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A STUDY OF THE UNIVERSITY RESEARCH CONTRACT PROGRAM

T.J.F. PAVLASEK

Submitted March 1975

Report on

A STUDY OF THE UNIVERSITY RESEARCH CONTRACT PROGRAM

Prepared in compliance with the requirements contained in the Agreement of 17th April 1974 between the Minister of Communications and T. Pavlasek

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Prepared December 1974
Formally submitted March 1975

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PREAMBLE

The purpose of this study, as specified in the contract agreement is: "To study the program of University Research Contracts and recommend policies to achieve the most effective use of university resources in support of DOC's research and development program, and to prepare a report of the study".

This document is the final report of the study. It has been prepared after a number of days of activity spread over the period June to December 1974. The activities and method of the study are summarized below in the section entitled 'Methodology'. This is followed by a compendium of selected 'Observations' and the report concludes by a number of 'Recommendations'. The 'Recommendations' deal with the continuation of the program, its method of operation and its scientific and administrative management.

The salient policy recommendations in summary are:

On Continuation: The program should continue, provided that, in due course, it can expect to receive increased resources, provided that it is coordinated internally more closely with other research contracted to universities (and or other agencies) and, provided that the continuation is directed towards evolving a working research partnership between DOC and the universities, rather than a straightforward client-contractor relationship.

On the Method of Operation: The effectiveness of the program is hampered by a substantial mismatch between the two parties involved

and bi-lateral administrative arrangements need to be found to relax this condition.

A basic premise of the program is that DOC's research and development policies are essentially established internally within the Department and that the URCP projects should simply conform to them. It is suggested that an interactive program definition process might be more beneficial and could make a vital contribution to DOC's R & D policies.

An extension and further development of the existing CRC University Liaison system to cover other branches of the Department would be an important first step especially if close interaction were encouraged with the Industrial Liaison system as well.

On Administration and Management: A 'Director of University Programs' should be appointed, provided that it is intended to enlarge the scope of the URCP and provided that such a Director, derived from the university milieu, can play a creative role in the development of both the research policies and the operation of the program. Such a 'Director' should be primarily a 'university' person and extraordinary measures may need to be taken to maintain this status. A part-time or limited tenure appointment might be considered, but, if a permanent service appointment is needed for reasons of continuity and good management and because of public service policy, then the terms of reference must be such as to ensure the Director's continuing credibility within the university milieu.

METHODOLOGY

The study was undertaken, to some extent, in lieu of the appointment of a 'Director of University Programs'. The person carrying out the study therefore attempted to act the role, in a sampled, simulated and part-time fashion, of such a Director. The following steps were taken and various activities appropriate to such a role were undertaken:

1. A number of objectives of the study were defined in greater detail and are listed in Appendix I. In retrospect it can be noted that these objectives were too ambitious and could not all be acheived, but they continue to be most relevant.

2. A period of introduction and familiarization was spent to learn about the structure and infrastructure, the method of operation, the persons and personalities in DOC. (Such an experience for a 'raw outsider' is simultaneously exhilarating and traumatic. This point needs to be kept in mind in the case of an eventual appointment of a 'Director', especially if non-permanent tenure is contemplated.)

3. The basic documentation for the URCP over its entire period of existence was examined, although, of necessity in a sampling fashion. A 'Mid-Program' report was submitted and is included in Appendix II.

4. A series of interviews was carried out within the Department and a list of the persons met is in Appendix III. Included in the interviews were the ADMR, some members of the Research Committee, Chairmen of the Working Panels and a selection of Project Officers.

In view of the concurrent administrative study (Brisebois and Monster), a number of discussions were also held with the administrative study group.

5. A smaller number of 'field' visits was carried out at several universities as listed in Appendix IV. The purpose of these visits was to learn something about the projects themselves and especially to obtain some first hand appreciation of the contractor's opinions and evaluation of, and experiences and difficulties with the URCP.

6. Various publications, documents, research project reports pertaining to the URCP were collected and examined, again to considerable extent in a random sampling method. A listing of these appears in Appendix V.

OBSERVATIONS

These Observations are in four parts:

1. Those dealing with DOC
2. Those concerned with universities
3. Those discussing the DOC-University interface
4. Those commenting on past and current URCP projects.

1. DOC

1.1 DOC's primary mission is in the legal, regulatory, economic and social spheres. It is not the Department's role to operate communications systems. The research objectives of the Department therefore, of necessity, become influenced by this fundamental mission. The Department, however, is concerned with the impact on the country of a 'high technology' and must therefore carry out its primary mission with the fullest appreciation, understanding and participation in this 'high technology'.

1.2 The DOC structure contains a major (in fact the second largest, integrated) Canadian human and material resource (CRC) which participates in and has made notable contributions in research in this 'high technology'. On the other hand, research in the socio-economic etc. spheres is conducted by the Department within its 'normal' administrative structure or through external contract projects. Whether a 'socio-economic etc.' research centre should or should not exist, within or separate from CRC, is an important policy question which is not the direct concern of this Study. A specific policy decision on this issue will, however, strongly influence the future nature of URCP projects.

1.3 Observation of the internal operation and management of the URCP evinces a number of comments:

1.3.1 An internal Management Group Study partly preceding and paralleling this 'Study' provides a valuable insight into URCP's administration. A most valuable contribution of the Management Study Report is its Appendix which contains statements of 'research objectives' of the various branches and divisions of DOC. The value of this Appendix lies in the fact that it appears to represent the first comprehensive attempt at such a collective definition of Objectives, which are very revealing in themselves. They show: i) a very wide range of different tasks, often quite unrelated, ii) a considerable difference in the interpretation by the various branches (and their related disciplines) of the nature and methods of 'research', iii) a need for an examination of the manner whereby 'research' objectives become defined.

1.3.2 The Working Panel structure has many commendable features, including its interdisciplinary nature. There appear to be difficulties, however, related to the multiplicity of the Panels and the feeling of frustration of some panel members which arises from the limited resources which are available and from the evident fact that the task of the Panels is unilateral and non-creative. The use of the Panels themselves in the process of research objective definition and for the setting of criteria may be worth considering. The Panel membership includes persons with high qualifications as experts and it would seem to be reasonable to make productive use of such talent.*

* The recent restructuring of the Panels appears to be helpful especially as the Panels become more directly involved in the process of research objectives definition. (Footnoted March 1975)

1.3.3 The criteria used for the selection of projects tend to produce contradictions and conflicts. This makes the task of the Working Panels, the Executive Committee and the Research Committee especially difficult. Two factors - limited funds and the urge for wodespread regional distribution - are especially problematic because of the complexity of the selection process.

1.3.4 An important aspect of the URCP structure is the use of Project Officers for the monitoring of the projects. This laudable, in fact essential, arrangement appears to function quite well, but in many instances is not fully exploited because: i) the task is frequently an 'additional burden' on the Project Officer, ii) the project is not in the direct line of the P.O.'s interests, iii) it is in many cases physically and economically impossible for the P.O. to interact effectively with the contractor, iv) the high mobility of personnel within the Public Service makes supervisory continuity very difficult.

1.4 A major observation concerns the amount of funds available for the URCP. The amount allocated was substantially increased after the first year of operation, and was to have had a continuing growth. In fact, however, it has been essentially static since the initial growth. This means that, in real terms it has declined substantially and seriously. Furthermore, in the early years, most of the projects were in the technological rather than in the socio-economic sector, but since then the range of activities covered has doubled by the inclusion of the latter. In addition, the projects have spread from a central geographic region to the entire country. The resulting great dilution of limited resources

tends to lead to token support of activities, which, therefore, may not be sufficiently funded to achieve even minimal objectives. When this is coupled with a natural tendency of university researchers to underestimate the cost of research, it is proper to question whether the funding level is realistic.

2. The Universities

2.1 Canadian universities are obviously dispersed geographically and are uncoordinated operationally both externally and internally. More than do most instututions, they cover an exceptionally wide range of objectives, interests and skills. This is simultaneously their weakness and their strength.

2.2 The effectiveness of universities as research contractors (in terms of a Make or Buy policy), depends in the first instance on the nature of the task to be undertaken. It must be noted, however, that criteria for determining suitable contract research for universities are still in the process of definition. Such criteria, inasmuch as they exist, are a matter of much controversy and depend on value judgement. Opinions range from the extreme of the idealistic scholar whose particular doctrine dictates the abhorrence of activities in conflict with his doctrine, to the pragmatic approach of a director of a university's industrial research institute, whose values are based on performance, productivity, delivery and cost effectiveness. Since contract research policy (as opposed to 'free' research grant policy) must be pragmatic, it is important to determine the degree to which a particular research task can be performed productively

and delivered within an agreed upon budget and time span. It would be useful to state categorically the criteria for the types of research contracts which universities can undertake effectively. However, such a categoric statement might be misleading at this time, since such criteria are in a continuing process of definition. Nevertheless it is useful to quote at this point the opinions of one university's external contract manager, whose perception of the matter is based on a number of years of experience. The comments are quoted here with permission, but anonymity has been requested by the source.

"Applied and Contract Research at Universities"

" Definition: Contract research is the orientation of research effort in response to a sponsor's demands. Pressure for orientation is present in all research, but is clearly stated in applied research in terms of objectives, scope of work, timing and funding.

Applied research in the area of physical science usually has the ultimate objective of developing a new product, process or system. (The sponsor must see some long term way to recover the research cost.) Here, universities are at a disadvantage, because they have little close contact with the 'market place' and have only limited feedback from large numbers of discriminating users. Exceptions to this are the medical schools with their teaching hospitals, faculties of agriculture, etc.

Because research is not the sole activity of the individual faculty member, he tends to lag the high technology industry in the application of fundamental research knowledge.

Applied research in the social sciences area is heavily observation weighted. The methodologies of such research are much more developed and better understood in the universities. Such research is more likely to appear to be objective; it tends to be simplistic and hypotheses are much more difficult to prove.

Universities are good at:

a) developing the basic understanding to those things which are currently being done empirically (e.g. many, already generated findings can lead to an improved product or system)
b) applying sophisticated research techniques
c) applying mathematical modelling and or statistical techniques to a problem
d) providing a sponsor with expertise in a field wherein he has little knowledge, on a short term basis, or until the sponsor can afford to develop his own in-house capability.

Universities are poor at:

a) recognizing technology of significant commercial application
b) developing prototypes demanding large market feedback
c) projects requiring large coordinated manpower effort, or even moderate effort on short notice

Universities are supposed to be good at:

a) taking a long term contemplative look and identifying long term concerns (but I don't think that, in fact, they are good at this)
b) mounting interdisciplinary research efforts. (The disciplines are indeed available but effective research project management is not generally available.)

It should be noted that those things which universities are least good at might be solved by a sponsor establishing a research project which he manages, but of which certain recognized portions are under the direction of faculty members. Such projects could be based on or off campus, but in the latter case, close contact would have to be provided. Lack of commercial security etc. would likely make most sponsors leery of such arrangements. "

2.3 A special feature of universities, as noted earlier, is their essentially dispersed nature. This, in itself, presents a considerable and challenging problem for a Department of Communications, representing in microcosm the total national communications problem.

The dispersion is of two kinds: externally, geographic, and internally, by disciplines. Both forms of dispersion influence the nature of research projects which can be chosen usefully.

The geographic dispersion means that there exists in Canada considerable duplication of human resources in many disciplines and this provides a considerable degree of choice while being at the same time the source of the embarrassment known as 'regional distribution'. A further serious effect of this dispersion is that few institutions approach a large critical mass size and few have the ability to manage large scale research problems. This constitutes what is essentially a communications challenge and poses the question of whether widely dispersed institutions can be encouraged to act in a cohesive manner.

The other order of dispersion, internal along departmental discipline lines, is even more vexing because it is indicative of the insularity and isolationism within universities. This is further compounded by the laudable but frequently awkward rugged individualism of faculty members. This is not a great problem when the research objective is one dimensional and fits entirely within the specific expertise of a particular individual. However, the more wide ranging and significant research projects require interdisciplinary teamwork. It seems that the traditional university environment is only beginning to adapt to this form of activity. It is noteworthy that a report for one of the URCP projects stresses, as a final conclusion, that the most important result of the project undertaken was that the participants learned how to structure, manage and operate a successful interdisciplinary team activity.

2.4 A specific note of observation is appropriate about the competence to be found in universities which is specific to communications. As noted above in 1.2, DOC itself contains major research resources in communications high technology in CRC. A similar situation exists in universities. The various pertinent departments (electrical engineering, physics, computer science, etc.) have a respectable history of contributions. This, in fact, antedates the existence of DOC by many decades. (e.g. A.G.L. McNaughton was investigating properties of high voltage surges on transmissions lines at McGill University in 1913.) On the other hand, while there is no question of the competence of the various social science departments, it must be noted that their interest in and contributions to the broader communications field has been minimal and has only now begun to be stimulated to a considerable extent in response to the URC Program. This condition is well described in the recent article by G.S. Jowett in "In Search".

A further internal difficulty relates to the difference of opinion over the theory vs practice issue. By and large, the university environment encourages the theoretical aspect of research work (publication in scholarly journals). This does not mean that many researchers are not capable of applicational work. However, the rewards for doing such work have not had much currency within the university milieu.

3. <u>DOC - University Interface</u>

The URCP activities have brought to the fore a number of administrative, organisational and, in some sense, societal problems

when an attempt is made to establish a close Government (DOC)/ University interface in research. Some of these are enumerated briefly here:

3.1 The yearly cycles of government and university life do not coincide. This produces difficulties especially during the starting up and completion periods of a project. Furthermore, the very existence of the yearly fiscal cycle hampers effective research activity. The problem of managing activities which exceed and or do not coincide with the standard one year fiscal period requires very serious attention from both sides.

3.2 In addition to the above 'synchronization' problem, it should be noted that both the systems involved tend to have different and varying delay and response times.

3.3 It was noted during the course of this study that on the 'government' side there was only a cursory and, to a great extent, legendary understanding and knowledge of universities and vice versa. This points to the need of setting up some mechanism whereby DOC will have better knowledge of the nature of and resources in universities. A notable exception to the general condition prevailing is the system of 'university liaison' officers constructed by CRC, and this points the way to a solution. For the universities the difficulty of understanding government is even more formidable. The constantly changing structures, organisation, policies and personalities pose a formidable puzzle which, while grist for the mill of the political scientist, is not of much help to, for example, a mathematician, and it indeed tends to 'turn him off'.

4. Comments on the Projects

The writer has not been involved, during the brief encounters made, in a systematic study of the evaluation, utilization or implementation of the results of past projects. Nor has he had opportunity to make a sufficiently in-depth study of the results of enough projects to propose evaluation and utilization procedures. The following comments are therefore only preliminary impressions about the quality and results of the projects and their manner of execution. Such a systematic study would obviously form a major and continuing part of a Director's work.

4.1 Definition of Projects: Project proposals are either unsolicited or the result of previous preliminary discussions. The latter are and should be favoured, since they represent considerable preliminary work on both sides. It seems, however, that considerable additional benefit might be derived from unsolicited proposals if they were considered to be 'idea inputs', comprising a valuable free contribution to DOC on the part of the applicant. Since there are always more 'acceptable' proposals than funds, perhaps those which are 'regrettably' turned down, but are nevertheless of interest to DOC, should be utilized by encouraging the applicants to continue their activity on a 'funded proposal' basis. In any case, the large number of proposals received, does represent a form of information input, the utilization of which should be encouraged.

4.2 Project Coordination: It is notable that in some Working Panel areas there exists close coordination between in-house activity and university researchers. Furthermore, interaction among the university contractors is sometimes encouraged in a structured manner by conferences etc. This is an important contribution to the effectiveness of the Program and should be encouraged in all areas although it may not be a procedure pertinent to all.

4.3 Result Utilization and Implementation: The writer has been unable, so far, to explore the manner in which the results of completed projects are utilized and possibly implemented. Clearly, this would depend on the basic objective of each project. However, since the program is a 'Contract' and not a grant program (the achievements of which are traditionally measured by publication success) it seems reasonable that the writing of a final report should not necessarily be the end of a project. The nature of the results and their applicability or utilization should receive substantial attention.

4.4 Project and Funding Support Magnitude: As noted earlier, the range of topics covered is remarkable and the projects vary condiserably in size. Not infrequently, a project does not exist in isolation within a university, but is in fact only one component or a supplement to a broader activity. In other words, the university has 'assembled' funds from several sources to carry out a larger research task. Other projects are self-contained and very small, being essentially in the feasibility study category. In either case the financial viability of a project

requires ongoing scrutiny. The tendency, quite naturally, is to strive towards minimal funding, which may not be adequate in exploiting a potentially productive research objective. It is in the funding magnitude that the contradictions in the criteria for project selection become most obvious. Fund distribution to satisfy requirements of 'public policy' does not necessarily simultaneously lead to realistic and productive research projects.

RECOMMENDATIONS

The recommendations arising from this study have been enumerated in the Preamble and concentrate on three focal points of the URCP. These are:

1) Continuation of the Program
2) Method of Operation
3) Administration and Management

While other recommendations on many minor details might also be desirable at this time, they would in any case be subsidiary to those above and would be largely of an administrative and procedural nature and therefore largely of an arbitrary kind.

1. Continuation

As a result of the study, the writer is of the opinion that the URC Program is yielding effective and productive work with many additional useful by-products. It is recommended that the program should continue. However, the funding involved is rapidly becoming derisory and the program is on its way to oblivion if increased support is not forseeable. It would also seem desirable to coordinate the program more overtly with other contractual agreements made through other budget sectors. In addition, the policy objectives of the URCP should seek a closer partnership mode of operation than the ordinary client-contractor relationship. While no previous observation was made about this point, it seems that the apparently complete absence of the 'communications industry' from the URCP picture - almost as if the industry did not exist, should be a major policy concern.

2. Method of Operation

As commented on in the Observations, there are many reasons for difficulties in the government-university relationship. Nevertheless, the program does function despite that. It does seem desirable however, to seek ways of cushioning the process of research objective definition, project selection, project management and result evaluation and utilization from the basic fiscal cycle of government as well as the inner processes of the universities.

A second and equally important operational recommendation is that the university resources should be utilized at an earlier stage of the definition of research objectives in DOC. The universities may be able to serve DOC better by being engaged in studies necessary for the definition of R & D policy and objectives.

3. Administration and Management

It can be concluded in many respects that the Program is already over-administered and over-controlled. The addition of a "Director of University Programs' would therefore seem to be an unnecessary additional item of overhead and would be quite unjustifiable in relation to the size of the Program especially if the Director were to play only a passive, purely administrative role.

Nevertheless it is recommended that such a Director be appointed with the clear intent and terms of reference that he should play an active role in:

a) Developing the Program's effectiveness, scope and size

b) Evolving a process of closer interaction between DOC and the universities. (This implies direct involvement in the CRC liaison system.)

c) Making a major contribution to the development of DOC's R & D policy and objectives

d) Becoming closely involved in the DOC - Industry interface.

In addition to the above special terms the Director's normal administrative responsibilities would include the management of project proposal generation and processing, the supervision of fund allocation, the negotiation of contracts, general supervision of the work, the evaluation and the promotion of utilization of useful results.

The selection and term of appointment of such a Director would require him to be from the university milieu. Special care should be taken to ensure the Director's continuation within the university milieu.

APPENDIX I

ORIGINAL DEFINITION OF OBJECTIVES OF STUDY

WITH ELABORATIVE QUESTIONS

DOC UNIVERSITY PROGRAM REVIEW

(a) EVALUATE DEPARTMENTAL OBJECTIVES[1] IN TERMS OF THEIR INTERPRETATION[2] AND IMPLEMENTATION[3] IN RELATION TO THE UNIVERSITY PROGRAM.

COMMENTS (a)

1) Objectives
   - what are they
   - what broad categories are they in
   - how are they defined

2) Interpretation
   - who has right to interpret
   - what are the levels of interpretation

3) Implementation
   - what means are there to implement
   - direct and indirect implementation

(b) DEVELOP METHODOLOGY[1] TO ACHIEVE THE MOST EFFECTIVE USE[2] OF UNIVERSITY RESOURCES[3] IN THE DEPARTMENT'S RESEARCH AND DEVELOPMENT PROGRAM,[4] AND IN THE SOCIAL PROGRAM.[5]

COMMENTS (b)

1) Methodology means
   - organizational structure
   - operational procedures
   - organizational and individual attitudes

2) Effective Use
   - what are the criteria of effectiveness (viz DOC Directives, Brisebois Study)
   - are DOC and university criteria in conflict? How can they be reconciled
   - direct vs derived
     immediate vs long term
     tangible vs abstract

3) University Resources
   - what are they? - categories?
   - what "Data Banks" - exist
     - need to be built
     - should be used
   - what are the capabilities, potentials and limitations

4) Department's R & D Program
- what is present, future content
- what is its raison d'être
- what is its structure
- how does it evolve
- what is <u>its</u> relationship to the "Communications World"? (GUIS)

5) Social Program
- what is its fundamental philosophy
- should there be a philosophy
- how is this philosophy evolved

(c) CONSIDER HOW THE PROGRAM MIGHT BE MADE MORE EFFECTIVELY (1) RELEVANT (2) TO DOC IN-HOUSE PROGRAMS.

COMMENTS (c)

1) Relevant to DOC
- Direct contribution
- knowledge and theory extension
- long term resources development (human and material)

2) In-House Programs
- evaluation of general relevance of in-house program

(d) DEVELOP METHODS FOR EVALUATING (1) THE RESULTS OF THE PROGRAM, (2) INCLUDING WHAT USE IS MADE OF THE RESULTS OF THE CONTRACT.

COMMENTS (d)

1) Evaluating
- who should evaluate
- how to evaluate
- categories of evaluation

2) Use
- dissemination of results
- methods for promotion of use

(e) FROM THE POINT OF VIEW OF THE UNIVERSITY, (1) WHAT CONSTITUTES A (2) SUCCESSFUL CONTRACT?

COMMENTS (e)

1) University
- entire or part of
- impact on community

2) Success (See d-1)
- who, how, criteria?
- benefits individual, institution, general

(f) STUDY THE METHODS OF INFORMING UNIVERSITIES[1] OF THE PROGRAM, FOR EXAMPLE BY COMPARING VARIOUS POSSIBLE METHODS, AS:

1) PRINTED AND OTHER MATERIAL[2]

2) PERSONAL INTERACTION[3]

3) USE OF MEDIA[4]

COMMENTS (f)

1)	Informing Universities	- is information to be broadly distributed or specifically directed? - what categories of information are there
2)	Printed etc.	- content, format - promotional - factual informational - dissemination of new results - brochures to journals to books
3)	Personal Interaction	- DOC personnel visits - on-campus representation - individual visits to DOC - "structured" visits and or activities of DOC and university personnel
4)	Media	- general publicity (P.R.) - involvement in special conferences - support of specialized journal

(g) DEVELOP METHODS FOR SATISFYING SPECIAL REQUIREMENTS[1] SUCH AS:

1) OBTAINING MEANINGFUL REGIONAL DISTRIBUTION[2]

2) SUPPORTING EXISTING MAJOR RESEARCH CENTRES[3]

3) SUPPORTING DEVELOPMENT OF NEW RESEARCH RESOURCES[4]

COMMENTS (g)

1)	Special	- what are the special requirements - by whom and how are they determined - are they relevant or counterproductive

2) Regional Distribution - is emphasis on distribution or can it be changed to "promotion of country-wide cohesiveness".

3) Research Centres - build on strength or support new growth

APPENDIX II

MID-PROGRAM REPORT

To: Dr. R. Langille
Director General, Research & Development

Mid-Program Report on
"Review of University Research Contracts Program"

July 17, 1974
T. Pavlasek

1. Activities

The undersigned has completed, on this date, nine one-day visits to the Department. The dates of the visits are indicated in the attached addendum which also contains a statement of expenses.

The review program to-date can be described as a project definition, study and data-gathering activity. The undersigned has met and held discussions with the ADMR, the Director General of CRC and R & D and some of their staff. In particular, lengthy discussions have been held with the Chairmen (or their deputies) of the seven working Panels, with the coordinator of the CRC University liaison organisation and with the team conducting the administrative review of the URC Program.

At the onset of this Review there was prepared a statement of seven objectives with qualifying comments. This statement of objectives has been used during the interviews as a means of starting a discussion but not for the purpose of conducting a structured questionnaire. The undersigned has in each case attempted to obtain a natural mode commentary, rather than a forced mode response and has sought an evaluation of both the overall purpose and mode of operation of the URC Program as well as specific comments about particular problems encountered. The Working Panel Chairmen were also asked for guidance in the choice of projects to be chosen for more detailed study and for eventual selection for an on-site visit.

2. Program Completion

Two stages of the review now remain to be carried out. First is the selection of and then the visiting on site of specific projects. Some of this work can be undertaken immediately but, because of the summer period, most visits should be made at the end of August and early in September.

The second and last stage consists of the preparation of a report, its formal presentation in writing and, if appropriate, some involvement in the follow through which may result. A

.../2

feasible target date is the end of September. Initial drafting of the report can now be started while visits to projects are initiated.

3. At this mid-stage point, it may be useful to record some unordered impressions of varying priority value, which are emerging.

3.1: It is evident that the program is viewed, within the Department, in many, often contradictory ways. Some contradictions are of the order of principle, e.g.: i) fundamental exploratory vs specifically directed research; ii) "Real" bid type contract vs unsolicited (almost "grant") proposal projects; iii) Universities as supplementary vs primary research resources.

Other contradictions are of an administrative and even political nature, e.g.: i) broad range of projects (technological to socio-economic) vs administrative and operational conformity; ii) centres of excellence vs regional distribution; iii) development of continuing research activity vs government yearly fiscal cycle.

3.2: The Department's structure as it relates to university research is obviously different in the technological and in the socio-economic regulatory areas. Depending on high-level decisions regarding the Department's own future development, the relationships to universities will necessarily differ. In the technological area there is great strength in CRC but in type and kind this can be matched in the universities. In the socio-economic regulatory area the Department has major, if not unique expertise of an operational kind but does not have a structured (à la CRC) research organisation while the universities would appear to have neither, (except in some special, isolated cases).*

An outsider's view on the subject can help define the options which are available in decision-making but the ultimate decisions could well be a matter of arbitrary choice determined by factors other than optimization of research achievement.

3.3: The undersigned senses that the meaning and objectives or research will continue to be a subject of discussion in government for a long time to come (unlike the obvious need for book-keeping). It would seem highly desirable to view the URC Program not merely by itself separately, but as an

*This phrase was added at a later date.

.../3

integrated part of an ecological system involving the Department's in-house activities, relations with industry and relations with universities. In this respect it would seem that an evaluation of the actual resources and potential within the universities is not yet within sight. The CRC University Liaison program is an important start in this direction but it has no socio-economic component and no such corresponding structure exists or even seems possible on that side. In any case, should these be two separate structures?

3.4: The question regarding a University Program Director continues to be unresolved. It seems that if the URC Program becomes transformed for administrative reasons, then the post may appear superfluous especially in the light of CRC's liaison scheme.

However, with or without a URC Program, is there not need for a more general liaison approach to enhance the interlinkage with Universities? The question is in itself a socio-economic research problem (with major technological components), in its own right.

In balance, at this stage, the writer's opinion is that a Director (University Programs) is in fact needed but not if his sole mission is to be concerned with the URC Program alone.

APPENDIX III

ALPHABETIC LISTING OF INDIVIDUALS CONSULTED WITHIN DOC

R. Aubin

R. Barrington

B. Blevis

D. Brewer

B. Brisebois

D. Cameron

A. Casey-Stahmer

J. Chambers

J. Chapman

L. Durr

J. Gilbert

L. Greene

L. Hatton

G. Holbrook

G. Jowett

R. Langille

R. Mamen

J. Monster

M. O'Neill

R. Tanner

E. Warren

Z. Zalatan

APPENDIX IV

LIST OF VISITS TO UNIVERSITIES

University	Persons Met	Project No.	Date
QUEENS	Beal McKirdy Franks Tavares and eight members of project team	74-305 74-412	Sept. 12, 1974 Thursday
CARLETON	George Coll Strickland	74-605 74-606	Sept. 17, 1974 Tuesday
TORONTO	Dakin	73-608	Oct. 7, 1974 Monday
MEMORIAL	Bruneau Dempster Gogan Williamson Roberts Benedict House McNamara	 74-705 74-613	Oct. 21/22, 1974
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