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# PROSPERITY CONSULTATIONS

## Aerospace and Defence Sectors

A Contribution to the



PROSPERITY INITIATIVE  
INITIATIVE | PROSPÉRITÉ

**This report has been prepared by a private sector consultation group at the request of the Honourable Michael Wilson, Minister of Industry, Science and Technology and Minister for International Trade, as a contribution to the Prosperity Initiative.**

**This document is one of a series of reports setting out the conclusions and recommendations of intensive consultations on the competitiveness challenges facing major industry sectors across Canada. The groups were broadly-based and included wide participation by a variety of stakeholders.**

June 1992

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## Aerospace and Defence Sectors

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A Contribution to the



PROSPERITY INITIATIVE  
INITIATIVE PROSPÉRITÉ

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## **INTRODUCTION**

The report of the Aerospace and Defence Sector Prosperity Consultations Group has been prepared for submission to the Honourable Michael Wilson, Minister of Industry, Science and Technology. The report contains recommendations for action by industry and by government, action which, if taken, will improve the international competitive position of this industry sector.

Aerospace has long had an international focus but the pace of globalization is accelerating rapidly and steadily. Given the Canadian industry's past track record of successful export market penetration, these issues might not be seen as urgent priorities. However, complacency in both industry and government is the single chief enemy of competitiveness.

Given Canada's unacceptably low productivity performance over an extended period, total quality management adoption levels far behind our international competitors and government support initiatives that are often inconsistent, it is clear that the need for change is urgent.

These consultations are but a beginning. Major work lies ahead. The remarkable cooperation from industry among the more than fifty companies involved must continue. The time and effort necessary to develop a work plan within the AIAC/ISTC MOU must be made available. This plan must be implemented quickly.

Canada needs a "Canada Incorporated" approach to its aerospace/defence sector with coordinated interdepartmental policies and programs. Government and industry must continue to work as a team. The teamwork exemplified in the production of this report bodes well for the future.

The Aerospace and Defence Prosperity Consultations Group wishes to express its appreciation to the Honourable Michael Wilson for the opportunity to be part of this process. We feel that other manufacturing sectors may be able to benefit from Canada's aerospace/defence sector international successes.

This report must be seen as the first phase of an action plan which in turn must be put into place on an **urgent** basis. The aerospace/defence sector of Canada is prepared to do its part in addressing these competitiveness issues and looks forward to working with government, academia and labour to resolve the challenges which face us. We are confident of success and look forward to a mutually satisfactory resolution of the issues and recommendations contained in this report.

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Ken Kivenko  
Vice Chairman

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Elvie Smith  
Chairman

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## COMMITTEE MEMBERS

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President & CEO  
Air Transport Association of Canada  
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Vice-President  
Government Relations  
CAE Electronics Ltd.

## **RECOMMENDATIONS**

## **RECOMMENDATIONS**

### **LEARNING**

#### **A. ACTIONS REQUIRED BY INDUSTRY**

1. Establish an Aerospace Industries Association of Canada sub-committee on **learning** to improve the sharing of learning information among companies and trade associations.
2. Involvement and commitment by top level management is essential. Learning expenditures must be adequate, say 5% of work hours.
3. Measure training results to ensure training effectiveness. In the short term, focus learning efforts on productivity growth.
4. Partner with labour in developing a participative management environment.
5. Build on existing aerospace industry/academic cooperative successes to tailor training curricula to industrial needs. (Ex. Centre for Aerospace Manpower Activities in Quebec).
6. Push hard at the provincial level to define and achieve world class competitive educational standards at all levels.
7. Establish a consistent policy of employing technology/engineering summer/co-op students.
8. Provide for career-long learning for all employees.
9. Accept that continuing and rapid change is inevitable; view change as an opportunity and plan so as to benefit from it.



## **LEARNING**

### **B. ACTIONS REQUIRED BY ALL LEVELS OF GOVERNMENT**

1. Benchmark Canada's educational system against international competitors and define required improvements.
2. Provide seed money to initiate Centre for Aerospace Manpower Activities in Quebec type cooperative training/education, assessment and curriculum design activities in all provinces.
3. Define a recognition/award system for top performing high schools and universities, similar to the Canadian Awards for Business Excellence.
4. Ensure that industrial needs are transmitted to educational institutions to accelerate fundamental change in those institutions.

## **INNOVATION**

### **A. ACTIONS REQUIRED BY INDUSTRY**

1. Ensure that strategic plans focus on international markets and customer needs.
2. Ensure that risk taking innovation is encouraged by developing a non-threatening company environment.
3. Top management must be totally committed to innovation. They must be fully involved in a regular, serious and effective strategic planning process.
4. At least 10% of sales must be assigned steadily to Research and Development by both larger and second tier companies.
5. Develop multi-disciplinary team approach and apply "concurrent engineering" concepts. Managers should see themselves as coaches/facilitators.
6. Manufacturing process as well as product development must be included in Research and Development activities.
7. Corporate culture networking should be organized through Aerospace Industries Association of Canada/Industry, Science and Technology Canada to improve the managing and measuring of the continuous improvement process.
8. World-class core competencies must be identified and steadily developed; these are central to innovative performance.
9. Larger companies must encourage innovation in smaller supplier companies, including licensing and undertaking joint ventures.

## **INNOVATION**

### **B. ACTIONS REQUIRED BY GOVERNMENT**

1. A pragmatic approach to government assistance including Defence Industry Productivity Program, procurement and associated industrial benefits must be taken, supporting only projects which are of demonstrable benefit to Canada. If these are regionally dispersed, fine, but regional distribution for its own sake should not be promoted.
2. Government's industrial development strategy must include much improved coordination among procuring government departments.
3. Continue current policy of giving priority in government Research and Development support to successful companies with an export focus.
4. Encourage strong industry representation on the boards of National Research Council/Chief Research and Development, universities, etc. to set relevant training and research priorities.
5. Ensure adequate venture capital in all regions of the country with a hi-tech focus. (This would be much more effective than current approaches to regional development).
6. The Department of Supply and Services unsolicited proposals program should be re-introduced.
7. Give higher profile to Canadian Awards for Business Excellence Innovation Award winners.

## **COMPETITIVE DOMESTIC MARKET**

### **A. ACTIONS REQUIRED BY INDUSTRY**

1. Establish, along with government, a senior task force to make recommendations to ministers and to Aerospace Industries Association of Canada in regard to all action items listed here for industry and government.
2. Seize the opportunity to develop products for the domestic market which will also be competitive internationally.
3. Actively encourage the development of high performance/quality standards which will lead to internationally competitive products.
4. Establish long-term prime/supplier relationships to ensure continuity of supplier continuous improvement initiative.

## **COMPETITIVE DOMESTIC MARKET**

### **B. ACTIONS REQUIRED BY GOVERNMENT**

1. Provide senior participation in the task force under A.1. of this section.
2. Undertake an immediate review of industrial regional benefits policy.
3. Fundamental reassessment of the role of technical service detachments including the elimination of a substantial number of detachments and reduced government administrative involvement in contractor operations.
4. Accept commercial pricing for government contracts. Focus on adequacy of price/quality as opposed to tracking costs and profits.
5. Replace current audit practices with an annual supplier audit focused on quality and commercial pricing.
6. When a strategic Canadian benefit results, unbundle major crown projects to enable Canadian companies to bid separate items.
7. Unless new sources are clearly needed and sustainable, encourage existing firms to meet Canada's needs.
8. Recognize the development of new management techniques and new manufacturing processes as eligible costs against Defence Industry Productivity Program and other programs.
9. Ensure that government procurement specifications do not result in over-engineered products which are non-competitive internationally.
10. Institute for Canadian government aerospace/defence procurements, a program modelled on the U.S. "Blue Chip" program which rewards superior performance.
11. Accelerate the decision making process for major capital projects.

## **TRADING SMARTER**

### **A. ACTIONS REQUIRED BY INDUSTRY**

1. Establish on a priority basis appropriate international collaborative and other arrangements to enhance market penetration.
2. Concentrate on innovative niche market products based on sound market research.
3. Total quality management, steady Research and Development investment and strong customer focus must be strongly supported by top management to world-class standards.
4. Develop company-wide focus and understanding of the global nature of the aerospace/defence business.
5. When appropriate develop low cost suppliers abroad.
6. Industry via Aerospace Industries Association of Canada and other trade associations must energetically support government efforts to enhance the Defence Development Sharing Arrangement/Defence Production Sharing Arrangement.
7. Develop much stronger international marketing skills. The Aerospace Industries Association of Canada defence and marketing sub-committee should undertake a specific program to support this initiative.
8. Recognize and be prepared for rapid and continuing change in international markets.
9. Make much greater use of government trade and defence personnel stationed abroad.

## **TRADING SMARTER**

### **B. ACTIONS REQUIRED BY GOVERNMENT**

1. The government must make every effort possible to ensure a level playing field. This includes:
  - a. providing more competitive and timely Export Development Corporation concessional financing where required;
  - b. continuing to monitor international subsidy programs and non-tariff barrier developments, challenging foreign governments on a case-by-case basis where appropriate.
2. Simplify, harmonize and physically concentrate the regulations, intelligence and services relating to international trade.
3. Export controls and human rights positions must be clearly enunciated and consistently applied. The completion of foreign transactions already under contract, including Repair, Overhaul and Maintenance must be allowed when export control rules change.
4. Routine export control permits should follow a fast track process.
5. Consider one stop export marketing assistance to industry. The International Trade Commissioner Service and Defence Programs Bureau should be promptly reintegrated with Industry, Science and Technology Canada.
6. Enhance dissemination of market intelligence from foreign posts.
7. Consider and consult with industry carefully before modifying international marketing support programs.
8. Work diligently to ensure that the Defence Development Sharing Arrangement/Defence Production Sharing Arrangement with the U.S. stay in place.
9. Continue to ensure strategic industrial base technologies are maintained/developed in Canada through government acquisition/Industrial Benefits programs.

## **PARTNERSHIPS**

### **A. ACTIONS REQUIRED BY INDUSTRY**

1. Work more closely with academia:
  - a. get involved at all levels, elementary, secondary and university to stimulate interest in science and engineering and to raise educational standards;
  - b. encourage tailoring of curricula to industry needs;
  - c. sponsor product/market driven Research and Development in universities.
2. Communicate missions and goals widely and clearly with all levels: accept labour as true partner in all activities.
3. Support small business incubator initiatives in academic institutions.
4. Large firms must offer high quality, meaningful partnerships to smaller firms.
5. Make greater use of Aerospace Industries Association of Canada networks in all skill areas; specifically make greater use of the Aerospace Industries Association of Canada/Industry, Science and Technology Canada Memorandum of Understanding.
6. Energetically support National Research Council initiatives to focus on industrial needs.
7. Treat customers and suppliers as long-term partners.



## **PARTNERSHIPS**

### **B. ACTIONS REQUIRED BY GOVERNMENT**

1. Actions by the various federal and provincial governments in international markets must be better coordinated.
2. Federal government policies, regulations and activities should be screened for their impact on Canadian international competitiveness. Industry, Science and Technology Canada should lead an ADM level steering committee to coordinate this activity.
3. The effective industry/government working relationship must be steadily nurtured via continuing meaningful consultation and dialogue. (e.g. the Industry, Science and Technology Canada/Aerospace Industries Association of Canada Memorandum of Understanding).

## **FINANCING**

### **A. ACTIONS REQUIRED BY INDUSTRY**

1. Give Export Development Corporation early notice of possible sales to new markets where Export Development Corporation support may be needed.
2. Develop expertise in dealing with underwriters and financial markets.
3. Develop a full knowledge of available federal and provincial assistance schemes.
4. Industry should avoid government loan guarantees because they are generally not effective. (Government - Federal, Provincial)
5. Energetically support and defend the Defence Industry Productivity Program. Numerous independent studies have validated this program. Funds for Defence Industry Productivity Program must, in real terms be at least maintained and preferably increased.
6. Industry must manage assets better, reduce inventory to just-in-time levels in order to free up cash.

## **FINANCING**

### **B. ACTIONS REQUIRED BY GOVERNMENT**

1. Revise the tax structure so that private sector risk takers have a reasonable prospect of making a profit on high-tech start-up companies. (Current tax rates encourage would be venture capitalists to leave the money in secure, low risk investments).
2. The development of widely dispersed (geographically) venture capital firms should be encouraged by every means possible.
3. Review section 31 Export Development Corporation on concessional financing. Faster response and bolder approaches are required. Smaller firms also need more Export Development Corporation help.
4. Defence Industry Productivity Program funds must, in real terms, be at least maintained and preferably increased.
5. Federal and provincial governments should define coordinated programs to provide broader support for new high-tech industrial developments. (e.g. Federal support for product and process Research and Development and provincial support for manufacturing equipment and start-up costs.)
6. Government should consider better progress payment schedules on major contracts. Holdbacks are particularly difficult for small firms.

# **CHAPTER 1**

# **LEARNING**

## LEARNING

### INTRODUCTION

The world is quickly moving towards a more knowledge-intensive economy. An essential condition to Canada's ability to adjust to increasing competition and changing markets is the need for new and upgraded skills as well as the means through which these can be obtained. The continued prosperity of the Canadian aerospace industry depends greatly on developing and promoting a learning culture.

### SUMMARY OF PRESENTATIONS

#### The Sub-Committee on Learning

The objective of the sub-committee was to gather the thoughts and observations of several representatives of aerospace and defence electronics industry companies which have had extensive experience in issues related to learning. More specifically, the proposed issues for consideration included: entry level skills; skills upgrading; and, schooling, engineering and management focus. Companies were selected on the basis of their relevant experiences with these issues and invited to participate in the consultations process.

#### The Participants

**Bell Helicopter** and **Dowty Aérospatiale** have recently had to deal with the establishment of new manufacturing facilities dedicated to the production of new products involving new technologies. Both have had to implement fast-track methods to acquire the required expertise. Whereas Bell focuses on "finding a better way" and applies work simplification theories of the 1960s, which are still relevant today, Dowty promotes building high performance work and people systems. Both companies stress the importance of a team approach with each team receiving the tools necessary to plan, control, and execute their work.

**Menasco Aerospace Ltd.**, a well established aerospace sub-system supplier, described its participative management approach to the Menasco Continuous Quality Improvement program. The company has implemented intensive training for all employees in advanced quality systems. Training is viewed as an investment not as a cost of doing business.

**CAE Electronics Ltd.**, which is highly R&D oriented, addressed the issue of education in a competitive globalized economy and the need to strengthen Canada's education system. We must create "brain power" in Canada rather than low wage workers. By re-emphasizing science and mathematics in schools, Canada will be more adequately prepared for continuing technological development which is a key to competitiveness.

**EDO Canada Limited**, a small company involved in advanced material components, focused on the need to respond to rapid changes in technology and market demands. While much

of its training requirements are met through in-house programs, much of its learning experience has come from transfers of technology and a sustained R&D effort.

**The Centre for Aerospace Manpower Activities in Quebec (CAMAQ)**, which is a non-profit corporation resulting from an initiative of the Quebec aerospace industry in cooperation with labour and the provincial as well as federal governments, spoke of partnership in training and described ongoing activities to promote the development of relevant educational programs in that province.

Of note is the establishment of a high school level program "L'École des métiers de l'aérospatiale" scheduled to accommodate as many as 500 students, starting in September 1993, to offer programs in machining techniques; tool design; and, structural, mechanical and wiring assembly. The Centre is also supporting an Aerospace Engineering Masters Degree program which was established in September 1990, in conjunction with five Quebec universities and fourteen aerospace companies.

Learning is as much a process of developing an attitude or behavioural tendency as it is a process of acquiring new skills and knowledge. In that context, **Kristin Shannon**, a strategic planner and trend forecaster teamed with **Ed Fitzhenry** of **Pelorus Navigation Systems, Inc.**, a small manufacturer of aerospace navigation equipment, to highlight the Full Learning Experience (FLEX) program which emphasizes the study of thinking patterns, encourages flexible thinking and brain training as well as promotes learning attitudes and values.

### **Summary of Findings**

While each of the participants' approach to learning was designed to meet the specific needs of their organizations, there were elements common to all which are key to a successful learning experience. These are:

- The direct involvement and commitment of top level management to creating a learning organization.
- Learning is a continuous process of striving for improvement of all skills, manual, mental, and social.
- Good communication and information sharing contribute to a better understanding of company values, objectives, and results.
- Learning must promote flexibility and multiple skilling.
- Industry must interact with the educational system to establish basic requirements and develop appropriate curricula.
- The rate of organizational learning is a competitive advantage.

## **RECOMMENDATIONS**

In considering the key issues raised by the participants, it is clearly evident that the fundamental focus of any approach to learning must be to maintain and improve competitiveness. Training must emphasize:

**TEAM BUILDING**  
+  
**PARTICIPATIVE MANAGEMENT**  
+  
**CONTINUOUS IMPROVEMENT**  
+  
**MEASUREMENT OF RESULTS**

Therefore, in order to foster the ongoing development of a learning culture within Canadian aerospace companies, the sub-committee would offer the following recommendations:

### **A. Actions Required by Industry**

1. Establish an Aerospace Industries Association of Canada sub-committee on learning to improve the sharing of learning information among companies and trade associations.
2. Involvement and commitment by top level management is essential. Learning expenditures must be adequate, say 5% of work hours.
3. Measure training results to ensure training effectiveness. In the short term, focus learning efforts on productivity growth.
4. Partner with labour in developing a participative management environment.
5. Build on existing aerospace industry/academic cooperative successes to tailor training curricula to industrial needs. (Ex. Centre for Aerospace Manpower Activities in Quebec).
6. Push hard at the provincial level to define and achieve world class competitive educational standards at all levels.
7. Establish a consistent policy of employing technology/engineering summer/co-op students.
8. Provide for career-long learning for all employees.
9. Accept that continuing and rapid change is inevitable; view change as an opportunity and plan so as to benefit from it.

**B. Actions Required by all Levels of Government**

1. Benchmark Canada's educational system against international competitors and define required improvements.
2. Provide seed money to initiate Centre for Aerospace Manpower Activities in Quebec type cooperative training/education, assessment and curriculum design activities in all provinces.
3. Define a recognition/award system for top performing high schools and universities, similar to the Canadian Awards for Business Excellence.
4. Ensure that industrial needs are transmitted to educational institutions to accelerate fundamental change in those institutions.

**LEARNING SUB-COMMITTEE:**

**Chairman:**

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Professor University of Toronto  
Chairman & C.E.O. - Fleck Manufacturing

Mr. Lloyd Shoppa  
President  
Bell Helicopter, Mirabel

Mr. Ed Fitzhenry  
President & C.E.O.  
Pelorus Navigation Systems Inc.

Mr. Charles Ethier  
Industry, Science and Technology Canada



## **CHAPTER 2**

# **INNOVATION**

## **INNOVATION**

Following is a summary of the views expressed by a representative sample of small, medium and large Canadian aerospace companies with a history of successful performance through innovation which were invited to make presentations to the Sub-Committee on Innovation.

The presentations were based on the following guidelines:

### **GUIDELINES FOR PRESENTATIONS**

We consider innovation from the perspective of three categories:

1. Innovation in products and technologies.
2. Innovation in production covering the broadest scope of activities: manufacturing, process technologies, testing, purchasing, distribution.
3. Innovation in all aspects of management, marketing, support, as well as human resources and information technology.

Based on your insights, your company's experience and the experience of your particular industry sector, please address the following questions in the context of each of the three categories stated above:

1. What kinds of innovation initiatives have enabled you to achieve a competitive advantage in the market?
2. How are you organized to achieve these kinds of innovation?
3. What threats and weaknesses do you perceive to exist which hinder innovation in your industry sector in Canada?
4. What unique opportunities for innovation in your industry sector exist or should be created in Canada and how do you propose that we go about creating them?
5. What, in your judgement, is the market's or international customers' perception of, or industry's success in, innovation?
6. What should be the role of organized labour in helping to foster a climate of innovation in our industry in Canada?
7. What other general comments or suggestions do you have to help our industry innovate better?

## **SUMMARY OF RESPONSES**

### **Organizational Issues**

Successful innovators organize for innovation.

- Top management totally committed to innovation through action: resource allocation, promotion policy, business performance reviews, setting of goals and objectives, organizing for innovation.
- Unbureaucratic organization which allows creativity to flow freely.
- Thin and informal management structure ensuring that the innovators are close to the decision makers.
- A non-punitive environment which is tolerant of mistakes and encourages risk taking.
- Strategic business and technology planning which takes the long view - at least five years into the future.
- An environment which promotes continuous learning from both success and failures.
- Both formal and informal continuous learning.
- Tripartite links of company, government and university as sources of innovation.
- Risk sharing with government agencies.
- High emphasis on multi-functional, multi-disciplinary teams for bringing products to market. "Concurrent engineering" encompassing all R&D skills, production and test engineering, marketing, customer support working concurrently on product and process development in a customer-focused environment.
- Successful embodiment of innovative management, such as TQM, will be a competitive discriminator in the 1990's and beyond.
- Management and Unions must develop better understanding and mutual trust to permit the concept of TQM to succeed.

### **Geographic Infrastructure**

Innovation is stimulated within technology hubs comprising diverse industries and skills. The federal government's regional distribution policy runs counter to this and is, therefore, a negative factor.

**Resources**

Successful, innovative companies:

- Invest heavily into company-funded R&D above and beyond all external assistance - typically 10% of sales or more;
- Invest heavily into market development;
- Maintain a strong balance between being technology driven and market driven;
- Continuously invest in upgrading capital facilities by introducing the latest, most advanced and effective R&D tools in both hardware and software, testing tools and production facilities;
- Maintain the state-of-the-art in all categories of capital investment.

**The Customer**

Successful, innovative companies:

- Are customer focused;
- Maintain multiple direct, corresponding links with the customer at all levels of the company's organization and through all the functions, marketing, R&D, production, quality, support, general management, contracts and so on;
- Involve the customer in their business and strategic plans.

**Human Resources and Policies**

Successful, innovative companies:

- Make heavy investments (5 to 10% of available hours of work) and have a pervasive program of continuous learning and training at all levels and in all functions;
- Empower their employees, teams and business units with relatively high levels of authority and autonomy;
- Implement wide-ranging processes of continuous improvement, Total Quality Management, self-directed work team structures;
- Exhibit strong, visible and active senior management commitment to the above;
- Actively encourage all employees to continuously seek new and better ways of doing their jobs and to experiment freely in a non-rigid, non-authoritarian, highly flexible and failure-tolerant environment;

- Constantly acknowledge and celebrate the successes of the teams and the individuals in the organization;
- De-emphasize the command and control structure of management;
- Select, train and encourage a management cadre which emphasizes its primary role as coaches, teachers, facilitators, orchestrators and problem solvers;
- Ensure that employees, especially technical professional people, are strong, trained conceptualizers and problem solvers;
- Foster a climate where the established way of doing things is constantly challenged, examined and willingly abandoned in favour of better, more effective and more productive ways;
- Ensure that the disciplines, methodologies and analytical tools of continuous improvement are taught to all and practiced.

### **Strategic Planning**

Successful companies have learned to manage strategically. They effectively carry out the formulation and implementation of market driven strategies and integrate R&D as part of the company's overall strategy, in order to secure a higher rate of success in the market.

### **R&D**

Successful innovative companies:

- Have an unwavering policy of product and process development, both revolutionary and evolutionary;
- Continuously produce a stream of new products which are designed to achieve a distinct, competitive advantage in the international market place;
- Have certain identifiable and distinct technological competencies which are among the best in the world;
- Have a cadre of recognized experts in the systems, product or process technologies which constitute the essential core of their company's human resource deployment.

### **The Market**

The consistently successful Canadian aerospace companies are focused on the international market directly or, in some cases, indirectly through Canadian primes who sell into the international market - and are not focused on the relatively small Canadian market. The corollary is equally true. It is of major and overriding importance to note that these companies have distinct technological competencies of world-class calibre which they constantly nurture and which they effectively use to generate innovative products and

systems which have achieved a sustainable, competitive advantage in the international marketplace - generally in specific market niches. These companies are recognized by the international market as leaders in their niche and are respected for the superiority of their products and services.

**Canadian Government Procurement As A Stimulant For Innovation**

The lack of an integrated government industrial policy in the area of government procurement is detrimental to industry competing in the global marketplace.

DND, DOT, DOC, EAIT, SSC and ISTC have understandably different mandates. However, a unifying competitive industrial strategy, which links Canada's aerospace industry and these government departments, through a structured market, is effectively missing.

It is imperative for a small country like Canada to ensure that there is maximum coordination among ISTC, SSC and the operating agencies like DND, DOT and DOC. Procurement from Canadian sources must be based on the strategy of the ability of the Canadian company to demonstrate that it will achieve a sustainable competitive advantage in the global market as a result of the Canadian government procurement. This must be the overriding consideration. Where an international competitive advantage cannot be achieved by designing a particular product or system in Canada for a Canadian requirement, then that system should be competitively opened to a qualified foreign source while the government aggressively negotiates a position for other truly competitive Canadian products with that foreign source for sales to the global market. This is the offset trade policy for creating a truly win-win situation.

It is also felt that the government's regional distribution policy handicaps locally established Canadian companies while favouring their foreign competitors who can set up shop in areas of current political desirability and generally adds complexity, time and cost. It hinders the innovative process by encouraging disjointed small establishments which have some short term work at a premium cost to the government but which do not develop the world-class technological competencies which would enable them to achieve a distinct, competitive advantage in the world market with proprietary, innovative, superior products. They inherently, thus, never lose their status of being wards of the state.

The government's Industrial Benefits policy hinders innovation. It creates some short-term "touch-labour" which is no longer the primary source of value-added in the 90's. At best it brings in mature technologies which do not lead to the Canadian recipients gaining an advantage in the international market.

This policy is a costly burden in most cases, which, as implemented, acts to discourage rather than encourage the purchase by foreign sources of truly innovative, proprietary Canadian products which have proven to be the only dependable source of profitable revenue, high value jobs and industrial growth.

A restructured policy needs also to address the lack of relative critical mass to face the globalization realities of the 1990's.

**The Government's Role in R&D**

As the cost of R&D continues to rise while the useful life of high technology products continues to decrease, the efficiency and effectiveness of R&D become critical issues. Concomitantly, the globalization of the markets, world-wide overcapacity especially in defence industries and the relatively high cost of knowledge work in Canada, have put downward pressure on margins, thereby decreasing the available money for company-funded R&D at a time when, in fact, more is needed.

The successful companies are learning to cope by using innovative management, TQM, concurrent engineering and other related process optimizing methods to significantly reduce the cost and time to develop products.

Successful companies have learned to manage strategically. They effectively carry out the formulation and implementation of market driven strategies and integrate R&D as part of the company's overall strategy, in order to secure a higher rate of success in the market.

The government must do likewise with the scarce resources at its disposal. Extensive consultation with and active involvement from industry must be secured to ensure that R&D carried out in government research labs, or otherwise sponsored and supported by government agencies, has a demonstrable objective of enabling industry to achieve a competitive advantage in the global market. Increased levels of sensibly deployed government assistance to industry for R&D are also necessary to enable Canadian industry to better compete in the global economy.

**INNOVATION SUB-COMMITTEE:**

**Chairman:**

Mr. John H. Simons  
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Canadian Marconi Co.

Mr. Ervin Spinner  
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## **CHAPTER 3**

# **COMPETITIVE DOMESTIC MARKET**

## **COMPETITIVE DOMESTIC MARKET**

### **INTRODUCTION**

There are many issues that impact the competitive domestic market. The sub-committee took the decision to deal with two areas that were considered critical and where change could be made by cooperation between government and industry. The sub-committee also recognized that the changes were process, structural and attitude related and would not require large financial investments by either government or industry.

It was decided to consider government/industry procurement practices and the federal industrial and regional benefits policy. Government and industry supplier development efforts were included in discussions of the two areas mentioned above. It was also considered important to determine the views of government customers [the Department of National Defence (DND) and the Canadian Space Agency (CSA)]. The sub-committee also recognized that although organized labour decided not to participate, they could have provided an important perspective on these consultations.

### **GOVERNMENT/INDUSTRY PROCUREMENT PRACTICES**

There is a special relationship in the aerospace defence electronics sector between government and industry. Government is a major user of aerospace products, indeed the only Canadian user of defence electronics equipment. This relationship has become increasingly strained over the years, with the potential for further deterioration. This could be increasingly more costly for both sides and impinge upon mutual cooperation.

DND and the CSA have both stated that the products when finally delivered by Canadian industry meet their operating requirement and are of high quality. It is thought that the sector has a world class reputation for their products. Although the primary focus of DND is on the quality of the product it cannot be at the expense of a burdening process nor at any cost. All parties agree that the emergent problems have the potential to negatively affect the links between Canadian Industry and the government.

These problems stemming from process changes, delays, costing and scheduling issues are the result of actions taken by both government and industry and are becoming an impediment to the normalisation of the industry/government contracting process. This has caused the government to develop and require unique and separate administration and contracting procedures.

The industry has responded by hiring additional accountants, invoice/inventory clerks, negotiators, etc. that deal specifically with government work. The company corporate overheads increase, specific disallowed costs for the government contracts are transferred to the commercial products and the resulting increased administrative burden and cost makes the firm inefficient and internationally non-competitive.

**\*Industry** - Has an obligation to provide a quality product, on time, and at a competitive price. Industry has an obligation to manage their cost structure, to adopt modern manufacturing and management processes (e.g. TQM) to assure they are positioned to deliver value to their government customers as well as be positioned to compete effectively in the international markets. Industry must also accept that they are not "entitled" to be the beneficiary of government orders simply because they are in the business. The concept of "delivering customer value" must be a major priority.

**\*Government** - First and foremost the government must recognize that the onus for major change is equally a requirement for them, given that many of their current day practices in themselves contribute to higher costs in industry as well as materially increasing their own procurement costs. The following points represent some examples of opportunities where the government can take positive action.

- \* **Eliminate TSD'S** - Adopt commercial quality standards with normal warranties for parts and workmanship, and eliminate the redundant and largely non-productive TSD activity.
- \* **Adopt commercial cost rates and commercial administrative procedures for procurements** - Focus on receiving value for the procurement dollar through a competitive bidding process and eliminate the non productive preoccupation on "allowable cost" and "rates of profit". As long as the government is satisfied it is receiving good value then it should be indifferent to the level of profit being earned by the supplying organization. The government must also accept that every company must recover its cost and generate a reasonable return for its shareholders and is therefore forced to recover disallowed costs from its commercial customers. As a result, the current practices may in themselves restrict a company's ability to win commercial orders both domestically and internationally. The adoption of a new and enlightened approach to procurement would allow the government an opportunity to reduce the infrastructure used to support the present system.
- \* **Competition** - Although the sub-committee well understands the benefits of healthy competition, it is our opinion that the limited size of the domestic market is such that the use of government monies to establish a new competitive sole source must be carefully considered. The result may be two weak capabilities, neither of which will develop into a world class supplier. There are adequate international aerospace and defence electronic suppliers to enable competitive prices to be established. It is our sense that the government's Industrial and Regional Benefits strategies must be focused on the creation and strengthening of an industry that can compete effectively worldwide, and avoid actions that will weaken its current strengths. Creation of excess capacity aimed at near term job creation, will ultimately result in the opposite effect.

Government and industry must work together to develop acceptable industrial strategies in these areas in order to ensure that existing capability is developed, not lost. In response, single source suppliers in these specialized sectors must face the challenge of becoming internationally competitive without domestic competition. The government is a major customer, and new contracting approaches must be introduced to ensure that the government receives value for money while the supplier becomes internationally competitive.

It may be appropriate to also introduce into the contracts a shared savings formula for continuous improvement, total quality management, flexible manufacturing techniques and other new methods of process and production to reduce the total contract price. If the government saves money on the total contract price through innovation by the contractor, then the contractor should be rewarded. It is the view of this sector that looking at reducing the total price while allowing cost savings sharing will encourage the industry to get the price down. This in turn will make the industry more competitive.

### **INDUSTRIAL AND REGIONAL DEVELOPMENT PROGRAMS**

The political imperatives associated with the current policies are well understood. The sub-committee does advocate, however, the development of industry capability where it naturally exists based on principles of sustainable development, non-duplication and specialization. The direction of government orders to specific regions must carry with it the obligation that the beneficiary provide goods and/or services on a competitive basis i.e. at prices readily available in other geographic areas of the domestic marketplace.

In general, the aerospace and defence electronics sector supports the use of procurement for industrial development and for their industry in the regions. On the positive side, a viable supplier base can be created, there can be long-term job creation and there will be commercial export opportunities. On the negative side, in this sector, there is an embryonic industrial capability in some sectors and in some regions. There is the danger of fragmentation of the existing capability and capacity by focusing on regional development rather than industrial development.

The industry is concerned that the government has no overall plan and looks at the possibilities for industrial and regional development on a case by case basis. There is no national procurement strategy that would allow industry to know what government wants "up front". If a strategy was developed, effective regional distribution could be achieved.

There is the perception that political pressures override long-term objectives. The sector wants political objectives to be stated early in the procurement process and then remain the same for the duration of the project.

There was a general belief that a critical industrial mass should be developed first. One of the ways to assist in the development of a competitive industrial base in this sector is to encourage new methods of production. Therefore, the government should consider supporting TQM, flexible manufacturing and industry modernization initiatives, through the Defence Industry Productivity Program and Regional Development Programs.

In Canada, for some areas within this sector, it would mean the development and nurturing of national champions. Once the national champions have been established and are competitive internationally, then regional development can start. Otherwise non-competitive regional firms may be created that will weaken the overall strength of the sector.

The industry is prepared to support regional distribution targets and is prepared to support the development of the regions. The industry is not prepared to continue to support non-competitive regional sources of supply. It is the industry view, that, after an appropriate period of time to become familiar with the requirement (the learning curve), regional suppliers should be prepared to provide at least domestically competitive products. The government should be prepared to re-assess regional development initiatives where industry has been unable to achieve this goal.

From the perspective of industry located in the regions, a government commitment to the development of regional industry can also be considered to encourage national unity. The policy has not only led to employment in disparate areas of the country but also to the economic and social spinoffs provided by the establishment of communities of educated, trained and relatively well paid work forces.

Regional industry for the most part is satisfied with the structure and administration of government assistance programs. While "more and better" programs would be desirable, there is a need for more subsidized trade missions. To complement the additional trade missions better financing terms (i.e. absorption of Export Development Corporation fees) could make the difference in winning a close international competition.

Finally, while the industry acknowledges the value and importance of the Industrial and Regional Benefits Policy (IRB), there is concern with respect to process. Industry has found that IRB management is too project oriented, administratively burdensome, and excessively demanding in reporting. In addition, there are numerous departments involved in the process, all involved with their own priorities. While using the policy for development and sustaining industry, expectations by Canadian suppliers have become too high. A "you come to me with your order book" attitude has been developed in some cases. As a result there is an attitude that price, quality and delivery are not essential if the deliverables are to fulfil an IRB requirement. This attitude must change.

The industry thinks that to make the policy more effective, there should be more inter-governmental coordination, closer collaboration between government and industry and a sharing of IRB management of foreign sub-contractors between the prime contractor and the Crown. The industry thinks that to make the policy more efficient there should be a reduction in IRB administration and risk, more IRB management flexibility and the development of standardized terms and conditions.

## **CONCLUSIONS**

The industry recognizes the need for a competitive domestic market where appropriate. The unique nature of the industry requires government/industry cooperation. The main two areas that affect the competitive domestic market are government procurement policy and

the industrial and regional benefits policy. There is a pressing need for changes to be made to both areas by the government. For industry there is a need to rely less on the government, introduce new methods of management and production processes, and to become more aggressive in seeking export markets.

## **RECOMMENDATIONS**

A government/industry task force of senior officials should be formed immediately to prepare recommendations to Ministers and to the Aerospace Industries Association of Canada in the following areas:

1. Revise the government procurement policy that will both encourage firms to change their management and production processes, and share financial and technical risk between the government and industry;
2. Revise the industrial and regional benefits policy to support existing Canadian capability where appropriate, reward innovative firms, reduce government involvement administratively and introduce government/industry risk sharing;
3. Revise government/industry funding programs (DIPP, EDC, regional development programs) to support new management and manufacturing techniques (TQM, flexible manufacturing, etc.);

The taskforce should focus on the following principles:

- Recognize the relative importance of domestic competition versus "clusters" for value to the customer in the home market, fair trade across provincial boundaries, managed trade globally and competitiveness in the export market.
- Recognize the relationship between cost, time to market, value to the customer, ROI (profits) for suppliers and the ability to re-invest in the future.
- Advocate a government-wide procurement policy, taking into account overall value to the Canadian taxpayer, government-wide (including political) objectives and private sector interests.
- Support the need for greater consultation and coordination across departments and with the private sector, with particular emphasis on innovation (R&D), procurement and re-investment.

The task force should report back on achievements and obstacles to Cabinet and the AIAC Board within six months, and thereafter on an annual basis as required. The government and industry should also form a permanent consultative mechanism to review, modify, recommend and re-affirm strategies and new directions in the aerospace and defence electronics sector.

**COMPETITIVE DOMESTIC MARKET SUB-COMMITTEE:**

**Chairman:**

Mr. Ken Perry  
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Mr. Bob Hamaberg  
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## **CHAPTER 4**

# **TRADING SMARTER**



## **TRADING SMARTER**

### **RELEVANCE OF INTERNATIONAL TRADE**

Continuing international competitiveness is a matter of survival for the Canadian aerospace and defence electronics industry. Domestic requirements can only support a small fraction of this industry, which exports 80 percent (\$6.1 billion in 1990) of shipments. International trade represents the cornerstone of prosperity for this industry, generating revenues and profits, supporting ongoing product development, creating high-calibre Canadian jobs, and providing opportunities for high-technology spin-off enterprises.

This industry is now facing severe challenges as the global environment is undergoing fundamental changes. Almost all nations are cutting their defence budgets, resulting in a growing worldwide overcapacity, industrial consolidation and restructuring. Competition is increasing as firms struggle to survive. Many competitors are focusing aggressively on diversification into civil and military niche markets currently held by Canadian industry. Protectionism is also increasing, reducing Canada's defence-customer base.

Consolidation is also expected to occur in the commuter and regional transport aircraft industry, where overcapacity exists as well. This will have important implications for the Canadian aircraft industry.

Nevertheless, there are some positive indicators. The decline in defence spending is somewhat offset by the continuing growth in the portion of electronics in defence systems. Strong long-term growth is predicted for civil aerospace markets, particularly for large civil transport aircraft, as demand for air travel is expected to increase again following the current recession, i.e. by mid 1993.

### **KEY ISSUES**

The committee examined the following key issues relating to this industry's competitiveness in the international market place: market access, globalization, and export controls.

#### **Market Access**

Commercial products are sold world-wide, whereas defence products are more restricted, primarily to NATO countries, depending on applicable export restrictions and levels of technology. For the industry as a whole, 62 percent of exports are shipped to the United States, who also supply about 90 percent of materials imported by the sector.

The primary obstacles to market access are competitors and non-tariff barriers. Foreign competitors are in most instances significantly larger than the Canadian firms, with broader capabilities and greater resources. Major industrial restructuring is resulting in fewer but more powerful competitors, not reluctant to engage in price wars to retain their market share in a declining market environment. Many are owned or controlled and strongly supported

by their governments. Outstanding examples among many are France and Italy. Such support includes government to government marketing and preferential treatment in domestic procurements, including large, fully-funded development contracts. In fact, Canadian firms are often competing against national teams led in many instances, by foreign governments.

Other examples of non-tariff barriers include offset requirements, restrictions against Canadian or other foreign firms for certain U.S. military development contracts, nationalistic buyers or foreign prime contractors preferring to source domestically, and foreign control of certain specialized technologies required by Canadian firms.

Sales financing has also become an extremely important issue. Most customers demand it. Foreign governments provide aggressive export sales financing assistance to their indigenous firms. France, Italy, Germany, Britain, Netherlands, Spain, Sweden and Brazil are notable examples. In Canada, Export Development Corporation (EDC) financing and ISTC support to industry through the Defence Industry Productivity Program (DIPP) are crucial to improve the financial competitiveness of Canadian exporters. But EDC is frequently non-competitive against competitors' concessional financing, and at times apparently whimsical with respect to eligible recipients. Furthermore, EDC charges the seller with applicable fees, making the selling price apparently higher against competitors whose financing organizations instead charge the purchaser with the fees (as does the U.S. EXIM bank).

Winning export contracts depends on an in-depth understanding of the markets being addressed, including local politics which often play a significant role in decision making. In addition, marketing in this industry sector requires hard work, perseverance and patience, as well as skill and deep pockets. The use of local representatives to obtain market intelligence and create a local presence for the firm is advisable for many countries. Smaller Canadian firms are often deficient in these areas, reducing their exporting successes.

Canadian embassies abroad, and the Canadian trade commissioners are very helpful in providing Canadian firms with initial contacts with foreign governments and firms, provide intelligence about local business opportunities and politics, and provide other services to help Canadian firms.

### **Globalization**

Strategic alliances and teaming arrangements with foreign firms are becoming increasingly more important for a number of reasons, including: political preference for domestic sources; offset requirements stipulating local or co-production; the need to share costs and risks of new development programs; customers' preference for whole systems solutions; obtaining needed technologies.

Several Canadian sector firms have found that acquisitions of U.S. firms have greatly helped in penetrating the U.S. market. Similarly, to obtain business in post EC'92 Europe a distinct European presence is required. This does not remove the need to do country-specific marketing.

Inhibiting factors to teaming arrangements and acquisitions are high management overhead and a lack of experience in these areas by most Canadian firms.

**Export Controls**

Canadian export controls are generally not a serious problem for most firms, providing they understand the Export Controls List (ECL). A concern is the apparently whimsical application of human rights related export controls by the Canadian government, which may place hitherto acceptable countries on the controls list, confounding established trading relationships. Also, U.S. export controls can apply for products with significant U.S. content, overlapping Canadian controls which are generally less restrictive in civil markets.

It is advisable for Canadian firms to work closely with the technical staff of the government which interprets the ECL, and the Department of External Affairs officers handling the various geographic desks, and trade commissioners, to exchange information and intelligence.

**RECOMMENDATIONS**

The present international environment is causing a global restructuring of the industry, changes in trading patterns, and concern in many countries about the viability of domestic industries. Competition and protectionism are also increasing.

Exports are a matter of survival for the Canadian aerospace and defence electronics industry. The following recommendations are offered to industry and government to strengthen the international competitiveness of this industry sector.

**Industry**

Canadian exporters in the aerospace and defence electronics industry are internationally successful on the basis of innovative niche products and outstanding quality. To continue to be competitive in the changing international environment:

- Industry must develop much stronger international marketing skills.
- Exporting companies must maintain and enhance the competitive advantage of their products and services.
- To ensure continued success each company must continuously increase its investment in long term technology development programs aimed at product and process improvement and innovation.
- Industry must adopt the Total Quality Management (TQM) culture, and make its implementation mandatory among subcontractors.
- Industry must undertake, on a priority basis, international collaborative and other collaborative arrangements to enhance market penetration.

**Government**

This subcommittee has one important recommendation to government:

- The government must become much more effective in supporting its exporting companies by doing everything possible to ensure a level competitive playing field.

To establish a level playing field the following suggestions are offered:

- The government should simplify, harmonize and physically concentrate the regulations, intelligence and services relating to international trade which are currently distributed over a number of departments and locations.
- Exporters should have the option of deferring DIPP repayment based on exceeding specified incremental expenditures in R&D. The DIPP sharing ratio should be variable to take into account strategic, economic and risk factors.
- EDC financing should be more competitive, with less emphasis placed on EDC profitability.
- The Canadian government should trade offset obligations to help remove non-tariff barriers facing Canadian exporters. The policy prohibiting the banking of offsets should be reconsidered.
- Canada's IRB policy should be changed to ensure that foreign companies are not invited into Canada to duplicate competent indigenous capabilities. Instead of creating competition, the government should support international winners.
- Canadian regional distribution and development should be left up to industry to implement where and when it makes good business sense, with rewards given to successful performers.

**TRADING SMARTER SUB-COMMITTEE;**

**Chairman:**

Mr. Val O'Donovan  
Chairman & C.E.O.  
Com Dev Ltd.

Mr. Gaby Weintraub  
Vice-President  
Government Relations  
CAE Electronics Ltd.

Mr. Peter Trau  
Industry, Science and Technology Canada

## **CHAPTER 5**

# **PARTNERSHIPS**

## **PARTNERSHIPS**

### **INTRODUCTION**

The participants in the Partnerships sub-committee represented a wide range of experience and insights. There were representatives from the manufacturing and service sectors as well as academic institutions and research and development organizations. The degree to which these organizations' revenues originate from defence electronic and/or aerospace contracts ranges from total to a very small percentage.

A labour representative from one of the participating companies, had expressed great interest in participating but he was not available for these consultations.

The names of the participants, their titles, and the organizations they represent are included as Annex A. Copies of presentations are attached as Annexes B to H.

### **DISCUSSION**

There are many different kinds of Partnerships. They can range from an unstructured alliance to a contract. Not only will the type of partnership influence the nature of the relationship, but in the case of governments and academic institutions, it must also be remembered that members from these groups have other responsibilities besides those found within the context of the partnership. Therefore, they cannot be expected to contribute or participate in partnerships in the same manner as would a business.

The participants concluded that the concept of partnering or developing strategic alliances is seen as an intrinsically good thing. However, it would be worthwhile to revisit first principles and consider why Canadian business, labour, academia and government should enter into such activities. At the forefront, it should be recognized that establishing a partnership is not in itself a strategy. It is simply a means to an end. This end is the satisfaction of the needs of the partners.

This having been stated, it is worthwhile to briefly examine what is meant by the word "need". In a business context, this means the efforts required to provide a product or service for which there is a discernable market. When put in these terms, it is clear that not only business has this need. Labour, academia and governments must also meet the needs of clients through the provision of products or services. Entering into partnerships is one way to meet these needs.

#### **Internal Partnerships**

Although the tendency is to dwell on external partnerships (with the intent of meeting the needs of a potential customer) it should be remembered that every organization must also develop internal partnerships to be successful.

Although many factors and internal organizations are involved, the most critical is the one between a business and its labour force.

### **Business/Labour**

Several of the sub-committee participants offered examples of efforts in this area. The most dramatic was General Electric Canada. At an executive level, it was decided that this very large company had inefficient methodologies which resulted in slow responses to clients. It had to metamorphose into an organization which is responsive to customer needs and with the ability to move quickly to deal with new challenges within the context of a highly variable environment. This was accomplished by means of a concept which GE has called "work out". The concept of "work out" entails a significant level of dialogue among the various levels of management and the labour force, without the encumbrances of communication through "chain of command".

The emphasis was on "Integrated Diversity", which entailed constant dialogue, feedback and sharing of ideas, technology (among various divisions - both technical, information, and management methodologies), people and experience.

Employees are now empowered as part of the decision-making process. In turn, management is now no longer a separate group, making all the decisions. Both form a team and work together.

This process does not absolve management from the responsibility of managing; there are still decisions that only management can make. However, it does change the level at which decisions can be made. Hence, employees are an interactive part of the process, not simply human extensions of the administrative process or production machinery. In fact, as an extra benefit, the process helps develop the self-confidence among employees to offer more observations and/or solutions.

Although this is generally recognized as a good thing, there are, regrettably, casualties in the process. For example, when CDC introduced Quality Circles as part of their effort towards TQM (Total Quality Management), they found that not all employees could adjust. For an individual that had been on the line for many years, doing what he/she was told and not expected to offer creative input, it was a difficult transition suddenly to be an interactive part of the process. Nonetheless, the introduction of Quality Circles was seen as a success. As in the case with GE, the employees became part of the process. Inspectors were no longer required. Team leaders did not have to be chosen by management. Natural leaders simply surfaced. Once again, at the worker level, the focus shifted from internal processes to the final product, in response to client needs.

### **External Partnerships**

#### **Business/Business**

The sub-committee's discussions centred on the different forms of partnering available to businesses. They can range from a straight contract (with strict limitations in what the inter-relationships are) to strategic alliances (which may or may not entail actual



agreements formalizing the arrangements). Within this is a range of possibilities requiring varying degrees of flexibility, dialogue and trust.

Successful alliances between businesses consist of partnerships wherein capabilities complement one another. For example, the eventual success of R&D activities can only be enhanced when an R&D firm such as MPR Teltech aligns itself with firms that have manufacturing, marketing and sales capabilities. As a result, R&D becomes client or product driven, rather than purely technology driven, (with no guarantees of future markets).

Within the Canadian context, there is always some concern that attempting to establish alliances with other businesses may expose unique technology to the scrutiny of potential competitors. However, it was concluded that some of the best partnerships occur when the alliance is developed before R&D activity is even initiated. In the case of more mature technologies, probably the best protection is for the firm to enter into a new relationship with technology that is relatively recent, but old enough that it is well established and could be sacrificed if necessary.

Several of the business representatives offered examples of successful partnership experiences. Examples included Paramax with GE, CDC, Frontec, CAE, HSA, Andrew Antenna and SED; Frontec with CDC and SED.

### **Business/Academia**

There are two main approaches to partnerships between Business and Academia. One focuses on the students as the final product and business as academia's client. The second form of partnership is research driven with the intent of being able to provide a product or service. In the case of the former, several of the participants offered examples of partnerships in this area. CDC has been involved in co-op programs with Universities. They are now looking to develop ties with high schools and colleges. Frontec is in the process of setting up training programs with the Arctic and Labrador Colleges.

Historically, there has been a tendency to focus in on Universities to set up programs to help develop students for their eventual entry into the work place. However, there is a significant need for trained technicians. Programs to develop these people are best focused at the College level. An example that intrigued many of the participants was Holland College, which is so focused on the concept of the student as a product, that they offer a six month warranty to business to guarantee that the student is trained to meet the company's needs.

The second form of partnership between academia and business was addressed in terms of the efforts currently under-way by the Carleton University Development Corporation (established in 1991). This is a "for profit" organization which manages the property of the University and also acts as a facilitator between academic researchers and the business world. An example of this sort of activity is working with a group such as TRIO (Telecommunication Research Institute of Ontario) which is an association of Canadian institutions, companies (possible manufacturers of the product or end users) and

universities. Their combined efforts pull together R&D, patent applications, product development, marketing and sales capabilities.

The Southern Alberta Institute of Technology was also offered as an example of an academic institution which is aggressively pursuing linkages with business. Apparently, its charter sets up the Institute as a business unit. As such, revenues must come from business dealings since government grants will not balance the books.

Canadian universities can also facilitate the process of technical transfer to other universities and business through activities such as publications, conferences, seminars, institutions, patents/licences, contracts, joint ventures, personnel exchanges and research parks. For example, there are about 14 Research Parks in the country. Each reflects the strengths of the local businesses. The affiliated universities have developed programs to complement these initiatives.

Although more popular in the USA, new business incubators offer great opportunities for very small businesses with a good idea but none of the where-with-all to manage a firm. The sub-committee concluded that there is a role for Canadian universities to play here as well.

### **Business/Government**

In order to succeed, it is generally accepted that Canadian business cannot rely on the domestic market and must export. It is also a given that Canadian R&D efforts need to be maintained and enhanced. In the case of R&D, the development of partnerships is often crucial to success. However, the domestic market cannot usually sustain any activities wherein R&D partnerships are required. Therefore, Canadian business must seek out partnerships in the international forum. This, in turn, emphasises the need to develop international skills.

As part of the effort to develop and maintain strategic alliances with her industries, and to support international marketing initiatives, the Crown currently provides assistance in areas such as: market intelligence, missions support, market support, insights into the current diplomatic environment and many others.

Canadian firms must also apply to the federal government for export permits. This is an area that occasionally causes concern. It is understood that, as part of foreign policy, the Canadian Government must control where Canadian goods are sent. It does, however, limit Canadian firms' ability to compete against firms whose governments are more liberal in their export philosophies.

Probably one of the greatest sources of frustration, and occasional confusion for Canadian industry, is the number of government departments and agencies that they must deal with, and the fact that they occasionally take different positions on the same issue. It is difficult to set up an alliance with the Crown when departments and/or agencies express different views.

This situation is exacerbated by the fact that firms must also deal with provincial offices abroad. Given the number of representative offices, foreign business people often ask Canadian business people "who speaks for Canada?"

Current federal IRB policies can cause difficulties for Canadian firms that are seeking international partnerships. Current regional as well as industrial policies often force Canadian firms into expensive and inefficient partnerships with the risk of no long term benefits. This can result in poorly focused R&D investments as well as increased costs. Due to this, Canadian firms are often perceived as costlier potential partners than firms from other countries.

Although the focus has been on the federal government, businesses must also be prepared to align themselves with provincial, territorial and/or municipal governments. Frontec offered some insights into the challenges of working out mutually agreeable arrangements with the Government of the Northwest Territories as well as municipalities. In this case, the challenge is enhanced by the cultural differences due not only to different organizations (business versus government) but also due to differences between southern and northern and/or aboriginal values.

## **FACTORS FOR SUCCESSFUL PARTNERSHIPS**

If a partnership is created, it is because there is an actual need, not just because the abstract concept appeals to the players. A good business alliance, be it with another business, government, academia, or labour, needs the following to ensure success:

### **Attitudes**

- Commitment and good will from all partners.
- All levels, and all organizations within each of the partners must "buy into" the benefits of a partnership (Executives, middle managers, supervisors, through to working level/all divisions, sectors etc.).
- Mutual respect (avoid arrogance, elitism).
- Mutual trust (in terms of technology and willingness to continue the relationship, even if the original project does not pan out).
- Willingness to innovate and improve.
- Be prepared to share profit, power and risk.
- Be aware of your own and possible partner's pre-conceptions.
- Recognize that there may be internal apprehensions and a resistance to change
- Understand needs of client.

### **Management**

- Partnership and its results should be realistically monitored, on an on-going basis to determine if expectations are being met.
- The partnership must be flexible enough to allow for feedback and subsequent fine-tuning.

- Management must plan, develop strategies and set goals to support partnership activities.
- Designate specific personnel to be responsible for management of relationship.
- Channels of communication must be well specified and adhered to.
- Recognize that the management of a small company often has more power and a shorter decision cycle than the top executive from the large company.
- Partnerships are easier among organic, non-hierarchical organizations.
- Partnership contracts should contain:
  - the strategic intent of the partnership
  - specification of hard deliverables
  - specification of softer interactive activities
  - specification of management responsibilities and problem solving mechanisms
  - conditions for termination of partnership
  - although the partnership contract is required, it should only be used as the framework of the partnership.

**Relationships Among Partners**

- Partnership representatives must be truly representative, with a real grasp of the need for the partnership and empowered to accomplish something.
- Partners must benefit from the experience.
- Partners must have something to offer to the others.
- Partners must treat each other in a fair and equitable manner.
- Maintain ongoing/constant dialogue, not only at executive & management levels, but also at working level.
- Be prepared to commit time and resources to the partnership.
- There must be a real common need (not a perceived one).
- All working levels among the partners must be prepared to work together and cooperate.
- All partners must be prepared to improve the quality of the partnership, even if that means changing their own methods or re-considering the relative importance of their perceived values.
- Each partner must be clear on what is expected from them and what they expect for the others.
- Each partner must be clear on what they expect from the partnership.
- There must be mutual interdependence.
- It is easier if organizational cultures are similar. If not, partners must recognize that different is only that, not necessarily better.

**RECOMMENDATIONS**

In order to compete against countries such as Germany, France and Japan, Canadian governments (federal & provincial), industry, academic institutions and labour must learn to speak with one voice. The individual stakeholders can assist the process by implementing initiatives such as those listed below.

**What Governments Can Do**

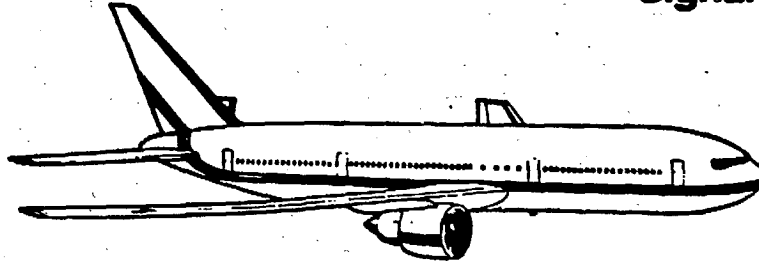
(Most of the following recommendations refer to the federal government)

- Because successful alliances depend so heavily on mutual trust and on the personal chemistry between the representatives of the partners, a great deal of coordination and therefore costs are required to maintain a good relationship, in particular, international partnerships. In the case of successful partnerships, government would help this process by providing financial incentives such as preferred taxation against these costs.
- Ease the burden on companies bidding for major crown projects. Accelerate the decision-making process. If a process must be abandoned, do not let it linger. It not only means extra, needless, expenses for industry, it also results in opportunities lost as firms pursue a contract that will not come to pass.
- Governments need to review their approaches to R&D to ensure the development of better partnerships. Funding should be more responsive to the needs of the market place and the maintenance of a long range focus.
- The federal government should re-introduce unsolicited proposals for R&D. These proposals should complement a national R&D strategy.
- Governments need to work out long-range strategies with industry in terms of product development, and the R&D activities that are needed to support these efforts.
- Procurement and R&D funding should not be used as political tools.
- Government (federal and provincial) departments and agencies must resolve conflicting mandates and ensure that they have complementary strategies to assist Canadian industry.
- Working in concert with industry, focus on the most effective way to channel limited funds (R&D and Capital).
- Government does not appear to be encouraging the development of partnerships, by making changes and being innovative, to the same degree as universities and businesses.
- Help industry in setting up an infrastructure to manage the front end of innovations better.
- Recognizing a solid R&D base is essential to maintaining a healthy industrial base, to facilitate R&D partnerships, government should provide non-procurement mechanisms such as tax credits to R&D partners.

**What Industry Can Do**

- Industry should be first for consistency.
- Members of partnerships must know the needs of the customer or the capabilities or needs of any potential partner. See for example the Boeing/Allied Signal mutual pledges (page 43).
- In addition to the current focus on American exports, other markets should be examined. This in turn will influence how partnerships are formed. To pursue other markets, Canadian firms will need not only form partnerships with American but also non-American firms. (In the case of the former, this is to act as a facilitator in markets with which the Canadian firm is more familiar.)
- Although the bottom line is critical, attempt to look beyond the next periodic report and work out strategies for the future.
- Canadian business must learn to embrace rather than resist the opportunity to change.
- Canadian companies have to be realistic in addressing potential markets. If they are too small to compete "head-on" with large firms, they should target niches and/or partnerships.
- As a result of internal partnerships with labour, (such as TQM), middle management's role will need to be redefined and individuals will have to be redeployed.
- Businesses must respect labour and enlist their support to work out collectively acceptable strategies for the future, (internal and external partnerships) using good partnership techniques.
- Recognize that the period of time that a business can benefit from the revenues of a "cash cow" has shrunk significantly over the last several years. In order to quickly respond to changing markets, more energy must be focused towards product pre-development. (This is based on the model of pre-development leading to development and deployment which then leads to product/service sales.) However, in order to remain competitive, this focus must be well-managed, employing scarce resources in an effective and efficient manner.
- Canadian business needs to spend more time on: understanding potential markets; product design; working on profit models.
- Although there is a great deal of talk about down-sizing and doing more work with fewer resources, Canadian business must also work "smarter".
- Companies should be more involved in assisting academia to develop students for their entry into the marketplace.
- Business should get involved with academia at high school level (for example, participation in exhibitions such as Ottawa's Destiny 2000). Too many students, with the potential to continue on in areas wherein business needs trained people, are dropping out before they even reach college or university.
- Canadian business will have to be more aggressive in pursuing qualified university graduates for potential employment. Many of the best students are being picked up by international firms before Canadian firms even get around to looking for new people.
- Become more knowledgeable on most current federal government international policies and the resulting impact on export controls.
- Industry, through its associations, should ensure that the various government departments are aware of industrial long range strategies.

**BOEING**



## MUTUAL PLEDGES

### TRUST

Candor, honesty and respect will be a way of life in our business relationship.

- no surprises
- straightforward
- integrity
- keep our promises

### COOPERATION

We recognize this is a continuation of a long-standing relationship and not merely a transaction. The decision which we made will have a long-lasting impact on each of our companies. We will work together to identify and solve all problems which arise.

### TEAMWORK

We have a heritage of working together to design, develop and operate good airplanes. We must all work together to achieve common goals with a clear understanding of each team member's responsibilities. Good teamwork requires free and open communication.

### LISTENING

We have a responsibility to each other to approach every issue with an open mind and listen carefully to each other's point of view before making a decision. We will be careful not to reject an idea because it didn't originate with one of us.

### RESPONSIVENESS

We shall have as a basic premise an objective to provide timely and quality responses to one another on or before the agreed-to date. If additional time is required it will be requested well before the due date with a reason and a new commitment which must be met. All responses shall be accompanied by a thorough explanation supporting the response and be handled in a professional and courteous manner.

### QUALITY

We will approach every aspect of our relationship with quality as an overriding objective.

- information
- planning
- design
- support
- decisions
- communication
- production
- operation

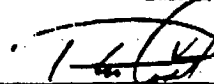
We will endeavor to do it *right* the first time with the highest degree of professionalism.

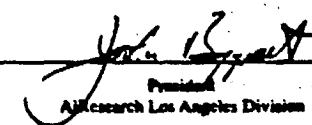
## BOEING 777 OBJECTIVE

In order to launch, on time, a truly great airplane, we have a responsibility to work together to design, produce and introduce an airplane that exceeds the expectations of flight crews, cabin crews and maintenance and support teams and ultimately our passengers and shippers.

From day one:

- Best dispatch reliability in the industry
- Greatest customer appeal in the industry
- User friendly and everything works

  
 Executive Vice President and  
 General Manager  
 New Airplane Division  
 Boeing Commercial Airplane Group

  
 President  
 Allresearch Los Angeles Division  
 Allied Signal Aerospace Company

**What Academic Institutions Can Do**

- Aggressively pursue linkages with business.
- Develop the graduates that business needs.
- Steer away from research and development that is purely technology-driven and focus more on product or client driven activities.
- Work on improving attitudes towards business. There is still a tendency to see business input as not pure enough or "tainted".
- Become more active in the establishment of technology transfer programs, new business incubators and science parks.

**CONCLUSION**

Partnerships offer each of the participants an opportunity to be, as a group, better than the sum of their individual parts. Although ongoing efforts are required to make a partnership work, it does get easier with each subsequent partnership.

Aside from the direct benefits of the partnership, there are many collateral benefits. For example, a dynamic alliance with another organization will foster the desire to improve internal systems. Management and employees will embrace concepts such as TQM in order to ensure that they offer solid contributions to the partnership.

Many firms are accustomed to an enriched Defence R&D environment. The available funding is shrinking. Survival will depend on several factors, including the development of strategic alliances/partnerships.

Internationally, Canada is recognized as a country with many good ideas, but because of our cultural, historical and political issues, in tandem with a small domestic economic base, we are often weak in seizing opportunities. Partnerships offer one mechanism to overcome these shortfalls, exploit our strengths and realize our potential.



**PARTNERSHIPS SUB-COMMITTEE:**

**Chairman:**

Mr. Charles Belzile

Vice-President

Government Relations

SNC Industrial Tech. Inc.

Mr. Gordon M. Sinclair

President & C.E.O.

Air Transport Association of Canada  
(ATAC)

Saskia Meuffels

Industry, Science and Technology Canada

# **CHAPTER 6**

# **FINANCING**

## FINANCING

### INTRODUCTION

In its initial review of the Prosperity Initiative documents, the subcommittee discussed the five aspects of Financing issues that are identified in Prosperity Through Competitiveness (pp. 19-24), namely:

- The influence on investment decisions of:
  - Canada's corporate tax system;
  - the cost of capital in Canada;
  - the access to capital in Canada; and
- The competitiveness of Canada's financial services sector; and
- The role of public infrastructure investment in maintaining competitiveness.

The subcommittee found little evidence that these issues significantly impair the competitiveness of the Canadian aerospace and defence electronics sectors, with the following exceptions:

1. The difficulties encountered by *smaller* firms in the industry in accessing adequate capital (a problem faced by small firms in most industrial sectors in Canada); and
2. The need for modifications of the tax system to improve the environment for investment in innovation in Canada.

In addition, the subcommittee identified a third 'financing' dimension, one that was not even mentioned in Prosperity Through Competitiveness, but which is central to the future competitiveness of our aerospace and defence electronics sector -- namely,

3. *The amount and nature of direct government assistance provided to the aerospace and defence electronics sector in Canada.*

The facets of direct government assistance to international aerospace and defence electronics are many. The subcommittee focused on two specific programs: the Export Development Corporation's sales financing assistance, and R&D support available under the Defence Industries Productivity Program (DIPP).

Each of the three financing dimensions of Canada's competitiveness is the subject of a separate chapter of this report<sup>1</sup>. The report concludes with a chapter listing the subcommittee's recommendations.

### FUNDING SMALL HIGH-TECH FIRMS - VENTURE CAPITAL MARKETS IN CANADA

Denzil Doyle of Doyletech provided the subcommittee with an overview of venture capital markets in Canada. Below is a summary of his presentation and observations.

Canada's share of high technology exports among OECD countries has been declining [Figures 1 and 2]. High tech (defined as industries which invest over 10% of revenues on R&D) is the fastest-growing trade sector for OECD countries overall, projected to rise from just 8% of OECD exports in 1973 to 27% by 1995. Low tech products (where the industry invests less than 1% of revenues on R&D) are of declining importance in OECD exports.

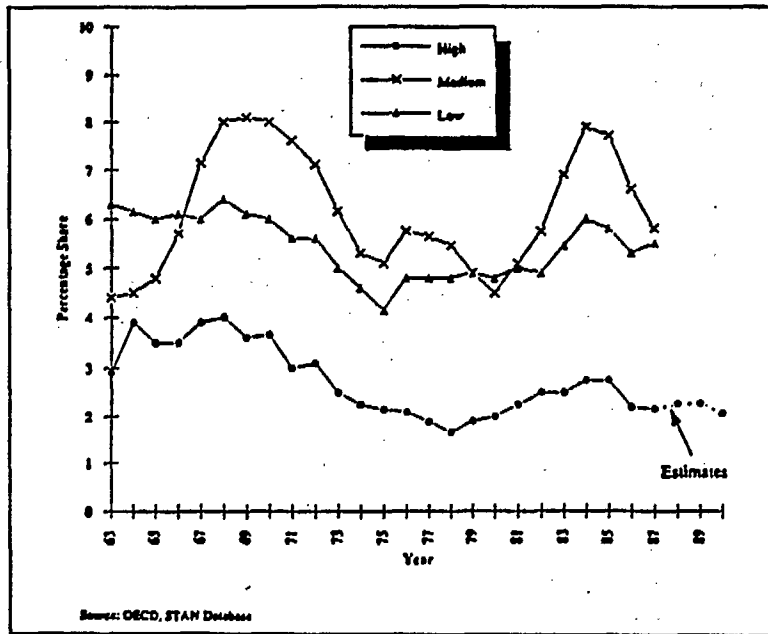


Figure 1 Canada's Share of OECD Exports by Technology Sector, 1963-87.

<sup>1</sup> The subcommittee also expressed concern about the lack of coordination amongst government departments and agencies and the existence of contradictory policies (e.g. regional) which diluted the impact of direct financial assistance provided to the sector. There were also concerns expressed as to the value Canada had received from its bilateral (DDSA/DPSA) and multi-lateral (GATT, OECD Consensus) agreements and arrangements, and as to whether faith in the efficacy of these was warranted.

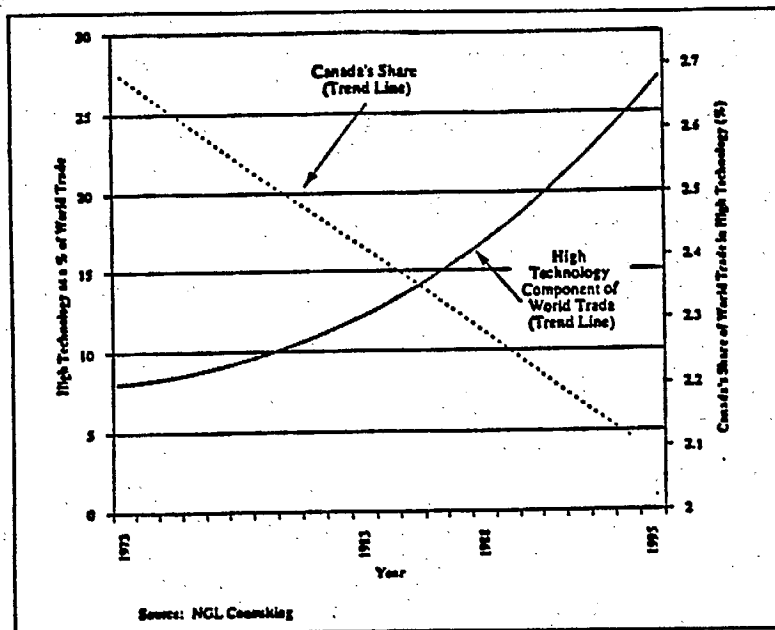


Figure 2 World Trade in High Technology and Canada's Share of That Trade

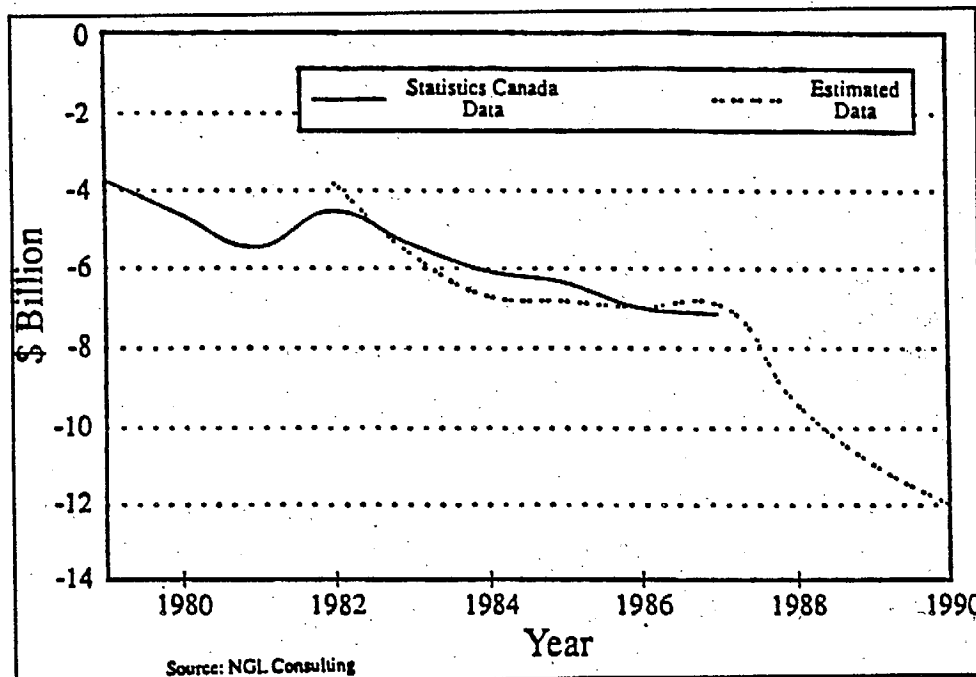


Figure 3 Canada's High Technology Trade Deficit

Mr. Doyle suggested that a Canadian focus on improving the productivity of its resources sectors (as suggested by Prof. Porter), was inappropriate since Canadian resource processing firms were about as good as they could get at adopting automation and improving productivity (even though not much of the technology is actually developed here).

Although the federal government has stopped reporting data regarding Canada's high-technology trade deficit, Mr. Doyle estimates that it now stands at \$12 billion annually [Figure 3]. This represents a lost opportunity for direct employment of 120,000 college graduates and indirect employment for an additional 400,000 Canadians.

The importance of fostering a high-technology industry was illustrated by a comparison of data for the Ottawa-Carleton area versus a number of other North American sites where high-tech industries are being encouraged [Figure 4]. As one example, the investment flows into Austin, Texas, have been significant, with impressive impacts on the local economy.

| Area            | Electronics Jobs * |               |                | Venture Capital **<br>Investments in Electronic<br>Companies '86-'98 (\$M) | Comments  |
|-----------------|--------------------|---------------|----------------|--|---|
|                 | December 1988      | December 1998 | Percent Change |  |   |
| Albuquerque     | 4,200              | 6,200         | 48             | 17.50  |   |
| Austin          | 11,300             | 30,500        | 170            | 983.80   | U. of Texas major technology engine   |
| Boise           | 2,800              | 9,000         | 221            | 1.70   | Hewlett Packard has 4,000 of the 9,000 employees  |
| Colorado        | 36,000             | 54,000        | 50             | 437.70   |   |
| Orange County   | 54,900             | 68,900        | 26             | 1906.10  |   |
| Phoenix         | 25,700             | 43,600        | 70             | 292.00   | Mainly large corporations   |
| Portland        | n/a                | 31,000        | n/a            | 223.30   | Tektronix is major technology engine  |
| Raleigh-Durham  | 20,500             | 27,100        | 32             | 148.60   |   |
| Sacramento      | 2,500              | 10,200        | 306            | n/a  | Benefiting from decentralization of Silicon Valley                                      |
| San Diego       | 30,000             | 36,500        | 22             | n/a  |   |
| Seattle         | 11,900             | 23,700        | 99             | 289.90   | Boeing is major technology engine<br>Benefiting from decentralization of Silicon Valley |
| Silicon Valley  | 179,600            | 221,700       | 23             | 4020.30  |   |
| Total           | 380,000            | 562,400       | 48             |  |   |
| Ottawa-Carleton | 22,000             | 25,000        | 13             | 30***  | Most of the venture capital went into Newbridge and Corel                               |

\* Source - American Electronics Association  
 \*\* Source - Alex Brown & Sons Inc.  
 \*\*\* Estimate

Figure 4 Ottawa-Carleton Compared to Other Technology-Based Centres

Start-up firms have virtually no hope of attracting enough capital, and even established small high-tech firms cannot finance their rapid growth through retained earnings. Consequently, there will continue to be a need for some government involvement. However, industry's message should be that while government R&D grants will continue to be necessary for high-tech firms, a priority effort should be undertaken to define incentives that make investments more attractive for private money.

The Canadian venture capital industry in 1989 controlled approximately \$3.3 billion in assets [Figure 5]. In 1989, the funds available from pension funds declined to \$212 million from \$657 million the previous year. In 1989, the venture capital industry re-invested \$343 million (down slightly from \$354 million in 1988), versus the approximately \$3 billion available from government programs and tax credits. However, very little (\$84 Million) of that

|   | 1988                         | 1989                        |
|---|------------------------------|-----------------------------|
| • Book value of investment portfolio of venture capital companies   | \$3.1 B                      | \$3.3 B                     |
| • Amount of money flowing to the industry from its investors (e.g. pension funds)   | \$657 M                      | \$212 M                     |
| • Amount of money invested by the industry in enterprises of all types  | \$354 M                      | \$343 M                     |
| • Investments by stage of maturity of enterprises <ul style="list-style-type: none"> <li>• early stage</li> <li>• expansion</li> <li>• acquisition and leveraged buyouts</li> </ul> | \$80 M<br>\$101 M<br>\$131 M | \$57 M<br>\$94 M<br>\$152 M |
| • Investments in high technology enterprises at all stages  | \$96 M                       | \$84 M                      |
| • Investment in high technology early stage enterprises (est.)  | \$30 M                       | \$20 M                      |

Source: Venture Economics Canada Ltd.

**Figure 5** Breakdown of Canadian Venture Capital Investments, 1988-89.

found its way to high-tech firms, and much less to start-up high-tech firms (\$20 million). Furthermore, only \$57 million was employed for early-stage R&D, versus \$152 million for "mezzanine financing", LBOs, etc.

Since 1986, as the number of investments made by public sector venture capital agencies has risen, the number undertaken by the private sector has declined [Figure 6]. The presence of so many government-backed sources of financing is undoubtedly "scaring off" private sector investments. As taxpayers, we have to question whether we want our money used in this fashion. Mr. Doyle feels that this trend is counterproductive and dangerous -- bureaucrats don't know enough about managing the growth of smaller high-tech firms, and are unlikely to undertake the degree of due diligence that would be done by private sector investors.

Government grant programs should be more innovative; according to Mr. Doyle, industry should be pushing for "smarter" assistance instead of lobbying for more support. Government assistance has also focused too narrowly on R&D. Insufficient R&D investment is not necessarily the primary problem of Canada's small high-tech firms. These firms need a much broader range of support than simply R&D funding. For example, the U.S. Dept. of Commerce attacks the operations of Canadian firms in the U.S. and government agencies are

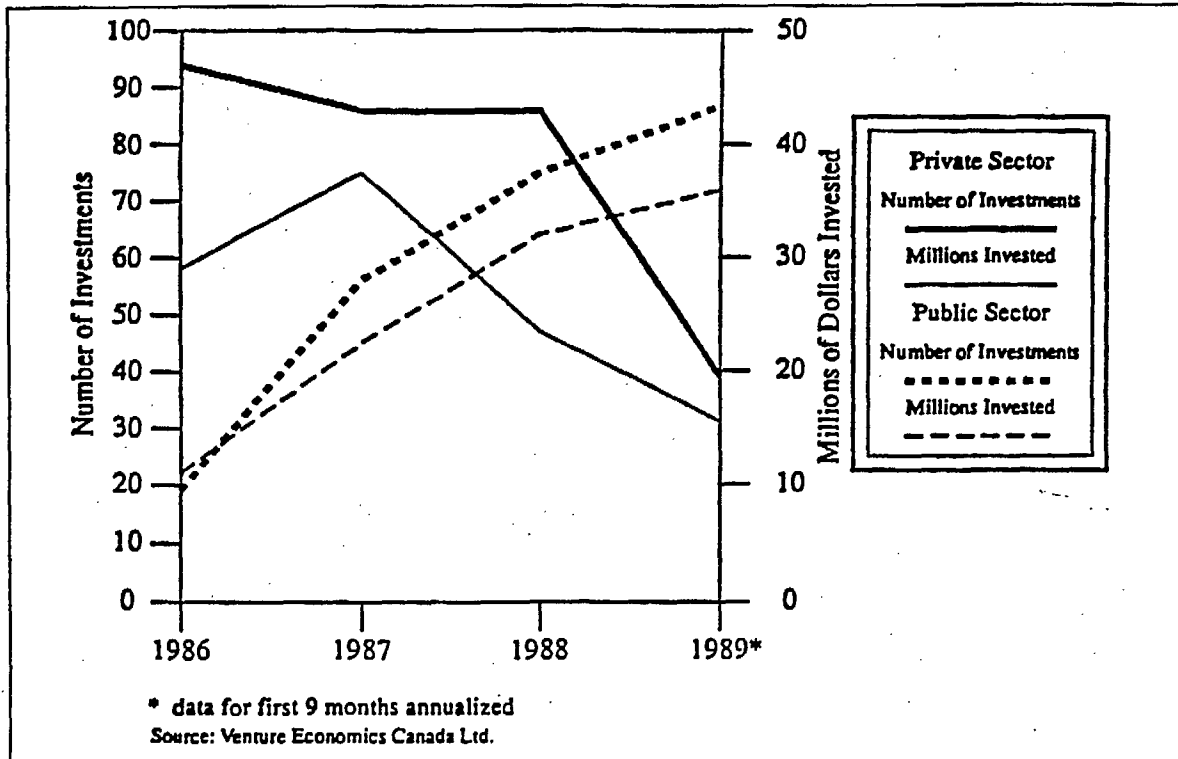


Figure 6 Public vs. Private Sector Venture Capital Activity

not able to provide suitable assistance in combatting these attacks. Support should be more broadly based than simply R&D, because small firms need help with distribution, legal services, etc.

The challenge is to get more Canadian private sector money to invest in Canadian high technology. The venture capital industry will likely continue to shun the high-tech sectors and start-up financings so long as returns from the patient capital required for these riskier investments are taxed at the same rates as those from short-term financial manoeuvrings.

In examining how to lessen the importance of governments in the venture capital business, Canada should look to programs in countries such as Australia and Finland, where innovative approaches have been employed. Australia, for instance, employs Management Investment Corporations (MICs) which are structured and regulated so as to ensure that adequate mentorship accompanies financial support. MICs have to have corporate expertise available to inject into new companies.

The Australian MICs are also allowed a 100% write-off on their investments. Mr. Doyle suggested that this was a critical factor in the ultimate success of such an initiative, and that Canada had to find ways to tax the returns to 'patient' capital differently. He proposed that governments consider special legislation that would exempt from tax the capital gains or dividends accruing to long fixed-term investments in high-technology firms (fixed for, say, five years).



## **CANADA'S TAX SYSTEM**

Canadian grants and tax credits for R&D are excellent. There is approximately \$3 billion now directed from governments to R&D in Canada, through tax credits and through an array of granting programs such as DIPP, IRAP and CAP.

However, government departments and bureaucrats are un-coordinated and exercise too much discretion in determining how this assistance is awarded. This includes the administration of Investment Tax Credits, where Revenue Canada inspectors can and do disallow certain activities as being product development rather than R&D. Revenue Canada is continuing to work on the definitional problems associated with R&D tax credits.

Finance Department officials reviewed a number of initiatives included in the February 26 Federal Budget which were aimed at improving the climate for investment in innovation in Canada. These were:

- a. A reduction in the rates of withholding tax on dividends from 10% to 5%;
- b. Enrichment of tax credits and improved treatment of concurrently-used equipment (used for both R&D and production);
- c. Amendments that enriched the tax credits for investments in labour-sponsored venture capital corporations (LSVCCs) to 20% to a maximum of \$5000 per person, and extension of the range of eligible investments for LSVCCs to businesses with assets of up to \$50 million;
- d. Restriction of the \$100,000 capital gain exemption to "productive investments" (i.e. eliminating real estate transactions) while maintaining the former small business capital gain exemption of \$500,000.

The goal of investment-oriented incentives is to allow capital to flow to where it "should" -- that is, to investments that further Canada's development.

In subcommittee discussions, industry participants made the following comments:

- a. Perhaps government policies should, in addition to sharing risks at the front end, focus on improving the rewards available from "desirable" activities;
- b. Policies must ensure that foreign subsidiaries are not penalized, they have been an irreplaceable source of expertise and technology in the development of Canada's high-tech industries;
- c. In the U.S. (and other countries) mechanisms have been put in place to encourage state pension funds to invest in high tech;
- d. Under existing tax regulations, companies are only able to offset 75% of current taxes due through the application of tax credits. This leads to a build-up of unutilized tax credits. All taxes should be offset.

## **DIRECT GOVERNMENT ASSISTANCE**

The crucial role of supportive government programming in the past success of the sector was highlighted in the overview contained in Industrial Competitiveness: A Sectoral Perspective. The industry outlook in that document emphasized that intense foreign government involvement in the sector was likely to continue, and recommended that "Canadian industry and the federal government must continue working together to ensure that government assistance remains adequate for changing international circumstances". Concern about the direction and extent of future government assistance was apparent from the earliest discussions of the main consultations committee. The issue is simple: *if Canada is to have a competitive aerospace and defence electronics sector, the government must be competitive in the assistance which it provides to the sector.*

While the importance of government assistance is "obvious" to those who know the sector, any attempt to examine the question of government support (and/or subsidy) within an analysis of industry competitiveness would likely be greeted with some skepticism by those unfamiliar with the dynamics of the international aerospace and defence electronics markets. Accordingly, the subcommittee has prepared the following explanation of how these seemingly contradictory notions are necessarily complementary in the case of the aerospace and defence electronics sector.

### **Why Competitiveness<sup>2</sup> Requires Government Assistance:**

#### **The Unique Case of the Aerospace and Defence Electronics Sector**

Canada's aerospace and defence electronics sector has repeatedly proven its ability to provide attractive products (in terms of product design, quality and timeliness) by persistently making the substantive investments required in research and development and production systems and tooling. However, without direct government assistance it would have been impossible to price these products attractively and consequently many of these investments would never have been made. This circumstance has little to do with the relative productivity and efficiency of the Canadian industry; rather, it reflects the reluctance of international capital markets to finance product developments in this sector and the willingness of the governments of all competitor nations to step forward as financiers of the sector for rational strategic reasons.

#### **The Reluctance of Private Capital Markets**

Private sources of capital are reluctant to finance product development activities of the aerospace and defence electronics sector because *the expected returns rarely warrant the level of risk involved in such investments*. Much of the risk in the sector is related to the extremely long product cycles and associated future market uncertainties. For major projects, such as a new airframe or engine, it is not unusual for research and development to commence five to ten years before the first product is delivered. To these substantive R&D expenditures must be added the investments required in production machinery, equipment and tooling. These front-end investments must then be recovered through limited annual production rates

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<sup>2</sup> "Internationally competitive" means that a firm is able to profitably provide what its customers want at a price that those customers are prepared to pay.

that must be maintained over ten or fifteen years. Even with significant additional investments in product upgrades (derivatives) there remains the strong probability of product obsolescence as new technologies, government regulations, or shifting markets and customer requirements lead to more attractive competing products before an adequate return on investment has been attained.

The record seems particularly clear in civil aerospace. One recent analysis of the three large commercial aircraft manufacturers<sup>3</sup> concludes that

"in none of the last twenty years has Airbus or McDonnell Douglas made a profit in the commercial business"

and, further, that

"Airbus could not have entered, or remained, in this business without a major outside source of capital that was willing to take the very long term view."

That source of capital was, of course, the host governments of the four Airbus partners. Of the three manufacturers, only Boeing has generated sufficient retained earnings to self-finance development of a new aircraft, and even Boeing has chosen to limit its own financial risk by enlisting major risk-sharing partners for its new B-777 program.

### **Why Governments are Willing to Provide Assistance**

The reluctance of private capital markets to finance the massive investments required has not arrested the advance of the international aerospace and defence electronics sector, because governments worldwide have become financiers. There are several rationales offered for providing this 'special' treatment to the sector.

In the case of the United States (and former Soviet Union), direct government assistance has been marshalled primarily within a framework of **strategic military considerations**. These nations would not have attained their current pre-eminence in aerospace and defence electronics technologies and production volumes without the substantial domestic defence expenditures that have been made over the past three decades. Government procurement has usually been as important an instrument of industry support as funding of research and development and other assistance measures.

Among the next tier of producing nations, including France, the United Kingdom, Germany, Japan, Canada and Italy, the potential for **economic and/or socio-political benefits** from government investment in the sector tend to be at least as important as the retention of a defence production capability. Aerospace and defence electronics is regarded as a strategic industrial sector because it is innovation-driven, knowledge-intensive, and globally oriented. Few sectors offer equivalent potential to generate high quality, highly-paid employment opportunities and significant export earnings.

Among emerging and aspiring producer nations such as Brazil, Spain, Indonesia, Korea and (most recently) Taiwan, the aerospace and defence electronics sector is regarded as a potent **catalyst for the advancement of overall industrial capability** by introducing state-of-the-art manufacturing technologies and processes. Not insignificantly, these nations also value the **international recognition** as an advanced industrial economy that is bestowed by the high-technology products of an indigenous aerospace and defence electronics sector.

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<sup>3</sup> The Airline Monitor, January 1992.

For all of these reasons, aerospace and defence electronics is regarded as a strategic industrial sector, and governments worldwide provide extraordinary assistance to the sector. The message is clear -- *if Canada is to have a competitive aerospace and defence electronics sector, the government must be competitive in the assistance which it provides to the sector.*

### **Assistance Provided in Other Countries**

In order to provide a yardstick for further discussion of the adequacy of the assistance available in Canada for the aerospace and defence electronics sector, David Thomas of ISTC's Aeronautics Branch reviewed material which he had presented to the AIAC's Contracts and Finance Committee in April 1991 concerning foreign government assistance levels.

The available evidence suggests that:

1. The level of government support provided to the aerospace and defence electronics industries of the United States and of European countries is more generous than that provided in Canada<sup>4</sup>; and, furthermore,
2. The mechanisms employed elsewhere appear to be more diverse and often less transparent than those available to the Canadian sector. This is particularly so because of the ownership position held by many European governments in their aerospace firms, and because of the funding provided through defence programs in the United States.

OECD data that summarizes the involvement of governments in aerospace R&D funding in Europe and the United States is shown in Figure 7 below. By the OECD's estimates, the United States government funds over 75% of aerospace R&D and the governments of Great Britain, West Germany and France contribute approximately 60% of total R&D funding to the aerospace industries in these nations. These assistance levels are considerably higher than the 30% figure which the OECD calculates to be the Canadian government share in 1985.

### **The Export Development Corporation - Sales Financing Assistance**

The Export Development Corporation recognizes that the aerospace industry is an important customer -- accounting for roughly \$500 million in business in 1991. The corporation realizes that its support programs for Canadian exporters were often a key element in international competition for aerospace sales. In recent years the EDC has shifted towards more activity in commercial (developed) markets. Only the EDC and the Swedish export credit agency are "Crown corporations", operating on a self-sustaining basis. All other countries' export financing agencies draw upon public funds on an annual basis.

The subcommittee invited Mr. Jim Brockbank of the EDC to attend a special session in order to discuss a number of issues with members of the aerospace and defence electronic sector. Several aerospace firms indicated that they were "extremely happy" with the job that EDC had been doing for them in support of export sales. Bell Helicopter, for example, believes that because of this support, they had achieved substantially more international sales than if they

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<sup>4</sup> More extensive military expenditures and a stronger defence orientation of the industries in these countries partially explain this difference. However, assistance to purely commercial projects (notably, Airbus and Fokker F-100 development) has also been more generous.

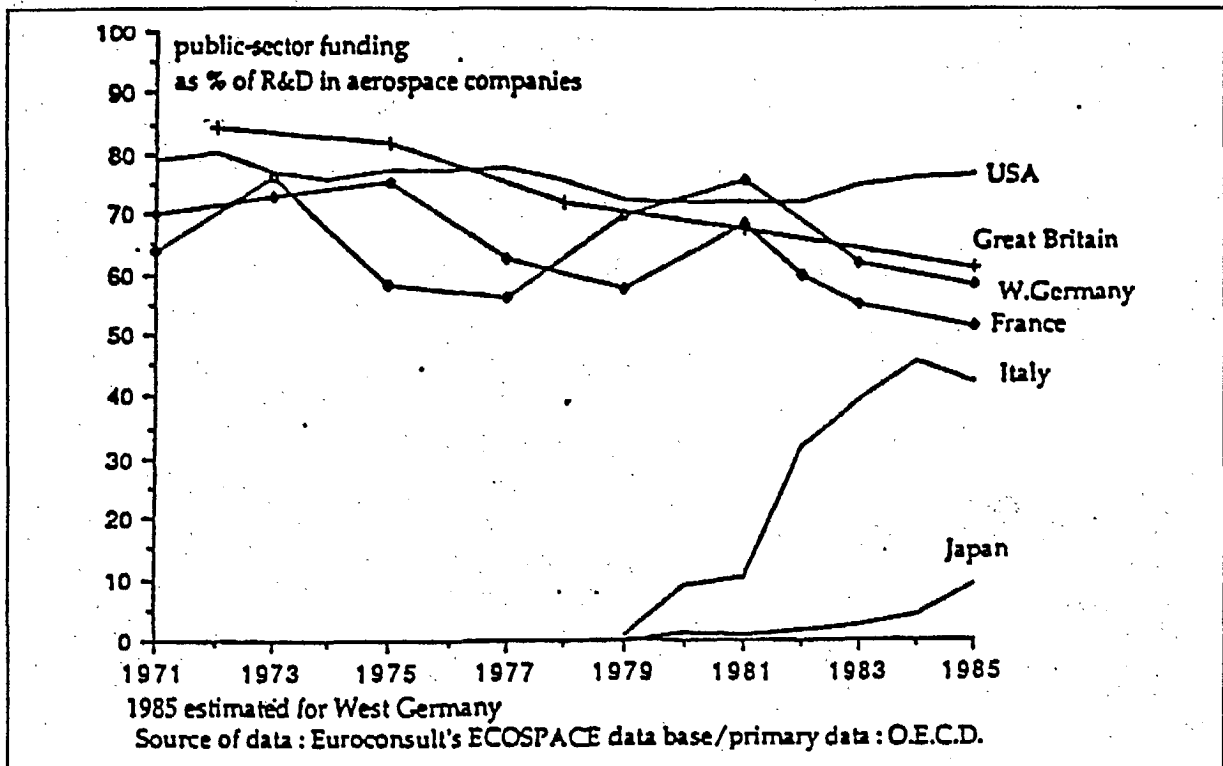


Figure 7 Share of Government Funding in Total Aerospace R&D, 1971-85.

had been operating from the United States and relied on U.S. export assistance programs. Spar Aerospace agreed that EDC provided superior support to that available from the Exim bank. Although the Exim was doing more direct financing, its programs were more difficult to access than those of the EDC (apparently they have half as many staff handling ten times the number of transactions). EDC's management fees also tend to be a little higher than those charged by the U.S. Exim. (Mr. Brockbank EDC revealed that there were indications that at the end of the next annual review Exim rates might double in some cases.)

The EDC has no exposure fees in Category 1 markets, which accounted for approximately 60% of the volume of financings arranged by the EDC in 1991. Exim's exposure fees are openly available and are thus clearly known (a plus) and have been cheaper than EDC's. To some extent this is because they are not "market-oriented" -- i.e. they are only reviewed annually. EDC has proven to be more reliable in terms of where you will be able to get coverage, which may change for the Exim with the vagaries of U.S. foreign policy. However, European competitors are more likely to obtain coverage in some "questionable" markets. Agencies such as COFAS and ECGD also appear more willing to do standardized agreements for international consortia (partially explainable because these are guaranteeing agencies rather than lenders).

Signatories to the OECD Consensus arrangement have moved quickly over the last four months to adopt a more market based pricing mechanism (based on the CIRRs - commercial interest reference rates).

An emerging trend specific to aerospace markets was the emphasis on suppliers sharing the financial risks of new aircraft programs. Consequently, the EDC was increasingly being asked to handle "bridge" financings for suppliers, so that they could be paid when their components arrived at the prime manufacturer's plant, rather than only after the prime had completed assembly and testing and had delivered the aircraft to its airline customer.

In the subsequent discussion a number of specific issues were addressed, including:

1. Timing Some companies had identified the speed of the EDC's response to their requests as a problem area. Mr. Brockbank indicated that response time was always being improved and that there was probably further room for improvement. However, some applications had come in [unnecessarily] at the very last minute after months of negotiations with a foreign purchaser. Industry could help by getting the EDC involved earlier, particularly with new customers.
2. Canadian Content According to Robin Taylor of Spar Aerospace, the level of Canadian content was a continuing problem for space systems. Glenn Leduc of Bell suggested that, while his firm had been very impressed with the flexibility of the EDC in handling their special problems in this regard immediately following the startup of Mirabel, the increasing requirements for offsets as part of overseas sales would likely lead to additional concerns in the future regarding Canadian content levels.

Mr. Brockbank responded that the EDC was well aware of the industry's concerns. The program objective had even been changed, to "optimization" rather than "maximization" of Canadian content levels. However, it was also important to recognize a key difference between the American Exim bank approach and that of the EDC. While EDC was prepared to finance 85% of the total shipment value, the Exim would only finance 85% of the U.S. content of the shipment.

3. Mr. Dixon asked whether EDC could provide financing for "Key Money" - the up-front cash now required of subcontractors by some primes to 'buy' a supplier position on a new program. Mr. Brockbank suggested that it might be feasible if it was within the confines of the Export Development Act. Among other things, there had to be an export sales contract. The EDC would also have to assess what were the risks of repayment default, and what types of recourse would be available.
4. Concessional Financings Ms. Taylor indicated that other countries appeared more willing to undertake some concessional rate financings than Canada, including possible linking of aid and trade, something that has been less common recently but may again become popular in the future.

Canada's Section 31 financing procedures are designed to be a reactive mechanism. In each instance involving either concessional financing terms or where a transaction would exceed the financing limits budgeted by EDC for a particular country, the EDC has to approach Cabinet on behalf of the exporter.

In summary, the overall tone of the discussions on export financing indicated that the industry was being well served by the EDC, which had been particularly flexible and accommodating in recent years. However, it was also clear from comments made at earlier committee meetings that neither Canadair nor CAE Electronics considered current support

from EDC to be adequate for their needs. Accordingly, the subcommittee searched for explanatory differences between the marketing of small passenger aircraft and flight simulators (the products of these two companies) and the marketing of Bell's helicopters or Spar's space systems.

Bell and Spar make most of their overseas sales to "sovereign" customers, primarily government agencies, where the risk of loan default was remote relative to that incurred in a loan to airlines (the primary foreign customers of Canadair and CAE). Secondly, foreign helicopter purchasers might be less sophisticated than a typical airline in terms of their demands for financing arrangements and deals. Furthermore, these customers often presented less of a risk of default than might an airline customer. These, at least, are possible explanations for the difference of opinion within the industry as to the adequacy of EDC support.

**The Defence Industry Productivity Program (DIPP)**

Although the DIPP program was not addressed in a formal working session, at several points during its deliberations the subcommittee heard concerns about the government's future commitment to the program. The key concerns expressed were as follows:

- a. DIPP budgets have not kept up with inflation;
- b. DIPP budgets have not kept up with the growth of the industry. Consequently, DIPP is now funding a much lower proportion of industry R&D investments than was the case earlier;
- c. DIPP Terms and Conditions do not reflect the changing dynamics of the aerospace and defence electronics sector in the following areas:
  - i. Assistance for concurrent engineering,
  - ii. Assistance for production process R&D, and for some aspects of TQM implementation,

**RECOMMENDATIONS**

1. The provincial and federal governments should withdraw from the venture capital business, and introduce tax relief measures so that private sector risk takers have a reasonable prospect of making a profit on start-up companies.
2. The Export Development Corporation should review its approach to concessional financing with an intention of making this type of support more readily available and/or negotiate much tighter international agreements so as to provide a level playing field.
3. To improve the responsiveness of the EDC, industry should provide early identification to the corporation of the possibility of a requirement for assistance, particularly where the firm has not previously received EDC assistance for that market.

4. The Federal Government should at least maintain and preferably increase the real dollar purchasing power of the DIPP budget.

**FINANCING SUB-COMMITTEE:**

**Chairman:**

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President  
Canadair Group/Bombardier

Mr. Bob Finlayson  
General Manager  
KFW Canada Ltd.

Mr. Gilles Labbé  
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Heroux Inc.

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Prosperity consultations :  
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