	CMA 717 Doppler Radar	1-654	9PD1-0009	1974	194,100
Canadian Marconi	Aerosat Avionics	1-815	9ST77-00001	1977	1,006,000
Canadian Marconi	Engine Instrumentation Displays	1-647	9SQ4-0001	1974	158,000
Canadian Marconi	Omega CMA 759/771	1-924	9ST78-0001	1978	291,000
Canadian Marconi	Weight & Balance Indicator	1-408-13	9PHO-0013	1971	32,040
Canadian Marconi	CMA719 Automatic Omega Receiver	1-495	9PDI-0012	1972	1,198,000
Canadian Marconi	RNAV Area Navigation	1-515	9PDI-0029	1975	817,000
Canadian Marconi	Satellite Navigation	1-408-15	9PHO-0015	1971	375,000

APPENDIX 1 TO ANNEX VII (cont'd.)

LIST OF DIPP PROJECTS INCLUDED IN THE FILE REVIEW SAMPLE

CONFIDENTIAL

COMPANY	PROJECT NAME	PROJECT REQUISITION NO.	CONTRACT AGREEMENT SERIAL NO.	CONTRACT AGREEMENT YEAR	AMOUNT OF FUNDS AUTHORIZED -$
Canadian Marconi	Avionics Diversification	1-182	9PY7-13	1970	13,300,000
Canadian Marconi	Liquid Crystal Displays	1-907	9ST78-0003	1979	53,500
Canadian Marconi	Engine Instruments - Value Engineering	1-807	9ST76-0009	1977	190,300
Canadair	CL89 Drone	1-474			50,000
Canadair	CL 289 Drone - Technology Maintenance	1-735	9ST5-0009	1975	280,000
Canadair	CL 289 Project Definition Phase	1-553	9RD2-0019	1972	495,000
Canadair	CL 289 Transition phase	1-722	4RD5-0002	1975	700,000
Canron Inc.	Base Water & Sewage System	1-197	4ME8-37	1969	353,000
CAE Electronics	Motion & Control Loading Systems	1-803	9ST77-00002	1977	167,000
CAE Electronics	TAGS	1-219	9PK9-7	1970	10,200,000
CAE Electronics	Digital Flight Simulator	1-382	9PFI-0001	1971	750,000
CAE Electronics	Magnetic Anomaly Detector	1-338	9PL9-0018	1970	292,100
CAE Electronics	Boeing Simulator	1-728	9PF5-0002	1975	262,000
Computing Devices	Digital Scan Converter	1-617	9PD3-0008	1973	298,000
Computing Devices	Advanced Spear System	1-746	9ST5-0010	1975	3,385,000

APPENDIX 1 TO ANNEX VII (cont'd.)

LIST OF DIPP PROJECTS INCLUDED IN THE FILE REVIEW SAMPLE

CONFIDENTIAL

COMPANY	PROJECT NAME	PROJECT REQUISITION NO.	CONTRACT AGREEMENT		AMOUNT OF FUNDS AUTHORIZED -$
			SERIAL NO.	YEAR	
Computing Devices	Small Projected Map Display	1-764	9ST76-00003	1976	154,000
Computing Devices	Thrust Measurement	1-307	9PK9-8	1970	579,000
Computing Devices	Thrust Computing System	1-876	9ST78-00004	1977	253,000
Leigh Instruments	Electrical Systems	1-631	9PC3-0011	1974	1,216,000
Litton Systems	Airborne Radar Maritime Patrol	1-913	9ST79-00002	1979	700,000
Litton Systems	Marine Gyrocompass	1-804	9PD77-00005	1977	1,175,000
Litton Systems	Airborne Radar Development	1-776	9ST76-00006	1976	225,000
Pratt & Whitney	JT-15 Engine	1-887	ENGJ-168	1978	11,500,000
Pratt & Whitney	PT6A-60 Series	1-898	9BG78-00003 ENG-P-181	1979	10,400,000
Pratt & Whitney	Small Aircraft Engines	1-221	9BG9-1	1970	2,045,000
Pratt & Whitney	Ship Propulsion Engines	1-391		1971	135,000
RCA Victor	Satellite Communication	1-701	9ST5-0001	1975	1,539,000
RCA Victor	Sat Com Products	1-337	9PJ9-20	1970	1,337,000
Aviation Electric	Fuel Control Design	1-562	9BH2-0081	1973	171,928
Aviation Electric	Vehicular Navigation Equipment	1-136	9PC4-79	1965	900,000

APPENDIX 1 TO ANNEX VII (cont'd.)

LIST OF DIPP PROJECTS INCLUDED IN THE FILE REVIEW SAMPLE

CONFIDENTIAL

COMPANY	PROJECT NAME	PROJECT REQUISITION NO.	CONTRACT AGREEMENT		AMOUNT OF FUNDS AUTHORIZED - $
			SERIAL NO.	YEAR	
Hermes Electronics	Sonobuoy	1-603	9PL3-0001	1973	860,000
Hermes Electronics	Bathythermograph	1-713	9PL5-0001	1975	100,000
C.R. Snelgrove	Frequency Control	1-737	OST5-0064	1975	470,000
Spar Aerospace	Decompression Computer	1-305	OLJ9-389	1969	143,931
Spar Technology	Communication Systems	1-878	9ST78-00006	1979	2,135,000
Westinghouse	Sonar Product Development	1-750	9PL76-00001	1976	463,000
Westinghouse/Fathom	Hytow	1-835	9SU77-00003	1978	75,000
Diffracto	Laser Dimensioning	1-850	9ST78-00002	1978	75,000
Vulcan	Explosafe	1-741	9ST5-0015	1976	626,550
Levy Russell	Tank Refittment	1-856	9MY77-00079	1978	355,000
Menasco	Hydro Mechanical Systems	1-529	9BD2-0006	1972	1,800,000
Nordic International	Airport Crash Vehicles	1-882	OST78-00045	1978	136,000
Garrett Mfg.	Temperature Control	1-576	9BP2-0101	1973	1,150,000

APPENDIX 1 TO ANNEX VII (cont'd.)

LIST OF DIPP PROJECTS INCLUDED IN THE FILE REVIEW SAMPLE

CONFIDENTIAL

COMPANY	PROJECT NAME	PROJECT REQUISITION NO.	CONTRACT AGREEMENT SERIAL NO.	CONTRACT AGREEMENT YEAR	AMOUNT OF FUNDS AUTHORIZED - $
Program Element - CA Capital Assistance					
Laurentian Concentrates	Protein Foam	1-472	9MM1-0014	1971	45,000
Leigh Instruments	Production Machinery	1-392	9PHO-0002	1970	137,000
Litton Systems	Area Navigation Systems	1-361	OPDO-17	1970	3,307,000
KK Precision Parts	Production Machinery	1-569	9MJ2-0051	1972	18,000
Orenda Ltd. (Hawker Siddley)	Production Machinery	1-368	9BT9-36	1970	478,000
Bata Industries	Machining Centre	1-394	9MEO-3	1970	64,000
CAE Electronics	Production Machinery	1-768	9MJ5-0052	1976	163,000
Allis Chalmers	Fork Lift Trucks	1-626	9MJ3-0033	1974	74,500
DBM Industries	Production Machinery	1-590	9MJ2-0073	1973	33,000
Joly Engineering	Machine Tools	1-890	9MJ78-00030	1978	504,000
N.W. Clayton	Punch Press Facility	1-956	9MJ7800053	1979	105,000
Air Ground Equipment	Lathes & Grinder	1-675	9MJ4-0015	1974	38,000
Bristol Aerospace	Welding Machine	1-558	9BT2-0055	1972	94,500
Universal Die & Tool	Machining Centres	1-709	9MJ4-0046	1975	158,000
Canadair	Mercure	1-524	9BC4-0007	1975	550,000

APPENDIX 1 TO ANNEX VII (cont'd.)

LIST OF DIPP PROJECTS INCLUDED IN THE FILE REVIEW SAMPLE

CONFIDENTIAL

COMPANY	PROJECT NAME	PROJECT REQUISITION NO.	CONTRACT AGREEMENT		AMOUNT OF FUNDS AUTHORIZED - $
			SERIAL NO.	YEAR	
Program Element - SE Source Establishment					
Canadian Marconi	N-GRC-103 Radio Sets	1-531	9PG2-0011	1972	378,000
Canadian Marconi	Pave Low III Doppler	1-861	9PD77-00016	1978	165,000
Electronic Craftsmen	Specialized Coil Products	1-358	9PC9-22	1970	6,000
Hermes Electronics	Sonobuoys	1-426	9PLO-0022	1971	75,000
Allis Chalmers	Fork Lift Trucks	1-527	9MJ2-0030	1972	12,000
Canadair	Mercure	1-524	9BA2-0001	1972	5,730,000
Garrett Mfg.	USN Landing Assault Craft	1-487	9LK1-0008	1971	307,000
Garrett Mfg.	Hybrid Microcircuits	1-869	9PE7700017	1978	92,000
Geroux	Landing Gear	1-441	9BDO-0019	1972	73,500
Maritime Industries	Propulsion Units	1-519	9LMI-0009	1972	122,000
Aircraft Appliances	10KW Generators	1-739	OPF5-0122	1976	102,500
Aircraft Appliances	15 & 30 KW Generators	1-844	OPF7700132	1977	225,000
CAE Electronics	NC Machining Centre	1-767	9MJ5-0053	1976	6,500
Digital Graphics	Computer Aided Design	1-704-2	9GW4-0005	1974	5,700
EDAC Inc.	Electronic Connectors	1-796-2	9PX760009	1976	301,000
Sihi Pumps	Vacuum Pumps	1-711-2	9MJ4-0048	1975	23,500

APPENDIX 2 TO ANNEX VII

MONITORING AND CONTROL REQUIREMENTS BY PROGRAM COMPONENT

CONFIDENTIAL

MONITORING AND CONTROL REQUIREMENTS BY PROGRAM COMPONENT:

APPENDIX 2 TO ANNEX VII OF THE DIPP EVALUATION STUDY

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MONITORING AND CONTROL REQUIREMENTS BY PROGRAM COMPONENT

I - INTRODUCTION

The ISB file documentation indicated that, in general, more departmental resources were devoted to the project approval process than to the subsequent monitoring and control of project implementation. This observation was confirmed by the replies received in response to the internal questionnaire. The monitoring and control function was not deemed to be of lesser importance. Rather, the limitedness of the departmental resources dedicated to the DIP Program dictated that priority was given to the various stages of the approval process rather than to monitoring and control.

The following short case histories demonstrate the importance of and the need for the monitoring and control function for each component of DIPP.

II - SOURCE ESTABLISHMENT

Source Establishment projects are paid for only if the company wins the contract. Proof of this is easy enough to obtain. What is not so obvious is the diversity of contracts that the file reviews have identified in this category and the conditional aspects of some of these contracts. Far from being exempted from the monitoring and control process, SE projects require this scrutiny as much as R&D projects do.

(i) Canadair: Mercure contract, project 1-524. The Crown invested $11 million in this project. The intent of ITC support was to expand Canadian aerospace capability to meet European standards. Although Canadair won the contract for selected major components of this French aircraft program, the aircraft itself was a failure, thus the DIPP investment failed. The decision to expand Canadian capability to new, risky markets is not questioned, but the file record indicated that DSS showed more concern about the market than ITC did. The file also reflected a lack of response by the Market Advisor. ITC appears to have concentrated on winning the contract. Little attention was paid to the market for the French aircraft.

Since the project was funded in phases, to a total of 80% Crown investment, appropriate monitoring and control of the first phase could have influenced the investment decision of later phases. While minor sales were made, the project did not achieve its goal of penetrating the French aerospace market, and the lessons learned were not transferable to the North American market.

(ii) Garrett Marine: Litton USA Navy Contract, project 1-487, Crown investment $307,000. Garrett bid $2.5 million on what it thought was a straightforward contract for ship parts. Although Garrett met its contract obligations to the full, the cost of meeting the contract was $4.5 million (against a revenue of $2.5 million), and Garrett Marine went out of business. What happened was that Garrett found itself with an R&D project disguised as Source Establishment. Had more

attention been paid to certain predicted, adverse project characteristics which emerged during the execution process, the extent of the subsequent problems may have been reduced.

(iii) Garrett Manufacturing, Hybrid Microelectronics: Ford Aerospace project 1-801, Crown investment $83,000. The contract benefits for this project show a typical approach by US major contractors. Suppliers are asked to bid on a certain size package of parts. The successful subcontractor will, however, only be awarded a fraction - say 10-25% - of the contract as a performance indicator. Subject to successful completion, the balance of the contract may be released, and the subcontractor may then qualify for other parts in other projects. In this case, Garrett was successful, and by the end of the DIPP contract, the ratio of sales to Crown investment was 18:1.

It can be seen that winning a Source Establishment contract is no guarantee of success or profits. Monitoring and control properly performed can minimize losses and maximize benefits. The requirement for monitoring and control is equal to that for R&D projects.

III - CAPITAL ASSISTANCE

Capital Assistance grants are made for the purchase of equipment; often, they may be given in conjunction with a Source Establishment project. Certain steps are unique to CA projects: the equipment on installation is subject to inspection to verify the equipment and its operating condition, and the equipment is subsequently tagged with a sticker indicating that it is the property of the Federal Government.

Capital Assistance projects are generally not as specific as SE or R&D projects; they are targeted more at a perceived market opportunity.

(i) Universal Die and Tool; project 1-709; value $316,000 (50% contribution:50% repayable loan). According to the records, the intent was to widen the company base from one or two principal customers to the aerospace industry in general (Lockheed, Northrop, Hughes, McDonnell Douglas) for those products which the company was in a position to export or to provide import substitution. The company had declined business for lack of capability, even from companies for whom it was a qualified subcontractor. Criticism (by the Marketing Advisor) indicated UDT did not have sufficient export "get up and go".

The file does indicate that some benefits were gained, but they are not conclusively linked to DIPP. The company modernised its plant at a cost of about $360,000 to meet "matching investment" criteria. A new US defence customer, ITT Gilfillan, is identified. The anticipated employment increase did not materialise within the time covered by file documents.

(ii) N.W. Clayton Co.; project 1-956; value $210,000 (50% contribution: 50% repayable loan). The company wanted to move into a market segment from which it was excluded by virtue of its inefficient equipment. Also, it was gradually losing ground in its existing market segment. While the company was strongly supported by the Marketing Advisor, it was equally strongly opposed by the Machinery Advisor. The former argued the case for new markets. The latter argued that the company

did not need the machinery to handle existing markets. The company polled 15-20 industrial clients who indicated that without the equipment Clayton would not be cost competitive and consequently would become increasingly ineligible for future business and that it already stood to lose existing business. The project was approved.

The file indicates that the company entered new markets with some success. Company "matching investment" was estimated at around $180,000. Sales increased to existing customers, and customers in new market segments were identified. Employees increased 33%, from 30 to 40, though it is not clear what precise relation this had to the new machines. The plant was expanded. The company commenced exports: in three years, they increased from $8,000 actual (1977/8) to $265,000 actual (1978/9) to $1,000,000 forecast (1979/80).

(iii) KKK Precision Parts; project 1-569; value $36,000. This project differed from the others reported in that KKK was taking over machinery stored in a DSS warehouse, repossessed from two bankrupt companies. Subsequently, KKK itself went bankrupt.

It would seem some two or three Capital Assistance companies go bankrupt annually. In some cases, the transfer of equipment to a new user is successful; in other cases it is not. ITC has no obligation to repair repossessed equipment. In this case, the machinery was apparently in very poor condition. The company took on the obligation, but it later found out that it could not generate any cash flow with the equipment and that the repair costs approached the cost of

the assumed debt. The file does not suggest whether general management problems or this project contributed to the demise of the company.

The file was handled, in 2½ years, by 5 different ISB officers.

IV - RESEARCH AND DEVELOPMENT

R&D case studies are not described in the same detail for reasons of complexity and length. Rather, some general comments are made on how R&D projects develop during implementation.

The average DIPP R&D project starts off with a fairly definite operational concept of the end product, for example, a DASH-7 aircraft, an Omega navigation receiver, a military rocket, or some engine instrument displays. DIPP is not generally involved with laboratory research or basic research. Occasionally, projects may end up in that category but they were not intended to do so. Thus, the average project requires little basic research but a considerable amount of engineering development to improve performance, to adapt new technology, to match new systems, to evaluate technical options, and so on. the object of the engineering development is to produce a product that is attractive to end users at an affordable price within a specific time frame. This may not sound exotic, but it is an area to which Japanese and German industrial enterprises in particular devote considerable attention.

INITIAL PHASE

At the start of the project, activities are mainly technical. Since the project has been put together by engineers, this first phase is reasonably well laid out, although DSS and Technology Branch believe improvements can be made. Complaints exist about the rigidity of ITC contracts, but in essence, it is the company which prepares the technical section of the Statement of Work that is used to control project technical progess. In most cases, charts, such as Gantt and PERT, and narrative are used for control. In a number of cases, however, there is merely a list of technical jobs, with few or no performance standards for the end product.

FINANCIAL MONITORING

Financial rate-of-expenditure is monitored by companies performing R&D, since it is valuable as a project performance indicator. If the rate of spending is faster than predicted, then either the project may be ahead of schedule or the costs or the technical problems may have been underestimated. If the rate of spending lags behind the prediction, either the project is coming in under cost or the project is delayed, usually for technical reasons. Discriminating between these situations is important, but it is rarely practiced, and most financial monitoring is limited to looking at progress claims.

MARKETING

Marketing activities have been mostly theoretical to this point: the better projects will have some real market inputs, but these inputs will be few. The

end forecast and strategy will be fuzzy. As the technical development progresses, the company will increase contact with potential end users. The main performance indicator used by most companies is market potential; some go beyond this and provide sales forecasts.

The difference between market potential and sales forecasts is often confused. The company may or may not develop profiles of its competition and its own position in the target market relative to its competition. It is a rare company that does so, and in DIPP, such companies are the exception rather than the rule. When such analysis is applied to market potential on a customer-by-customer basis, the forecasts are strengthened. The more common practice is to apply unsubstantiated "market penetration factors" to broad market estimates.

DIPP products usually require either government regulatory testing (Military Specifications/Aircraft and Engine Certification, etc.), extended prototype evaluation (airline navigation systems), or quality control testing to tight military specifications. Such testing is usually planned for in the project. What is almost invariably missing is a comparable plan for marketing activities, so that when the engineers are finished the marketers can carry on, i.e., the company has developed not only a product and a forecast but also the strategy to achieve the forecast.

As the project progresses technically, the following marketing activities should be in progress:

- updating the market forecast and the competitive position;

- determining that the product need continues to exist in the same form as the product under development;

- refining of the market strategy for later implementation and identifying sales and service needs precisely.

It is apparent that the technical and financial monitoring and control of R&D projects is essential in order to track the progress of project implementation. It is equally important that this progress be related to the project's market strategy and marketing activities modified when necessary to improve the potential commercial success of the project. Likewise, SE and CA projects must be monitored and controlled properly in order to minimize losses and maximize the benefits.