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**Industrial Research and  
Assistance Program (IRAP)**

**Report on the Delivery  
Process**



**GOSS GILROY INC.**

Management Consultants  
Conseillers en gestion

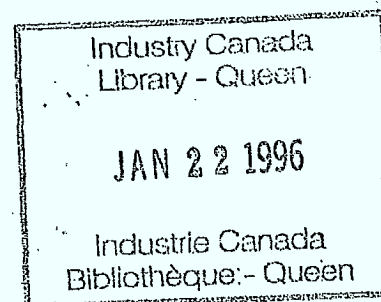
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## **Industrial Research and Assistance Program (IRAP)**

### **Report on the Delivery Process**

*Prepared for:*

Industry, Science & Technology Canada



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February, 1993

# INDUSTRIAL RESEARCH ASSISTANCE PROGRAM (IRAP)

## REPORT ON THE DELIVERY PROCESS

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PART I

EXECUTIVE SUMMARY

I

## INDUSTRIAL RESEARCH ASSISTANCE PROGRAM (IRAP)

### REPORT ON THE DELIVERY PROCESS

#### PART I

#### EXECUTIVE SUMMARY

##### 1.0 Objective:

The objective of this review of IRAP is to identify possible opportunities for improving the efficiency and effectiveness of ISTC program delivery by introducing those IRAP Program processes and procedures which might appropriately be adopted by ISTC.

##### 2.0 Methodology:

2.1 The review was carried out through a combination of interviews plus an examination of NRC and ISTC documents.

##### 3.0 Overview of Findings:

The key findings of the review are as follows:

- IRAP is a single element program with both a funded and a non-funded component.
- IRAP assists SME's to improve their use of technology and/or research and development in order to adapt technologies to solve immediate problems. (ISTC - S & T programs encourage firms to take a longer term approach to effect more basic changes.)
- The annual budget for 1992/93 the funded component is approximately \$55 million.
- The non-funded consultation activities consume more than 50% of the field officers' time. (Field Officers are referred to as "Industrial Technology Advisors - ITA's".)
- IRAP covers all industry sectors, focusing mainly on the technology aspects. (S & T programs focus equally on the commercial aspects and are sector specific.)
- A separate, totally dedicated, organization within NRC, headed by a Vice President, manages and delivers the program.
- IRAP management and delivery involves a total 307 persons of which 220 are ITA's in regions. In addition, there are approximately 60 support staff in regions. Of the 220 ITA's, 160 are contract employees of the "Host" organizations.

- The network of ITA's and support staff is strategically distributed throughout 72 offices, located in seven regions in Canada.
- The T's & C's for IRAP are simple and facilitate flexible delivery policies and guidelines. e.g. Simple application and project eligibility criteria.
- There are two levels to the funded program activities;
  - Technical Enhancement (TE) projects with contributions less than \$15,000; and,
  - Research, Development and Adaption (RDA) projects with contributions up to \$350,000.
- Contributions range from \$1,500 to \$350,000 per project. The average contribution/year/project, for all projects, is roughly \$10,000; approximately 3,000 (67%) of these projects have contributions of less than \$6,000, of which 1,500 of these projects cover the costs for the hiring of student assistants.
- Contributions are based, almost exclusively, on salaries and wages. (For ISTC programs, eligible costs cover a broad range of expenditures.)
- Accountability and responsibility for all projects, is fully decentralized to regions.
- Decision-making is close to the clients.
- Approval authority for contributions up to \$250,000 rests with the Regional Directors. (Note: All biotechnology innovation projects must be approved by the Vice President, Biotechnology - NRC.)
- All program funds for new projects are allocated to the regions. For payments, the ITA's have the authority to approve individual claims up to \$50,000.
- Extensive consultation takes place before an application is received and applications are not "registered" until most of the information has been submitted.
- IRAP clients make extensive use of scientific advisors/specialists from NRC and other organizations.
- Interdepartmental committees serve as advisors on larger cases.
- Presently, there are no national manuals or guidelines although draft national guidelines are currently under review and are expected to be finished by the end of February 1993. (In ISTC, manuals and guidelines are considered to be essential tools for the consistent delivery of the program.)
- Standard evaluation formats are not required for projects under \$250,000 although the ITA's tend to follow a "standardized" procedure. The use of standard formats was approved in December 1992 for all projects and project synopses submitted to committees for review. (Use of standard formats in ISTC is well established and considered to be helpful in reviewing project recommendations.)

- Target turnaround times have been established, ranging from 10 working days for small cases to a maximum of 90 working days for the larger cases. (It should be noted that the "clock" does not start until most of the required information has been submitted.)
- Commercial intelligence is sought primarily for use by the ITA's in consulting with clients. It is not formally disseminated internally or externally.
- IRAP is a responsive program. Little formal promotion takes place except for participation in conferences, seminars, etc. This is due, in part, because the demand for assistance already exceeds program funds.
- Qualifications of an ITA include at least 10 years industrial experience in a middle management position plus a degree in engineering or science.
- Staffing and training of ITA's is the responsibility of the Regional Directors.
- IRAP program maturity and simplicity of eligibility criteria has resulted in few challenges to higher (ministerial) authority.
- Some NRC staff expressed concern that commercially oriented ISTC programs (AMTAP, MAS, MVP), if delivered by NRC, would "dilute" IRAP's focus on technology and science.
- ISTC Ontario sees the transfer of AMTAP to NRC as a major loss of a very successful program which "opens doors" and provides ISTC with access to commercial/technical intelligence essential to its new directional thrusts.

#### 4.0 CONCLUSIONS:

- 4.1 The simplicity of IRAP; its large volume of cases, most of which are small; its cross-sectoral client base; its extended network of technical/scientific expertise across Canada; all represent major departures from S & T programming, with the result that organizational structures, authorities and processes for IRAP are not readily transferable to ISTC.
- 4.2 Notwithstanding the above, the following principles employed in delivering IRAP, and which contribute very importantly to the effectiveness of its delivery, should be considered for possible application in ISTC.
  - Total decentralization of authority and responsibility to the Regional Directors.
  - Allocation of program funds to the regions.
  - Simplified T's & C's allowing program decisions to be based upon administrative policies and procedures.
  - Simplified evaluation and analysis procedures and letters of offer.
  - Extensive consultations with prospective applicants before the acceptance of an application in order to reduce turnaround times.



(PART I)

- Establishment of a central administration/coordination unit in headquarters for all ISTC programming activities.

**NOTE:** See also Annex 1 for a detailed comparison between IRAP and the ISTC - S & T programs.

PART II

II

REPORT OF FINDINGS

**INDUSTRIAL RESEARCH ASSISTANCE PROGRAM (IRAP)**

**REPORT ON THE DELIVERY PROCESS**

**PART II**

**THE REPORT:**

**SECTION A - BACKGROUND**

**1.0 Objective:**

The purpose of this review is to examine the operational procedures and the organizational structure used by NRC in delivering the IRAP Program in order to determine the extent to which the principles and procedures employed might beneficially be adopted by ISTC in delivering its programs. The review is a corollary to the "Mid-Term Review of Funded Programs" carried out by the firm of Goss, Gilroy and Associates, Ltd. earlier this year.

In short, the objective is to identify further possibilities for improving the efficiency and effectiveness of the ISTC program delivery process.

**2.0 Methodology:**

2.1 The review of IRAP was carried out through a combination of interviews plus an examination of documents provided by NRC as well as those available within ISTC. Interviews were conducted with the following key NRC personnel:

Dr. Denys Cooper	-	Head, Technical Assessment and National Coordination Group, Ottawa.
Dr. George Fraser	-	Manager, Program Coordination, Ottawa.
Stephen Palmer	-	Senior Industrial Technology Advisor, Ontario Region, Ottawa.
Roy Crew	-	Technology Advisor, Field Advisory Service, Ontario Region, Scarborough.
David Hawkes	-	Industrial Technology Advisor, Ontario Region, Mississauga. (Contractor with Ortech International Ltd. a "Host" organization.)

(PART II - SECTION A)

2.2 The Ontario Regional Office (Toronto) liaises closely with NRC on the larger IRAP projects and serves on the IRAP Committee at the regional level.

2.3 The following ISTC personnel were interviewed:

Gerry Kelly - Director General, Industry Development and Technology, ISTC, Toronto.

Gerry Cooper - Director, Surface Transportation, Machinery and Resource Industries, ISTC, Toronto.

Barry Lett - Manager, Program Services, ISTC, Toronto.

2.4 The cooperation afforded the interviewers by all of the above individuals was exceptional. Their openness and willingness to discuss issues was much appreciated.

## SECTION B - REVIEW OF IRAP DELIVERY PROCESS

### 1.0 General:

- 1.1 The IRAP Program was first introduced in 1962 as a nation-wide, single element program available to all industry sectors for the purpose of encouraging the development and use of new technology by Canadian companies. The intent is to focus primarily on small and medium size companies (SME's) with up to 500 employees. (Prior to August 1992, the maximum number was limited to 200 employees.) Assistance is provided for up to 75% of eligible costs which consist primarily, of salaries, wages and selected travel expenses, but may cover certain approved market and feasibility studies and, in some instances, specialized equipment. Any eligible firm in any manufacturing sector may apply.

The Technical Information Service which was begun in 1977 became an integral part of IRAP in 1982.

- 1.2 The program operates with an annual budget of approximately \$55 million (1991/92), for projects; \$12 million for NRC Administration; plus, \$16 million for the salaries of ITA's contracted from "Host" organizations.

- 1.3 In order to facilitate delivery, activities under the program are structured as follows:

- Non-funded consultation and advisory services.
- Technology Enhancement (TE) Projects.  
Contributions up to \$15,000 per project.
- Research, Development and Adaptation (RDA) Projects.  
Contributions range from \$15,000 to a maximum of \$350,000 per project.

In special circumstances, contributions above \$350,000 for an individual project are possible but in practice these are rare. For contributions exceeding \$1,000,000, Treasury Board approval is required.

**Note:** The above distinctions have been made via an NRC policy decision. The T's & C's identify eligible applicants and eligible projects in general terms only.

- 1.4 More than 50% of the field effort by the ITA's is devoted to the non-funded consultative activities.. In the two funded components, approximately 7,500 potential projects are considered annually and of these, roughly 60%, or 4,500, are approved for assistance. The smaller TE projects account for at least 80% of the total approved projects. Approximately 3,000 projects involve contributions of less than \$6,000 each and 10% of the case volume consumes about 40% of the annual budget for an average contribution per project of about \$10,000 per year. (Larger projects may cover two to four fiscal years.) It is estimated that the 4,500 projects approved annually represent approximately 3,500 different companies. Overall, including the non-funded activities, it is estimated that, annually, there are 20,000 interactions by IRAP staff with 10,000 different organizations, each year.

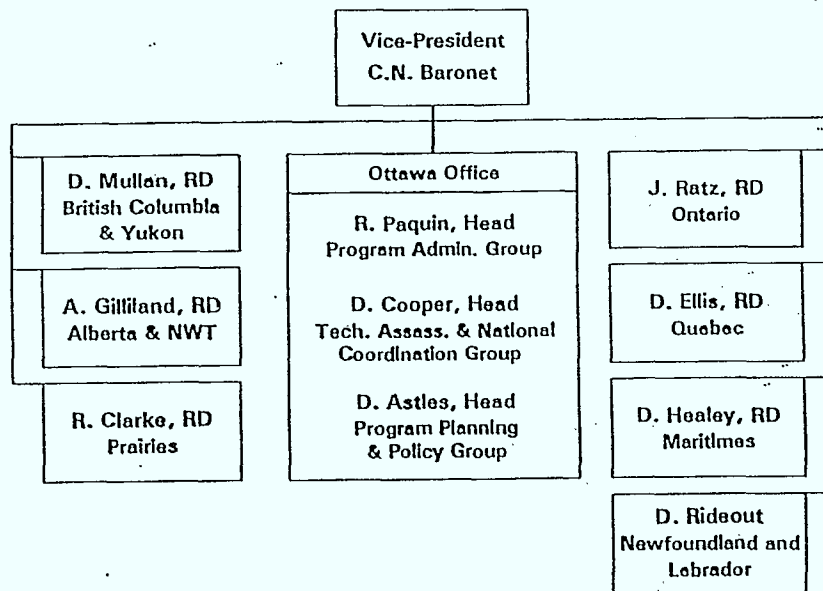
2.0 Organization:

- 2.1 The program is administered and delivered by a separate organizational unit in NRC, headed by a Vice President (presently C.N. Baronet). For delivery purposes, the country is divided into seven regions, each headed by a Regional Director. (See Exhibit No. 1)

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***ORGANIZATIONAL CHART FOR IRAP***

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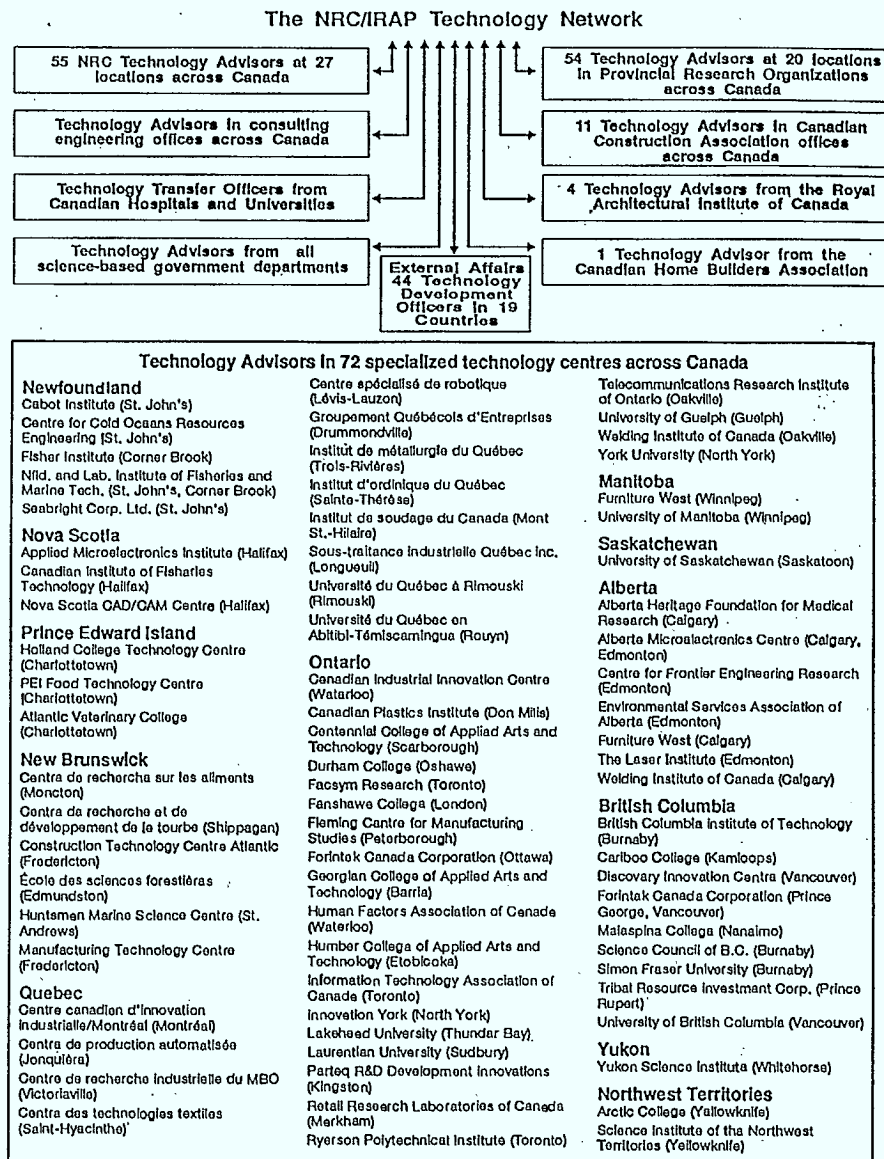


**NRC - CNRC**

Exhibit No. 1

(PART II - SECTION B)

The engine of the delivery process is the ITA (Industrial Technology Advisor). Presently there are 220 ITA's plus 60 support staff in place distributed in some 72 locations across the country within seven geographic regions. (See Exhibit No. 2)



June 1992  
EW/IRAP-6-E

(PART II - SECTION B)

The following table shows the number of ITA's presently in the seven regions as well as the 1991/92 program expenditures for each of the regions.

<u>Region</u>	<u>No. of ITA's</u> *	<u>Expenditures</u> 1991/92 (\$ millions)
Newfoundland & Labrador	9	\$ 1.7
Maritimes	27	4.4
Quebec	44	10.8
Ontario	61	20.8
Prairies	26	3.9
Alberta and NWT	18	4.0
British Columbia and Yukon	29	7.9
<b>TOTAL</b>		<b>\$53.5</b>

\* Current staffing excluding vacancies.

Of the total 220 ITA positions, 160 are ITA contractors, most of which are employed by the individual "Host" organizations; i.e. provincial research organizations, universities, industrial and professional associations private consultants. These individuals are dedicated full-time to the delivery of the IRAP program. Support for the "host" organizations is provided in the form of contributions under Annex 1 of the IRAP Terms and Conditions and the maximum amount for any recipient is \$2,000,000 per year. (Contributions in excess of \$2,000,000 are subject to Treasury Board approval. See copy of the Terms and Conditions attached as Annex 2 to this report.) (See also Section B - Item 9.2)

Comparable figures for ISTC are not readily available due to the variety of duties assigned to ISTC officers. However, it is interesting to note that there are approximately 30 officers in the Ontario Region (ISTC) to deliver a wide range of departmental programs and related services as compared to the 61 NRC ITA's in Ontario wholly dedicated to the delivery of the IRAP program.

From the ITA community, senior ITA's are appointed to provide administration and functional direction to 10 to 14 other ITA's. The senior ITA is also a working officer with his own case load. (See Exhibit No. 3)

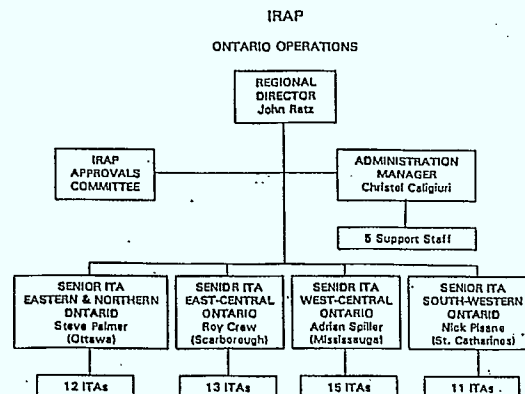


Exhibit No. 3



(PART II - SECTION B)

3.0 Program Management:

- 3.1 The central theme of the IRAP delivery process is virtually full decentralization of accountability and responsibility. Regional Directors are fully responsible for the management, administration and delivery of all projects within their geographical area. NRC headquarters provides guidance on program policy and becomes involved only on projects over \$250,000 or as specifically requested by a Regional Director on a smaller, but complex, project. (Input from the Technical Assessment and National Coordination (TANC) Group is required for all projects over \$200,000.) All project funds are allocated to the Regions, and are subject to adjustment based on actual requirements during a given fiscal year.
- 3.2 Project approval authority for all projects under \$15,000 (TE's) has been delegated to the senior ITA's. Regional Directors have approval authority for project contributions up to \$250,000, with the provision that cases with contributions in excess of \$100,000 must be recommended by a Regional Advisory Committee and reviewed by an Interdepartmental Advisory Committee which includes OGD's, NRC Institutes, and TANC representation.

Projects involving contributions over \$250,000 are reviewed by an Interdepartmental Committee in headquarters and approved by the Vice President. Projects over \$1,000,000 require Treasury Board approval. Even for larger projects exceeding \$250,000, the Regional Director can refuse to forward a recommendation to headquarters if he/she wishes to allocate the funds in some other way, since the funds must come out of his/her regional budget.

4.0 Program Delivery: (See also Exhibit No. 4 on the page 13)

- 4.1 As a standard practice, ITA's enter into extensive discussions with the client prior to accepting an application in order to review the potential merits of the project and to determine whether it meets the criteria for IRAP assistance. The ITA also provides assistance in gathering information and developing an acceptable work plan. Once this preliminary interaction has been completed, the organization is invited to submit an application. However, this application is not formally registered until most of the required information has been received from the applicant and the ITA is reasonably confident that the project will be approved. As a consequence, the target turnaround time is 10 working days for the TE projects. For RDA projects under \$100,000, the target is 40 working days and for the larger projects, up to 90 working days. Target turnaround times are generally met.

- 4.2 The IRAP delivery structure and mandate of its ITA's contributes positively to project turnaround times and client satisfaction on a number of fronts, namely:

- ITA's are located in numerous technology centres in each of the provinces and territories to provide on-the-spot assistance to industry. (Seventy two (72) centres across Canada - Exhibit No. 2)
- Much of the ITA's activities concerns the provision of advice and assistance to their clients, hence, potential applicants are generally well known to the ITA and projects have often been discussed at some length before a decision is made by the client to undertake the project.
- ITA's play an active role in collecting project data and information and in assisting the applicant in developing and preparing the application.
- Decision-making is close to the clients.

(PART II - SECTION B)

- 4.3 The case load (active funded projects) for each ITA varies considerably depending on the region, but may range from 10 projects to as many as 50 projects. Where the case load is low, the ITA's devote a greater portion of their time to the non-funded activities of the program; i.e. the provision of assistance and advice. For the funded program activities, the ITA spends about 75% of his/her time on the smaller TE projects.
- 4.4 All projects, regardless of size, are analyzed and evaluated at the regional level unless assistance is requested from headquarters by the Regional Director as on a large or more complex project. Even so, the Regional Director makes the final recommendation on assistance. For some projects, the regional ITA may, on occasion, request TANC or an OGD to assume the role of the ITA as project manager with the NRC, or "Host" ITA, providing administrative support.
- 4.5 IRAP management would like to locate some sector specialists in the larger centres in each region. Because of resource constraints, this has not been possible. At present, ISTC is frequently called upon to provide sector advice and to assist in evaluating the commercial aspects of RDA projects
- 4.6 There is no standard evaluation format for TE projects and this does not appear to be a problem. However, for RDA projects a standard format is required. While not mandatory, the same format is generally used for the smaller RDA projects. NRC staff at both headquarters and regions appear to be comfortable with this flexible arrangement.
- 4.7 "Agreements" for TE projects are standardized and simplified through the use of the reverse side of the Application Form. (See Annex 3.) "Agreements" for the RDA projects are four pages long, using a standardized format. (See Annex 4.) Consultation with Legal Services is minimal at the offer stage and this facilitates the delivery process but presents few post offer problems when a dispute arises. On balance, NRC management prefers the current flexible approach.
- 4.8 The consultative approach during program delivery is both formal and informal, depending upon the size and complexity of the project. Advice is readily available to both the ITA and to the client, most of which is free, at least for a limited period of time. For the non-funded activities, extensive use is made by the ITA's of the NRC network and seeking such advice is at the discretion of the ITA. For RDA projects, the ITA accesses as required, NRC's network of both in-house and external scientific and technical advisors.
- 4.9 NRC's network of "Scientific Advisors" includes senior scientists located within NRC, in OGD,s, in universities and, in industry. "Scientific Advisors" are used only with the approval of the clients and their services can be engaged by the client for a limited time at the cost of their travel and accommodation expenses. Frequently, applicants are encouraged to engage a "Scientific Advisor" to assist them with their project and IRAP will then ask the "Advisor" to act as its "monitor" in assessing whether or not the project is achieving its stated objectives.
- 4.10 Project monitoring and claims processing is the responsibility of the ITA and appears to pose few, if any, problems. Applicants submit regular milestone reports which include claims against budgeted amounts and projected cash flows. ITA's (NRC employees only) have signing authority for up to \$50,000 per claim, but because claims are submitted monthly, most claims are approved by the local ITA irrespective of the size of the contribution. However, data entry by the ITA into the central information system is necessary before payment can be

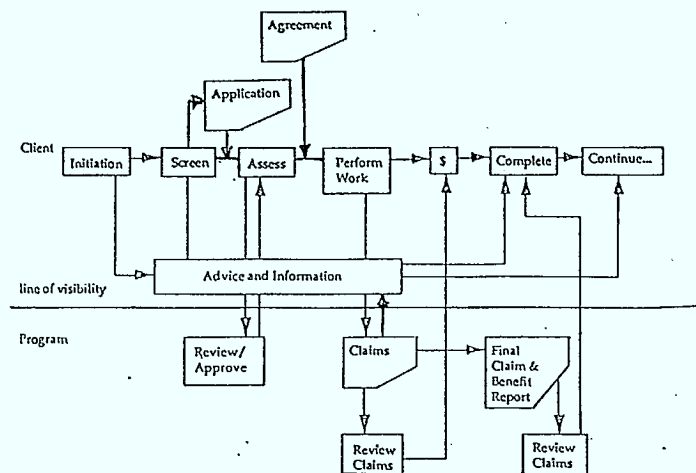
(PART II - SECTION B)

made. IRAP follows a "use it or lose it" approach and payment shifts between fiscal years depend upon the client's needs and the availability of IRAP funding. ITA's must be alert to identify projects which are not proceeding on schedule and for which unplanned payments may be sought in subsequent fiscal years.

In short, the process is simplified due to the large number of very small projects, the limitation of the types of eligible costs (basically salaries and wages) and the authority delegated to the ITA's (NRC employees) to approve claims thus limiting the number of individuals who must authorize/approve a claim before it reaches the cheque preparation stage.

- 4.11 Presently, there are no formal manuals or guidelines in existence at the national level. However, IRAP Administration in H.Q. has recently drafted a set of national policy guidelines and these are under review by the IRAP Management Committee. (It is expected that the draft guidelines will approved by the end of February 1993.) At the regional level, regional directors are free to develop operational/administrative procedures and guidelines as needed within the bounds of general direction provided by headquarters. To maintain and encourage consistency in the delivery of the program, Regional Directors meet regularly with the Senior ITA's within each region and the Regional Directors from all regions meet approximately every two months.

IRAP DELIVERY PROCESS



- IRAP distinguishes itself by working on-site with firms and by emphasizing technical advice and information

Exhibit No. 4

**5.0     Information System:**

NRC has developed a rather comprehensive single program information system exclusive to IRAP. The data base is used primarily by the "Contributions Office" in recording project commitments and in authorizing project payments, but is also used by the ITA and others as a project control record and for assembling program statistics and special interest data. Primary source for data entry is the ITA, although some regions have a data entry clerk for this purpose. The information system is part of the overall NRC system and control of the software and the related budget rests with the NRC Information Branch in headquarters. The information budget under IRAP for 1991/92 for the specific requirements pertaining to the IRAP program was approximately \$650,000 and was used in operating the system and in monitoring the integrity and timeliness of the data being collected.

**6.0     Project Monitoring:**

6.1     There is no formal procedure for a pre-approval integrity review of project recommendations. However, the Program Administration Group in H.Q. regularly selects a sample number of approved (a mix of completed and still to be completed) projects for a post-review of the analysis and evaluation by an ad-hoc committee of independent ITA's. The results of these reviews are communicated to the responsible ITA and the Regional Director as part of the learning/training process. In addition, NRC Internal Audit carries out their regular financial and systems audit of IRAP activities as does the Auditor General.

6.2     All projects are scheduled for benefit monitoring within 12 months of completion.

**7.0     Commercial Intelligence:**

Industrial intelligence is actively sought after by the ITA's, but primarily for use in assisting clients. It is not formally documented for dissemination either internally within NRC or externally to industry at large.

**8.0     Promotion:**

High profile program promotion is neither carried out nor needed. Because of the established level of interest in the program, "word of mouth" publicity is wide spread amongst clientele. Furthermore, demand already exceeds resource capacities and promotion is essentially limited, therefore, to participation in seminars, conferences, and related events by IRAP personnel both in H.Q. and regions.

**9.0     Human Resource Skills:**

9.1     The IRAP ITA, through the NRC network, has access to in-depth technical scientific expertise and advice, covering a wide range of disciplines. "Scientific Advisors" (some 300 in total) are available to clients and are used extensively on RDA projects at the nominal cost covering their travel and accommodations expenses. In addition, scientific (technical) advisors from universities, institutes and other organizations are frequently used as resource persons. IRAP management is very satisfied with the "value for money" received via these resources.

9.2     NRC has adopted a rather unique, but effective, approach to the acquisition of IRAP delivery personnel. Of the total of 307 person year utilization, only 107 of these are permanent NRC employees. The remaining 200 are under contract from "Host" organizations. All but a few ITA's are full time dedicated personnel and part-timers are presently being phased out.

(PART II - SECTION B)

Selection and training of "Host" ITA's is the responsibility of the Regional Director. Turnover within this group is low, morale is high and IRAP management appears very satisfied with their performance. Typically, the required qualifications for an ITA include an engineering or scientific background with at least 10 years of industrial experience at a middle or senior management level.

- 9.3 As in ISTC, IRAP personnel have expressed concern about the difficulty in providing the training desirable to maintain and upgrade officers' skills and knowledge given the resource restraints of both time and money.
- 9.4 IRAP management state that morale is high within the ITA community and that IRAP personnel are justly proud of their deserved reputation for providing practical and useful technical advice and support to clients as well as for their ability to offer financial assistance, where necessary. There seems little doubt that the ITA's see themselves, primarily, as technical advisors to their clients and are satisfied that they are fully exercising their mandate and achieving the objectives of the program. This factor alone, no doubt, contributes significantly to the high morale and low turnover rate of IRAP program personnel. While they do not neglect the "commercial" aspects of project delivery, the highest priority is, admittedly, placed upon the technical requirements of a project.
- 9.5 IRAP management believes that their delivery structure and inventory of skills would enable them to handle any program which is technology oriented.

**10.0 Political Sensitivity:**

- 10.1 Because of the maturity of the IRAP Program; its broad sector coverage; and the relatively small size of the average project; eligibility criteria are generally well understood by industry. Consequently, there are few challenges to decisions with respect to the eligibility of either the applicant or the project. Only infrequently are IRAP staff called upon to respond to queries directed to the Minister. This contrasts with ISTC program experience.

## SECTION C - OBSERVATIONS

### 1.0 IRAP Program and Delivery Process:

- 1.1 The IRAP delivery organization is structured to deliver two relatively straight forward funded program components, as well as a non-funded component which offers technical advice and assistance through a single element program. (See copy of program T's & C's attached as Annex 2.)

Like the IRAP program itself which has been amended and adjusted in the years since its inception in 1962 to meet the ever-changing needs of its clients and the objectives established for it by the government of the day, the IRAP delivery system has also evolved over that same 30 year period to its present form and structure to meet those same needs and objectives.

- 1.2 As of August 31, 1992, ISTC was delivering 31 different contribution and loan assurance programs not counting the numerous "one-offs". Seven of these programs could be classified as "S & T" programs. Included as one program in the "S & T" group are the "Sector Campaigns". Under "Sector Campaigns", there are twelve (12) different components, most of which have multiple program elements. Most of the other S & T programs also have multiple program elements.

ISTC has been required to make an abrupt shift from the delivery of national programs with broad areas of eligibility to a series of complex programs and program components requiring new skills and radically different approaches to program delivery.

- 1.3 ISTC programs are sector and product specific whereas IRAP methods, including access to advisory networks, are suited to the delivery of a program which is available to companies in all industrial sectors.
- 1.4 IRAP assistance is directed to solving identified problems through the application of technology or through research, development and adaption whereas, S & T programs encourage clients to look at new and "leading edge" technology to develop new products or processes for future exploitation. The transfer of S & T programs to NRC might result in a shift in emphasis from "commercial" to "technical" by IRAP, thereby defeating the purpose of the particular program. For example; under AMTAP, a holistic approach is taken to identify a client's strength and weaknesses and technical issues may represent only one of a number of areas which require attention.
- 1.5 IRAP focuses on the provision of technical advice and assistance, particularly to SME's, utilizing the non-funded component of the IRAP program. ISTC projects are generally larger in size and clients are looking to ISTC to provide financial assistance.
- 1.6 IRAP's reputation rests, largely, on their ability to provide timely and useful technical advice and assistance. A change in direction to meet the demands for commercial analysis could "dilute" IRAP's strong, and needed, technical orientation.



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- 1.7 The delivery of ISTC's, S & T programs by NRC would require that IRAP acquire the sector expertise necessary to deliver these programs. However, the requirement to be selective as to who would receive assistance would be a significant change for IRAP.
- 1.8 The highly complex S & T type project (excluding projects under AMTAP, MAS, MVP) requires that a core of experts in each particular subject area be available. Locating these experts in every regional office would not be cost efficient.
- 1.9 IRAP is basically "application-driven". Little or no pro-active approach to program promotion is taken. ISTC pro-actively seeks out its clientele and provides incentives for applicants to enter into specific initiatives.
- 1.10 It has been suggested that a firm's use of IRAP may be a logical first step prior to applying for assistance under a S & T program.
- 1.11 IRAP has no experience in, or structure available to gather and disseminate industrial intelligence to industry. To undertake even a portion of this activity would require extensive training of IRAP staff and would likely require several years for IRAP personnel to establish the informal and formal contacts in industry essential to the provision of "good" information. NRC are concerned that the essential and valued "in-confidence" relationships established between NRC and its clients would be lost if clients feared that confidential information could be made available to competitors.
- 1.12 At present, IRAP closes its "window" when all program funds have been committed for the year. The "first come, first served" approach would not appear to be applicable to S & T programs because of their sensitive nature.
- 1.13 IRAP regional offices are only now becoming involved with the larger projects which were previously delivered out of NRC headquarters. Comparisons between IRAP field offices and ISTC regional offices based on past performance are, therefore, not yet valid.

**2.0 Transfer of ISTC Programs (S & T) to IRAP:**

It seemed appropriate, as part of this review, to consider the suitability and practicality of transferring some or all of the S & T programs to NRC/IRAP for delivery. Both NRC and ISTC staff interviewed were well aware of the recent discussions which have taken place in this regard.

- 2.1 Based on the foregoing, it is our opinion that the significant differences between the NRC/IRAP approach and the purpose and objectives of ISTC would require that NRC/IRAP make major structural and attitudinal changes (organization, skill mix, etc.) before they could assume the mandate for the S & T programs.
- 2.2 Some NRC staff interviewed expressed concern that commercially oriented ISTC programs (AMTAP, MAS, MVP), if delivered by NRC, would "dilute" IRAP's focus on technology and science, areas of expertise of which they are justly proud. At the same time, ISTC Ontario, sees the transfer of AMTAP to NRC as a major loss of a very successful program which "opens doors" and provides ISTC with access to commercial/technical intelligence essential to achieving its new directions. (See also SECTION D, Item 1.4.)

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- 2.3 IRAP is not considered to be a "politically sensitive" program. ISTC programs tend to carry much higher "political" profiles because of their "leading-edge" approach, the discretionary nature of the firms and sectors assisted, and because of the significant funding available under the programs. IRAP personnel would have to adjust their approach to deal with this reality.



## SECTION D - CONCLUSIONS

### 1.0 Basic Conclusions:

Our review of IRAP, including the comparison of its delivery process with those of S & T programs, has led us to the following conclusions:

- 1.1 The simplicity of IRAP; its large volume of cases, most of which are small; its cross-sectoral client base; plus the network of technical/scientific expertise available to NRC, all represent major departures from S & T programming, with the result that organizational structures, authorities and processes for IRAP are not readily transferable to ISTC.

We note that this conclusion may appear to be at variance with the recommendation contained in the Report of the Steering Committee on Prosperity Initiatives entitled, "Inventing our Future" which reads, in part:

"Consolidate government technology support programs into coherent, readily accessible packages, responsive to customer needs and with demonstrable value added. A model for this should be the Industrial Research Assistance Program...".  
(Emphasis added).

However, the Prosperity Report does not discuss the details re the suitability of the IRAP delivery process to meet the specific needs and objectives of many of the highly specialized government programs now in existence. The IRAP program is more closely related to the former "universal" type programs of DREE/DRIE than it is to the selective programming now present in ISTC.

- 1.2 IRAP delivery depends upon ITA's which are located in a large number of centres throughout the country. The volume of small projects and the IRAP mandate to provide advice and assistance requires this type of geographical distribution. ISTC deals with a small number of complex programs and projects. Geographical decentralization is practical under only limited circumstances.
- 1.3 The S & T eligibility requirement that applicants enter into complex alliance or network arrangements requires time and skills not readily available to IRAP at present. Because of the low volume of projects, it is not possible to locate these skills in every regional office in Canada.
- 1.4 The major strength of IRAP delivery staff is technical/scientific. IRAP management express concern that the transfer to NRC of programs such as AMTAP, MVP and MAS, which are heavily commercially oriented, would weaken IRAP's capacity to maintain a technical/scientific focus even though it could strengthen its business expertise. ISTC regional managers see this transfer as a loss of access to commercial intelligence important to the Department's new direction.

A similar concern was also reflected in the Government Response to the Report of the Standing Committee on Industry, Science and Technology, Regional and Northern Development entitled: "IRAP: AN INQUIRY INTO THE INDUSTRIAL RESEARCH ASSISTANCE" which reads, in part:

"...IRAP may not be the appropriate vehicle to deliver the full range of support required by SME's. It would not be desirable to dilute the expertise of ITA's by requiring them to do too much...". (See Annex 5 and Annex 6.)

**2.0 Principles for Consideration:**

Notwithstanding the fundamental differences between IRAP and S & T programs, there are opportunities for closer interactions to assist the client. The following principles should be considered for possible application in ISTC. The adoption of some or all of these principles could require that ISTC accept a "major" shift in the present mind set in regards to accountability, program management and delivery; budgetary allocations/control; signing authorities; etc.

- 2.1 The decentralization of the authority and responsibility of the IRAP program delivery to Regional Directors allows for greater efficiency in the delivery of IRAP. A greater degree of delegation to ISTC regional offices would appear warranted for the S & T programs. A review should be undertaken to determine if delegation could be made standard for all programs.
- 2.2 The Minister should be approached to increase the signing authorities of RXD's, DG's and ADM's.
- 2.3 Simplification of S & T program T's & C's is desirable. Less reliance should be placed on detailed eligibility criteria, etc. in the T's & C's and more emphasis should be given to the use of departmental discretion in decisions whether or not to support particular industries or industry sectors.
- 2.4 The process of registering an application as an "application" on the date it is received, regardless of its completeness, should be reviewed. However, it should be noted that failing to register and application on its receipt, might result in its not being recorded and this contains the potential for "political" embarrassment in the future.
- 2.5 Evaluation processes and procedures should be reviewed to determine if simplification is possible.

PART III

III

DETAILED REPORT OF  
IRAP DELIVERY PROCESS

**INDUSTRIAL RESEARCH ASSISTANCE PROGRAM (IRAP)**

**REPORT ON THE DELIVERY PROCESS**

**PART III**

**DETAILED REPORT OF THE IRAP DELIVERY PROCESS**

**SECTION A - GENERAL**

**1.0     History:**

- 1.1        The IRAP program was first established in 1962. In 1972 it was altered towards increasing the commercial capabilities of companies through the support of research projects of high technical merit. In 1982, IRAP was consolidated with NRC's Technical Information Service program.
- 1.2        In 1982, IRAP was further amended to simplify and decentralize some of the operations and the IRAP national network was established with ten IRAP provincial offices across Canada. IRAP assistance was organized into the following modes:
- Field Advisory Service (IRAP-C)
  - International Technology Service (IRAP-I)
  - Projects Employing Students (IRAP-H)
  - Short-Term Projects (IRAP-L)
  - Medium-Term Projects (IRAP-M)
  - Long-Term Projects (IRAP-R)
- 1.3        In 1991, the approach was further refined to consolidate the offices into seven Regional Offices and to consolidate the activities under advisory and funded program components. (The components are defined as such for administrative purposes only. The program's Terms and Conditions (T's & C's) refer only to "projects" which are given a broad definition in the T's & C's.)
- Technology Acquisition and Information Exchange.  
      (Technology Enhancement - TE Program)
  - Research, Development and Adaptation.  
      (Research/Development/Adaptation - RDA Program)

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The Technology Acquisition and Information Exchange activity now incorporates the first four program elements identified in 1.2 above and the last two program elements are covered under the new Research, Development and Acquisition activity.

1.4 IRAP also delivers the **Technology Inflow Program (TIP)** started in the Department of External Affairs and, since 1992, funded program support now comes from IRAP.

1.5 The latest revision to the program's **Terms and Conditions** were approved by the Treasury Board in August of this year (1992). (See Annex 2)

1.5.1 The Regional Directors were heavily involved in the development of the proposed changes to the T's & C's. Consultations were also held with two other departments and generally with NRC headquarters.

1.5.2 There were no formal consultations with clients re the proposed changes to the program. Some complaints have been received from clients in respect to the larger or more complex projects about the lack of expertise available within the regions. However, the general response to the changes has been favourable because decision-making has been placed closer to the clients.

2.0 Program Coverage:

2.1 Eligible companies or groups of companies are those which are incorporated or registered whether provincially or federally in Canada.

2.1.1 IRAP is a national program, available to firms across the country.

2.1.2 The primary focus of the program is on small and medium-sized firms with up to 500 employees. (Up to August 1992, the maximum number of employees was limited to 200 employees.)

2.1.3 Up to 67% of all requests within a geographical region, are for non-funded assistance.

2.2 The maximum contribution available for TE projects is \$15,000 per project.

2.3 An administrative limit of \$350,000 has been established for contributions for RDA projects, although the T's & C's do provide for the approval of projects by NRC up to \$1,000,000 (few cases) and for submission to Treasury Board of projects which exceed the \$1,000,000 figure.

Eligible costs are limited to salary and wages (excluding overheads) for the client and sub-contractors, including consultants; to a portion of approved market and feasibility studies; to travel costs; and to consultants costs in support of companies with up to 500 employees. Some specialized research equipment may be eligible.

2.4 There is no mandatory requirement in the IRAP program for the creation of "alliances". However, IRAP does encourage applicants, where appropriate, to enter into formal or informal alliances to undertake projects.

- 2.5 Frequently, IRAP will co-fund projects with other agencies or departments. For example; in Atlantic Canada, ACOA may provide support for the acquisition of assets while IRAP will support the eligible salaries for a research project.

3.0 Program Management and Delivery:

- 3.1 The IRAP Program is administered and delivered by a separate organizational unit in NRC headed by a Vice-President.
- 3.2 The country has been divided into seven regions, each headed by a Regional Director.
- 3.3 In Headquarters (Ottawa), there are three organizational components which provide advice and direction in program administration; in technical assessment and national coordination; and, in program policy and planning.

(See Exhibit No. 1)

3.4 Delivery System

- 3.4.1 IRAP has contracted with a number of "Host" organizations consisting of provincial research organizations; colleges and universities; industrial and professional associations; and private consultants to establish a national network of "Industrial Technology Advisors (ITA's)" to deliver the program and to assist firms in accessing the IRAP Program.
- 3.4.2 The existing delivery structure, using industry experienced ITA's, results in an efficient and effective method to deliver both the funded and non-funded services under the IRAP Program. It is NRC policy to encourage the ITA's to act independently and to be creative in advising clients on the use of technology. ITA's have high morale and there is a recognized "esprit de corps" amongst IRAP personnel. There is limited pressure upon the individual ITA's to produce a higher volume of projects. IRAP budgets are fully committed each year and more emphasis on funded program activities would have a negative impact upon the ITA's ability to provide advice and non-funded assistance to their clients.
- 3.4.3 The process relies heavily upon the skill and expertise of the individual ITA who is continually challenged to maintain his/her skills and knowledge at a current level.
- 3.4.4 There is recognition that the strong technical background of the ITA's can result in some weaknesses or deficiencies in respect of the commercial aspects of project evaluation and analysis. While wishing to strengthen the commercial skills of the ITA's, IRAP management does not want to dilute the technical strengths now present in the ITA structure. The Ontario Region is

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investigating ways of strengthening the commercial analysis functions through arrangements with the University of Toronto, Waterloo University and the continued and expanded use of CASE officers.

(See Exhibit No. 2)

4.0 Program Accountability and Responsibility:

- 4.1 Each of the Regional Directors is responsible for the management, administration and delivery of the projects located within the geographical area for which he/she is responsible.
- 4.2 All program funds, with the exception of a small amount retained in headquarters to cover expenditures on old projects still being administered by headquarters, are allocated to each of the regional offices. The Regional Directors are responsible for the management and utilization of these funds.
- 4.3 Until recently, there have not been any IRAP program manuals or guidelines applicable nationally. The Technical Assessment and National Coordination Group (TANC) has prepared draft policy guidelines and these are now being reviewed by the IRAP Management Committee.

## SECTION B - PROGRAM DELIVERY

### 1.0 Receipt of Applications:

- 1.1 All applications for assistance (funded or non-funded) are received and evaluated in the regional offices in the region in which the project is located. Applications for projects, regardless of their size or complexity, are usually assigned on a geographical basis to the ITA responsible for the area in which the applicant is located. Most of the applications received are submitted through the local ITA's.
- 1.2 It is the general rule that application forms are not given to potential applicants until an ITA has met with the firm; has reviewed the project; is satisfied that it project meets the requirements of the program; and, is satisfied that the applicant has collected all of the required information. Approximately 40% of all inquiries in Ontario, do not meet program criteria for financial support even though technical advice and counsel may be given in many of these cases.

The ITA may bring in another ITA (s) to review the proposed project and will usually provide direct assistance to the firm in developing and preparing the proposed work plan, pro-formas and other required information.
- 1.3 An ITA may continue to work with a firm after it leaves the ITA's geographical area, provided that it is practical to continue to do so because of distance or because of the relationship which may have been established between the client and the ITA.
- 1.4 An application is not formally recorded as having been received until the ITA determines that all of the information required to carry out the evaluation has been received and is confident that the committee will have enough information on the project to arrive at a recommendation.
- 1.5 Applications are generally accepted on a "first-come, first-served" basis.
- 1.6 Application Forms are not required for the non-funded component activities of the Program.

### 2.0 Project Analysis and Evaluation:

- 2.1 All projects are analyzed and evaluated within the region in which the project is located unless the Regional Director asks headquarters for assistance either at the evaluation or at the project monitoring stage. The Regional Director still has the final say as to whether or not the project should be recommended for assistance.
- 2.2 When the contribution is expected to exceed \$100,000, the ITA must request input from the Technical Assessment and National Coordination Group in headquarters.
- 2.3 The ITA acts as the "Project Manager" for each of the projects for which he/she is responsible.



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- 2.4 In some cases, another government department (OGD) may possess the key technical knowledge and is requested to take on the role of the ITA and to act as the project manager with the NRC-ITA serving as the NRC administrative manager for the project.

Some concern is felt by IRAP managers in allowing OGD's to spend their IRAP budget.

- 2.5 There is a standardized evaluation format for RDA project contributions. While use of this standardized format is not mandatory for the smaller projects, it is in general use for all RDA projects, regardless of size. The standard format covers:

- The technical and commercial objectives.
- The technical feasibility of the project.
- Market skills and prospects.
- Financial capability of the applicant to carry out the project.
- Incrementality.

ITA's are concerned about the commercial aspects of a project and, in Ontario, may refer clients to the University of Toronto (2 days free service - paid by NRC) or to other similar organizations. In competitive situations, ITA's try to treat all competitors equally, on a positive basis.

The opinion was expressed that the ITA's are comfortable with the existing process and, generally, would not favour the use a standardized evaluation format for all projects under either TE and RDA although it was pointed out that the format used in the Ontario Region is basically standardized for all projects.

- 2.6 For TE and RDA projects, the ITA satisfies himself/herself of the following:

- Does the project make sense?
- Is it incremental?
- Does it fit the program and the company's objectives?
- Will the company continue to develop the skills?

- 2.7 It should be noted that most of the applicants are already in business and have established "track records".

2.8 Consultation Process

- 2.8.1 For TE projects, consultations with others is at the discretion of the ITA. Such consultation may be with other ITA's in the network, with NRC Institutes, with OGD's, etc.

- 2.8.2 Some technical assessment must be obtained for all project contributions in excess of \$15,000. For RDA projects, all projects in excess of \$100,000 must be referred to the Technical Assessment and National Coordination Group (TANC) for their comments. Projects under \$100,000 may be referred to TANC, or to any other group, at the discretion of the ITA. (For projects under \$100,000, regions may make their own special arrangements re the level of consultation required.)

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- 2.8.3 "Scientific Advisors" (Advisors) may be assigned to work on a project. The use of Advisors on a specific project is usually proposed by IRAP, although the clients can, and do, request the assistance of Advisors. Where proposed by IRAP, the client has the right to reject any specific individual or organization (e.g. conflict of interest, security of proprietary information, etc.) and IRAP will then select another Advisor for the client's acceptance.
- 2.8.4 For non-funded program activities, ITA's make extensive use of the advisory services available to them through the NRC network.
- 2.8.5 IRAP management believes that the consultation process could be strengthened, at least in some regions.

2.9 Program Guidelines and Manuals

Each region has its own set of regional guidelines and policies for the administration and delivery of the program. Consistency in program administration and delivery in the Ontario Region is also supported through regular meetings of the Regional Director with his four area managers (Senior ITA's). A set of national guidelines has been drafted and is now being reviewed by IRAP program management.

3.0 Project Approvals:

- 3.1 Contribution signing authorities are governed by the NRC Financial Signing Authorities chart and are as follows:

3.1.1 TE Projects

Signing authority for all project approvals up to \$15,000, can be delegated to the senior ITA's within a region, subject to the regional delegation.

3.1.2 RDA Projects

\$15,001 to \$30,000 contribution, Regional Director after consultation with two other Senior ITA's.

\$30,001 to \$100,000 - By the Regional Director after review by a Regional Advisory Committee of six persons, three of which must be permanent NRC employees.

\$100,001 to \$250,000 - Recommended by a Regional Advisory Committee and reviewed by an Interdepartmental Advisory Committee, made up of representatives from OGD's and NRC Institutes, (\*) and approved by the Regional Director.

\$250,001 to \$1,000,000 - Reviewed by an Interdepartmental Advisory Committee (\*) and approved by the Vice President.

Over \$1,000,000 requires approval of the Treasury Board.

Projects under the biotechnology component require the approval of the Vice-President, Biotechnology (NRC).

(\*) The opinions of these Interdepartmental Advisory Committees are important to NRC. Accordingly, very few committee recommendations are reversed and committees could be seen to be "approving" projects.

3.1.3 It is the objective of IRAP management to delegate as much authority as possible to the field level.

#### 4.0 Letters of Offer:

4.1 The IRAP Agreement (Offer) for a TE project is contained on the reverse side of the TE Project Application Form. (See Annex 3.) A simple four-page document is used for an RDA project offer. (A sample is attached as Annex 4.) This short document makes for ease of administration, although in cases where a dispute arises, IRAP generally has little on paper upon which to support its position. Nevertheless, the risk involved is considered acceptable given the relatively small size of the contributions and the flexibility available to the ITA's to administer their projects.

**Note:** It should be noted that IRAP employs a "use it, or lose it" approach with clients. Annual commitments and annual expenditures are identified in the letters of offer but lapses in claims in one fiscal year may be negotiated provided that there is sufficient justification and adequate funds available.

#### 5.0 Project Monitoring (Claims):

- 5.1 The project manager (ITA) is responsible for the receipt and processing of all cost claims and for ensuring that the required status reports are received.
- 5.2 The ITA regularly visits the applicant to obtain and review regular milestone reports, reports on costs claimed against budgeted amounts and projected cash flows.
- 5.3 NRC ITA's have signing authority for up to \$50,000 per claim. Because claims are made on a monthly basis, all but a few of the cost claims are approved by the local ITA.
- 5.4 There is no standard format for the recording, calculation and processing of claims for TE projects but invoice forms are provided for RDA projects.

#### 6.0 Benefit Monitoring:

- 6.1 All projects are monitored for benefits resulting therefrom within 12 months of the completion of the project. (Experience indicates that benefit monitoring is up-to-date.)
- 6.2 Benefit monitoring is the responsibility of the ITA's. Headquarters reviews the benefit reports and records them in the data base for review and control purposes.

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- 6.3 Generally, benefit monitoring does not extend beyond the first year after completion of the project except for an update on prior projects is required when finalizing a new RDA proposal.

**7.0 Program Integrity Review and Post Completion Audit:**

- 7.1 There is no formalized procedure for a pre-approval integrity review, that is: for a formal review of the project recommendation for "quality assurance" purposes, prior to its submission for approval.
- 7.2 The Program Administration Group regularly selects a sample number of approved projects (both completed projects and projects still underway) and assigns them to independent ITA's for a review of the analysis and evaluation. The results of these reviews are communicated to the ITA responsible and to the Regional Director concerned and are used as part of the "learning/training" process. Regional Directors have requested that this review process be extended.
- 7.3 NRC Internal Audit carries out their regular program of financial and systems audit on IRAP activities.
- 7.4 The Office of the Auditor General carries out a financial audit of IRAP activities as part of its audit of the National Research Council.
- 7.5 In December 1991, the Standing Committee on Industry, Science and Technology, Regional and Northern Affairs recommended that the Auditor General review management practices and financial accountability of IRAP's contributions and consider whether it is in the best interest of the IRAP program to merge financial and operational management in the same organizational structure. The report of the Auditor General was submitted to the Committee on May 13, 1992 and a copy of the Report is appended as **Annex 5**. Also appended as **Annex 6** is a copy of the Government Response to the Report.

**8.0 Program Information Systems:**

- 8.1 Project information is entered at the regional level and information can be accessed at either the regional office or at headquarters.
- 8.1.1 Primary source for entry is the ITA although some regions have a dedicated data clerk for this purpose.
- Data must be entered before project is approved.
  - Data must be entered before payments can be made.
  - Some ITA's "complain" about the need to carry out this function.
- 8.1.2 Project data is used primarily by the "Contributions Office" in the authorization of project payments.
- 8.1.3 System provides program statistics. e.g.
- By province.
  - By industry.
  - By special interest area.

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- 8.1.4 Information can be used for project control purposes.
- 8.2 Program contains a "key word" search capability which allows ITA's, and others, to search for similar projects, etc.
- 8.3 Control of the systems software program rests with the Information Branch in Ottawa. IRAP personnel believe that it would be advantageous if this control was returned to IRAP.
- 8.4 IRAP considers that a principal weakness of the information system is its inability to function as a full "program management system".
- 8.5 A "user group" meets regularly to review program needs and proposed changes.
- 8.6 The informatics budget for 1991/92 amounted to \$650,000, broken down as follows:

- O & M	\$550,000
- Minor capital acquisitions	<u>100,000</u>
Total	\$650,000

Plus: Salaries for 3 py's not included in the above.

9.0 Other:

- 9.1 NRC does not use internal MOU's as delivery tools in the same manner as those employed by ISTC and does not contemplate their use in the foreseeable future.
- 9.2 IRAP management involves Legal Services in the administration of the program as little as possible. However, as noted in Section 4.1 above, it may leave NRC exposed at times when an applicant challenges a position taken by IRAP management.

## SECTION C - PROGRAM PROMOTION AND INDUSTRIAL INTELLIGENCE

### 1.0 Program Promotion:

- 1.1 The level of program promotion varies from region to region. Because of the generally high interest in the program, there is little or no need to undertake publicity programs to attract applicants. Most promotion takes place through the "word-of-mouth" advertising by satisfied clients and through IRAP personnel participation in seminars, conferences and other similar activities. Formal advertising takes place only in those areas where the program is not well known. ITA's may belong to local trade, industry or research organizations and thus promote the program through these associations.

### 2.0 Industrial Intelligence:

- 2.1 Industrial intelligence is actively sought in order to develop an information base for use in assisting IRAP clients. It is not collected to provide general or detailed information on any product, industry or industry segment. No formal dissemination of the intelligence gathered takes place within NRC or to OGD's.
- 2.2 ITA's are encouraged to attend technology forums to obtain and/or to upgrade their knowledge to better evaluate and analyze projects and to assist them in their provision of assistance to clients.

## SECTION D - HUMAN RESOURCES

### 1.0 Human Resource Utilization:

- 1.1 IRAP is administered and delivered by a combination of NRC employees and through "host" organizations under contract with NRC to provide these services. The "host" organizations include provincial research organizations; universities; technical colleges; private consultants; industrial and professional organizations; and other like organizations.  
  
"Host" organizations provide their services to NRC under contribution arrangements which are covered by a separate set of Terms and Conditions.
- 1.2 Present human resource utilization amounts to 307 py's, of which 107 are permanent NRC employees. The remaining 200 are under contract with the "host" organizations. (See the Organization Chart for the Ontario Region - Exhibit No. 3.)
- 1.3 IRAP management is satisfied with the performance of the "host" ITA's. With some minor exceptions, they are dedicated 100% to IRAP activities and take day-to-day direction from IRAP management. The remaining part-time ITA's are now being phased out.
- 1.4 Turnover of "host" ITA's is low. In the Eastern Ontario Region, the turnover in the current fiscal year is two out of thirteen contract ITA's. Selection, training and evaluation of "host" ITA's is the responsibility of the Regional Directors. Most training is of the "on-the-job" category with some participation in PSC officer training courses.
- 1.5 In addition to the above, it is estimated that the equivalent of 4.5 py's are dedicated to the delivery of IRAP in the following OGD's; Communication; Fisheries; and Agriculture, Energy, Mines and Resources, and CCRS.

### 2.0 Other Delivery Assistance:

- 2.1 ITA's also have access to approximately 300 scientific advisors to assist clients in identifying and implementing technological changes to their operations and in monitoring projects to determine that the identified milestones have been achieved. Approximately 1/3 of the advisors are NRC staff with the balance coming from OGD's and the private sector, universities, technical colleges, etc. The scientific advisors are not paid for their work and receive only reimbursement for their travel expenses. Even though no fee is paid, NRC has had little difficulty in obtaining the assistance of qualified advisors and it is the opinion of IRAP personnel that this is a highly successful activity for ITA's, Regional Directors and their clients.

### 3.0 Training:

- 3.1 The basic skill requirement for an ITA is an engineering or a scientific background. IRAP program training is primarily based upon on-the-job training and ITA's are encouraged to acquire other needed skills through PSC's Professional Development Program; e.g. financial, commercial analysis skills. In the interviews conducted, some

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concern was expressed about the lack of business expertise available to help SME's, given their need for such help.

- 3.2 ITA's are generally engineers with at least 10 years of industrial experience. Typically, they have come from senior or middle management ranks, have in-depth technical knowledge and expertise a specific area, with broad experience in other fields of technology.
- 3.3 Restricted O & M funds limits the dollars available for training. Removing officers from the "line" to attend courses also creates some problems in maintaining case throughput.
- 3.3 It was the opinion of one Senior ITA that the ideal structure is a mix of permanent and contract ITA's. The use of contract ITA's strengthens the network because of their contact with outside research and industry organizations. There is little evidence that contract ITA's face conflicts due to conflicting demands emanating from their "host" organization and from IRAP management. In practice, it is understood by both organizations that the "host" ITA is expected to devote his/her full time to the IRAP program.

### 4.0 Other:

- 4.1 It was reported that NRC intends to approach the Treasury Board for authorization to hire 75 additional ITA's over the next 5 years. These will be full time or term employees of NRC or of the "host" organizations.



## SECTION E - PROGRAM STATISTICS

1.0 IRAP Activity - Fiscal Year 1990\91:1.1 Statistics:

<u>Component</u>	<u>No. of Projects</u>		<u>(\$000's)</u>	
TE Component	3,662	83%	\$15,506	32%
RDA Component	<u>736</u>	17%	<u>33,102</u>	68%
<b>Total</b>	<b>4,398</b>		<b>\$48,608</b>	

(The 1992/93 budget is \$55 million.)

Note 1: Activities under the former program elements have been grouped together under the revised program activities.

- 1.2 Based on the above, the average contribution per project amounts to \$11,052. (The average for the current fiscal year is approximately \$9,000.)

It is estimated by IRAP program staff that approximately 1500 projects have a maximum contribution of \$2,000 each, and another 1500 projects have a maximum contribution of \$6,000 each and that 10% of the total projects consume approximately 40% of the program budget.

- 1.3 It is estimated that the above 4400 projects represents approximately 3500 different companies. In total, it is estimated that in a given fiscal year, there are 20,000 interactions by IRAP staff with 10,000 different companies.

(See Exhibit No. 5 - following page)

## (PART III - SECTION E)

IRAP Regional Elements Support - Fiscal Year 1990/91

## Project and Contribution Distribution

PROVINCE	IRAP-II		IRAP-L		IRAP-M		IRAP-M+		IRAP-R		TOTAL	
	No.	\$(000)	No.	\$(000)	No.	\$(000)	No.	\$(000)	No.	\$(000)	No.	\$(000)
BC	203	1,121	234	1,026	79	2,108	13	323	23	2,272	552	6,850
AB	97	466	138	505	40	1,187	7	200	14	822	296	3,180
SK	74	320	166	613	33	454	1	34	7	427	281	1,848
MB	73	322	156	543	15	315	4	107	11	839	259	2,126
ON	203	788	545	2,143	163	4,633	27	932	100	11,240	1,038	19,736
QC	479	1,821	646	2,930	69	1,839	11	329	26	2,635	1,231	9,554
NB	89	441	103	372	12	261	3	132	4	145	211	1,351
NS	72	356	85	347	20	425	6	224	1	41	184	1,393
PE	79	412	60	233	26	643	2	8			167	1,296
NF	103	475	57	272	17	361	2	166			179	1,274
TOTAL	1,472	6,522	2,190	8,984	474	12,226	76	2,455	186	18,421	4,398	48,608

IRAP Regional Element Support by Type of Industry, FY 90/91

	H		L		M		Total	
	No.	\$(K)	No.	\$(K)	No.	\$(K)	No.	\$(K)
Bldg.	152	759	262	1044	22	481	436	2284
Chem.	61	247	77	312	27	960	165	1519
Consult.	4	10	1	5	4	42	9	57
Elec.	209	933	222	937	131	3937	562	5807
Food	236	1157	334	1327	94	2075	664	4559
Mach.	76	295	141	594	30	724	247	1584
Rubber	8	36	6	26	1	26	15	88
Met. Fab.	137	602	265	1074	18	392	420	2068
Pet. Coal	5	25	9	36	4	83	18	144
Non-Met.	7	33	29	124	1	12	37	169
Paper	7	20	11	41	1	17	19	78
Other-Mfr.	131	597	379	1568	75	2062	585	4218
Other-Non.	128	424	90	347	27	661	245	1432
Pharm.	20	89	19	28	15	368	54	535
Service	68	255	57	236	21	461	146	952
S/W	120	610	59	267	63	2074	242	2951
Prim. Met.	9	33	19	89	1	31	29	153
Text.	30	108	73	296	4	127	107	531
Transport	32	143	58	245	6	128	96	516
Wood	32	145	79	339	5	70	116	554
Total	1472	6522	2190	8984	550	14731	4212	30237

## Exhibit No. 5

2.0 ITA Case Loads:

- 2.1 The number of active projects managed per ITA varies widely depending on the region concerned. The number of projects can range from 10 to 50 per officer. In those regions where the officers have a lighter funded program case load, a larger percentage of their time is spent on the non-funded activities of the program.
- 2.2 For the funded program activities, it is estimated that the ITA spends approximately 75% of his/her time on TE projects and the balance on RDA projects.

(PART III - SECTION E)

- 2.3 An ITA will have up to 100 firms in his/her active inventory of clients. More than 50% of the ITA's time and effort will be devoted to the provision of advice and for non-funded assistance.

3.0 Turnaround Targets:

3.1 Turnaround Targets

TE Projects: 10 working days

RDA Projects:

Under \$100,000 \* 40 working days

Over \$100,000 \* 90 working days

\* Target for 75% of projects processed.

Note: It should be noted that the "clock" does not start until the ITA is satisfied that he/she has most of the information needed to carry out the evaluation of the project.

- 3.2 It is estimated that TE projects are turned around in 2 to 5 days, on average. No figures were available on the turnaround time for RDA projects.

# ANNEX 1

**INDUSTRIAL RESEARCH ASSISTANCE PROGRAM (IRAP)****REPORT ON THE DELIVERY PROCESS****ANNEX 1****COMPARISON OF PROGRAM DELIVERY PROCESS**  
**NRC - IRAP VERSUS ISTC - S & T PROGRAMS**

<b><u>SUBJECT</u></b>	<b><u>NRC - IRAP</u></b>	<b><u>ISTC - S &amp; T PROGRAMS</u></b>
<b>Program Mandate:</b>		
• Focus	Primarily technical. Encourages greater use of technology and of research, development and adaption to solve identified problems and to improve competitive position.	Use of "leading edge" technology to enhance international competitiveness.
• Type of programming	National.	National.
• Coverage	Targeted cross-sectorally.	Targeted to specific sectors or sub-sectors.
• Clientele	SME's.	Varies with program.
• Instrument	Single program.	Multiple programs - multiple program elements.
<b>Program Characteristics:</b>		
• Volume of cases/Average per year	4,500 projects.	317 (1991/92)
• Average annual budget	\$55 million.	\$78.3 million (Offers Authorized in 1991/92)
• Maximum contribution per project	\$350,000 (NRC Policy).	Varies with program/program element.
• Public perception	Relatively high visibility. Deemed useful and effective. Not considered to be "political".	High visibility, complicated programs with "slow" delivery. "Politically" sensitive.
• Program Complexity: (T's & C's)	Single program. Simple.	Multiple programs. Complex.

(ANNEX 1)

- |                       |   |   |
|-----------------------|---|---|
| • Class of applicants | Single class.   | Ranges from single applicant to complex alliances. Specific to each program and program element.  |
| • Types of projects   | Two types. Broadly defined (TE's and RDA's).                    | Multi-type. Specifically defined  |
| • Eligible costs      | Basically salaries and wages.                                   | Broad range. Varies by program and program element. Includes operating expenses, special purpose equipment, studies, salaries, wages and overheads. |
| • Program target      | Not specifically targeted to any industry sector or sub-sector. | Targeted to specific sectors and segments within the sectors.   |

**Program Management:**

- |                                     |   |  |
|-------------------------------------|---|--|
| • Organization for delivery         | Single purpose, dedicated organization headed by a Vice President of NRC. | Program delivery integrated (ISB's and Regions) with other duties.             |
| • Accountability and Responsibility |   |  |
| • Budget allocation                 | Total allocation to regional offices.                                     | Primarily held in H.Q. except for some special arrangements; e.g. AMTAP, MSDP. |
| • Delivery of program - to clients  | Delivery totally decentralized.   | Mixed centralized and decentralized delivery - varies with program.            |

**Approval Authorities:**

- |               |  |   |
|---------------|--|---|
| • Authorities | Regional Directors - up to \$250,000.<br>Vice President - \$250,001 to \$1,000,000.            | RXD's/DG's - maximum of \$100,000 for those programs where authority <u>delegated</u> . Where not delegated, authority remains with the H.Q., ADM. Minister's approval for all projects over \$100,000 up to limits set by government policy. |
| • Commitments | IRAP follows a "use it, or lose it" philosophy because of the high demand for available funds. | Limited restrictions to the carry-over of unused funds.   |

**Delivery Mechanism:**

- |                      |  |   |
|----------------------|--|---|
| • Structure          | National network working through "host" organizations who supply the Industrial Technical Advisors (ITA's) along with NRC permanent staff. | No governing policy/direction. Delivery structure developed for each program. |
| • Use of Contractors | Major - 2/3 of ITA's contracted from "host" organizations.   | Modest - Supplementary to ISTC staff. Ad-hoc arrangements.                    |

<u>SUBJECT</u>	<u>NRC - IRAP</u>	<u>ISTC - S &amp; T PROGRAMS</u>
• MOU's	Not used in the ISTC context.	Used selectively.
<b>Application Processing:</b>		
• Consultation Process	Pre-application - Extensive use of "Scientific Advisors" (NRC, OGD's and other ITA's in the Network.)	Pre-Application - Extensive via use of internal and external inputs.
	Pre-Approval - Internal and interdepartmental committees.	Pre-Approval - Extensive through internal and interdepartmental committees.
• Project Assessment	Emphasis on technology involved.	Emphasis on technology involved as it impacts on commercial and internal competitiveness of applicant.
	Eligibility criteria simple.	Complicated eligibility criteria. Varies by program and program element. e.g. use of alliances.
	Limited use of standard evaluation formats.	Extensive use of standardized evaluation formats.
<b>Letters of Offer:</b>	Simple: TE Program - Incorporated into the Application Form.  RDA Program - 4 page letter (minimum Legal consultation).	Lengthy/Complex - Highly legalistic.
<b>Eligible Costs:</b>	Limited primarily to salaries and wages.	Covers broad range of operating expenses and capital costs, depending upon the program and program element.
<b>Claims:</b>	Up to \$50,000 verified and approved by the NRC ITA. (Covers most payments on all projects of all sizes.)  Claims may be submitted monthly.	Requires manager level approval.  Generally not more than quarterly.
<b>Turnaround Time:</b>		
• Target	TE's - 10 working days. RDA's - Under \$100,000 - 40 working days. - Over \$100,000 - 90 working days.	No targets established.

<u>SUBJECT</u>	<u>NRC - IRAP</u>	<u>ISTC - S &amp; T PROGRAMS</u>
<ul style="list-style-type: none"> <li>Recording the receipt of the application</li> </ul>	Only after receipt of most of the required information.	Application recorded as received when the Application Form is <u>received</u> by the Department regardless of the completeness of the information.
Guidelines and Manuals:	No national guidelines in existence. Draft Guidelines presently under review.	Detailed manuals and guidelines for each program.
Integrity Reviews:	No pre-approval review. Post review based on selected samples.	H.Q. pre-approval review on all contributions over \$100,000. Below \$100,000 integrity reviews are discretionary.
Information Systems:	ITA is prime entry source. System used as a data base and control system.  System used to trigger payments. It is proposed to eliminate the need for "hard copy" through the use of electronic mail.  System covers one program only.	Officer is the prime entry source. System used as a data base and for project/program control.  Claims verification, approval and payment based on "hard copy" submitted.  Covers all Department programs.
Case Loads:	Varies from 10 to 50 funded projects, depending on the geographical location of the ITA.  At least 50% of the ITA's time is spent on the non-funded activities supported under the program.	N/A  ISTC officer must be knowledgeable and provide advice on many programs as well as to assist industry clients in the provision of many services.
Promotion:	Mainly informal via client references. ITA's participate in conferences, seminars, etc. to make the program known.  ITA response is largely reactive. Need for promotion is limited. Annual budget is fully committed each year.	Extensive use of program brochures, publications, etc. Officers, managers participate in conferences, seminars, etc. to inform clientele of programs and services offered.  Department takes pro-active stance with targeted sectors.
Industrial Intelligence:	Informal - Obtained primarily to assist clients. No formal method for disseminating intelligence gathered, either internally or externally.	Major thrust of the Department to provide service to industry sectors and to facilitate technology transfer and commercial/market information through a formal process of providing interested parties with industry and sector information.



<u>SUBJECT</u>	<u>NRC - IRAP</u>	<u>ISTC - S &amp; T PROGRAMS</u>
Human Resources:		
• Skills/Experience	Undergraduate degree in engineering or science. Graduate degree in business related subjects is desirable. 10 years experience in industry at middle or senior management level.	Undergraduate degree in commerce, engineering or science. Graduate degree in business related area desirable. Background and experience re the "commercial" side of industry. Middle to senior management level experience.

## ANNEX 2

National Research Council  
Canada

Conseil national de recherches  
Canada

Vice-President  
Industrial Research  
Assistance Program

Vice-président  
Programme d'aide à la  
recherche industrielle

**NRC-CNRC**

## MEMORANDUM

Date 8 September 1992

To Regional Directors,  
Ottawa Office Heads

From Clifford Nelson Baronet



Re Treasury Board approval of IRAP Terms and Conditions

We have recently received notification that the Treasury Board has approved as requested the revised Terms and Conditions for IRAP Contribution Funds. A copy of the approved version is enclosed for your information and reference.

As you know, the Terms and Conditions were revised to reflect the new mode of operation of IRAP and to clean up certain administrative details. The most significant change is that the Terms and Conditions allow Regional Directors to approve Contributions up to \$250,000. I am pleased to confirm that, effective immediately, you will no longer need to seek my approval for Contributions between \$100,000 and \$250,000. Contributions over \$250,000 will still need my signature and Biotechnology Development Program Contributions must still follow the current procedure as they all require the signature of the Vice President, Biotechnology.

...2/

Ottawa, Canada  
K1A 0R6

(613) 993-0695  
Docufax: (613) 954-0501

Canada

Other highlights of the IRAP Terms and Conditions are:

Network Contributions (Code Vote 46):

1. The eligibility of recipients and eligible costs for IRAP Network Contributions (IRAP CA) have been broadened to accommodate more types of network members and network activities under the Technology Associates heading. The three-day-per-year restriction on ITA services has been removed.
2. The detailed table on advanced payments has been replaced by a reference to the Treasury Board policy on grants and contributions.
3. The review and approval process better reflects the new mode of operation of IRAP.

Contributions to firms (Code Vote 31):

1. The size of eligible recipients for Contributions to firms has been changed from less than 200 employees to firms having up to 500 employees (with exceptions permitted). The Terms and Conditions specify that firms must demonstrate that they have the "...appropriate management, technical, marketings skills and the financial capability to embark on and successfully carry out the project and the subsequent commercial exploitation of the project results." This is normal due diligence.

As a reflection of the new focus on clients with a capability to progress technologically, the Terms and Conditions also say, "...projects should be those that are designed to generate, enhance or develop scientific or engineering know-how in firms."

2. The Proposal Review and Approval process now reflects the new mode of operation of IRAP. The various restrictions on the composition of selection committees have been removed. The only prescription is that proposals be reviewed by a committee established in the region in which the recipient is located. These committees can recommend commitments up to \$350,000.

| PT

For projects exceeding a threshold set by the Vice President (currently \$100,000 for RDAs), the committee must contain representation from NRC labs and OGDs.

3. The Terms and Conditions specify that payment "will be contingent upon receipt by IRAP of required reports demonstrating satisfactory progress against the milestones listed in the statement of work." This highlights the importance of having a good statement of work in a proposal and well thought out milestones. The number and type of milestones should be commensurate with the size and type of project. Remember, because we are supporting technically risky projects, milestones should be based on process stages of the project and not specific technical results (e.g. "Month 3: will have tested 15 possible formulations for the product" *versus* "Month 3: will have formulated the product using components X, Y, and Z."). Reports need not be lengthy or complicated but should give an idea about how well the project is proceeding.

The Terms and Conditions also specify that NRC may terminate support of a project not showing satisfactory progress against milestones or where the recipient no longer has the technical or financial capability to fulfil its project obligations. A clause to this effect should be in all Contribution Agreements so the recipient is fully aware of this.

4. As a result of our discussions on the wisdom of putting a penalty clause in the license of technology clause, it was decided that the Terms and Conditions should be modified to give IRAP the right to put such a clause in Contribution Agreements. Treasury Board has accepted this. We may now do so if we wish but are not obliged to.
5. The Terms and Conditions specify that the total level of Crown support for IRAP-funded projects will not exceed 75% of eligible costs for the project. This is, in essence, the "Stacking Rule" applied to all IRAP projects regardless of their size.

**Annex I**

**TERMS AND CONDITIONS**

**CONTRIBUTIONS TO ORGANIZATIONS**

**NATIONAL RESEARCH COUNCIL (NRC)**

**INDUSTRIAL RESEARCH ASSISTANCE PROGRAM (IRAP)**

**1. Description for Estimate Purposes**

Contributions to organizations to provide technological and research assistance to Canadian industry.

**2. Eligible Organizations**

**a) Provincial Research Organizations**

Contributions may be made to support the salary and expenses of industrial technology advisors engaged by provincial research organizations.

**b) Research Institutes and Technology Centres**

Contributions may be made to support the salary and expenses of industrial technology advisors employed by approved technology centres and research institutes to deliver technology advisory services and promote technology diffusion to Canadian firms.

**c) Canadian Universities and Colleges**

Contributions may be made towards the salary and/or expenses of technology transfer specialists and/or industrial technology advisors who are employees of universities and colleges.

**d) Other Organizations**

Contributions may be made to other organizations towards the salary and expenses of technical professionals who provide technology diffusion and assistance, technology transfer and industrial technology advisory services to Canadian firms.

e) **Associate Organizations**

Contributions may be made to the above or other organizations which are associated with NRC/IRAP for the promotion of technology diffusion for the benefit of Canadian firms.

**3. Allowable Costs**

IRAP contributions may support a portion of the salaries and expenses of designated individuals within approved organizations providing industrial technology advisory services, and may support the salary and expenses of technology transfer specialists or may offset the costs of other technology diffusion and assistance services provided by approved specialist organizations to firms in Canada.

**4. Program Management**

The responsibility for managing IRAP lies with the NRC Vice-President responsible for IRAP, who is assisted by the Regional Directors, the heads of the IRAP Ottawa office groups and the Contributions Office, Finance and Informatics Services, NRC.

Negotiations with individual candidate organizations, selection and approval of supported organizations and overall regional budget control will be the responsibility of the Regional Directors, with advice from the IRAP Ottawa Office. This is subject to appropriate delegation limits within IRAP. Day to day operations will normally be overseen by IRAP Regional Directors.

The Ottawa Office groups ensure national consistency and coordination by the provision of technology assessment, administrative, and policy and planning support to the Vice President responsible for IRAP and to the Regional Directors.

The Contributions Office of NRC Finance and Informatics Services provides financial and administrative advice, training, and standards, and provides financial controls to ensure the judicious financial management of IRAP contributions.

**5. Review and Approval Process**

For new organizations, IRAP will review each case, assess its merits and determine suitability for placement of contributions. The overall performance of each current organization will be reviewed annually by the appropriate Regional Director who will assess its performance and determine suitability for future contributions based on satisfactory performance and the needs of the regional strategy for IRAP.

**6. Dollar Limits to Signing Authorities**

The dollar limits to signing authorities will be as specified in the NRC Financial Signing Authorities chart.

**7. Supporting Material Required from Potential Recipients**

Organizations wishing to become part of the IRAP network, after preliminary discussions with IRAP to establish that the goals of both the organization and IRAP would be met by a formal agreement, shall prepare a work plan, appropriate to IRAP's general program of providing technical assistance to firms in Canada, for consideration and approval by IRAP. The work plan shall identify:

- individuals who will provide the technical advisory, technology transfer or technology diffusion services;
- \* - the particular areas of expertise and services to be made available to client firms without fee and the limitations to be placed upon the provision of services;
- estimated costs for the services provided to IRAP clients.

**8. Method of Payment**

Payments will be made monthly or quarterly based on progress claims which will be submitted along with progress reports indicating both the nature and level of activities and the identifiable economic and social benefits of these services rendered.

Advanced payments, where deemed necessary, will be made in accordance with the Treasury Board policy on Grants and Contributions and will be based on projected expenditures or cash flow requirements.



**9. Maximum Amount**

The maximum amount for any recipient is \$2,000,000 per year. Contributions in excess of \$2,000,000 will be subject to Treasury Board approval.

The President of NRC will, in the Annual Management Letter to Treasury Board, report all IRAP contributions over \$1,000,000, their recipients and their purpose.

**10. Evaluation Procedures**

Targets will be established by NRC/IRAP for various activities and how well the recipients meet these targets will be monitored. The activities are described in the work statement of the Contribution Agreement between the recipient and NRC. The recipients will report regularly at a frequency and in a format that is specified in the Contribution Agreement. The benefits derived by the firms receiving the services from the recipients will also be used to help determine the effectiveness of the contributions. A report on benefits derived will be prepared every year by each recipient.

IRAP will be subject to periodic program evaluation carried out in accordance with NRC guidelines.

**11. Audit**

All contribution arrangements will require appropriate record-keeping and will establish the right of the federal government to conduct an audit of the recipient's performance of their obligations under the arrangement. Audit arrangements, including the scope of the audit, will be determined by NRC and may involve the use of auditors appointed by NRC or of the recipient's independent auditors.

**12. Conflict of Interest**

Prospective or current recipients shall inform IRAP of the following situation if it exists:

- a) the recipient employs or has as a major shareholder a former public office holder who left the federal government within the last twelve months; and
- b) that person was at a senior management level while in public office.

In such a case, that person must obtain from his or her former department written confirmation that he or she is in compliance with the post-employment provisions of the Conflict of Interest and Post-Employment Code of the federal government.

Recipients shall ensure that persons they employ under the proposed contribution arrangement comply with the NRC Code of Conduct for Industrial Technology Advisors and shall provide such confirmation to IRAP.

**13. Duration**

These Terms and Conditions shall apply on a continuing basis subject to the availability of funds from parliamentary appropriations for these activities.

Annex II

**TERMS AND CONDITIONS**

**CONTRIBUTIONS TO FIRMS**

**NATIONAL RESEARCH COUNCIL (NRC)**

**INDUSTRIAL RESEARCH ASSISTANCE PROGRAM (IRAP)**

**1. Description for Estimate Purposes**

Contributions to Canadian firms to develop, adapt and exploit technology.

**2. Class of Recipients**

Eligible companies or groups of companies are those which are incorporated or registered either provincially or federally in Canada, and which are engaged in activities and/or have capabilities that can be enhanced by application of technology derived from the physical and life sciences and engineering. The primary focus of the program will be on small- and medium-sized firms having up to 500 employees. The firm must demonstrate that it has the appropriate management, technical, marketing skills and financial capability to embark on and successfully carry out the project and the subsequent commercial exploitation of the project results.

In certain cases, arrangements may be concluded with firms which will not be the ultimate commercial exploiter of the technology under development. In such cases it must be clearly demonstrated that such an arrangement is the most effective means of ensuring the exploitation of the technology in question by the ultimate user.

**3. Project Eligibility**

To qualify, projects should be those that are designed to generate, enhance or develop scientific and engineering know-how in firms. Whenever appropriate, firms will be encouraged to take advantage of the expertise of the laboratories of the federal government, universities and other sources of needed technology. Projects must be intended to improve the competitiveness of the company.

#### **4. Program Management**

The responsibility for managing IRAP lies with the Vice-President responsible for IRAP, who is assisted by the Regional Directors, the heads of the IRAP Ottawa office groups and the Contributions Office, Finance and Informatics Services, NRC.

The responsibility for managing individual projects, or contributions to firms, will normally be delegated to an Industrial Technology Advisor, who functions as project manager, who is assisted as necessary by the IRAP Ottawa Office, scientific staff in NRC or other government department laboratories, or by the Contributions Office. In certain cases technical experts from other organizations may be designated project manager but, in such cases, financial signing authority will remain with a duly authorized employee of the National Research Council.

The Ottawa Office groups ensure national consistency and coordination by the provision of technology assessment, administrative, and policy and planning support to the Vice President responsible for IRAP and to the Regional Directors.

The Contributions Office of NRC Finance and Informatics Services provides financial and administrative advice, training, and standards, and provides financial controls to ensure the judicious financial management of IRAP contributions.

#### **5. Proposal Review and Approval Processes**

##### **5.1 Proposals**

Firms will be required to submit proposals detailing the project objectives, the work plan, the costs and schedule, the performance milestones, specific capabilities of the organization, and will indicate the potential economic benefits to the firm and to the Canadian economy. All major stages of the project should be identified, including technical development, marketing and production planning and financing. Firms must demonstrate that they have the technical, financial, and managerial capabilities to complete the project and exploit the results.

Firms will be required to indicate the level and specifics of their own funding of the project tasks and activities. The firms should provide justification for IRAP funding for these tasks and activities. Proposals should include an indication of technical and commercial risks involved in the project.

More than one firm may be considered for funding in the same technology field. Where an opportunity has been identified by IRAP staff and no firms have submitted a proposal, requests for proposals may be issued by IRAP.

## **5.2 Project Analysis**

Proposals will be assigned to an IRAP Industrial Technology Advisor, as project manager, who will establish technical feasibility, potential economic benefit and the degree of incrementality the project brings to the technological base of the firm. The project manager may, on a confidential basis and with due regard to the policies and regulations governing protected business information, consult other Industrial Technology Advisors or any appropriately qualified technical expert for advice on the project on a confidential basis.

Where the project would involve a significant degree of potential collaboration with other organizations, the project manager may refer the recipient to an ITA in the IRAP Technology Assessment and National Coordination Group, who will facilitate the appropriate collaboration.

## **5.3 Project Assessment**

After appropriate analysis and preparation of necessary documentation, the project manager will present the project to an IRAP selection committee which will make the recommendation whether or not to support the project. In the case of projects for which the IRAP support would exceed thresholds that may be set from time to time by the Vice-President responsible for IRAP, this committee will include representation from NRC laboratory institutes and other government department(s).

The project will be reviewed by a committee established in the region in which the recipient is located. The IRAP Regional Director or delegate will act as chairman. These committees may recommend project commitments involving up to \$350,000 of IRAP funds.

In special circumstances, at the discretion of the Vice-President responsible for IRAP, the selection committee may be convened in Ottawa, chaired by the Vice-President responsible for IRAP or a delegate to review and recommend commitments for larger and more complex projects, i.e., those for which the support would exceed the thresholds noted in the above paragraph.

#### **5.4 Approvals**

When the local IRAP Committee has recommended support of the project, approval to make a contribution to a limit of \$250,000 may be given by the Regional Director.

Projects requiring more than \$250,000 in IRAP contributions will require approval by the Vice-President responsible for IRAP and other appropriate NRC authority as required.

All IRAP projects funded in support of the National Biotechnology Strategy will also require the approval of the responsible Vice-President.

#### **6. Licence of Technology**

Contribution agreements will contain a clause specifying that for firms wishing to transfer, to other firms, technology that has arisen from projects that have received or are receiving IRAP funding, the NRC Vice-President responsible for IRAP must approve such transfers on the basis that the transfer will result in the maximum economic benefit to Canada, as determined by the NRC Vice-President responsible for IRAP. Agreements may contain a clause requiring a recipient in default of this condition to repay the IRAP contribution and be deemed ineligible for receipt of further IRAP support. However, NRC's right to require a recipient to repay the contribution in the case of default does not imply that the recipient will be released from this condition upon voluntary repayment of the contribution.

#### **7. Contribution Agreements**

The contribution agreements expresses a cooperative commitment on the part of the firm and NRC and, where appropriate, other participants. The firm agrees to carry out the approved program and to carry the technology on to commercial exploitation for the benefit of Canada if economically feasible.

**8. Method of Payment**

Payments will be made based on invoices received for actual and reasonable allowable expenses incurred and paid, and will be contingent upon receipt by IRAP of required reports demonstrating satisfactory progress against the milestones listed in the statement of work. NRC reserves the right to terminate support of projects not showing satisfactory progress against the milestones or where the recipient no longer has the technical or financial capability to fulfil its project obligations.

**9. Allowable Costs**

IRAP projects will be cost-shared with the firm assuming a significant proportion of the costs. NRC will normally fund portions of the project related to the salary costs for scientific and technical effort in the firm or for approved subcontractors, including consultants. Portions of approved market and feasibility studies will be an allowable expense.

NRC may contribute up to 75% of total eligible costs, including travel costs incurred through visits of company technical staff to other technology sources.

IRAP financial contributions to consulting firms will be limited to the funding of activities undertaken by such firms in support of companies with up to 500 employees.

**10. Dollar Limits to Signing Authorities**

The dollar limits to signing authorities will be as specified by the NRC Financial Signing Authorities chart.

**11. Maximum Contribution**

The maximum contribution per project will be \$1,000,000. Larger projects will require the specific approval of the Treasury Board.

The President of NRC will, in the Annual Management Letter to Treasury Board, report all IRAP contributions over \$1,000,000, their recipients and their purpose.

The level of total Crown support will not exceed 75% of eligible costs for projects receiving support from federal and provincial sources including tax incentives, loans, guarantees, grants and contributions, except where the Minister for Science directs otherwise.



## 12. Ongoing Project Monitoring

Each arrangement will be monitored throughout its term by the project manager, assisted, as required, by other ITA(s) and/or by scientific advisor(s) from an NRC Institute or another government department and by the NRC Contributions Office.

Progress reports will be required at principal milestones, as identified in the contribution agreement, letter of arrangement, or statement of work. A final report will be required at the completion of the project. Arrangements will also require reporting to the project manager, at appropriate points or at specified dates, on technical progress, results to date, expenditures to date, and cost and time of completion.

## 13. Evaluation Procedures

Post-project follow-up reviews will be undertaken to determine the degree of achievement of the objectives of the project and to identify the economic and other benefits accruing as a result of the project. The degree of achievement of objectives and the benefits derived from the project by the recipients will be used to help determine the effectiveness of the contributions. All contribution agreements will include a clause requiring the firm to agree to provide feedback on downstream benefits arising from the IRAP project.

The program as a whole will be subject to periodic program evaluation carried out in accordance with NRC guidelines.

## 14. Audit

All contribution arrangements will require appropriate record-keeping and will establish the right of the federal government to conduct an audit of the recipient's performance of their obligations under the arrangement. Audit arrangements, including the scope of the audit, will be determined by NRC and may involve the use of auditors appointed by NRC or of the recipient's independent auditors.



**15. Conflict of Interest**

Current and prospective recipients shall inform IRAP of the following situation if it exists:

- a) the recipient employs or has as a major shareholder a former public office holder who left the federal government within the last twelve months; and
- b) that person was at a senior management level while in public office.

In such a case, that person must obtain from his or her former department written confirmation that he or she is in compliance with the post-employment provisions of the Conflict of Interest and Post Employment Code of the federal government.

**16. Duration**

These Terms and Conditions shall apply on a continuing basis subject to the availability of funds from parliamentary appropriations for these activities.

# ANNEX 3

**NRC/IRAP****Technology Enhancement**

Protected Business Information  
Complete in duplicate and sign both copies

**Application/Contribution Agreement  
Form T1**

IRAP Project No. \_\_\_\_\_

Client No. \_\_\_\_\_

F.E.D. \_\_\_\_\_

**Client Information**

Name: \_\_\_\_\_

Tel: \_\_\_\_\_

Address: \_\_\_\_\_

FAX: \_\_\_\_\_

City: \_\_\_\_\_

Prov: \_\_\_\_\_

Postal Code: \_\_\_\_\_

No. Employees: \_\_\_\_\_

Business Products: \_\_\_\_\_

Annual Sales: \_\_\_\_\_

Ownership: \_\_\_\_\_

% Canadian \_\_\_\_\_

In Business Since: \_\_\_\_\_

\_\_\_\_ Whole Company or \_\_\_\_ Division of: \_\_\_\_\_

**Project Information**

Title: \_\_\_\_\_

Company Project Manager: \_\_\_\_\_

Technical Problem Description: \_\_\_\_\_

Summary of Work to be Done: \_\_\_\_\_

Benefits Expected:

(a) Increased Sales: \$/yr: \_\_\_\_\_

(b) Cost Reduction: \$/yr: \_\_\_\_\_

(c) Jobs Created (net): \_\_\_\_\_

(d) Other (specify): \_\_\_\_\_

**NRC Contribution & Schedule****IRAP Project Manager (ITA)**Planned Starting Date: \_\_\_\_\_  
Planned Completion Date: \_\_\_\_\_  
Lapsing Date: \_\_\_\_\_

Name: \_\_\_\_\_

Phone: \_\_\_\_\_

Total Project Cost: \$ \_\_\_\_\_  
Current Next

Address \_\_\_\_\_

Fiscal Year: \_\_\_\_\_

Signature: \_\_\_\_\_

Contribution by NRC: \_\_\_\_\_

Date Received: \_\_\_\_\_

1. Conditions of Contribution (overleaf), Summary of Project Financial Requirements (Form T2) and Proposals are part of this Agreement.
2. When signed by both parties, this constitutes the Agreement between NRC and the client company.

Authorized Signatures: Name (print) \_\_\_\_\_

Title \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

For the Company: \_\_\_\_\_

For NRC/IRAP: \_\_\_\_\_

**National Research  
Council Canada****Conseil national  
de recherches Canada**

Canada

## CONDITIONS OF CONTRIBUTION - TECHNOLOGY ENHANCEMENT PROJECTS

### PROJECT

1. The project shall be carried out in Canada.
2. The company shall obtain prior written approval from NRC before starting a project for which financial assistance will be requested and for any changes in the nature of the work and/or in the choice of participants.
3. Title and rights to the technology resulting from this project shall be owned by the company or, when owned by third parties, controlled by the company through negotiated agreements. All proprietary information relating to the project coming into NRC's possession will be treated as commercially confidential.
4. The company shall carry out in Canada, all subsequent technical development and production work resulting from this project. This restriction will remain in effect for 5 years following the date of termination of IRAP assistance.
5. Acknowledgement that the work was assisted, in part, by NRC should be included in all press releases and publications arising from this project. Any public acknowledgement of assistance shall not imply endorsement by NRC of any company product, process or expertise.
11. Final invoices must, in addition, be:
  - a) submitted before lapsing date indicated, and
  - b) accompanied by report required (Clause 6)
12. Lapsing date shall normally be the earlier of
  - a) 60 days after specified completion date, or
  - b) April 10 following specified completion date.
13. If not fully invoiced by the lapsing date, the balance of NRC's contribution shall lapse. For this purpose, the invoice should have been post-marked or hand-delivered by the lapsing date. Company may reapply, but approval will be subject to availability of funds and competing needs of other applicants at the time.
14. If a delay beyond the specified completion date is expected, Company must promptly review the situation with the IRAP Project Manager. The Company may seek a prior extension of the lapsing date. Extension shall be at the sole discretion of NRC.
15. Costs which have been, or are intended to be, recovered through another government program or contract, shall not be claimed from IRAP.

### REPORTING

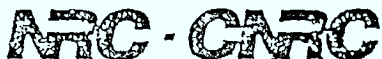
6. Upon completion of the project, the company shall send to the IRAP project manager a brief written report summarizing the technical results of the work and benefits accrued or expected. The company should also maintain data relating to economic benefits traceable to this project and provide these to NRC on request.

### RECORDS, REVIEWS AND AUDITS

7. The company shall maintain project records and receipts for payments to approved subcontractors, and records of experimental work performed on the project, for a period of at least two years after completion of the project.
8. On reasonable notice, the financial records referred to in Clause 7 will be made available to authorized representatives of NRC for inspection and auditing.
9. Upon reasonable notice, authorized representatives of NRC are to be permitted to make inspections of the facilities and plant used by the company in connection with the project and to discuss the project with the IRAP-supported personnel. The nature, extent and frequency of such inspections are at the discretion of NRC.

### INVOICING

10. Invoices must:
  - a) be made out on the forms provided by NRC. Alternatively, with the concurrence of the NRC project manager, the company may use its own invoices, which must be made out to NATIONAL RESEARCH COUNCIL CANADA and be on official company invoice form or letter-head and show full company name and address.
  - b) show IRAP project number, and amount claimed.
  - c) be signed by an authorized company official.
  - d) be only for costs already incurred and paid by the company. In the case of consultants or subcontractors, a copy of their claims marked "Paid in Full" over original signatures of their authorized officials must accompany the company's claim to NRC as proof of payment.
  - e) be "in arrears". Where possible, these should be submitted each month.
  - f) in the case of students employed on the project, indicate the date of "commencement" and date of "termination" of duties for the student on the first and last invoices respectively
  - g) be sent to the designated IRAP Project Manager
  - h) comply with any other requirements specified for the project.
16. A request for a waiver of any of these Conditions of Contribution, either in whole or in part, should be submitted to the IRAP Project Manager in writing with suitable explanations. Waivers are at the sole discretion of NRC. No offer to refund NRC financial assistance or other recompense will give the company any rights to a waiver.
17. Failure by the company to comply with any of the foregoing clauses shall be considered as sufficient justification for suspension or termination of assistance for this project. Funding of future projects could also be affected.
18. Any company shareholder or employee formerly employed by the federal public service as a senior manager must provide NRC with confirmation, in writing, that he/she is in compliance with the post-employment provisions of the Conflict of Interest and Post-Employment Code.
19. No member of the House of Commons shall be admitted to share or part of an agreement relating to IRAP assistance or to any resulting benefits.
20. In the case of projects employing students, a "Student Form" will be submitted for each student. The additional Conditions of Contribution #21-27, which are printed on back of that form, will also apply.

**NRC/IRAP***Technology Enhancement*

Protected Business Information

Complete in duplicate and sign both copies

Application/Contribution Agreement  
Form T2

IRAP Project No.:

Client No.:

## Summary of Project Financial Requirements

For the Period: 19 to 19 Duration of Project: week

Company Name:

## 1. Salary Costs (Company Employees and Students)

NRC Use

Name & Academic Level	Title or Function	No. Wks (A)	% of Time (B)	Weekly Salary (C)	Total Salaries (AxBxC)	Support Requested	Approved Amount
Company Employees							
Students (Attach Forms)							
Sub-total					D:		

2. Consultant Rate : \$ /day x No. days

E:

3. Subcontractor Name: #1

#2

- Labour:  
- Materials

F:

4. Travel: - Fare:  
- Accommodation:  
- Other:

Sub-total

G:

5. Other Company Costs (specify):

H:

Total Costs: \$ (D+E+F+G+H)

NRC Contribution (Requested): \$

Company Contribution: \$

Other Support (Requested) Source:

\$

I hereby certify that, to the best of my knowledge, the information on these forms is true and accurate

Name (print)

Title (print)

Signature

Date

National Research  
Council CanadaConseil national  
de recherches Canada

Canada

PERSONAL:

Name:

Phone:

Present Address:

Permanent Address:

Direct Costs:

	<u>This FY</u>	<u>Next FY</u>
Salary: Weekly \$ Total \$	\$	\$
Relocation:	\$	\$
Travel (project related)	\$ _____	\$ _____
<b>TOTAL COST</b>	<b>\$</b>	<b>\$</b>

Duration \_\_\_\_ Wks. \_\_\_\_ Days

<u>This FY</u>	<u>Next FY</u>
\$	\$
\$	\$
\$ _____	\$ _____
\$	\$

EDUCATION:

In Process

Already Received

Degree or Diploma:

Field of Discipline:

University or College:

Conventional or Coop Program:

Course Duration (Years or Terms):

Completed (Years or Terms):

Graduation (Month & Year):

WORK EXPERIENCE (Technical): (Use separate sheet if necessary)

1. Employer:

Location:

Dates:

Salary:

Full- or Part-time

Duties:

2. Employer:

Location:

Dates:

Salary:

Full- or Part-time:

Duties:

Student's Signature:

Date:

Additional Conditions for Projects employing university or technical college students.

- 21. Students supported by NRC for this project shall assign to the company all rights to inventions, including patents, arising during the support period.
- 22. Students supported by NRC must be Canadian citizens, landed immigrants, or hold a valid work permit.
- 23. Students shall be employed in a way appropriate to their technical training.
- 24. The employment of students through this program must not directly result in displacement or release of existing personnel.
- 25. The student shall be considered as a regular student employee of the company and shall be entitled to all benefits required by law and those normally provided for student employees by the company.
- 26. Employee benefits such as vacation pay, sick leave, medical and hospital plans, etc. will be the responsibility of the company.
- 27. For students leaving the employ of a company before the end of the agreed period of employment, IRAP support is terminated on their last working day. In such cases, arrangements may be made with the IRAP Industrial Technology Advisor (ITA) for employing another student.

GHF/tmb  
March 2, 1992

# ANNEX 4



SAMPLE LETTER

Date

Name of Individual  
Company Name  
Address  
City, Province  
Postal Code

LETTER OF ARRANGEMENT FOR PROJECT #XXXXXXX  
TITLE: "XXXXXXXXXXXXXXXXXXXXXXXXXXXX"  
DATE RECEIVED: MONTH/DAY/YEAR

Dear Mr. xxxxxxx:

We are pleased to advise you that your proposal for the above project has been approved for support under the NRC Industrial Research Assistance Program (IRAP).

Initial IRAP support for the first stage (xxxxxxxxxxxxxx) of the project from Month/Day/Year will be \$xxxxxxx, as shown in the NRC contribution section.

1. SPECIAL CONDITIONS

Further support will be conditional upon providing information satisfactory to IRAP, as follows:

1.1 By (Date) Month/Day/Year

- 1.1.1 (Condition)
- 1.1.2 (Condition)

1.2 By (Date) Month/Day/Year, milestones and/or go/no go milestones.

Support beyond this (these) go/no go milestone point(s) (1.2, etc.) will be conditional upon satisfactory progress as evaluated by IRAP.

LETTER OF ARRANGEMENT - Month/Day/Year  
Company - PROJECT NO. XXXXXX  
(This heading should appear on page 2 and subsequent pages.)

## 2. NRC CONTRIBUTION

Gov't Fiscal Year -----	Internal Company Salary Costs -----	External Contracts -----	Total IRAP Support -----	Dates -----
1992/93 *Initial Support	XXXXXX\$	XXXXXX\$	XXXXXX\$	Month/Day/Year to* Month/Day/Year
1993/94	XXXXXX\$	XXXXXX\$	XXXXXX\$	Month/Day/Year to Month/Day/Year
1994/95	XXXXXX\$	XXXXXX\$	XXXXXX\$	Month/Day/Year to Month/Day/Year
TOTAL	XXXXXXXX\$	XXXXXX\$	XXXXXXXX\$	

IRAP support for internal company costs will be \_\_% of salaries paid to those working on the project, up to a maximum of \$XXXXXX. IRAP support for external contracts will be 50% of costs incurred up to a maximum of \$XXXXXX.

Further details of IRAP support are given in the attached RD-3 forms.

## 3. PROJECT OBJECTIVES

It is agreed that IRAP will contribute to research and development in support of the following objectives:

3.1 First objective (All objectives should be quantified.)

3.2 Second objective

3.3 etc.

A work plan for the above project is attached.

## 4. COMPANY'S OBLIGATIONS TO NRC

Your company also agrees to provide IRAP with the following:

LETTER OF ARRANGEMENT - Month/Day/Year  
Company - PROJECT NO. XXXXXX

- 4.1 Consultant/subcontractor agreements before first payments by NRC
- 4.2 Interim progress reports on:
  - 4.2.1 "XXXXXX" (go/no go milestone) by Month/Day/Year
  - 4.2.2 "XXXXXXXXXX" by Month/Day/Year
  - 4.2.3 Etc.
- 4.3 Company financial and Project Audit Reports
  - 1992 fiscal year by Month/Day/Year
  - 1993 fiscal year by Month/Day/Year
  - 1994 fiscal year by Month/Day/Year
- 4.4 Final report on project by Month/Day/Year
- 4.5 Project benefits report by Month/Day/Year  
(end of project + 6 months)

These should be sent to your Project Manager, XXXXXXXX XXXXXXXX.

## 5 GENERAL CONDITIONS

This letter of Arrangement with the attached Work Plan, RDA-3 Forms and the "Conditions of Contribution", when signed by an authorized official of your company and of the National Research Council, comprises your agreement with NRC/IRAP.

Please note in particular "Conditions of Contribution" no. 4 regarding acknowledgement of IRAP assistance in media announcements or technical publications (but not commercial literature), no. 12, regarding the audit of the project, and no 21, which deals with the ownership of the technology to be developed.

Would you please notify us of your acceptance of this offer and of the attached "Conditions of Contribution" dated January 24, 1992, by signing and returning the enclosed duplication copy of this letter to the address indicated below:

XXXXXXXXXXXXXXXXXXXX, Regional Director  
Industrial Research Assistance Program  
National Research Council  
XXXXXXXXXXXXXXXXXXXXXXXXXXXX  
XXXXXXXXXXXXXXXXXXXXXXXXXXXX  
XXX XXX

LETTER OF ARRANGEMENT - Month/Day/Year  
Company - PROJECT NO. XXXXXX

As soon as we have received notice of your acceptance of this support, we will send you the documentation required for claims against the NRC contribution.

Yours truly,

Clifford N. Baronet  
Vice-President, IRAP

cc: Regional Director

D. Cooper  
G. Fraser  
IRAP Contributions Office  
ITA

ACCEPTED:

\_\_\_\_\_ Signed at \_\_\_\_\_, this \_\_\_\_ day of \_\_\_\_\_ 19\_\_.

# ANNEX 5



AUDITOR GENERAL OF CANADA

VÉRIFICATEUR GÉNÉRAL DU CANADA

240 Sparks Street  
Ottawa, Ontario  
K1A 0G6

13 May 1992

Mr. Guy Ricard, MP  
Chairman  
Standing Committee on Industry,  
Science and Technology and on  
Regional and Northern Development  
House of Commons  
Room 515-S, Centre Block  
Ottawa, Ontario

Dear Mr. Ricard:

Pursuant to recommendation 3 of the December 1991 Report of the Standing Committee on Industry, Science and Technology, Regional and Northern Development, I am pleased to provide a copy of my report on the audit of Financial Management and Controls of the Industrial Research Assistance Program (IRAP).

The audit was conducted between February 17 and April 17, 1992 and we have examined the financial and management control systems and practices during that period. The audit objectives and scope were established further to discussions with yourself and research staff and are identified in part 3 of my report.

My report presents observations and recommendations on the program. A draft of the final report was discussed with National Research Council's management and their comments are included therein.

A copy of this report is also being provided to Dr. Pierre O. Perron, President of the National Research Council of Canada. If further information is required, do not hesitate to contact me.

Yours sincerely,

L. Denis Desautels, FCA

OFFICE OF THE AUDITOR GENERAL

Audit Report on the  
Financial Management and Controls of  
The Industrial Research Assistance Program (IRAP)  
of  
The National Research Council of Canada

May 13, 1992

# THE INDUSTRIAL RESEARCH ASSISTANCE PROGRAM

## TABLE OF CONTENTS

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3. AUDIT OBJECTIVE AND SCOPE	3
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Exhibits	
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2. NRC - Organizational Structure	



## MAIN POINTS

The result of our audit indicates that financial management and control systems and practices relating to contributions to organizations and to firms under the former regional elements of the Industrial Research Assistance Program (IRAP) are satisfactory overall. There are no indications that IRAP would benefit from merging financial and operational management into a single organization.

However, we have noted the following significant issues relating to the effective and efficient implementation of the new IRAP strategy. The NRC agrees with the issues raised and has already taken steps in several of the areas mentioned hereunder.

### Financial management roles and accountability:

- o The role of the Contributions Office in implementing the new IRAP strategy is still not defined (5.5).
- o The Contributions Office does not have sufficient financial expertise to adequately advise IRAP managers (5.7).

### Controls on project assessment and approval:

- o NRC has recognized the need for an Industrial Technology Advisor training plan to ensure the effective implementation of the new strategy but this plan has not yet been finalized (5.19).
- o Practices to ensure that the new strategy is applied in compliance with national guidelines have not yet been established (5.22).

### Controls on contribution payments:

- o Controls on contribution payments are satisfactory but the efficiency of these operations could be improved (5.28).

### Information required for program management:

- o NRC has not yet established performance indicators to evaluate and report the achievement of IRAP objectives under the new strategy (5.32).

## 1. INTRODUCTION

1.1 The Standing Committee of the House of Commons on Industry, Science and Technology, Regional and Northern Development (the Committee) held public hearings during the Fall of 1991 on the Industrial Research Assistance Program (IRAP) managed by the National Research Council (NRC).

1.2 In its report tabled in the House of Commons in December 1991, the Committee recommended among other things that the Auditor General review the management practices and financial accountability of IRAP's contributions and consider whether it is in the best interest of the IRAP program to merge financial and operational management in the same organizational structure.

1.3 Following discussions with the Committee Chairman and its research staff, we have agreed to carry out an audit of IRAP as indicated in part 3. This report presents the results of our work.

## 2. PROGRAM DESCRIPTION AND BACKGROUND

2.1 The purpose of IRAP is to assist small and medium-sized firms to improve their capabilities through technological development. It supports the work of small and medium-sized firms with respect to the adaptation, acquisition and utilization of technology through a national network of over two hundred Industrial Technology Advisors and several organizations and associations in the field of science and technology.

2.2 During 1991-92, IRAP made financial contributions to over 4,000 projects in firms and had about 20,000 contacts with clients. The total program budget for this period was about \$83 million, with \$12 million for salaries and other expenses, \$16 million for contributions to organizations under the IRAP-CA element and \$55 million for contributions to firms under the following four elements:

- o IRAP-H: to finance part of the salary of an engineering or science student employed on short-term projects;
- o IRAP-L: to finance a maximum of \$6,000 for outside consultants on short-term projects;
- o IRAP-M: to finance a maximum of \$100,000 for technical staff on medium-term projects aimed at developing or improving products or processes;
- o IRAP-R: to assist long-term projects that appear promising but involve higher risks.

2.3 Program delivery is provided by 258 persons across the country including 226 professionals and managers and 32 administrative support employees. Of the 226 professionals, 84 are from NRC and 142 are Industrial Technology Advisors hired under contribution agreements with members of the network.

2.4 IRAP financial management is shared between program managers and the Contributions Office. The Office, under the general direction of the Finance and Informatics Services Branch, provides support for the management and financial control of all NRC contribution programs.

2.5 Program evaluations with regard to the above elements commissioned by NRC in recent years have demonstrated the satisfaction of clients and the effectiveness of IRAP with respect to benefits to business and the Canadian economy.

#### **IRAP in transition**

2.6 IRAP is in transition following approval of a new strategic plan in September 1991. The four elements of contributions to firms referred to in paragraph 2.2 have been replaced, as of April 1, 1992, by two new elements — Technology Enhancement (TE) and Research, Development and Adaptation (RDA). The IRAP-CA element for contributions to members of the network remains unchanged. Exhibit 1 provides a summary description of the terms and conditions of former and new program elements.

2.7 A new organizational structure (Exhibit 2) was announced on February 20, 1992. The Vice-President IRAP is now responsible for providing strategic and operational management for the program and seven regional directors are responsible for program delivery. National coordination of activities will be supported by the IRAP Office in Ottawa.

2.8 The former H, L, and M elements were under the responsibility of regions while elements R and CA were managed by Head Office. Under the new structure, regions will now be responsible for managing all IRAP elements.

2.9 At the time of our audit, implementation of the new strategy was underway. Eligibility criteria, national guidelines and forms for the new elements were being finalized. Regions were in the process of developing 1992-93 operational plans and defining detailed procedures and practices for project assessment, approval and monitoring. Regional information sessions were planned to inform staff of the new procedures and practices.

### 3. AUDIT OBJECTIVE AND SCOPE

3.1 Following the recommendation of the Committee, the audit was aimed at determining:

- the appropriateness of financial and management control systems and practices with respect to IRAP contributions;
- whether the program would benefit from merging financial and operational management into a single organizational structure.

3.2 In view of the concerns raised by members of the Committee with respect to IRAP administrative difficulties, we have paid particular attention to the role of the Contributions Office in the Program's financial management. Moreover, we evaluated the systems and practices related to budgetary control, project assessment and approval, control of contribution payments and information required for program management.

3.3 Since systems and practices used under the new IRAP strategy will be similar to those currently used for elements H, L, M, and CA, we have concentrated our efforts on these aspects of the program. Our review of IRAP-R projects focused only on contribution payments control.

3.4 We carried out our audit between February 17 and April 17, 1992 and we have examined the systems and practices in place during this period. To meet our objectives, we have:

- reviewed the documentation on program terms and conditions in place during fiscal 1991-92 and on changes planned as a result of the new IRAP strategy;
- interviewed managers and Industrial Technology Advisors at Head Office and in the Quebec and Ontario regions as well as IRAP clients;
- examined the numerous internal audit and evaluation reports written on IRAP over the last four years;
- examined the operations of a sample of contribution agreements made during 1991-92.

### 4. OVERALL ASSESSMENT

4.1 The result of our audit indicates that financial management and control systems and practices relating to contributions to organizations and to firms under the former regional elements of the Industrial Research Assistance Program (IRAP) are satisfactory overall. There are no indications that IRAP would

benefit from merging financial and operational management into a single organization.

4.2 On the other hand, we have noted significant issues relating to the efficient and effective implementation of the new strategy. These issues relate to the future role and the level of financial expertise of the Contributions Office, the assessment and management of more complex projects, the efficiency of payment verification, monitoring practices in the application of national guidelines and the development of performance indicators to measure the achievement of IRAP objectives. NRC has already taken steps in several of these areas.

## **5. OBSERVATIONS AND RECOMMENDATIONS**

### **Financial management roles and accountability**

5.1 Several issues were raised during Committee hearings on IRAP financial management, and the roles and accountability and the impact of the creation of the Contributions Office. Committee members questioned whether the program would benefit from merging financial and operational management into a single organizational structure.

---

**Nothing indicates that IRAP would benefit from merging financial and operational management into a single organizational structure.**

---

5.2 Our examination uncovered no indication that IRAP would benefit from such a merger. Some uncertainty existed in 1990 with respect to budgetary and financial management accountability when NRC had delegated IRAP's budget to the Contributions Office in order to centralize control of contribution funds. However, NRC changed this situation in April 1991 and responsibility and authority for IRAP's budgetary allocation, control and utilization is now clearly delegated to program managers.

5.3 We are of the opinion that the division of responsibilities for financial management has not hindered the quality and speed of service to clients or financial control effectiveness. On the contrary, the fact that the Contributions Office is accountable to the Director General of Finance and Informatics Services may improve control by providing a separation of responsibilities for contribution payment verification. It should also be noted that the Office serves other NRC contribution programs. Centralization in the Office of some financial management tasks for all NRC contributions programs was aimed at improving the



efficiency and effectiveness of control activities for those programs.

5.4 However, we do have some concerns with respect to the future role of the Office in implementing the new strategy and its ability to fulfil its responsibilities.

---

The role of the Contributions Office in implementing the new IRAP strategy is still not defined.

---

5.5 The role of the Contributions Office has never been formally defined since its creation. In fact, we have found that its main activities consist in verifying contribution payment claims and providing support for the financial management of contributions made under elements R and CA previously managed in Ottawa. The Office also assisted managers responsible for these elements in negotiating and preparing contribution agreements and provided these managers with accounting services. In addition to these activities, the Office was to provide financial advice to IRAP managers upon request.

5.6 In the implementation of the new strategy, NRC has not yet defined the role to be played by the Office in negotiating and preparing contribution agreements and in the selection of TE and RDA projects that have been delegated to the regions. We have found, in our meetings with IRAP and Office managers, that several different opinions had been expressed as to the role the Office should play.

---

The Contributions Office does not have sufficient financial expertise to adequately advise IRAP managers.

---

5.7 The reputation for technical expertise of IRAP staff is well known. However, IRAP Industrial Technology Advisors recognize that they need advice on financial management matters such as policies, procedures and performance measurement. They also believe that they may need assistance in the financial evaluation of some projects and in analyzing the financial capability of some clients. These needs may increase since regions will deal with more complex projects in the future.

5.8 The need to improve the financial expertise of the Office has been clearly stated in an internal audit report published in December of 1989. We have found little progress made in this area. The financial expertise within the Office is not sufficient for the Office to provide the financial advice needed

by program staff. The Office manager is the only person with the required financial experience and expertise to discharge this responsibility.

5.9 A reorganization of the Office has been underway for over a year and it has been designed in relation to its role prior to the adoption of the new IRAP strategy. NRC has informed us that new financial management positions have been created to raise the level of financial expertise.

5.10 We believe that the role of the Office in the implementation of the new IRAP elements should first be defined clearly and then the structure, number of positions, and level of expertise required to carry out the work should be determined. Uncertainty about the role of the Office in implementing new IRAP elements could have a negative impact on program delivery. It is therefore important to clarify the situation on a priority basis while preserving IRAP managers' accountability for efficient and effective program delivery.

5.11 NRC should:

- o clearly define the role of the Contributions Office in the new IRAP strategy;
- o ensure that the Office has the appropriate structure and required financial expertise to fulfil this role efficiently and effectively.

*Management comments:*

*NRC will continue efforts which began in 1990 to provide for the effective management of its overall contribution funds and for more administrative and financial expertise to help deliver IRAP funds.*

*However, such changes can not be undertaken without sensitivity to internal and external factors. IRAP's first priority has always been to provide the highest level of service in the most efficient, streamlined manner. Accordingly, with the decreasing value of its contributions component, IRAP has had to give relative priority to Program services. This approach was consistent with restraint measures applied to all of NRC's administrative support functions since 1985/86. As a result, resource restraints, organizational culture and internal IRAP priorities influenced the changes.*

*As NRC implements IRAP's strategic plan, the support for an effective contribution office is a priority and appropriate resources will be allocated to this effort. The past year has provided the opportunity to define more clearly NRC's long term needs for the management of its contribution resources and to establish a clear role for the Contributions Office. Steps have been taken to reorganize NRC's Contributions Office and recruit expert financial and administrative support. In conclusion, NRC supports this recommendation and the necessary activities will be completed by September 1992.*

## Budgetary control

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5.12 As indicated by the Committee during its deliberations, NRC has had certain difficulties over the last few years in adequately controlling IRAP budgets. In large part, these difficulties were related to IRAP-R projects involving large sums spread over more than one fiscal year. However, this element has been eliminated in the new strategy. Weaknesses in the management information systems used at the time also complicated budgetary control.

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Improvements in budgetary control have been made. Program managers now have the information required to effectively monitor IRAP budgets in a timely manner.

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5.13 We have found that improvements have been made to budgetary control systems and practices during 1991-92 including the establishment of an improved version of the computerized IRAPnet system. This system is the source of information used to manage contribution budgets for the regional elements of the program. We have noted that several of the difficulties encountered during the first year of system operation have now been addressed and that users state that they are satisfied with the system.

5.14 We believe that the IRAPnet system now provides the information required for an effective monitoring of contribution budgets. Industrial Technology Advisors and program managers can, at any time, find out the state of their contribution budgets.

5.15 Our examination of a sample of projects has also indicated that the system of commitment control is operating satisfactorily and that controls in the IRAPnet system provide reasonable assurance that data is complete, accurate and reliable.

## Controls on project assessment and approval

5.16 Project assessment and approval practices vary according to type and value of projects. A request for contribution under elements IRAP-H and IRAP-L is evaluated in relation to eligibility criteria by the Industrial Technology Advisor who decides whether or not to recommend approval. Each project recommended by the Industrial Technology Advisor is then reviewed and formally approved by the Regional Director or his representative.

5.17 M projects are initially reviewed by Industrial Technology Advisors and then examined for their technical or commercial aspects by a selection committee recommending whether to accept



or reject the project. The Regional Director is responsible for approving all M projects.

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Overall, project assessment and approval practices provide reasonable assurance that approved projects comply with program terms and conditions and enable the achievement of program objectives.

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5.18 Our examination of a sample of projects approved during 1991-92 indicates that practices used to assess and approve applications for contributions under elements H, L, M, and CA provide reasonable assurance that, overall, projects comply with the terms and conditions approved by Treasury Board and enable the achievement of program objectives.

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NRC has recognized the need for an Industrial Technology Advisor training plan to ensure the effective implementation of the new strategy but this plan has not yet been finalized.

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5.19 The new strategy requires that Industrial Technology Advisors become involved with more complex projects. Since projects selected will now have to be part of a long-term business and technological development plan, Industrial Technology Advisors will have to pay more attention to evaluating these plans when assessing projects. In many cases, they will have to work with clients to develop them. Controlling more complex projects requires additional knowledge of project management techniques.

5.20 IRAP management is aware that Industrial Technology Advisor training is an essential element to the successful implementation of the new strategy. It has identified training needs in business diagnostic techniques, technology management and project management. A national training budget has been established and a training plan is expected to be completed by the summer of 1992.

5.21 In view of the importance of training, NRC should closely follow the development of the training plan, ensure that it will meet the needs and implement it as soon as possible.

*Management comments*

*NRC recognizes the value of strong management systems and good budgetary control within IRAP. To be most effective, such systems must support explicit reporting relationships and delegations of*

*authority which result in formal accountability. IRAP's new administrative structure which reflects sound management practices builds on IRAP's traditional values and the Program's commitment to excellent service for its client base. A key ingredient in the delivery of quality services is enhanced training for NRC employees within IRAP.*

*NRC supports the recommendation of the Auditor General. As the report states, NRC has recognized the importance of a training plan for IRAP personnel. This plan will be completed by July 1992.*

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Practices to ensure that the new strategy is applied in compliance with national guidelines have not yet been established.

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5.22 Compared with other federal contribution programs, IRAP's terms and conditions have always provided a great deal of flexibility in the selection of eligible projects and in the type of assistance provided. This flexibility is often quoted as one of the key factors in the success of the program.

5.23 In the framework of the new strategy, NRC has simplified program elements and increased their flexibility. New national terms and conditions and guidelines are in the process of being established and regions are responsible for implementing them to meet regional needs. These terms and conditions and guidelines define the criteria and practices to be applied in the assessment and approval of TE and RDA projects.

5.24 The purpose of these terms and conditions and guidelines is to ensure that new program elements will be delivered in a fair and equitable manner and that practices used in regions will permit selection of those projects most likely to meet overall program objectives.

5.25 It is important to have a quality assurance mechanism to ensure that national terms and conditions and guidelines are properly implemented and that project selection is carried out to meet program objectives. Such a mechanism would be particularly useful in the first year of implementation of the new strategy during which there is greater risk of confusion and error in implementing the new terms and conditions. The information obtained could allow the identification of shortcomings and taking timely corrective actions. Even though NRC has planned quality assurance measures, we consider that additional mechanisms are necessary.

5.26 NRC should establish a quality assurance mechanism to ensure the implementation by regions of the national terms and conditions and guidelines for project assessment and approval.

*Management comments:*

*The key features of IRAP are its decentralized delivery system, its easy accessibility to all users, its flexibility and its responsiveness to clients' needs. While its services are provided regionally, IRAP delivers a national program to its clients through its Canada-wide network of members.*

*The administrative framework which NRC has designed will build on the vital features of IRAP, ensure national coordination of efforts and achieve its commitment to serving Canadian firms. NRC has developed nation-wide decision procedures, more direct reporting and planning processes, and project selection criteria which will ensure consistency between regional and national Program directions and objectives.*

*NRC fully supports the recommendation and will enhance these management practices as it completes the management framework by September 1992.*

**Controls on contribution payments**

5.27 Contribution payment control systems and practices must efficiently provide reasonable assurance that payments comply with the level of funding approved and the terms and conditions established in agreements with recipients.

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**Controls on contribution payments are satisfactory but the efficiency of these operations could be improved.**

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5.28 Examination of a sample of payments made during the 1991-92 fiscal year showed that control on payment of contributions is, overall, effective. However, we have noted that the efficiency of these operations could be improved.

5.29 Under existing procedures, invoices submitted by IRAP clients may be verified up to four times. Industrial Technology Advisors in regions must first verify each invoice and sign them to confirm that the work has been carried out according to the terms and conditions of the contribution agreement. In some cases, the work carried out by the Industrial Technology Advisors is then examined by the Regional Administrative Officer. Claims higher than \$50,000 must also be approved by Regional Directors. Finally, invoices are sent to the Contributions Office where they are verified again for the same aspects prior to being forwarded to the Finance Department for payment.

5.30 The purpose of the verification carried out by the Contributions Office should be to provide an independent assessment of the appropriateness of payments. More than 60% of the 10,000 claims processed during 1991-92 were related to H and L projects of low dollar value and low risk. We believe that the Office should, with the new strategy, question the need to verify each invoice. There is a need to better integrate the work

carried out at national and regional levels to ensure that the frequency and scope of verification are established in relation to the relative importance of amounts and risks of error. Thus, the time devoted to these tasks by Office personnel could significantly be reduced.

#### 5.31 NRC should rationalize IRAP claims verification procedures.

##### *Management comments*

*It should be noted that during the transition to the new strategic plan, NRC felt it important to retain certain procedures so that its limited contribution resources would continue to be managed effectively. The creation of the Contributions Office itself reflects NRC's goal to administer effectively all of its contribution resources. NRC fully supports the recommendation of the Auditor General. It has established more efficient IRAP project decision procedures and will carry out a comprehensive reassessment of all its administrative procedures and systems related to the processing of IRAP clients' invoices before December 1992.*

#### Information required for program management

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NRC has not yet established performance indicators to evaluate and report on the achievement of IRAP objectives under the new strategy.

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5.32 The establishment of a framework to evaluate and report on program results in relation to established objectives is essential to ensure effective program management and accountability of its managers.

5.33 Such a framework should include the establishment of operational objectives which would allow meeting the objectives established for IRAP overall. It should also include the information to measure and report on the achievement of these objectives.

5.34 NRC has started developing this framework but much remains to be done. The strategic plan identifies overall program objectives and operational objectives are in the process of being developed for each region and for IRAP as a whole. Performance indicators to be used to evaluate and report on the achievement of objectives under the new strategy have still not been identified.

5.35 IRAP management recognizes the importance of establishing a framework to evaluate and report on performance and expects to establish such a framework for the beginning of fiscal year 1993-94.

5.36 NRC should ensure that the framework to be established for evaluating performance will enable reporting on the achievement of IRAP objectives so as to ensure management accountability.

*Management comments*

*NRC recognizes the importance of an evaluation framework for IRAP and fully supports the recommendation. NRC is proceeding with the development of an evaluation framework of IRAP to be completed by April 1993 under the direction of the Assessment Committee of NRC's governing Council.*



# SUMMARY DESCRIPTION OF IRAP TERMS AND CONDITIONS FORMER AND NEW ELEMENTS

## FORMER ELEMENTS

H

L

M

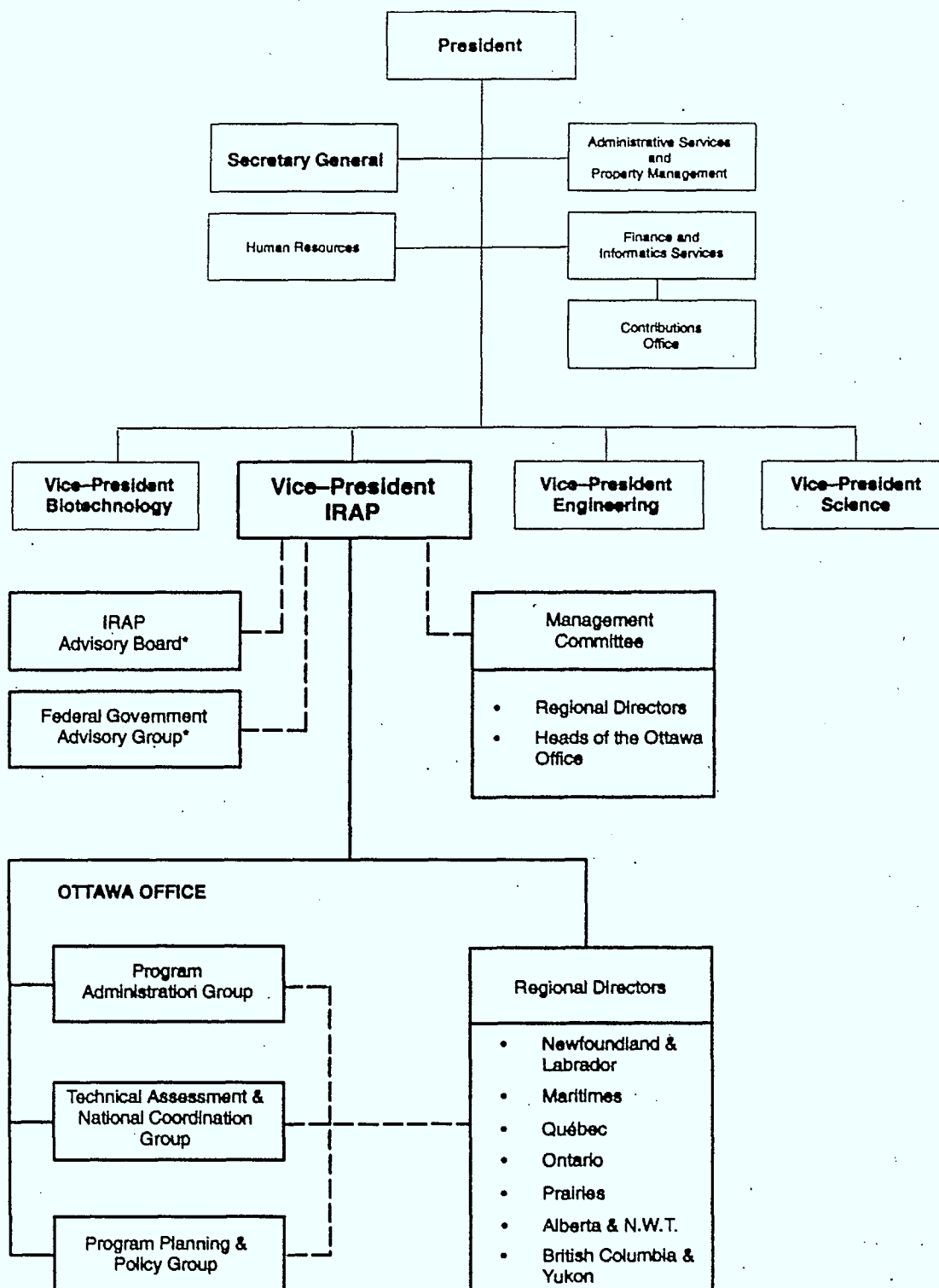
R

CA

PURPOSE	<ul style="list-style-type: none"> <li>Assist small and medium sized enterprises in solving technical and scientific problems through short-term projects using qualified students</li> </ul>	<ul style="list-style-type: none"> <li>Assist small and medium sized enterprises in solving technical problems through short-term projects using outside consultants</li> </ul>	<ul style="list-style-type: none"> <li>Assist small and medium sized enterprises in carrying out R&amp;D projects of less than 24 months that firms cannot carry out without technical and financial assistance</li> </ul>	<ul style="list-style-type: none"> <li>Assist in carrying out R&amp;D projects in cooperation with laboratories, Canadian universities or other reliable Canadian or foreign sources of technology</li> </ul>	<ul style="list-style-type: none"> <li>Make contributions to organizations which assist Canadian industry with technology and research</li> </ul>
CLIENTS	<ul style="list-style-type: none"> <li>Firms of 200 employees or less incorporated in Canada</li> </ul>	<ul style="list-style-type: none"> <li>Firms of 200 employees or less incorporated in Canada</li> </ul>	<ul style="list-style-type: none"> <li>Firms of 200 employees or less incorporated in Canada</li> </ul>	<ul style="list-style-type: none"> <li>Firm incorporated in Canada capable of carrying out its share of projects and market the results</li> </ul>	<ul style="list-style-type: none"> <li>Provincial research organizations, research institutes and technology centres, Canadian universities and colleges, Canadian association of consulting engineers and other organizations</li> </ul>
ASSISTANCE	<ul style="list-style-type: none"> <li>75% of the salary of a qualified student up to the maximum of the scale paid by NRC</li> <li>maximum period of 18 weeks</li> </ul>	<ul style="list-style-type: none"> <li>maximum of \$6,000 for specialized assistance on projects with a total cost not exceeding \$14,000</li> </ul>	<ul style="list-style-type: none"> <li>maximum of \$100,000 for personnel costs of the company or subcontractors assigned to the project</li> </ul>	<ul style="list-style-type: none"> <li>part of the salaries and other project related costs</li> </ul>	<ul style="list-style-type: none"> <li>maximum of \$2,000,000 per organization for salaries and fees of industrial technology advisors and technological transfer specialists and the cost of other technical services to Canadian firms</li> </ul>
NEW ELEMENTS	TECHNOLOGY ENHANCEMENT (TE)		RESEARCH, DEVELOPMENT, ADAPTATION (RDA)		CA no change
PURPOSE	<ul style="list-style-type: none"> <li>Assist small and medium sized enterprises through various small scale activities previously covered under IRAP-H, IRAP-L, IRAP-M</li> </ul>		<ul style="list-style-type: none"> <li>Provide technical or financial assistance to small and medium sized enterprises on R&amp;D projects involving applied research and development as well as adaptation of technologies of proven technical value (replaces IRAP-M and R)</li> </ul>		
CLIENTS	<ul style="list-style-type: none"> <li>Companies of 500 employees or less showing a desire to improve their technological capacity as well as industrial associations</li> </ul>		<ul style="list-style-type: none"> <li>Companies of 500 employees or less with technical capabilities</li> </ul>		
ASSISTANCE	<ul style="list-style-type: none"> <li>75% of direct salary costs or consultant fees related to technical feasibility studies, small scale R&amp;D projects, short-term technical outside assistance, projects using a qualified student, laboratory visits, technological transfers to industrial associations, establishing linkages between small and large firms.</li> <li>Maximum of \$15,000 per project; \$25,000 per year, per client</li> </ul>		<ul style="list-style-type: none"> <li>Assistance of \$15,000 to \$350,000 covering a period of up to 36 months for direct salaries of the company's personnel and up to 50% of subcontracting costs and 75% of consulting fees</li> <li>IRAP's contribution cannot exceed 50% of total project costs</li> </ul>		

# NRC-CNRC

## Organizational Structure



\* Committees in the process of being constituted

**ANNEX 6**



GOVERNMENT RESPONSE TO

IRAP: AN INQUIRY INTO  
THE INDUSTRIAL RESEARCH ASSISTANCE PROGRAM

A REPORT OF THE STANDING COMMITTEE ON INDUSTRY, SCIENCE AND  
TECHNOLOGY, REGIONAL AND NORTHERN DEVELOPMENT

RECEIVED / REÇU

JUN 19 1992

Program Services aux  
Services Programmes

RÉPONSE DU GOUVERNEMENT A

PARI: UNE ENQUETE SUR  
LE PROGRAMME D'AIDE A LA RECHERCHE INDUSTRIELLE

UN RAPPORT DU COMITÉ PERMANENT DE L'INDUSTRIE, DE LA SCIENCE  
ET DE LA TECHNOLOGIE ET DU DÉVELOPPEMENT RÉGIONAL ET DU NORD

IRAP: An Inquiry into  
the Industrial Research Assistance Program

INTRODUCTION

1. The Standing Committee on Industry, Science and Technology, Regional and Northern Development has submitted to the House of Commons, in accordance with its mandate under Standing Order 108 (2), a report entitled IRAP: An Inquiry into the Industrial Research Assistance Program. Pursuant to Standing Order 109 of the House of Commons, the Standing Committee has requested a comprehensive Government response to this report.
2. The Committee Report results from an inquiry into the Industrial Research Assistance Program (IRAP) of the National Research Council (NRC) in response to reports of changes to the orientation of IRAP and concerns that the effects of inflation on its budget could impede the ability of the program to fill its role.
3. The Committee Report situates its examination of IRAP within the context of the need for Canadian business, particularly small and medium-sized enterprises (SMEs) to make use of science and technology to survive in the competitive global market. Indeed, the Government has identified science and technology as one of the major elements of Canada's future prosperity in its consultation paper entitled Prosperity Through Competitiveness, released in 1991 under the Prosperity Initiative.
4. Canadian SMEs need to be able to integrate technology into a strategy for the whole business. Success in acquiring and implementing technology is contingent on a number of aspects of a company's operation, e.g., management commitment, organization of work, the availability of skilled personnel and supporting services. Investments in technology are also conditioned by a range of factors, many of which are under the direct or indirect control of governments, e.g., policies affecting financing, regulations, and intellectual property.
5. Federal and provincial governments have a variety of policy instruments, programs and services aimed at one or more of these issues. For example, most new services of Industry, Science and Technology Canada (ISTC), such as the very successful Advanced Manufacturing Technology Applications Program, are in the area of business diagnostics, management awareness and management skills, and are intended to build the capability within SMEs to deal with technology in the context of the whole business.
6. These programs are intended to complement technology support instruments such as IRAP. In the present period of limited resources, it is desirable and necessary that key federal and provincial agencies, as well as the private sector, collaborate in developing and delivering their programs and services to ensure the maximum impact from their expenditures.



7. The Government is adopting and promoting this integrated approach to supporting the needs of SMEs throughout Canada in making technology investment decisions. This will involve initiatives to build and strengthen integrated delivery systems (networks) linking key service providers.
8. Within this context, IRAP makes a strong, catalytic contribution through its focus on addressing the technology needs of industry clients, and by guiding clients to the most appropriate sources of technology, advice and assistance.
9. It is important to note that IRAP is a unique Canadian technology network, consisting of institutional partners and technical advisors who combine technical advice with access to financial and information resources. The mission of IRAP is to support the competitiveness of Canada through the technological development of Canadian firms, particularly small and medium-sized enterprises. It does this by supporting technology innovation through research, development and adaptation of products, processes and intellectual property, working through its technically qualified and experienced staff at the level of the individual firm.
10. The Standing Committee Report acknowledges that IRAP plays a vital role in promoting the development and exploitation of technology by Canadian industry to gain a competitive edge. It goes on further to argue that the effects of inflation on IRAP's budget hamper its ability to continue to fill this role; that an expanded mandate for IRAP would benefit Canadian industry; and that some recent changes to IRAP should be reviewed. A series of recommendations are presented that address these issues. The Government's response to each recommendation is given below, following a restatement of the recommendation.

#### RESPONSES TO THE STANDING COMMITTEE'S RECOMMENDATIONS

##### RECOMMENDATION 1:

The Committee recommends that the federal government consider the advisability of increasing the total funding of IRAP to a minimum of \$110 million for fiscal year 1992-1993.

11. The federal government recognizes that inflation has had an overall impact on the budget of IRAP, as it has on the budgets of most federal programs. This is a reflection of the period of fiscal restraint in which we find ourselves and of the competing demands that exist for available science and technology funds. We must be guided by the need for responsible and firm management of the federal budget.
12. In recent years the Government has recognized the need to support the IRAP budget whenever possible out of new science and technology allocations. In 1987, the Government announced new funds for a number of initiatives under InnovAction, including \$28 million over four years for IRAP. This increased level of funding has been extended by the allocation of \$27 million over a four-year period beginning in fiscal year 1992-93.



13. NRC has taken action within the existing, confirmed resources for IRAP. IRAP has continued to provide benefits to Canada through the power of its technical support. This point is clearly illustrated in the December 1990 report of a recent IRAP evaluation study which states: "Clients value the technical and brokering advice received from IRAP staff, scientific advisors and other members of the technology network highly. IRAP is not just a financial program".
14. The IRAP Strategic Plan sets out new directions for the program, and NRC has indicated that additional resources could be used in this context. However, these needs would have to be considered within the fiscal framework set by the Minister of Finance in the Budget of February 25, 1992 and within the context of broad national effort to increase Canada's competitive capacity and prosperity.

RECOMMENDATION 2:

That the federal government consider the advisability of further doubling, by fiscal year 1997-1998, the funding of IRAP to \$220 million, in 1992-1993 dollars.

15. The Government notes that consideration of funding to \$220 million recommended by Committee is not supported by analysis. As stated earlier, fiscal and budgetary demands require that the Government manage the federal budget in a responsible manner, and the available science and technology funds within the context of numerous competing demands.
16. Proposals such as these must be supported by thorough analysis. In IRAP's case, this analysis should focus equally on its ability to provide technical advisory services to SMEs, not only on financial assistance.
17. A specific proposal to double the IRAP budget in five years would have to recognize the need for flexibility on the part of the Government in meeting the financial needs of other industrial innovation-related priorities and initiatives in science, technology, skills development, trade and investment.

RECOMMENDATION 3:

That the Auditor General review the management practices and financial accountability of IRAP's contributions. Such a review should consider whether it is in the best interest of the IRAP program to reunite financial and operational management in the same organizational structure.

18. The NRC has stated that the decision to separate the financial and operational management functions related to IRAP contributions was based on the results of reviews and audits, and on the advice of professional auditors and financial managers outside of NRC. This separation of functions does not change the responsibilities and decision-making authorities of IRAP managers, but aids fiscal control of the program.



19. IRAP managers have full authority to manage IRAP's budget and have access to all necessary financial, administrative, and personnel records. IRAP senior management retain all strategic and operational authority for IRAP and for the management of its day-to-day operations. The responsibility for negotiating, reviewing, or approving contributions also remains with IRAP managers.
20. Given the above information, the Government is satisfied that the decision to separate the financial and operational management was taken by NRC management on the basis of sound advice, and in the interests of instilling good management practises and improving program accountability.
21. However, noting the Committee's recommendation, the Office of the Auditor General has already responded positively to this recommendation and has undertaken a review of the management practises and the financial accountability of IRAP's contributions. The Auditor General will discuss its findings with NRC's officials and report the results, including NRC's comments, to the Committee by the end of April 1992.

RECOMMENDATION 4:

That the Minister for Science reaffirm that IRAP's mission and orientation will remain unchanged. Accordingly, IRAP should continue to serve the needs of its clients by seeking the best available technology from wherever it is to be found.

22. On behalf of the Government, the Minister for Science reaffirms, as he did during his appearance before the Standing Committee on November 7, 1991, that IRAP's basic mission and orientation have not been changed. IRAP will continue to serve the needs of its clients by seeking the most appropriate technology for their needs from wherever in the world it is to be found.
23. This is not to say that the design of the Program will remain static. It must be continually examined, and changed, when necessary, to meet the changing needs of clients. Such examination and change is embodied in the IRAP Strategic Plan, and in the evaluation studies behind it.
24. It also would include collaboration with the NRC laboratories, when appropriate to the needs of IRAP clients. As the Minister for Science pointed out in his testimony before the Standing Committee "...I don't think there is anything wrong with saying that if you are going to do a technology search, you might start with the laboratories of NRC. ...That doesn't imply to me any downgrading of what IRAP is suppose to do".
25. The foundation of IRAP will continue to be its national technical assistance network. This network is built around service to SMEs through more than two hundred Industrial Technology Advisors (ITAs) who provide both financial assistance and technical advice. However, the network consists of more than just the ITAs, and includes its





partnership and agreements with a wide variety of other R&D organizations.

26. Indeed, elements of the Strategic Plan, including greater regional authority, the networking strategy, and the new funding elements, will encourage IRAP personnel to build upon and strengthen existing links with complementary programs which are offered by numerous provincial departments and agencies and by other federal departments and agencies. The latter include Western Economic Diversification Canada, the Atlantic Canada Opportunities Agency, the Federal Office of Regional Development (Quebec), and the regional offices of Industry, Science and Technology Canada.

RECOMMENDATION 5:

That the federal government re-examine the appropriateness of the situation of IRAP within the NRC in the context of the requirement that IRAP be responsive to industrial clients and the government's industrial policy.

27. As the Minister for Science pointed out in his testimony before the Standing Committee on November 7, 1991: "IRAP would lose something if it wasn't part of NRC. ...there's a lot of work in the laboratories that can be used by the IRAP network people... . Not just what's going on in the laboratories, but those people in the labs have science and technology outlets all across this country and, indeed around the world".
28. NRC is an arm's-length government agency with a mandate that not only includes service to industry but also a responsibility to undertake activities in the broad national interest. As such, NRC is uniquely equipped to provide IRAP with an operating environment and technical support that reflects national priorities, but remains highly responsive to industry and the role of NRC's partners.
29. When viewed as a technology assistance program, not just as a funding program, it becomes evident that the linkages of IRAP to NRC's scientific and technical personnel, and to NRC scientific and technical information and services are important. They would be weakened if IRAP were not part of NRC. IRAP's location within an arm's-length organization also gives it a quick response capability and flexibility, as well as institutional clout to establish effective partnerships across Canada.
30. The Government believes that the credibility of IRAP is due not just to its strength in providing technical assistance, but also to being a part of an organization with a long-standing reputation for scientific and technical excellence. The Government feels that IRAP is most appropriately situated within NRC.



RECOMMENDATION 6:

That both senior IRAP management and the Chairman of the IRAP Advisory Board appear before this Committee on a yearly basis to discuss the status of the IRAP program.

31. The Government is in agreement with Recommendation 6. However, status reports should be looked upon within the context of the program and its evolution, not past questions. IRAP needs a period of continuity and stability during which the Strategic Plan may be fully implemented.
32. The Committee will recognize, of course, that it is free to request the appearance of officials of Federal Government departments and agencies, including NRC, as part of the annual review of the Main Estimates.
33. Senior NRC managers responsible for IRAP, including the President of NRC and the Vice-President responsible for IRAP, will be available, as well, to appear before the Committee on other occasions if the Committee so requests. If, on these occasions, the Committee wishes to discuss detailed aspects of IRAP's activities across Canada, IRAP Regional Directors could also appear.
34. The NRC has also suggested that, in recognition of the Committee's ongoing interest, an Annual Report on IRAP could be provided to the Committee. This report would cover any changes to the program and their implications for IRAP clients, as the Committee has suggested. The Government endorses this suggestion.
35. Future members of the Advisory Boards would, of course, be free to appear before the Committee. However, the Committee must recognize that the responsibility and accountability for the policies and priorities affecting IRAP clearly rests with NRC's Governing Council. Advisory Boards provide Council with guidance in this role, and with confidential advice. Members of Advisory Boards can offer individual perspectives and personal views, but cannot be considered spokespersons for the Board, NRC, or its components.

RECOMMENDATION 7:

That the National Research Council clearly justify increased decentralization and the alteration of IRAP elements, and provide the comparative advantages of the new structure over the old.

36. The Government recognizes that NRC managers faced many changing environmental factors in planning a strategy for the future delivery of the IRAP program. These include: resources that have been reduced through the impact of inflation; the need for IRAP to work closely and on a daily basis with other government agencies with evolving, complementary programs and services, delivered in a decentralized mode; and the intense need that international competition has placed on the federal government to promote the capabilities of Canadian industry.



37. Thus, while IRAP has been a very effective program, ignoring these pressures would have posed a serious threat to IRAP's viability and reputation as an adaptive instrument for industrial support. NRC management had to make tough decisions on the program's priorities and its strategic direction.
38. The Strategic Plan was not developed in isolation and was ~~x~~ based on considerable consultation with clients and partners, and analysis of recent program evaluation. The directions proposed for the program in the Plan are normal steps in the evolution of IRAP. These reflect the decentralized nature of the delivery of many other government programs with which IRAP must interact on a daily basis. They do not constitute a major reorientation of the program.
39. The new program structure spelled out in the Strategic Plan will increase the authority of IRAP regional managers and ITAs throughout the network to work with SME clients. It consists of a simplified structure of two program elements: Research, Development and Adaptation; and Technology Enhancement.
40. The Committee heard differing views concerning the likely impact of increased decentralization as spelled out in the Strategic Plan. Some witnesses felt that a central authority and bureaucracy for IRAP were needed to keep the extensive network "glued together". Others felt that the further decentralization of IRAP would result in a more regionally sensitive service and closer links between ITAs and the provinces. \*
41. The Government agrees strongly with the latter opinion. The IRAP network already functions in a decentralized mode, particularly in the delivery of national technical assistance services by its Industrial Technology Advisors. As the Minister for Science pointed out to the Committee: "Decentralization of the IRAP program will be welcome by business and research organizations across Canada. Developing strategies that respond to specific regional needs is essential".
42. Nonetheless, strong central planning is required to support the national coordination of the network. This need has been addressed in the new IRAP management structure at headquarters which includes a Vice President responsible solely for IRAP and an active role in technology assessment and network coordination.
43. The Committee also appears concerned that the Strategic Plan does not provide sufficient explanation for decreasing the number of IRAP program elements. In considering specific program changes, NRC based its decisions on a variety of information sources including evaluation reports, audits, surveys of IRAP clients, and the advice of the IRAP Advisory Board.



44. The Government is satisfied with the strategic directions that have been laid out for IRAP over the next decade by NRC management. The proposed changes are being effected. The Government has confidence in the ability of the NRC and IRAP management to do this job, and encourages them to complete it as quickly as possible.
45. Regardless, IRAP is subject to periodic external evaluation and review, as are all NRC programs. Such processes should be undertaken when the new programs and structures have had sufficient time to be implemented and their impact to be measured. They should focus on issues within the context of the program and its evolution, not past questions. For example, the ability of the network, operating in an increasingly decentralized mode, to maintain and strengthen inter-regional links and links with national laboratories should be examined.

Recommendation 8:

That the National Research Council re-establish an IRAP Advisory Board, and clarify the role, membership, and mode of operation of that Advisory Board.

46. The Government is pleased to inform the Committee that NRC's governing Council has approved plans to re-establish the Advisory Board, with a renewed mandate and membership.
47. The Government notes that NRC's governing Council has, over the 75 year history of NRC, sought external advice to guide its program decisions. IRAP is in the business of supporting technology innovation at the level of the individual firm and in response to the firm's needs. The need for external advice is self-evident in the case of this program.
48. With regard to the recent dissolution of the IRAP Advisory Board, the Committee should be aware of the circumstances surrounding this action. At its November 1991 meeting, the NRC governing Council determined that it was necessary to ensure the continued relevance and efficient functioning of the Advisory Board. With this in mind, a Working Group of Council members was created to examine current circumstances and issues affecting the functioning of the Advisory Board, and its future role.
49. This Group advised Council that an effective and thorough review of these issues could only be done fairly if the existing Board were dissolved, and made this recommendation to Council on November 14, 1991. Council accepted this advice, noting that action should be taken immediately in view of the urgent need to have a new structure in place to guide IRAP and respond to specific concerns expressed to the Standing Committee.
50. The Working Group consulted widely with IRAP partners, former Board members, and current and past IRAP managers, and submitted its recommendations to Council early in 1992. Council analyzed these recommendations along with other input and, on this basis, approved the terms of reference





for a new Board in February 1992. The membership of the new Board will be discussed by Council in the near future.

RECOMMENDATION 9:

That the Minister for Science clearly specify IRAP's role in the framework of the federal government's policy on science and technology upon completion of the review by the *ad hoc* working group of NRC.

51. The Committee report speaks of the role that IRAP "could" or "should" play in boosting Canadian competitiveness, and refers to the need to enunciate and clarify IRAP's role in this context. However, during his testimony to the Standing Committee on November 7, 1991, the Minister for Science stated quite clearly the Government's position concerning IRAP: "From the time that this government came to power, IRAP has consistently been recognized as a focus for federal technological assistance. IRAP must continue to be the hub of a national infrastructure to support industrial technology".
52. Canadian manufacturers, particularly SMEs, need to be able to deal with technology in the context of the business as a whole. Success in acquiring and implementing technology is contingent on a number of aspects of the company's operation, including management attitude and capabilities, skills availability, marketing, financing, standards and regulations, and the ability to link with the sources of technical information and advice. Most SMEs lack the internal resources to understand and deal effectively with this range of issues.
53. The Government is adopting an integrated approach to supporting the needs of SMEs in making technology investment decisions. The primary goal is to enhance the competitiveness of firms through better coordination of policy development and through the development of integrated delivery systems or networks linking the key service providers at the local, regional and national levels.
54. IRAP is one of many services that can assist business in the application and implementation of technology. However, while IRAP managers and ITAs have significant business skills and frequently guide SMEs to appropriate sources of business and non-technical expertise, IRAP may not be the appropriate vehicle to deliver the full range of support required by SMEs. It would not be desirable to dilute the expertise of ITAs by requiring them to do too much.
55. To ensure that IRAP clients benefit from complementary assistance programs, the IRAP Strategic Plan calls for even closer links to other, existing programs. NRC and IRAP management are actively working to strengthen these links. This is being done in harmony with the Government's other current efforts to better coordinate program delivery and policy assistance for SMEs.



56. The Government regards IRAP as a technical tool which initiates the industrial innovation process. It is an important tool and is central to technology innovation support provided by the Government, but is only one of many that we have to use in assisting SMEs. It can be used to best advantage by linking it to servers of other forms of support.

#### CONCLUSION

57. The Standing Committee on Industry, Science and Technology, Regional and Northern Development has raised important issues in its report concerning the future role of IRAP. Areas addressed in the recommendations include the institutional location of the program, its structure, management and delivery, the program's budget, and perhaps most importantly, the mission of the program and its role within the Government's strategy for promoting industrial innovation.
58. The Minister for Science has stated publicly in his appearance before the Committee, and has reiterated in this report that the Government considers IRAP to be a key element in the national infrastructure supporting industrial innovation, and that its basic mission has not changed.
59. The Government notes that NRC management developed the strategic planning framework for IRAP to adapt to a changing operating environment. Changes made to the program under the new Strategic Plan have raised concerns that have found expression in the Committee's recommendations.
60. The Government was also concerned, not about the Strategic Plan, but about the possible negative effects that the debate over these changes could have on the integrity of IRAP. The Government stresses that it is satisfied with the strategic directions that have been laid out for IRAP over the next decade by NRC management, and has confidence in the ability of NRC and IRAP management to implement the proposals.
61. A number of the Committee's recommendations have anticipated NRC plans for IRAP that have now, or will soon be implemented. For example, a Vice President has been appointed with exclusive responsibility for IRAP, plans are well developed for the re-establishment of the IRAP Advisory Board, and a measure of incremental funding has been provided to maintain the IRAP budget.
62. The Government emphasizes that IRAP has been a very successful program and now has a long-term planning framework within which to continue this success. What is required now is encouragement to continue with the implementation of the Strategic Plan, and a stable period within which to adapt to the changes to the program.

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