Technological Innovation Studies Program

Research Report

THE ATTITUDE OF TRADE UNIONS TOWARDS TECHNOLOGICAL CHANGES*

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Preliminary Report

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The Attitude of Trade Unions Towards Technological Changes

I. INTRODUCTION

This report forms part of our continuing study of the employment implications of technological changes. Earlier reports[1] sought to determine the nature of technological changes, the nature of effects technological changes have had on employment and skills, and the nature of manpower adjustments that were necessitated and undertaken. The reports are based largely on information obtained through questionnaires, correspondence, and interviews with representatives of industry and trade union officers.

The present report is based on information provided by unions. A questionnaire (appended) was sent to 325 unions across Canada in early summer 1979, and this was followed with extensive correspondence and a few interviews with union officers: 64 completed questionnaires and 30 letters containing responses to some of the questions were received.

The response rate was considerably higher than the number of responses would indicate: a substantial number of local and regional unions indicated that the information was not available at their organizational levels, and that they forwarded the questionnaire to their central offices.

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[1] The Effect of Technological Changes on the Educational and Skill Requirements of Industry (distributed by the Department of Industry, Trade and Commerce, Ottawa, 1978); The Effect of Technological Changes on the Sectoral Distribution of Employment in Canada (Department of Economics, The University of Calgary, 1979); and Technological Changes and the Demand for Skilled Manpower in Canada (Department of Economics, The University of Calgary, 1980).

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Similarly, local and regional union organizations in industries operating throughout the nation, such as the railways, for example, indicated that because workers move throughout the system it is often difficult for the local or regional office to know whether workers become disemployed or have been transferred to other localities. They, too, suggested that the information can best be provided by the head office of their organizations. Hence, for statistical purposes, some of the completed questionnaires, and the information contained in some of the letters, can be viewed as collective (multiple) responses.

The purpose of the investigation was to determine the nature of effects that technological changes have had on wage-earners, the nature of accommodative arrangements unions have been able to negotiate with management, and the nature of policies unions have adopted in relation to technological changes and their effects on workers.

The responses of unions differ significantly from the responses of management on the nature of technological changes.* Whereas management has tended to emphasize computers, electronic processes and other forms of high level technology, unions put the emphasis on changes which for the most part are rather routine and continuous. Although some unions made references to computers and electronic systems (printing, telecommunications, seafarers, air controllers), the majority referred to the use of plastic materials and new alloys, (plumbers, carpenters, woodworkers, wire workers, pulp and paper workers), to prefabrication of materials and operational systems (construction workers, and elevator constructors), to improvements in motor power and

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*Reported in The Effect of Technological Changes on the Educational and Skill Requirements of Industry, (1978).

increases in operational units (transport and railway workers), and generally to measures which have tended to increase productivity faster than the increase in demand for the goods and services produced by workers. The main reason for this difference in management and union responses will be found in the fact that the technology of most production processes is still predominantly electro-mechanical. The computer, the microprocessor, and generally electronic systems are mainly at the office level of production processes--in accounting, management, planning, and communications. They have not yet reached the shop floor, which explains why most unions are not yet concerned about them.

The majority of responding unions have conveyed a conditionally positive attitude towards technological changes: some of them indicated recognition of the potential benefits to be enjoyed from the resultant increase in productivity, and some gave recognition of the inevitability of technological changes. But, both groups served notice that their consent and cooperation will be conditional upon the negotiation of satisfactory arrangements for workers who will be adversely affected, such as, guaranteed employment, training and retraining, severance pay, and other.

However, a examination of collective agreements indicates that unions have not been very successful in their efforts to negotiate protective arrangements for their members. Management continues to regard technological change a managerial prerogative, to be exercised largely at will, and regards the adverse consequences of change as the cost of technological progress. The responses indicate that approximately 53% of the respondents had negotiated advance notice to the union of pending changes, the period of advance

varying between 90 days (35% of respondents) and 60 days (8.2% of respondents); 8.2% had negotiated "as much as possible" advance notice; 2% negotiated 4 months; and one indicated one year's notice. Although the majority of respondents indicated that their primary goal was to ensure the employment of their members, only 36% appear to have succeeded in the negotiation of retraining, and only three indicated that they had negotiated guaranteed employment; 27% had negotiated severance pay; and 23% had provisions for early retirement.

The reason given by unions for the limited protective provisions in collective agreements is the limited nature of technological changes to-date:

> "Technological change in most cases is not abrupt ... it resulty in a worker having to familiarize himself or herself with a new machine or instrument ..."
>
> "There are no rapid and immediate changes in technology which affect ... jobs or working conditions. Rather, what we find is a slowly evolving body of technology which changes in a very gradual manner"

This suggests that technology negotiations will not be given priority consideration unless developments warrant it. Situations in which priority was warranted, as in the railways, for example, priority was given and some protective arrangements were negotiated.

It is significant to note that very few of the respondents expect increases of employment in the activities of their jurisdiction. The majority expect future technological changes to reduce employment in their industries. Yet, there is no evidence that technology negotiations are on

the agenda. Since most unions are reactive in their approach to negotiations, most of them will undoubtedly wait until it happens and then attempt to negotiate the stated "conditions."

The question arises whether it is desirable for unions to postpone negotiations on conditions until technological changes are initiated or introduced. Experience at the railways, the post office and at a number of newspapers suggests otherwise. Serious consideration should be given to the commencement of discussions or approaches to manpower adjustments in advance of initiation. Unless unions and management have in place agreed upon accommodative arrangements, the anticipated acceleration in technological changes over the next decade will generate widespread industrial turmoil.

II. SUMMARY OF FINDINGS AND CONCLUSIONS

1. The available evidence suggests that labour unions have had little impact on the introduction of technological changes. Some delays in implementation have been suggested, and there are some indications of less than optimal utilization of new technology in situations where the cooperation of the unions has not been secured. But, generally it cannot be said that unions have held back the introduction of new technology in Canada, nor can it be said that workers have deliberately under-utilized new technology to minimize its potential adverse impact on employment.

2. The evidence suggests that unions have not provided the degree of employment security for their members that is commonly assumed. Although it is difficult to determine how many workers displaced from their jobs by technological changes would have been retained in employment in the absence of labour-management agreements on transferability, retraining and employment guarantees, the evidence indicates that where alternative employment opportunities did not exist within the firms involved in the change, workers lost their jobs. Hence contractual provisions notwithstanding, where technological changes resulted in reductions in employment, reductions in employment appear to have been effected.

3. Generally, the attitude of unions towards technological changes is a reflection of the employment records of the industries in their jurisdictions: positive attitudes exist in industries which have recorded expanding employment, even though significant technologocal changes take place in them; the attitudes are negative in industries which experience declining employment, even though technological changes in them may be sporadic and mininal; and an attitude of indifference prevails amongst unions whose members have not been affected by technological or any other changes.

4. Also, the evidence indicates that the attitudes expressed by some unions are the outcome of perceived management attitudes towards the employees: where management attitudes are perceived to be understanding and reasonable, union attitudes are generally consenting; where management attitudes are perceived to be indifferent or non-committal, union attitudes are conditional and protective.

5. Surprisingly, an attitude of indifference was communicated by most public service organizations. They appear not to be concerned with technological changes and their effects, and, indeed, appear not to have given much thought to the issue. Considering that over the next decade electronic technology is likely to impact severely on office and other forms of service employment, the members of public service organizations should be concerned.

6. Whether positive, negative, or indifferent, the statements of most respondents are of a general nature: they will not oppose technological changes, provided satisfactory adjustments are negotiated in relation to adversely affected workers; or they will oppose technological changes that affect workers adversely; or they are not concerned about technological changes since they do not expect any in their areas of activity. There is only limited evidence of serious bargaining on technology and its implications.

7. The absence of serious bargaining on technology and its implications for workers, work and working conditions can be explained in part by the continuing resistance of management to discussions on the issue, but more so to the fact that generally union policies have been reactive, not anticipatory. To-date technological changes have been relatively slow, and the effects of most have not been of a nature and magnitude to cause unions concern. Hence the largely passive and platitudinous reaction.

8. Reactive technology bargaining is not the most desirable form of bargaining: it is bargaining under pressure of on-going adverse developments. The example of the railways, the post office, and a number of newspapers attests to the problem.

9. Heretofore major technological changes have been sporadic. Although some of them generated labour agitation and serious

work disruptions, their effect on the economy at large was not very pronounced, largely because they were spaced over time and involved single industries.

10. The anticipated acceleration in technological changes over the next decade can be expected to have more pronounced effects on the economy at large than what was experienced heretofore. The possibility exists of simultaneous major technological changes in whole sectors of the economy. Such a development can result in widespread and continuous disruptions in economic activity. Existing legislation and current provisions in collective agreements cannot meet adequately the challenge of changes involving substantial manpower adjustments. Therefore,

11. It is imperative that all provinces enact basic regulations regarding approaches to the introduction of major technological changes, involving such matters as union-management discussions before implementation, training and retraining responsibilities and cost sharing, severance pay, early retirement, and other adjustment processes and procedures.

12. Similarly, it would be prudent for unions and management to abandon the practice of <u>reactive</u> technology bargaining, and negotiate standing arrangements on such matters as employment guarantees, retraining, transfers, and other provisions.

13. For work activities in which employees are not organized, such

as office employees, management should be required to formulate accommodative arrangements and have them incorporated in the standing conditions of employment.

14. An examination of collective agreements reveals very limited provisions regarding technological changes and their effects on employees. Only one-third of major collective agreements (covering 500 or more employees) contain provisions for retraining, less than one-third provide some form of wage/employment guarantee, and only 47% provide for severance pay. Collective agreements in the non-manufacturing commercial sector contain provisions that are substantially more limited.

15. Collective agreements contain limited provisions for the retraining of displaced employees. Limited commitments by industry to retrain can be interpreted to mean limited commitment to retain into employment displaced workers. In the context of anticipated changes in technology over the next decade or two, the limited commitments by industry to retrain and retain mean that the public sector must have in place retraining and placement policies and programmes.

16. Two explanations are offered for the limited provisions in collective agreements, which are essentially the same as those offered in relation to the virtual absence of technology bargaining: one is, the continuing resistance of management to discussions on the issue. Technological change is generally

regarded a management prerogative, to be exercised at will as part of management's right to manage. Necessary manpower and work adjustments and accommodations are introduced at management's initiative, on an ad hoc basis, with or without negotiation with worker representatives. Apparently, many accommodations have been effected on this basis, and the procedures remain ad hoc, i.e. have not been incorporated in collective agreements. The second explanation is the reactive approach to bargaining. Where technological changes have been significant, where adverse effects caused agitation amongst workers, and where accommodative arrangements proposed by management were found inadequate, negotiations were initiated and various provisions incorporated in agreements. Where changes had more limited effects on workers and generally satisfactory accommodations were implemented by management, the issues did not become subject to negotiation. And where no technological changes have taken place, no apparent need was found to negotiate on the matter. Had the approach to bargaining been anticipatory, instead of reactive, the evidence undoubtedly would have been different.

17. Satisfactory accommodations on an ad hoc basis are possible only as long as the technological changes are minor, and effects on workers are minimal. When the rate of technological change accelerates, affecting adversely increasing numbers of workers, the ad hoc, management initiated, approach to accommodation will

no longer be viable or acceptable to workers and their unions. This suggests the need for changes in approaches to the formulation and implementation of accommodative arrangements. If the bargaining process does not evolve satisfactory standing procedures within the next few years, the legislative process will have to set general guidelines.

18. In the formulation of accommodative arrangements, special consideration must be given to skilled workers and their organizations. Unions whose membership is constituted of one skill, face the problem of having to negotiate their demise as organizations, when their members' skill is eliminated from the production process. Indications are that such unions will insist that their members be trained to functions related to the operation of the displacing technological process. One respondent wrote on the issue: "Having devoted time to become proficient in one's work, it cannot help but have a demoralizing effect to know that job opportunities are shrinking; to know that one's craft is becoming unrecognizable through technological change; to feel that unsettling effect of knowing that you may be next on the layoff list. Such concerns often breed 'back to wall' bargaining and a contempt for the work place." This has important implications for labour-management relations and for productivity.

19. The majority of respondents communicated an attitude which can best be characterized as <u>conditionally positive</u>: they recognize

the desirability of technological change, and accept the inevitability of its implementation, but make their consent conditional upon the negotiation of satisfactory accommodations for workers who will be adversely affected. The following expresses a typical attitude: "In principle we are not opposed to technological change given certain conditions. The employees must be protected from its impact as much as possible. There should be on-going consultations between the employer and the union before any change is introduced; and finally, the employees directly affected should share in the increased productivity resulting from any technological change."

20. A few unions expressed reservations about their negotiations on technological changes, which they attributed to lack of management cooperation. One of them wrote: " ... it is our experience that management prefers to avoid informing its employees of proposed technological changes which might affect their employment until it is absolutely necessary or until it is an accomplished fact."

21. In the negotiation of accommodative arrangements, the highest priority is given to employment security, to be effected through transfers, upgrading and retraining. Where employments cannot be secured because of age, inadequate education, family or other obstacles, priority is given to arrangements which provide for early retirement or severance pay.

22. But, difficulties were reported in the negotiation of the intangible aspects of employer-employee-place of employment-craft relationships. The "guarantee" of employment does not always guarantee employment in one's trade, nor does it always guarantee satisfying work. Yet, that is apparently what workers want their organizations to negotiate.

23. Indications are that unions will seek more precise employment commitments than has been the practice heretofore. Instances were reported of unsatisfactory work assignments to displaced workers which resulted in "voluntary" quits. This suggests that in the absence of employment specifications, "voluntary" attrition can be brought about through the assignment of undesirable work functions. Such occurrences will lead to demands for the specification of the nature of work functions to which displaced workers can be transferred.

24. Respondents expressed concern for workers who cannot be retrained, and for those who do not wish to be retrained or relocated. Current provisions for early retirement and severance pay are not regarded adequate, even for workers who have worked as many as 30 or more years. It was suggested to us that economic justice dictates the introduction of policies which would guarantee a reasonable standard of living for all who have allocated 30 or more years of their lives to continuous participation in economic activity.

25. A source of conflict is the isolation of the employment effects of technological changes from the employment effects of other developments: it would appear in some cases employment effects which unions attributed to technological changes, and therefore, covered by contractual provisions, management attributed to changes in demand. This has given rise to the suggestion that any and all adverse effects on employment should be subject to discussion, regardless of cause.

26. Another source of conflict arises from attempts to redistribute work functions amongst workers. When technological changes take over or eliminate some work functions, and compel the redistribution of the remaining functions amongst different occupations, jurisdictional disputes arise. It is imperative that procedures be created to cope with the resultant conflicts. The acceleration of technological changes will undoubtedly necessitate considerable redistribution of work functions amongst occupations. This has been one of the most serious problems in disputes involving adjustments to major technological changes.

27. A significant proportion of responding unions expect future technological changes will have negative effects on employment in their industries, and indicate a determination to safeguard the employment of their current members. In the context of the anticipated acceleration in technological changes, this has important implications for labour-management relations and for public policy on the issue.

III. GENERAL DISCUSSION ON UNION ATTITUDES

One of the major issues of concern to policy-makers is the rate of increase in productivity; and one of the major factors contributing to productivity is technological change. But, in addition to being associated with increases in productivity, technological change is associated with the displacement of workers and the destruction of skills, which is a major concern to workers and their organizations.

There prevails a view in society at large that unions generally are an obstacle to technological change: it is alleged that unions either oppose the introduction of new equipment or place so many costly conditions to its introduction as to destroy its potential advantage over existing processes. Fear of technological unemployment and loss of union membership are held to be the reasons for the alleged opposition.

In reality, the evidence suggests that unions generally are not opposed to technological change. They are aware of the close relationship between technological change and productivity, and since rising productivity enables them to deliver to their members increases in wages and improvements in benefits, they cooperate with management in the implementation of technological changes. There are exceptions, of course, but exceptions should be treated as exceptions, not as the basis for general conclusions.

The historical antagonism of workers towards new technology was founded on the reality of frequent displacements of workers by new equipment and changes in processes, and the absence of any legislative provisions or contractual arrangements designed to protect or accommodate displaced workers. Technological changes were deemed to be a managerial prerogative,

and the prerogative was interpreted to constitute a right to implement technological changes without regard to their effects on workers. If the implementations displaced some workers, that was an inevitable cost of economic progress.

The growth of trade unionism and the development of strong union organizations has tended to reduce worker antagonism towards technological change, and fear of technological unemployment. This is related in part to the protection that is associated with membership in a collective organization, and in part to the educative activities of union organizations. Increasingly, collective agreements contain some worker protection against displacement, whatever the cause, and in recent years some protection has been provided in labour legislation.

Although technological changes continue to be regarded a managerial prerogative, the labour-management environment appears to be conducive to the introduction of contractual provisions which will cushion their adverse effects on workers. Amongst the provisions sought by unions the major ones are:

(a) Advance notice of technological changes;

(b) Discussions between representatives of labour and management regarding time, procedures and accommodation of adversely affected workers;

(c) Guarantees that regular employees will not lose their employment as a result of technological changes, even though they may lose their job-related skills;

(d) Commitment by employers that necessary reductions in employment will be achieved through attrition, at some agreed upon annual rate;

(e) Separation allowances for workers who elect to retire.

There is evidence of increasing realization on the part of management that the effective utilization of new technology depends on the knowledge and attitudes of the workers attached to or associated with its operation. Where knowledge is inadequate and attitudes are negative, utilization is ineffective and the attainment of potential efficiency is long delayed. Hence, the attitudes of workers and of their organizations towards technological changes are critical to the introduction and efficient utilization of new technology. Failure to determine their attitude, or having determined their attitude to disregard it, can involve considerable costs.

A recent United States study[2] classified the attitudes of labour unions towards technological change into five categories:[3]

1. encouragement - when the union urges the employer to adopt new methods to increase productivity in order to stay competitive.

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[2]Doris B. McLauglin, The Impact of Labor Unions on the Rate and Direction of Technological Innovations, Institute of Labor and Industrial Relations, The University of Michigan-Wayne State University, Ann Arbor, Michigan, February 1979.

[3]Originally identified by Sumner H. Slichter, James J. Healy and E. Robert Livernash in Impact of Collective Bargaining on Management, The Brookings Institution, Washington, D.C. 1960.

2. willing acceptance - when the union does not oppose the introduction of technological innovation.
3. adjustment - when the union accepts the changes and focuses on collective bargaining to cushion its members from any negative effects of the change.
4. competition - when the members increase productivity through more efficient use of old methods; for example, seeking to retain the traditional methods of operation by accepting wage cuts and/or agreeing to the elimination of certain work rules.
5. opposition - when the union conducts one or several work stoppages over the changes or flatly refuses to allow its members to use the new technology.

The study found that 48.9% of unions indicated willing acceptance of technological changes, 24.5% demonstrated opposition, 23.9% indicated adjustment, 2.7% demonstrated encouragement, and 0% indicated competition.[4] In relation to those who indicated opposition, the study emphasizes that such was the initial reaction to the new technology, and that it was usually followed by either willing acceptance or adjustment.[5]

In our study, responses to the questionnaire and interviews indicate that the majority of unions accept technological changes (most of them willingly, but a substantial number in resignation), but make their acceptance conditional on the negotiation of satisfactory accommodative

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[4] Doris B. McLaughlin, Ibid., Table 1, p. 29.

[5] Ibid., p. 99.

arrangements in relation to adverse effects on workers.

The Lessons of History

Unions face difficult policy choices in relation to technological changes: the historical record indicates that most industries which failed to keep-up with modern technology declined and ultimately failed; whereas industries which kept-up with modern technology survived and many of them expanded. In the former, workers lost their jobs; whereas in the latter, some lost their jobs, some lost their skills, some lost both their jobs and their skills, but many were retrained and most retained their employment. Furthermore, as the industries expanded, and new industries emerged from the new technology, new skills were created and employment expanded.

Notwithstanding the creation of new skills and employment, technological changes disrupt established processes of production, displace workers from jobs to which they are accustomed, and create sufficient uncertainty about the nature of skills and employment to follow the initial stages of implementation, to give rise to a sense of fear. Oftentimes, the sense of fear reaches exaggerated levels, because of lack of information or misinformation. History is replete with examples of resistance to technical change motivated by fear of its economic consequences. It is reported, for example, that the city council of Danzig, fearing unemployment from a ribbon loom invented in the 17th century, had its inventor secretly strangled;[6] Arkwright's cotton spinning machine was opposed by both spinners and landlords, the first from fear of unemployment and the second from concern that

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[6]Dudley Dillard, Economic Development of the North Atlantic Community, Prentice-Hall Inc., 1967, p. 246.

they may have to pay higher taxes for poor relief for spinners thrown out of work.[7]

It is noteworthy, however, that the opposition to technical change, regardless how intense and on some occasions violent, has seldom been directed against technical changes as such; rather, most often it has taken the form of protest against actual, anticipated and imagined adverse consequences on workers and society at large. In view of this record, it is regrettable that no serious effort is in evidence on the part of management and governments to provide information on the nature of pending technological changes, their anticipated effects on workers and society at large, and the nature of measures to be instituted to deal with the anticipated adverse effects. Instead, the evidence indicates limited prior consultation with the organizations of workers, and limited standing policies regarding the accommodation of adverse effects.

The evidence suggests further that union attitudes are formed on the basis of perceived management attitudes towards their employees: where management attitudes are perceived to be reasonable and accommodative, union attitudes appear consenting; where management attitudes are perceived to be negative, non-conciliatory or indifferent, union attitudes appear conditional and protective.

It is instructive to note that in most instances the perceived attitudes of management are largely the outcome of the frequency, nature and content of communication between management, the unions and the employees.

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[7] Dillard, Ibid., p. 246.

There is general dissatisfaction with the communication process, and this undoubtedly contributes to the protective attitudes that most unions have adopted towards technological changes.

The fundamental problem appears to be management's attitude towards unions. Even in enterprises in which unions have been long established, they continue to be regarded as interlopers. Indications are that they are not consulted very often, even when decisions have direct and indirect effects on workers. Occasionally they are by-passed entirely, and workers are informed directly on the nature of technological changes that are being implemented, the general nature of employment effects that would result, and the nature of accommodations that would be instituted. Instances were reported also of technological changes in process of implementation, and no information on them to either the union or the workers, giving rise to rumours of mass layoffs. Enquiries by union officers apparently emitted verbal assurances that workers had nothing to fear, all problems would be resolved satisfactorily.

Policy Pronouncements of Labour Organizations

The pronouncements of labour organizations on the subject of technological changes and their implications for workers and work have been for the most part conditionally positive. Although the conditions put forth by some border on the obstructionist, for the most part they do not seem unreasonable. Indeed, an examination of collective agreements suggests that the majority of labour organizations have exercised a remarkable degree of restraint. Even in manufacturing, which is largely organized, only one-third of the collective agreements of major enterprises (500 employees or

more) contain provisions for retraining and wage or employment guarantees (see Table 1).

In 1977 the Quebec Federation of Labour called on the government to introduce legislation which would require employers to give up to two years notice of planned technological changes which would result in layoffs or plant closures.[8] In addition, it urged the establishment of a tripartite body with authority to examine the financial records of companies and rule on the economic necessity of proposed reductions in employment.

By contrast, at a 1977 UAW Skilled Trades Conference on New Technology references to technological changes were generally positive. Concerns were expressed about adverse effects on employment and skills; about the introduction of new technology during periods of excess unemployment; and about the alleged tendency of "a substantial number of managements to use new technology to displace workers"; but, the delegates resolved to "continue to support the need for technological progress," conditional upon the undertaking by industry to give advance notice of pending changes, and to limit the rate of reduction in employment to the rate of normal attrition. In addition, the resolution urged governments, business and industrial leaders of the United States and Canada to "take rapid, affirmative and effective steps to establish full employment," underlining the condition that the "continuing acceptance of new technology by workers and their unions must be cemented on a base of consistent full employment."[9]

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[8]Reported in The Financial Post, December 3, 1977.

[9]UAW, New Technology, Vol. 12, No. 2, Spring 1978, pp. 6-7.

Similarly, in 1976 the Federation of Telephone Workers of B.C. advised its negotiators not to oppose technological changes, but to negotiate appropriate accommodative arrangements for adversely affected workers. Their instructions were to ensure that the most senior employees got the first opportunity to train on the new equipment, process or work method; that displaced employees, whatever the reason, not suffer any income loss if transferred to lower job classifications; that junior employees be downgraded first; that early retirement be an option; and that marks of any tests involved in qualification for re-training opportunities be checked by an independent party.[10]

The Ontario Federation of Labour made only passing reference to technological changes at its 1978 convention. One of the resolutions called for the establishment of retraining programmes to facilitate effective adjustment to technological change:

> "Training boards should be set up ... so that a comprehensive training program can be developed to meet the country's needs for skilled labour. Service areas should be brought into this program and retraining should be guaranteed to offset the effects of technological changes."[11]

The Policy Choices of Unions

Unions face two negative choices in relation to technological changes: opposition may save jobs in the short-run, but, if successful in holding off the introduction of new technology, will most likely result in

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[10] Letter to all plant negotiators from the Business Agent of the Federation of Telephone Workers of B.C., dated August 3, 1976.

[11] Reported in The Financial Post, November 25, 1978.

the loss of jobs over the long-run; whereas acquiescence may result in some immediate displacements of workers and skills, but gives historical promise of more jobs in the long-run.

An examination of the choices that have been made suggests a close relationship between the nature of the choice, the nature of the union organization, and the quality of the union leadership. The nature of the union organization is important because a union whose membership is constituted of one skill is more likely to oppose technological changes which threaten the destruction of the skill, than one which is constituted of a number of skills. The long-standing conflict between the railways and their firemen in relation to the introduction of the diesel locomotive, and between newspapers and their typographers in relation to the introduction of printing automation, are amongst the most recent examples. The nature of the leadership is important because the employment effects of the policy choices that union leaders make are not equally visible, and are not related equally to the policy-decision. For example, a given contraction in employment can result from inadequate capital investment, failure to employ modern technology, or inadequate demand for the product. But, inadequate demand may result from high per unit costs, attributable to inadequate capital investment and failure to employ modern technology.

This is not the sort of relationship that is commonly associated with policy choices. In the minds of most workers demand for the product is market determined, and development of the market is a managerial responsibility. It is most unlikely that they will associate the decrease in demand with decisions taken regarding the introduction of modern technology. In such case

the union leaders responsible for holding back the technological change remain secure in their positions, ostensibly fighting for security of employment. By contrast, the contraction in employment that results from technological change is more visible and can be related directly to the change in technology. Hence, the decision to acquiesce and cooperate in the introduction of technology which has negative employment effects places the leadership in a defensive position. They must justify the policy-decision to those who are adversely affected, and must allay the concerns of the membership at large regarding the effects on employment and skills of anticipated future technological changes. Clearly union leaders who choose to cooperate with management in the introduction of technological changes have a more difficult task than those who choose to oppose it.

The majority of union leaders neither oppose outright nor advocate technological changes. Instead, they declare conditional acceptance, and then seek to negotiate the conditions under which they will not oppose their introduction.

Union Conditions

Amongst the specific conditions put on the table in recent years, job protection has been given the highest priority. This has been particularly the case in instances where major skills were affected adversely, and where alternative employment opportunities in local and regional markets were limited. Job protection involves, of course, the negotiation of not only a guarantee of employment for the displaced workers, but also commitments by the firm regarding training and retraining, transfers, the nature of employment activities in alternative positions, wage guarantees, and related issues.

Where the nature of new technology and production processes preclude the possibility of retraining and re-employment, the accommodative arrangements involve placement with other firms, severance pay, early retirement, income maintenance plans, and supplementary unemployment benefits.

The conditions can be so restrictive, of course, and the costs of accommodative demands so high, as to render the technological change unprofitable. If the costs of meeting the conditions were to exceed the anticipated benefits of the technological change then the conditional acceptance would be, in fact, disguised opposition.

The historical record indicates that the most difficult accommodations have been those which involved long-established skills, and one skill organizations: whenever new technology threatened the continuing existence of a skill, the union organization faced the dual problem of employment security for its members and its own existence. The negotiation of alternative employments for its members, in the jurisdictions of other unions, or arrangements for severance pay and early retirements, constitute in effect the negotiation of the union's own demise. Few unions elected to do so voluntarily.

Unions facing such a dilemma have commonly insisted that their members be trained to operate the new equipment or be employed in some activity peripheral to the operation of the equipment. For example, the Brotherhood of Locomotive Firemen and Enginemen insisted that firemen should continue to be employed on diesel locomotives as assistants to engine drivers, and the International Typographical Union has insisted that its members continue to be employed in capacities related to the operation of

the computerized equipment.[12]

The attitudes manifested in these demands have a historical precedent. During the industrial revolution craft unions took the stand that the machines that were being introduced into craft shops were to be operated by craftsmen, even if their craft skills were not required for the operation. The recently resolved conflict between The Times of London and the National Graphical Association ultimately came to the same issue: who should operate the new computerized equipment. The NGA agreed to accept the equipment if the company were to agree that only NGA members will operate it.[13] Similarly, a regional vice-president of the International Typographical Union explained to us that electronic technology has had the effect of moving the typesetting process from the backroom to the front office. If members of his union were to be trained and moved from the back-room to the front office, conflicts will be reduced significantly.

But, it is instructive to note that in all these cases the problem was not limited to the employment security of workers whose jobs were adversely

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[12]The assignment of alternative work functions for members of a given union is not as simple an act as it may appear. The alternative work functions may fall within the jurisdiction of unions, which would give rise to jurisdictional disputes. This problem arose at the Victoria Press in British Columbia in 1977, and in an Arbitration Award dated September 7, 1977, Paul C. Weiler declared: "Technological changes do not ... respect the boundary lines developed between the unions. New equipment may require a reshuffling of work assignments which cuts across and blurs traditional jurisdictional lines." Such reshuffling will become increasingly necessary as an accommodation to technological change. Procedures acceptable to both unions and management must be developed to facilitate the process.

[13]The Economist, June 9, 1979, p. 25.

affected. Indeed, satisfactory employment and other arrangements would probably have been made with only limited conflict. But, arrangements which would have phased out the skills, would have also phased out their organizations. This was expressed very succintly by a spokesman of the Brotherhood of Locomotive Firemen and Enginemen in testimony before a Conciliation Board:

> "We charge the CPR with wilfully exacerbating relationships by injecting and demanding priority for their demand to remove firement from diesel locomotives. ... The very livelihood of our members, the continuation of our craft, and the continued existence of our organization are at stake. ... This means that firemen are to give up their jobs, see their craft die and their organization disappear. These are not negotiable demands."[14]

Such attitudes should be anticipated from unions whose existence becomes threatened by technological changes. It should not be expected that such unions will readily negotiate their own demise. A different approach would have to be taken in the negotiation of conditions for the implementation of technological changes in such instances, than the approach taken when the existence of the organization is not being threatened.

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[14] The Labour Gazette, February 1957, pp. 178-179.

IV. THE ARTICULATION OF UNION POLICIES - RESPONSES TO QUESTIONS

We asked unions to comment on the policies of their organizations regarding technological changes. The purpose was to determine whether unions have made technological change a policy issue, and whether they have attempted to formulate policy responses to potential problems.

In view of the historical record, on-going technical changes, and the considerable publicity that has been given to the potential employment implications of computers, microprocessors, numerically controlled instruments, word processors and other electronic processes and systems, we expected to find well articulated policies, based partly on actual experiences and partly on well educated expectations. We were disappointed: there is no evidence of comprehensive study of situations where technological changes have taken place, and no evidence of established policies. Most of the responses contained the opinions of the respondents, rather than the established policies of their organizations. The absence of policy can itself be policy, of course, but when the issue concerns problems for which acceptable accommodations would have to be negotiated, the absence of policy compels ad hoc responses, which, depending on circumstances, may or may not be of advantage to those who are adversely affected.

A few unions indicated that they monitor changes, assess their effects on employment and skills, and assist their members to remain up-to-date in their knowledge so that they can be retrained to the requirements of the new technology. But, the majority have indicated no specific technology-related policies. They rely entirely on the general policy to negotiate terms and conditions of employment which will ensure the continuing employment of their

members. Many collective agreements contain terms and conditions of employment which provide for relocation, retraining and re-employment of workers regardless of what may cause their displacement. Hence, specific reference to technological displacement is not regarded necessary.

This does not mean the majority are not concerned about the adverse employment effects of technological changes. They are concerned; but, there is no indication that their concerns have been given the form of policy specifications.

This is the more surprising in the light of union complaints that general employment guarantees in collective agreements have not in all instances provided the security of employment that was expected. Apparently, conflicts have arisen in the determination of what factors were responsible for reductions in employment: while unions have attributed some of them to technological changes, and sought to invoke contractual undertakings to retrain, relocate, re-employ, or grant severance pay, management attributed them to decreases in production. There is no protection, of course, against demand-related decreases in production; and considering the derived-demand nature of employment, it is generally recognized that, other things being equal, employment in individual firms will vary with production.

Nevertheless, the responses of some unions contain the implication that policy specifications regarding technological changes and their effects on employment and skills have not been formulated because of managerial intransigence. Had management been more forthright with advance notices on

pending changes, and information on the nature of changes and anticipated effects on employment and skills, unions would have been in a better position to formulate alternative accommodative policies.

Some of the responses manifest considerable bitterness on the matter. Management stands accused of not telling "the whole truth," and thereby embarrassing union leaders and causing adjustment difficulties. Apparently, in certain instances union leaders accepted management's assurances regarding potential effects and negotiated appropriate terms and conditions of employment, only to discover shortly thereafter that the effects were different and the negotiated terms and conditions inadequate. Such outcomes result, of course, in bitterness and antagonism and contribute to difficulties in labour-management relations.

The policies and attitudes of some unions can be deduced from the following statements:

> "We realize it has come, and we are concerned about guaranteed employment for our union members";
>
> "... retraining, income maintenance and severance pay. But, our main policy is to try to keep our members working, rather than joining the unemployed lines, as over 100 have done in the past 2 years";
>
> "Our policy is to prolong the inevitable"
>
> "We do not oppose progress, but unfortunately many of the technological changes adversely affect our members"
>
> "Our organization cooperates with management in the implementation of technological changes because we have no choice"
>
> "This organization is against change for change sake. We would oppose any change unless every effort is made to employ displaced workers in another area."

By contrast, a few of them declared:

"We try to keep our members updated in their jobs, and encourage them to be versatile, so if a position is lost to a technological change the man will be trained for another position. Our studying is done on our own time at no cost to the employer. However, the employer does supply some courses and training film which we attend on our time and at our expense."

"We attempt to stay aware of changes as they occur, and then establish training for those changes"

"It is our hope that in the future displaced workers will receive training in other vocations"

"Technological change is an opportunity to eliminate degrading, repetitive and unsatisfying work"

"We do not resist technological change, but attempt to channel the benefits in such a way that everybody benefits"

"Keep up-to-date on changes"

"Technological change ... made it necessary for our people to upgrade themselves, which is being generally accepted because work is not only interesting but less tedious."

Based on the statements of responding unions, we have classified union policies towards technological changes into five categories:

	Number of Responses	Percent
1. Conditional Acceptance.	23	42.6
2. Resignation	10	18.5
3. Advocacy.	9	16.7
4. Opposition.	8	14.8
5. Uncertain Position.	4	7.4
TOTAL	54	100.0

Conditional Acceptance is defined by the general statement "as long as consultation precedes the introduction of change, and management undertakes to make every effort to minimize the adverse effects on workers." Commonly, such is the policy of unions which face static or declining employment. The policy-goal is to secure the employment of union members, or failing that, to secure adequate severance pay.

Resignation was communicated by unions which had their battles and concluded that technological change cannot be held back. Having accepted the inevitability of it, they shifted their policy from opposition to negotiation of terms and conditions of employment which continue to reflect their concern about the economic welfare of their members.

Advocacy is a common response from unions of workers who are benefiting from technological changes. For the most part such unions are found in high technology industries.

Opposition was communicated by unions which are in the midst of conflict over the adverse effects of technological changes. Their comments indicate that they are today where unions that expressed resignation were fifteen years ago.

The majority have indicated a general recognition of the inevitability of continuing technological changes, and an acceptance of the possibility that changes will cause decreases in employment. Some of the indications are specific, and some are inferred. For example, the United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry reported that because of changes in materials, methods of pipe connections, and the introduction of new piping systems, it is now possible for a journeyman plumber with an apprentice to complete an average house in about one day. Prior to the introduction of these changes it took about one week. Similarly, the International Union of Elevator Constructors reported that because of prefabrication and factory assembly of escalators the work-time for installation has been reduced from three months to three days; and because of the increasing introduction of electronic parts, maintenance workers can attend to twice the number of units, even though the units are more complex.

Changes in materials and processes suggest changes in the work-functions of the workers involved. Yet, there is no evidence of policy-measures on the part of concerned unions for substantive changes in the educational and

training requirements of skilled trades. Acceptance of the technological changes that have taken place to-date, and recognition of the fact that more changes will come, has not been accompanied by appropriately significant changes in apprenticeship programmes. For example, it is questionable whether the length and comprehensiveness of some apprenticeship programmes can be justified in the context of on-going and pending technological changes which cast doubt on the continuing need for some of the work-functions performed today. The nature of on-going technological changes, including changes in materials, suggests that during this interim period in the conversion of production processes--"interim" in the sense of being in-between the existing electro-mechanical infrastructure and the emerging electronic systems network--we should train workers in specific work activities, and not in the broad range of work activities provided in apprenticeship programmes. For example, we should train electricians in specific wiring activities, and not in the broad range of activities in which electricians are trained; similarly, we should train workers in pipeline welding, instead of in welding generally; and so on. It is incumbent on unions of skilled trades to relax their regulations on the length and nature of training, and adopt more flexible policies regarding the qualifications of workers who participate in work activities which fall within their jurisdiction.

V. ANTICIPATED EMPLOYMENT EFFECTS OF FUTURE TECHNOLOGICAL CHANGES - RESPONSES TO QUESTIONS

We asked unions to comment on the anticipated effects of future technological changes on employment in the establishments over which their organizations have jurisdiction.

The question was designed to determine whether unions are aware of on-going and anticipated technological changes, and whether any efforts have been made to assess the potential employment effects of pending changes. We reasoned that unions could not negotiate effectively adjustments to technological changes, if they did not know the nature of pending changes and their potential effects.

The most significant, and most disturbing, information contained in union responses is the very limited communication from management regarding technological changes. The impression is conveyed that workers and their organizations are generally kept in the dark about pending changes in technology, and as a result, there prevails an atmosphere of uncertainty and concern, which is sustained by a continuous flow of rumours.

Equally disturbing is the lack of concern on the part of most public service unions. Excepting the organization of inside postal workers, who indicated unequivocal opposition to the nature of technological changes that have been introduced, and refused to cooperate in this investigation, the responses from public service employee organizations indicate that the subject of technological change and its actual or potential effects on employment has not been considered, and has not been an issue of concern. This lack of concern should concern the members of public service organizations. It is generally expected that changes in office technology over the next decade will have negative effects on employment of office personnel.

A significant proportion of responding unions anticipate negative effects of future technological changes on employment (Table 1): of the 63 unions that responded to the question, close to 40% (24) expect negative effects; and only 11% expect positive effects. The others either did not expect technological changes within their operations, or did not expect adverse effects, or indicated uncertainty about the potential effects.

TABLE 1

Anticipated Effects on Employment of Future Technological Changes.

(Survey Results, Summer 1979)

	Number	% of Total
Negative Effects Anticipated	24	38.1
Not Anticipating Technological Changes	15	23.8
Uncertain as to effects on Employment	11	17.5
Positive Effects on Employment Anticipated	7	11.1
Not Anticipating adverse effects	4	6.3
Neither Positive nor Negative effects	1	1.6
Negative effects on Some Occupations, but Positive effects on other anticipated	1	1.6
Total	63	100.0

The expressed anticipations of individuals unions are, for the most part, based on their past experiences with technological changes, and not on any particular knowledge about the nature of pending technological changes, or on assessments of their potential effects. This is reflected in their statements, which follow:

> "There were fears in the past regarding the adverse effects of computerization, but as far as we are aware it resulted in even more jobs."

> "Attrition will take care of part of the problem."

"We expect that future technological changes will continue to eliminate dull, boring jobs and to create more interesting, more responsible jobs. The telecommunications industry has a bright future and we expect our people to be part of it."

"We anticipate further layoffs in our plant due to technological change ... but, our experience has been that the new equipment doesn't always work out as well as planned and the company can't layoff as many as they would like."

"Improvements in parts and materials, and more computerized products will reduce need for repair and maintenance."

"... with the introduction of solid state equipment ... the use of sophisticated test equipment is essential, requiring not only retraining in the use of this equipment but also the upgrading of the theoretical training of our journeymen. Because the equipment is in its infancy in our plant, the employer failed to realize the need for retraining and then found it necessary to hire electronic technologists to service the equipment."

"Sometime in the near future all meters, whether they be gas, water or electrical will be read by telemetry through a central computer system."

"Computerization is a possibility in the semi-distant future but natural attrition should take care of most employment problems."

"The changes are to our benefit."

"Many of our workers are 2nd world war vets; ... many are of one skill and no education to speak of ... Persons with little or no education who are being displaced by technological change now, and at least for the next 10 years, will have little chance for meaningful employment ... Our companies are basically not too interested in training as long as immigration supplies the need."

Thus, the responses are a mixture of optimism and pessimism, depending on the nature of industry and the respondents' experience. Generally responses from industries on the fore-front of technological change, such as telecommunications, have been positive. The workers employed in such industries have relatively high levels of education and skill, and they are able to retrain and adjust to

the requirements of new processes. On the other hand, workers employed in industries which heretofore used standard technology and materials, generally have relatively low levels of education and skill. The introduction of modern technology and new materials in such industries, are a threat to the security of employment of such workers. Not only alternative employment opportunities are limited when account is taken of their age, education and skill, but also because of their age and education retraining becomes difficult. This is generally recognized, but not necessarily accepted, particularly by those who are affected. Whether acceptance is related to continuing desire to work, or to need for employment income, it is difficult to establish. Nevertheless, the problem suggests a need for a national policy decision on early retirement for such workers. Given a policy on the matter, with provisions for generous economic and social benefits, as befitting citizens who have participated in the nation's economy for periods of 40 or more years, unions will be under reduced pressure to resist technological changes which indicate displacement of workers.

VI. CONTRACT PROVISIONS RELATING TO EFFECTS OF TECHNOLOGICAL CHANGES

In 1966 the Economic Council of Canada examined the issue of manpower adjustments to technological changes and recommended the introduction of policies which would provide for (a) a mimimum of three months notice in relation to significant changes; (b) reductions in employment through normal attrition; (c) transfers of displaced workers to other jobs; (d) the establishment of training and retraining programmes; (e) the portability of pension rights; and (f) the establishment of financial adjustments, such as severance pay, supplementary unemployment benefits, and mobility allowance.[15]

A number of references were made in this report to the generally positive attitude of unions towards technological changes, provided satisfactory accommodative arrangements were made in relation to adversely affected workers. By "satisfactory accommodative arrangements" it is generally meant provisions of the nature recommended by the Economic Council of Canada. But, an examination of collective agreements indicates that unions have been only minimally successful in their efforts to negotiate desirable protective conditions. The majority of contracts have no provision for advance notice or prior consultation, no wage and/or employment guarantees, no provision for retraining, and no provisions for severance pay or supplementary unemployment benefits.

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[15] Economic Council of Canada, A Declaration of Manpower Adjustment to Technological and Other Change, Queen's Printer, Ottawa, 1966.

The absence of contractual provisions does not mean, of course, that some such arrangements do not in fact exist. It means only that they are not specifically provided in collective agreements. This is in accord with the prevailing attitude of management that technological changes are a managerial prerogative, and accommodative arrangements related to such changes should remain ad hoc and discretionary with management. Sporadic information suggests the existence of widespread ad hoc arrangements, largely negotiated outside the provisions of the collective agreements in force.

Information on the relevant provisions in 341 collective agreements covering manufacturing establishments with 500 or more employees is given in Table 2. Evidently, only 39% of the agreements, covering 47% of all employees, provided for advance notice and/or prior consultation; 24% provided for the establishment of joint labour-management committees; 33%, covering 40% of all employees, had provision for the retraining of adversely affected workers; 27%, covering 34% of the employees, had some form of wage/employment guarantees; 47%, covering 58% of employees, had severance pay provisions; and 24%, covering 36% of employees, had some provisions for supplementary unemployment benefits.

It is noteworthy, that the collective agreements in the knitting mills industry had none of the provisions; 33% of the agreements in the furniture and fixtures industry, covering 36% of all employees, provided for retraining only; 37% of the agreements (covering 55% of all employees) in the electrical products industry provided for severance pay, and 13% (covering 15% of all employees) provided for supplementary unemployment insurance;

TABLE 2

Provisions in Major Collective Agreements Covering Employees in Canadian Manufacturing Industries, 1977.[1]

	Advance Notice and/or Prior Consultation		Labour-Management Committee		Retraining in cases of Technological Change		Wage/Employment Guarantees if Technological Change		Severance Pay		Supplementary Unemployment Benefits	
	% Agreements	% Employees	% Agreements	% Employees	% Agreements	% Employees	% Agreements	% Employees	% Agreements	% Employees	% Agreements	% Employees
Food and Beverage	36	46	-	-	13	14	21	32	46	49	13	9
Tobacco Products	60	60	60	59	60	74	20	28	100	100	-	-
Rubber	9	13	-	-	-	-	-	-	64	71	73	78
Leather	40	41	-	-	20	17	-	-	-	-	-	-
Textile	44	46	-	-	44	48	6	3	33	37	6	11
Knitting Mills	-	-	-	-	-	-	-	-	-	-	-	-
Clothing	35	44	15	36	20	38	35	44	25	41	15	36
Wood	86	98	15	71	28	72	85	98	86	98	-	-
Furniture and Fixtures	-	-	-	-	33	36	-	-	-	-	-	-
Paper and Allied	90	93	68	73	65	63	84	87	88	93	-	-
Printing, Publishing and Allied	75	81	50	55	63	70	37	36	50	45	38	43
Primary Metal	50	59	15	18	50	63	47	62	38	32	56	71
Metal Fabricating	10	6	90	93	20	15	30	21	50	57	60	65
Machinery	12	5	76	81	35	52	-	-	24	44	18	33
Transportation Equipment	26	39	13	6	37	34	2	2	39	66	52	73
Electrical Products	-	-	-	-	-	-	-	-	37	55	13	15
Non-metallic Mineral Products	46	45	8	6	54	55	16	16	62	64	15	17
Chemical and Chemical Products	13	27	25	12	13	9	13	9	38	47	13	9
Miscellaneous Manufacturing	-	-	-	-	-	-	-	-	-	-	14	13
Total Manufacturing	39	47	24	27	33	40	27	34	47	58	24	36

Source: Labour Canada, Provisions in Major Collective Agreements Covering Employees in Canadian Manufacturing Industries, Ottawa, 1977.

[1] Agreements in effect January 1977, covering 500 or more employees. Total 443,222 employees in 341 bargaining units.

and in the leather industry, only 20% of the agreements (covering 17% of all employees) provided for retraining. By contrast, the agreements in the woods industries and the paper and allied products industries provided wage and employment guarantees, and severance pay to almost all employees, and 28% of the agreements in the woods industries (covering 72% of all employees) and 65% of the agreements in the paper and allied products industries (covering 63% of all employees) contained provisions for retraining.

The very limited provisions for retraining should be a matter of concern. In the context of the anticipated changes in technology over the next decade, the limited commitments by industry to retrain displaced workers suggests limited commitment to retain into employment displaced workers. If industry does not commit itself to retrain and retain its employees, then the public authority must have in place adequate retraining and placement programmes to accommodate the expected increase in demand for them.

In transportation, communications, trade, utilities and service industries collective agreements contain even more limited provisions than do the agreements in manufacturing industries (Table 3). On the average, only 28% of the agreements, covering 43% of all employees in those industries, provide for advance notice and/or for prior consultation; only 10% provide for the establishment of joint labour-management committees; 23%, covering 33% of all employees, provide for retraining; 18%, covering 27% of employees, provide for any wage/employment guarantees; 39%, covering 50% of employees, contain some provision for severance pay; and 4%, covering 3% of all employees, have provisions for supplementary unemployment benefits.

TABLE 3

Provisions in Major Collective Agreements Covering Employees in Certain Transportation, Communications, Trade, Utilities and Service Industries in Canada, 1978.[1]

	Advance Notice and/or Prior Consultation		Labour-Management Committee		Retraining in cases of Technological Change		Wage/Employment Guarantees if Technological Change		Severence Pay		Supplementary Unemployment Benefits	
	% Agreements	% Employees	% Agreements	% Employees	% Agreements	% Employees	% Agreements	% Employees	% Agreements	% Employees	% Agreements	% Employees
Air Transportation	34	36	8	12	16	12	8	5	83	86	-	-
Water Transportation	29	16	12	9	18	27	24	17	53	33	24	31
Other Transportation	18	28	-	-	14	20	14	15	18	23	-	-
Storage	50	37	-	-	50	37	25	26	100	100	25	11
Communication	37	63	20	43	33	55	27	50	50	67	-	-
Electric Power, Gas & Water Utilities	43	76	30	61	35	42	39	44	17	47	-	-
Wholesale Trade	40	24	-	-	50	39	10	13	60	42	-	-
Retail Trade	23	32	2	5	16	16	7	3	30	27	7	6
Services to Business Management	17	22	17	22	-	-	-	-	50	61	-	-
Accommodation, Food Services	-	-	-	-	8	7	8	7	33	65	-	-
Miscellaneous Services	-	-	-	-	33	32	33	32	-	-	-	-
Total	28	43	10	24	23	33	18	27	39	50	4	3

Source: Labour Canada, Labour Data: Provisions in Major Collective Agreements Covering Employees in Certain Transportation, Communications, Trade, Utilities, and Service Industries in Canada, 1978.

[1]Covers agreements in effect as of September 1978 for 389,751 employees in 182 bargaining units of 500 or more employees.

It is noteworthy, how reluctant industries appear to be to commit themselves to the retraining of displaced workers, and to undertakings which would guarantee wages and employment: only 16% of the agreements in air transportation, covering a mere 12% of the employees, provided for retraining, and only 8%, covering a mere 5% of employees, provided for wage/employment guarantees; in the communications industry, which in recent years has been on the forefront of technological change, only 33% of the agreements, covering 50% of the employees, had provisions for retraining, and 27%, covering 50% of employees, had wage/employment guarantees. Industries appear to prefer the easy way out of manpower problems, evidenced by the preponderance of provisions for severance pay.

Collective agreements at smaller establishments (with less than 500 employees) contain very limited provisions for consultation and worker accommodation to technological changes. Table 4 contains information on the relevant provisions at selected industries. Although the information relates to contracts in effect at January 1974, indications are that significant changes have not taken place since that time.

The most striking absence of contractual provision is notice of layoff in case of technological change. Considering that technological changes take time to become implemented and operational, and considering further that those responsible for the implementation of technological changes know considerably in advance of the commencement of operations the nature of effects on employment, on work and working, it is surprising to note the implicit resistance to the introduction of a requirement for advance notice of layoffs. Equally striking are the very limited provisions for

TABLE 4

Provisions in Collective Agreements Related To Technological Changes - Selected Industries With 200-499 Employees, Canada 1974.

Industries	Advance Notice or Consultation	Labour-Management Committee	Training/ Retraining	Wage or Employment Guarantee	Relocation Allowance	Notice of Layoff in case of Tech. Change
	% of Employees Covered	% of Employees Covered	% of Employees Covered	% of Employees Covered	% of Employees Covered	% of Employees Covered
Electrical	12.7	11.5	10.0	3.3	0.0	2.4
Steel	8.8	3.7	14.5	2.0	0.0	0.0
Auto	0.0	0.0	4.7	0.0	0.0	0.0
Wood, Paper & Allied	71.3	37.9	42.7	48.8	0.0	46.2
Textiles	28.5	4.4	21.5	11.2	0.0	2.7
Clothing	30.6	11.5	49.6	20.9	0.0	0.0
Mining	27.2	1.8	5.2	2.0	0.0	2.7
Lumbering	33.8	0.0	27.8	7.7	0.0	0.0
Utilities	6.8	4.9	15.1	6.8	0.0	0.0
Retail Trade	0.0	0.0	0.0	13.6	7.8	0.0

Source: Paul Malles, Canadian Labour Standards in Law, Agreement, and Practice, Economic Council of Canada, Information Canada, 1976, Appendix 5-B, Table 5-B, pp. 144-151.

training and retraining, and wage or employment guarantees.

In relation to training and retraining, small establishments encounter special problems, which are examined in another report in this series.[16] Nevertheless, the relevant contract provisions offer little hope to the majority of workers who might be adversely affected by technological changes: limited opportunities for retraining in the establishments of their employment; no wage or employment guarantees; and no advance notice of pending layoff. Undoubtedly, management would not display such an implicitly cavalier attitude if there were no retraining programmes in public institutions, and if there were no unemployment insurance system. But, there are costs in the failure to assume greater responsibility for the security of employment of those who commit their work to their enterprises, which manifest themselves in various forms of agitation, and ultimately in low productivity.

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[16] Technological Changes and the Demand for Skilled Manpower in Canada, January 1980.

VII. STRIKES OVER TECHNOLOGICAL CHANGES

There have been relatively few instances of strikes over technological changes as such, although a number have taken place over issues arising from the implementation of technological changes. An examination of the issues indicates that in most such instances the main source of conflict has been management's concept of its prerogative to introduce change without prior consultation, and by implication, its right to decide how matters arising from the change are to be resolved.

Management has the prerogative to consult or not to consult. Evidence suggests that in most instances management informs, does not consult; informs after commencement in the implementation of change or when the change nears completion; and often informs the affected workers directly, by-passing their union leaders. Such an approach to the exercise of managerial prerogatives on matters which affect workers, and bear on labour-management relations, causes considerable embarrassment to union leaders, and contributes significantly to labour-management conflicts.

The industry which achieved notoriety for its utter disregard of established labour-management consultative processes is the railway industry--significantly, an industry under federal jurisdiction and one which is partially publicly owned. Introduction of the diesel locomotive in the mid-1950's, and the decision of the Canadian National in 1964 to run its trains through Nakina, Ontario and Wainwright, Saskatchewan--two communities whose existence depended on the trains stopping to take supplies and change crews--became issues of serious and prolonged conflict between unions and manage-

ment. Indeed, the manner in which management exercised its prerogative, particularly in relation to the 'run-throughs,' gave the impression of deliberate intent to embarrass the union leaders.[17] The CNR argued that under the residual rights provisions of collective agreements, it had the right to make unilateral changes in working conditions; and its president argued that management was 'action oriented,' which was interpreted to mean it could not take time for consultation and negotiation with the representatives of labour prior to the introduction of technological and operational changes.[18]

Perhaps there is a lesson in this that goes beyond the specific case. Perhaps it manifests an attitude of governments and management of public enterprises (whether institutional enterprises such as the post-office, or commercial enterprises such as the CNR), which derives from a fundamental conflict between the general public good and the interests of special groups. This should not preclude prior consultation with groups which might be adversely affected. But, such does not appear to be the conclusion of managerial decision-makers.

Recent cases of strike action over technological changes and issues related to them are those of the Typographical Union against newspapers in Toronto, Ottawa, Montreal and Vancouver, the Canadian Union Postal Workers,

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[17] Freedman, Mr. Justice Samuel, Report of the Industrial Inquiry Commission Relating to the CNR 'Run-Throughs,' Queen's Printer, Ottawa, 1965.

[18] Economic Council of Canada, National Conference on Labour-Management Relations, Queen's Printer, Ottawa, 1964.

and the International Union of Elevator Constructors. Evidence suggests that in each case the main source of conflict had been not the technological change itself, which appears to have been accepted as generally inevitable, but rather the ways in which changes were implemented, and the unilateral ways in which manpower adjustments were formulated. The International Union of Elevator Constructors wrote:

> "We have had arrangements and Joint Committees for over fifty years regarding work jurisdiction in relation to onsite and offsite work and introduction of technological changes. Nevertheless, we are in constant dispute with the employers over violations to the agreements regarding changes in the equipment ..."

It is conceivable, of course, that obstructionist tactics compel employers to take unilateral action. But, if a union refuses to negotiate over a change which is deemed necessary, or a union puts conditions which are deemed obstructionist, the matter should be referred to an impartial authority for opinion before unilateral action is taken.

As indicated elsewhere in this report, there have been instances in which the interests of union organizations have been the main source of conflict, not the interests of the workers. The conflicts between the railways and the organization of their firemen, and those between newspapers and the organizations of their typographers manifest the institutional aspect of labour-management relations. They separate the interests of the organization from the interests of the workers it represents. When an occupation, such as that of locomotive firemen, is being rendered redundant, the organization of that occupation is being threatened with extinction. In negotiating satisfactory accommodative arrangements for its redundant members, such as transfers to other jobs, early retirement, etc. the organization would in effect be negotiating its own demise. Hence, regardless of how

satisfactory might be the proposed accommodative arrangements for displaced workers, the organizational bureaucracy would tend to reject them, at least in the initial phases of the change. The issue is particularly critical with organizations of single crafts. Multi-craft organizations avoid such a problem, particularly when contracting employment of one craft is offset by expanding employment in another.

VIII. LEGISLATIVE PROVISIONS REGARDING TECHNOLOGICAL CHANGES

In some cases limited provisions in collective agreements on issues of concern to workers and society can be explained by the existence of legislative provisions. What is required in law need not be restated in labour-mananagement contracts, except perhaps by reference to the relevant section of the law. But, such does not appear to be the case in relation to the issues arising from technological changes. As of April 1979, only the Canada Labour Code and the Labour Acts of British Columbia, Manitoba and Saskatchewan contained provisions which make specific reference to technological change; and even those provisions were limited to advance notice of pending technological changes, and the re-negotiation of the contractual relationships that were to be affected by the proposed changes (see following sections). The Labour Acts of the other provinces appear silent on the issue. All Acts provide, of course, for varying periods of advance notice in case of termination of employment of individual workers and groups of workers regardless of cause (excepting dismissal).

1. Technological Change Provisions in Legislation[19]

Federal	Canada Labour Code, R.S.C. 1970, c.C-1 as amended Section 149 to 153
British Columbia	Labour Code of B.C., S.B.C. 1973, (Second Session), c.122 as amended Section 74 to 78
	Public Service Labour Relations Act, S.B.C. 1973, c.144 as amended Sections 1 and 18 to 20
Manitoba	Labour Relations Act, S.M. 1972, c.75 as amended Sections 1(w) and 72 to 75
Saskatchewan	Trade Union Act, S.S. 1972, c.137 as amended Section 42.

[19] All information for this section was provided by the Legislative Analysis Branch, Canada Department of Labour.

Description of Federal Legislation

The Canada Labour Code, Part V, describes "technological change" as:

(a) The introduction by an employer into his work, undertaking or business of equipment or material of a different nature or kind than that previously utilized by him in the operation of the work, undertaking or business, and

(b) a change in the manner in which the employer carries on the work, undertaking or business that is directly related to the introduction of that equipment or material.

Except where a written notice of technological change has been given by the employer to the bargaining agent within a prescribed period before an agreement is signed or where the collective agreement contains certain provisions pertaining to the subject as specified in the Code, the technological change provisions apply to all employers bound by a collective agreement. The provisions apply when an employer proposes to effect a technological change that is likely to affect the terms and conditions or security of employment of a significant number of his employees bound by the collective agreement. The employer must give the bargaining agent notice at least 90 days prior to the date that the technological change is to take effect. This notice must include:

(a) the nature of the technological change;

(b) the date upon which it is to be put into effect;

(c) the approximate number and type of employees likely to be affected;

(d) the likely effect of the change upon the terms, conditions or security of employment of those affected;

(e) such other information as may be required by regulation.

Once the notice has been given, the bargaining agent has 30 days to apply to the Labour Relations Board for leave to serve notice to bargain collectively regarding the technological change.

In the case where the bargaining agent becomes aware (or, in the opinion of the Board ought to have become aware) that the employer has failed to give notice of technological change, the bargaining agent may apply to the Board for a determination of the matter.

After affording both parties the opportunity to be heard, the Board may determine

(a) that the employer was not bound to give notice;

(b) that notice should have been given, and further, may order the employer

(i) not to proceed with the alleged technological change for up to 90 days

(ii) to reinstate any employee displaced as a result of technological change; and

(iii) reimburse a reinstated employee for lost wages.

Such an order (b) by the Board is deemed to be the notice of technological change required to be given by the employer to the bargaining agent.

Description of British Columbia's Legislation

The Labour Code of British Columbia requires that every collective agreement entered into after the Act was passed must contain provisions for final and

conclusive settlement without stoppage of work, of all disputes arising in relation to technological change. If these provisions are omitted, the minister may insert them.

"Technological change" means

(i) the introduction by an employer of a change in his work, undertaking or business, or a change in his equipment or material from that equipment or, material previously used by the employer in his work, undertaking or business; or

(ii) a change in the manner in which an employer carries on his work undertaking, or business related to the introduction of that equipment or material.

Where an employer introduces, or intends to introduce a technological change that affects the terms and conditions, or security of employment of a significant number of employees to whom a collective agreement applied, and alters significantly the basis upon which a collective agreement was negotiated, either the employer or the bargaining agent may refer the matter to an arbitration board under the collective agreement, or as outlined under Part VI of the Code.

The arbitration board decides whether or not there has been or will be a technological change. If the finding is affirmative, the board informs the minister, and then may make one or more orders. These may include:

(i) that the change be made in accordance with the terms of the collective agreement unless the change alters significantly the basis upon which the collective agreement was negotiated;

(ii) that the employer will not proceed with the technological change for such a period, not exceeding 90 days, as the arbitration board considers appropriate;

(iii) that the employer reinstate any employee displaced by reason of the technological change;

(iv) that the employer pay to that employee such compensation in respect of his displacement as the arbitration board considers reasonable.

The arbitration board may recommend that the minister appoint a special officer to resolve the matter (see Part VII, Labour Code of B.C.) or, in its sole discretion, may order the parties to commence collective bargaining on a date stipulated by the board in order to revise the provisions of the collective agreement. This bargaining is to be carried on in relation to terms and conditions, or security of employment, or the assistance of the parties affected by the technological change.

The Act states specifically that the general prohibition against strikes and lockouts during the course of a collective agreement is suspended where the arbitration board has ordered the parties to bargain in relation to a technological change.

British Columbia Public Service

The Public Service Labour Relations Act defines technological change as

(a) the introduction by the Government into its work, undertaking, or business of equipment or material of a different nature or kind than that previously used by the Government in that work, undertaking or business; or

(b) a change in the manner, method, or procedures in which the Government carries on its work, undertaking, or business that is directly related to the introduction of that equipment or material,

that significantly decreases the number of employees; but does not include normal layoffs resulting from a decrease in the amount of work to be done. Where the Government intends to make a technological change, it must notify in writing the employees' bargaining agent. Within 14 days of such notice, the parties must commence collective bargaining in view of reaching agreement as to the effects of the technological change and in what way, if any, the agreement should be amended.

If an agreement is not reached by the parties prior to the full implementation of the change, the employees' bargaining agent may apply to the Labour Relations Board to have the existing collective agreement declared to be terminated. The Board declares the agreement terminated where it determines after investigation that a technological change has occurred.

Where the Government does not give an advance notice of future technological change, the employees' bargaining agent or any employees may refer the matter to the Labour Relations Board for determination. The Board must investigate whether the alleged change would constitute a technological change and make a final and binding order. Where the Board determines that the alleged change would constitute a technological change, the Government is notified accordingly and must commence collective bargaining with the employees' bargaining agent on the effects of the change and to determine in what way the collective agreement should be amended.

Upon the application of the employees' bargaining agent, the existing collective agreement may be declared to be terminated by the Board if agreement is not reached by the parties before the full implementation of the technological change.

If a technological change has occurred or is occurring and the Government has failed to provide the required notice, the bargaining agent or any employee may refer the matter to the Board. If the Board after investigation determines that a technological change has occurred or is occurring it must notify the parties of its decision and the parties must commence negotiations to revise the collective agreement within 14 days of being so notified.

Description of Manitoba's Legislation

The Manitoba Labour Relations Act defines technological change as

(a) the introduction by an employer into his work undertaking or business of equipment or material of a different nature or kind than that previously used by him in the operation of the work, undertaking or business, and

(b) a change in the manner in which the employer carries on the work, undertaking or business that is directly related to the introduction of that equipment or material.

The definition is identical to that in the Canada Labour Code.

Where an employer who is bound by a collective agreement proposes to effect a technological change that is likely to affect the terms and conditions, or the security of employment of a significant number of employees or to alter significantly the basis upon which the collective agreement was negotiated, he must give notice of the technological change to the bargaining agent at

least 90 days before the technological change is to be effected.

The notice in writing must state the nature of the technological change, the day on which the employer proposes to effect the change, the approximate number and type of employees likely to be affected by the change and the effect that the technological change is likely to have on the terms and conditions, or security of employment of the employees affected or the alteration that is likely to be made to the basis upon which the collective agreement was negotiated.

Where an employer gives such notice, the bargaining agent may serve notice upon the employer to commence collective bargaining to review the existing agreement or conclude a new agreement. The collective agreement in effect is then terminated on its date of expiry or 90 days after notice to bargain is served to the employer, whichever is earlier.

An employer who proposes to effect a technological change, may submit to arbitration the question of whether it is likely to affect the terms and conditions, or security of employment of a significant number of employees or alter significantly the basis upon which the collective agreement was negotiated. If the arbitration board finds that the change does affect the employees and the agreement, the arbitral award is deemed to be the notice of technological change required by the Act.

If the employer fails to notify the bargaining agent of the proposed change, the bargaining agent may refer to arbitration the question of whether the employer has effected a technological change that is likely to affect the conditions of employment of the employees or the collective agreement, or if he proposes to introduce such change within 90 days of the submission of

the question to arbitration. Where the arbitration board finds that a change has been made or will be made in the 90 day period, the arbitral award is to be considered as a notice of technological change which is required by the Act.

The provisions described above do not apply to an employer and a bargaining agent bound by a collective agreement where:

(a) the employer has given a notice that is substantially in accordance with the notice prescribed in the Act four days before a collective agreement is revised, renewed or entered into by the parties or four days before the last day on which notice to commence bargaining may be given by either party;

(b) the collective agreement specifies a procedure to negotiate and settle matters related to technological change; it contains provisions intended to assist employees affected by the change; it specifies that the legislated provisions do not apply to the parties during the term of the agreement; or the agreement was concluded before the provisions came into force;

(c) the employer and the bargaining agent agree by way of an agreement that is ancillary or supplementary to the collective agreement that the employer may make the technological change.

Description of Saskatchewan's Legislation

Under The Trade Union Act, 1972, technological change is defined as:

(a) the introduction by an employer into his work, undertaking or business of equipment or material of a different nature or kind than that previously utilized by him in the operation of the work, undertaking or business;

(b) a change in the matter in which the employer carries on the work, undertaking or business that is directly related to the introduction of that equipment or material; or

(c) the removal by an employer of any part of his work, undertaking or business.

With the exception of paragraph (c) which is particular to the Saskatchewan legislation, the definition of technological change is identical to that under the Canada Labour Code and the Manitoba Labour Relations Act.

The bargaining agent and the Minister of Labour must be notified of a proposed technological change that is likely to affect the terms, conditions or tenure of employment of a significant number of employees represented by a trade union. The notice must be given by the employer at least 90 days prior to the date on which the technological change is to be effected and must include the following information:

(a) the nature of the technological change;

(b) the date upon which the employer proposes to effect the change;

(c) the number and type of employees likely to be affected;

(d) the effect that the change is likely to have on the terms and conditions or tenure of employment of the employees affected;

(e) and such other information required by Regulation.

Upon allegation made by a trade union that the employer has failed to provide a notice of technological change, the Labour Relations Board may, by order, direct the employer not to proceed with the technological change for a maximum period of 90 days. The Board may also require the employer to reinstate any employee displaced because of the change and to reimburse such employee for any loss of pay suffered as a result of his displacement. Where a trade union makes an allegation of this nature, the Board may, after consultation with the employer and the union, make such interim orders as it considers appropriate. An order of the Board is deemed to be a notice of technological change.

Within 30 days after receiving the notice of technological change given or deemed to have been given by the employer, the trade union may serve notice on the employer to commence collective bargaining to revise the existing provisions of the agreement that relate to terms and conditions or tenure of employment or to include new provisions relating to such matters.

Where the Board is satisfied that the employer has on his own initiative given a written notice of technological change to the trade union in accordance with the requirements of the Act, or that the collective agreement specifies procedures by which matters related to technological change may be negotiated and settled, the Board may, by order, relieve the employer from complying with the requirements of the notice to commence bargaining or deny a trade union the right to serve such notice.

The employer is probibited from making any technological change where a notice to commence bargaining has been served by the union, unless, the

employer has been relieved by the Board from the requirement of bargaining collectively with the union, an agreement has been reached by the parties, or they have failed to enter or revise a collective agreement and the Minister has been informed of such failure.

Meaning of "significant number of employees"

In 1972, Saskatchewan adopted Regulations under The Trade Union Act defining the number of employees deemed to be significant for the purpose of technological change. Significant number means:

(a) the number specified in writing in the collective agreement between the trade union representing such employees and the employer of such employees, or

(b) the number determinated by the method of determining the number of employees that is deemed to be significant as set out in the agreement.

If the collective agreement does not specify a number of employees or a method of determining the number of employees that is deemed to be significant, the Regulations provide that "significant" means: where an employer has

(a) from 2 to 9 employees inclusive, 2 employees

(b) from 10 to 19 employees inclusive, 3 employees

(c) from 20 to 29 employees inclusive, 4 employees

(d) 30 or more employees, 20% of his total number of employees.

2. Provisions in Legislation for Notice of Termination of Employment of Individual Workers

Jurisdiction & Legislation	Notice Required	Application
Federal Canada Labour Code	2 weeks	Employers in federal industries Exclusions: employed less than 3 months, superintendents, managers, members of designated professions
Alberta (Board of Industrial Relations Order No. 61)	3 months but less than 2 years: 7 days 2 years or more: 14 days	Employers and employees Exclusions: where there is a custom, practice or agreement providing for (a) longer notice of termination of employment, or (b) the payment of an equal sum of money in lieu of notice of termination of employment employee has been employed 3 months or less
Manitoba Employment Standards Act	Pay period	Employers and employees Exclusions: employed less than 2 weeks, farm workers
Newfoundland Labour Standards Act	1 month but less than 2 years: 1 week 2 years or more: 2 weeks	Employers and employees Exclusions: employed less than 1 month and the construction industry
Nova Scotia Labour Standards Code	Employed less than 2 years: 1 week 2 to 5 years: 2 weeks 5 to 10 years: 4 weeks Over 10 years: 8 weeks	Employers (employees different) Exclusions: employed less than 3 months, construction industry, lay-offs under certain circumstances, business, trade and occupational profession

Jurisdiction & Legislation	Notice Required	Application
Ontario Employment Standards Act	Employed less than 2 years: 1 week 2 to 5 years: 2 weeks 5 to 10 years: 4 weeks Over 10 years: 8 weeks	Employers (special provisions for employees under notice of mass layoff) Exclusions: employed less than 3 months, alteration, decoration, construction, repair and demolition, roads, sewers, etc.
Prince Edward Island P.E.I. Labour Act	1 week	Employers and employees Exclusions: employed less than 3 months, seasonal employees, construction
Quebec Quebec Civil Code	Hired by week: 1 week Hired by month: 2 weeks Hired by year: 1 month	Listed employees and their employers. Exclusions: domestics, servants, journeymen, labourers
Saskatchewan Labour Standards Act, 1969	1 week	employers Exclusions: employed less than 3 months, farming, ranching, market gardening

3. Provisions in Legislation for Notice of Termination of Employment of Groups of Workers

Jurisdiction & Legislation	Number of Employees	Notice Required
Federal	50-100	8 weeks
Canada	101-300	12 weeks
Labour Code	over 300	16 weeks
Manitoba	50-100	8 weeks
Employment	101-300	12 weeks
Standards Act	over 300	16 weeks
Newfoundland	50-199	8 weeks
Labour	200-499	12 weeks
Standards Act	500 or more	16 weeks
Nova Scotia	10- 99	8 weeks
Labour	100-299	12 weeks
Standards Code	300 or more	16 weeks
Ontario		
Termination of	50-199	8 weeks
Employment Regulation	200-499	12 weeks
pursuant to The	500 or more	16 weeks
Employment Standards Act		
Quebec		
Manpower Vocational	10- 99	2 months
Training and	100-299	3 months
Qualification Act	300 or more	4 months

APPENDIX A

PLEASE COMPLETE AND RETURN TO:

DR. STEPHEN G. PEITCHINIS,
DEPARTMENT OF ECONOMICS,
THE UNIVERSITY OF CALGARY,
CALGARY, ALBERTA.
T2N 1N4.

QUESTIONNAIRE

EFFECTS OF TECHNOLOGICAL CHANGES ON EMPLOYMENT

NOTE: 1. Our objective is to determine (a) the effect of technological changes on jobs, (b) the nature of accommodative arrangements that are made in relation to the workers who performed those jobs, and (c) the extent to which technological changes have created new jobs.

2. Technological change is defined to include new and modified production techniques and processes, new methods of materials handling, the use of new and substitute products and services, new and more efficient information handling systems, and generally the mechanization and instrumentation of activities previously performed in whole or in part by workers.

Question 1. How many jobs have disappeared as a result of the technological changes introduced in the past ten years in the establishment(s) over which your union local has jurisdiction.

(a) Total Number.....

Question 2. Please describe briefly the nature of the technological change(s) that caused the disappearance of those jobs.

Question 3. What happened to the workers who performed the jobs that disappeared?

(a) Were retrained for the new jobs that were created as a result of the technological change.

No.....

(b) Were given other jobs in the same establishment (with and without retraining).

No.....

(c) Were transferred to other jobs in other establishments (plants, warehouses, offices, etc.) of the same company.

No.....

(d) Were placed with other companies.

No.....

(e) Did not want other jobs with the company and quit.

No.....

(f) Were released from employment.

No.....

Question 4. In relation to those workers who were released from employment, why were they released?

(a) Other jobs were not available [ ].

(b) They could not be retrained for other jobs [ ]. Number (if available).....

(b) They did not have adequate education for retraining [ ]. Number (if available).....

(d) They were too old for retraining [ ].

(d) They did not want to be retrained for other jobs [ ]. Number (if available).....

(f) They did not want to move to another locality [ ]. Number (if available).....

(g) Other reasons (please list them).

Question 5. What kinds of arrangements exist between your organization and the establishments over which it has jurisdiction regarding the introduction of technological changes? (Notice, prior consultation, joint committees, participation in assessing potential manpower effects, etc).

Question 6. What kinds of arrangements exist between your organization and the establishments over which it has jurisdiction regarding workers who are adversely affected by technological changes?

Question 7. Please comment on the anticipated effects of future technological changes on employment in the establishments over which your organization has jurisdiction (if possible, please describe briefly the nature of the anticipated technological changes).

Question 8. Please comment on your organization's policies regarding technological changes.

Name: ..... Organization: .....

.....

.....

Address: .....

.....

THANK YOU FOR YOUR COOPERATION.

Industry, Trade and Commerce | Industrie et Commerce

TECHNOLOGICAL INNOVATION STUDIES PROGRAM

PROGRAMME DES ÉTUDES SUR LES INNOVATIONS TECHNIQUES

REPORTS/RAPPORTS

	AUTHOR(S)/AUTEUR(S)	UNIVERSITY/UNIVERSITÉ	REPORT TITLE/TITRE DE L'OUVRAGE
1.	I.A. Litvak C.J. Maule	Department of Economics, Carleton University.	Canadian Entrepreneurship: A Study of Small Newly Established Firms. (October 1971)
2.	Harold Crookell	School of Business Administration, University of Western Ontario.	The Transmission of Technology Across National Boundaries. (February 1973)
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7.	J.W.C. Tomlinson	Faculty of Commerce and Business Administration, University of British Colombia.	Foreign Trade and Investment Decisions of Canadian Companies. (March 1973)
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49. Ilan Vertinsky S.L. Schwartz	Faculty of Commerce and Business Administration, University of British Columbia.	Assessment of R&D Project Evaluation and Selection Procedures. (1977)
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54. J. Robidoux	Faculty of Administration, University of Sherbrooke.	Study of the Snowmobile Industry in Canada and the Role that Technological Innovation has Played in Its Economic Performance. (English summary only). Facteurs de Croissance de l'Indstrie Canadienne de la Motoneige (1959-1978).
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