

A Union Member's Perspective on Technological Change

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Résumé de l'article

Les changements technologiques ont eu des conséquences profondes sur la façon dont le travail s'effectue. Des emplois ont disparu ou se sont modifiés au fur et à mesure que les robots et les ordinateurs ont envahi les milieux de travail. La connaissance du métier et l'exercice du jugement ont perdu de l'importance dans de nombreux postes où l'on a vu graduellement s'implanter des technologies sophistiquées. Étant donné les conditions actuelles et la forte récession économique mondiale, que peut-il arriver aux travailleurs syndiqués face aux changements technologiques? Cet article traite des expériences récentes touchant de pareilles transformations dans l'industrie des télécommunications.

Les travailleurs syndiqués décèlent plusieurs aspects positifs dans les changements technologiques : élimination de plusieurs postes ennuyeux, augmentation de l'efficacité qu'offrent les technologies et la promesse d'une meilleure qualité de vie. D'autre part, ils s'inquiètent beaucoup de ce à quoi le travail ressemblera dans l'avenir et au sujet de la manière dont les syndiqués auront à y participer. Y trouveront-ils des emplois aussi valorisants que ceux qu'ils occupaient auparavant? Y aura-t-il assez d'ouvrage pour tout le monde?

La situation à la Compagnie de téléphone de la Colombie-Britannique illustre bien les conséquences humaines des changements technologiques. Beaucoup de transformations comportent un mouvement massif vers l'informatisation des services à la clientèle, des échanges électroniques, de la vérification et du contrôle centralisé, de l'assistance-client, de tableaux de distribution interurbains, de la tenue des dossiers, du service des renseignements, voir de fonctions comme la prévision et la programmation.

Les premières modifications

Jusqu'en 1980, les changements technologiques effectués ont été faciles à prévoir. La transition du standard électromécanique au nouveau système de contrôle électronique s'est faite graduellement. Ces nouveaux dispositifs furent ce qu'on peut appeler « la première vague » de changements technologiques dans l'entreprise. On a installé ces nouveaux mécanismes comme s'il s'agissait de pseudoprogrammes de recherche et de développement au cours de la décennie 1970-1980. On a mis en place des programmes d'entraînement et les employés chargés de donner les cours de formation furent recrutés dans les provinces de l'Est. La plupart du temps, on s'efforçait d'établir une certaine équivalence entre les qualifications et l'intérêt général d'une part, et l'ancienneté, d'autre part, même si la règle de l'ancienneté perdait de l'importance au fur et à mesure que les exigences du savoir technologique augmentaient. Les programmes de formation aux technologies nouvelles consistaient dans des cours de base et un enseignement plus avancé. Au départ, l'entraînement semblait motiver ceux qui y étaient engagés, les personnes se laient d'antité et commençaient à se regrouper entre elles. Avec le temps, les employés ont senti que les possibilités de formation étaient réservées aux favoris de la direction, à ce qu'on a convenu d'appeler des *company people*. On semblait préférer certains travailleurs à ceux qui avaient plus d'ancienneté. L'entraînement rigoureux et la durée du service dans l'entreprise devinrent les critères de promotion.

Au cours de la première phase de changements technologiques, il y eut un certain remaniement ordonné du personnel. Plusieurs employés, qui comptaient de nombreuses années d'ancienneté, choisirent d'accepter des postes dans les bureaux décentralisés de la firme où l'on maintenait encore l'ancien système de transmission mécanique des appels. Les plus vieux travailleurs se préparèrent à la retraite. On ressentait de la frustration et de l'amertume à cause de la discrimination dont les employés se rendaient compte. Dans l'ensemble, cependant, la première vague de changements technologiques sembla se réaliser sans trop de heurts.

La deuxième phase de transformations

La décennie 1980 a vu le nombre des appels se multiplier et leur acheminement est devenu plus compliqué alors que, de par le monde entier, le nombre des appareils augmentait de plus en plus. Le système des indicatifs régionaux devenait une réalité :

on utilisait le téléphone entre les réseaux d'ordinateurs et la commodité des télécommunications s'appropriait à remplacer la facturation et la correspondance. Le réseau des lignes d'appels et les dispositifs de facturation furent les premières technologies qu'on mit en place pour remplacer les anciens tableaux « 31 » où, dans chaque localité, les standardistes avaient à répondre à tous les appels de la région. Le service individualisé à la population fit place à un système où tous les appels pouvaient être acheminés à la première standardiste disponible travaillant dans l'entreprise. Les standardistes n'étaient donc plus nécessaires dans les villages desservis par la Compagnie, puisqu'il était possible d'acheminer les appels à partir d'un poste central. Celles-ci n'avaient plus à calculer la durée des appels interurbains non plus que les commis à en assurer le contrôle. Ce qui était autrefois l'aspect humain du travail de standardiste se résumait maintenant à des réponses chronométrées, répétitives, enregistrées. L'ordinateur enregistrait toutes les opérations, calculait la durée des appels et les temps libres de la standardiste (passage aux salles de toilette et pause café) et il permettait aussi à la surveillante d'écouter de quelle manière la standardiste répondait au public. Après l'implantation du système « TSPS », les ingénieurs et les préposés aux plans n'étaient plus nécessaires dans les régions. Les fonctions de préposés aux plans furent remplacées par des dispositifs graphiques relevant directement d'une programmation spéciale.

Au début de la décennie 1980, le nouveau standard de commutateurs électroniques franchit le stade de la recherche et de la mise au point. En même temps, la centralisation devint un élément principal de la stratégie générale de l'entreprise. En 1981, elle s'étendit dans la centralisation des services des dossiers, de la facturation et de la vérification dans le nouveau système TSPS, ce qui eut pour effet d'éliminer de nombreux postes nécessaires à la facturation manuelle des appels ainsi qu'à la localisation des pannes. On démantela les dispositifs essentiels à la vérification à des postes centralisés et modernisés de façon qu'ils puissent fonctionner à partir de l'ordinateur central. Il en fut de même en ce qui concernait le couplage des câbles et les pannes rapportées par les abonnés. Cela permit de couvrir toutes les difficultés à partir d'un endroit central désigné sous le nom de Centre de contrôle régional du réseau (Regional Network Control Centre).

Plutôt que de fabriquer elle-même comme auparavant les pièces des dispositifs de téléphone, l'entreprise commença à les acheter. Comme l'usage d'un commutateur exige qu'on assemble en un tout ces pièces, les qualifications, le travail manuel et l'expertise de production de ces commutateurs ont disparu. De même, la vérification normale, l'ajustement, la réparation et le remplacement de ces accessoires furent presque totalement éliminés.

La résultante de ces changements a donné lieu à la création d'un nouveau type « d'employé du téléphone », c'est-à-dire d'un spécialiste très formé qui supervise un réseau de nombreux bureaux interreliés au moyen d'un ordinateur digital en fibre optique et à une programmation à action conjuguée. Le personnel d'entretien du bureau principal a fait graduellement place à des spécialistes qui adaptent la programmation aux exigences de l'entreprise.

Un certain nombre de conséquences incroyables résultent des transformations précédentes. Les effets les plus graves, en ce qui a trait au personnel, consistent dans des réductions considérables de la durée du travail nécessaire à l'installation, à l'entretien et à la réparation de l'équipement. Les prévisions indiquent que ces transformations seront plutôt légères si on les compare aux changements et aux chambardements de la prochaine décennie. Le personnel, qui est de 11 700 employés serait ramené à 6 000 environ entre 1995 et l'an deux mille. Présentement, 900 personnes s'occupent à l'installation, à la surveillance et à la réparation du réseau des communications.

Selon les prévisions, il n'y aura plus que 220 préposés à l'entretien, soit une diminution de 76 % de la main-d'œuvre actuelle. L'entreprise a encouragé les employés de 55 ans et plus, qui avaient 25 ans de service, à prendre leur retraite. Plusieurs postes — presque 200 depuis 1985 — n'ont pas été comblés. Les employés sélectionnés sont formés à travailler avec les nouveaux équipements. On a recyclé plusieurs jeunes travailleurs et ils occupent des emplois attrayants pour les salariés plus âgés. Un grand nombre de ces derniers, qui avaient de l'ancienneté, n'ont pas reçu la formation requise par la nouvelle technologie. On les a réaffectés à des postes subalternes où les personnes travaillent dans des classes qu'ils n'apprécient guère, et cela uniquement pour avoir un emploi et conserver leurs revenus.

Les perspectives du syndicat pour l'avenir

Quel rôle les syndicats peuvent-ils jouer face aux changements technologiques? Le présent article exprime le point de vue d'un syndique sur quelques-unes des questions clés qu'il faudra considérer dans les négociations avec la direction. Ce sont les suivantes : devons-nous accepter ou rejeter les changements technologiques? Dans quelle mesure nos emplois, les programmes de participation des employés, la formation et l'entraînement du personnel, de même que les conventions collectives devront-ils être modifiés?

Notre syndicat est sérieusement handicapé dans les discussions sur les changements technologiques. Nous avons accepté le fait qu'ils sont là et que ceci peut possiblement mettre en danger la survie de notre association aussi bien que la qualité de vie des employés au travail. Malheureusement, nous nous retrouvons dans un rôle de défenseur sans être capable de se garantir que nous pourrions réaliser nos aspirations. Nous avons pas la même facilité que l'employeur d'obtenir les connaissances, les budgets et les autres instruments requis pour atteindre nos objectifs. Les syndicats disposent, toutefois, de certains moyens qui peuvent accroître leur capacité d'influer sur le déroulement des changements technologiques. Nos membres veulent suggérer un triple rôle au syndicat : (1) un rôle de recherche qui aiderait à découvrir les changements technologiques les plus appropriés pour assurer la survie et le renforcement de l'organisation; (2) un rôle de soutien qui garantirait l'intégrité de nos conventions collectives; (3) un rôle d'information qui aiderait nos membres à comprendre les conséquences pour leur avenir de toutes ces transformations.

A Union Member's Perspective on Technological Change

**Barton Cunningham
and
Dennis Hull**

After having defined some of concerns union members have with technological change, this paper outlines the recent history of such changes in the telecommunications industry before offering a viewpoint on future responses to the issue.

Technological changes are having profound effects on the way work is carried out. Jobs are being eliminated or changed as robots and computers enter the workplace in increasing numbers. Individual craftsmanship and judgement are becoming less important in many jobs where it has been possible to introduce sophisticated technologies. Given these current conditions and the general world wide economic recession, what are the likely prospects for union members facing technological changes?

This paper¹ first defines some of concerns union members have with technological change. It then outlines the recent history of technological change in the telecommunications industry before offering a viewpoint on future union responses to the issue. This discussion is based on recent experiences with technological change in the telecommunications industry².

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1 Bart CUNNINGHAM assisted in writing this paper. The views are those of Denis HULL, who has a long history with unions.

2 Other reports describe other phases of the research.

TECHNOLOGICAL CHANGE: PROBLEMS AND PROSPECTS

It does not take a critical imagination to detect the flaws and problems that might occur when technological changes are introduced. Common difficulties have included:

- The implementation of technological changes has, in many cases, given rise to difficulties. Frequently, such changes are introduced with a clarification of new work roles, and without any idea of how well integrate with the organization's past methods and procedures;
- Many technological changes challenge employees' career goals and work values, demanding that they assess themselves, their capabilities, and their relationship to their jobs, families, and communities. Employees often resist training which requires them to confront their values, and employers have a difficulty in justifying its time and expense;
- Technological changes have not always been implemented within a «genuine regard» for the quality of the work environment, but have instead been used as a mechanism for reducing the workforce, undercutting the role of the union, and reducing interplay between management and union;
- Many technological innovations are often regarded as unclear, ambiguous, ill-defined, and lacking an agenda for assisting employees or managers to respond to their organizational needs or requirements;
- New technologies often have not been designed to take into account the social requirements of those who will operate or interact with them. Usually, once the technical design is completed, it is too costly to make adjustments for group or individual needs;
- Workers have not always accepted the value of technology, which they feel reduces their discretion and moves them toward the world typified by Orwell's 1984;
- Advocates of technological change have attempted to demonstrate that efficiency and productivity in the organization will improve. However, evidence of the social costs of new technologies are often not entered into the calculation;
- The promise of future jobs in the world of higher technology does not appear realistic when workers are faced with immediate layoffs.

Union members are not blind to the beneficial effects of new technologies. Indeed, their own experiences often includes the application of useful innovations. Bank tellers, accountants, secretaries, managers, pilots, researchers, and ticket agents are all experiencing the impacts of

more automated data processing equipment. Even welders, machine operators, fishermen, laborers and assembly-line workers are spending more time operating machines which increase the reliability and quality of their work.

Car assembly-lines, saw mills, oil refineries, fertilizer plants, and many other processes are becoming so automated that much of the work we once defined as demeaning and degrading is being eliminated. Many workers no longer have to sit by machines performing repetitive and thoughtless mechanical tasks. Microelectronics and other new technologies may allow some workers to contribute to organizations in more creative ways, such as in the planning, design, and marketing of products and services³.

Technology may provide workers with a new sense of prosperity, so that they can more fully enjoy personal life goals⁴. Psycho-historians like Kenneth Keniston describe an evolving style of life where there is a rejection of conditions interfering «with people being people»⁵. Individuals as a result, seem to be showing a greater concern for matters such as personal health, stress, personal development, and finding interesting and challenging work. Having a job may no longer be as morally important as it once was;⁶ union workers may now be more concerned about how work affects their life goals.

There is, however, a sobering history of horror stories about technological change in many organizations.

Unions members are facing difficult personal choices in the face of technological change. Clearly, companies have a need to introduce technological change, because of the lure of incentives provided by government, new regulations, the drive for profits, and, in these case of communications, the competitive pressure to stay even with improvements in the industry. This has propelled demands to further divide and specialize work processes, and to achieve economies through centralization and related volume processing. The drudgery of doing demeaning work in large mechanized machine shops may be giving way to «high tech» drudgery — typing in front of computer terminals, operating key punch machines, and assembling prefabricated parts. New technologies may eliminate many arduous, boring, and repetitive jobs, but may create others.

³ Many jobs will still exist in their traditional forms, especially in the service and small business economy — carpenters, plumbers, gardeners, tourist services, and so on — although new technologies will make them easier to perform.

⁴ Adriano TILGHER, *Work: What it has Meant to Men Through the Ages*, (trans. by Dorothy C. Fisher), New York, Harcourt Brace and World, 1930.

⁵ Kenneth KENISTON, *The Uncommitted*, New York, Dell Publishing, 1960.

⁶ Max WEBER, *The Protestant Ethic and the Spirit of Capitalism*, (translated by T. Parsons), New York, Scribner, 1930.

Over the last few years, numerous factories have closed and employees have been laid off as a direct result of corporate takeovers. In Canada, families such as the Reichmanns, Blacks, Belzbergs, and Bronfmans have drawn national attention to the corporate concentrations they are creating. In the United States, more than sixty well known U.S. corporations — like Gulf Oil, Nabisco, TWA, ABC — have disappeared from the Fortune 500 list since 1980, swallowed up by other companies.

Taking over a rival company offers a number of benefits, including reduced competition. Those supporting such moves argue that large companies are necessary to compete successfully with foreign challengers. Critics often point to the inevitable social fall-out of mergers and shut-downs. There are indications that the number of jobs available to the labour force will continue to be inadequate and the resulting high levels of unemployment will become a norm⁷. Robotics and automation have already taking their toll on jobs. Unemployment has become particularly noticeable among young persons, nearly 20 percent of whom are unemployed⁸. Full-time employment may no longer be a possibility for many of those entering the work-force⁹. There also seems to be a trend which is reshaping the membership of the union, as part-time work is becoming more prominent¹⁰.

One Canadian government study¹¹ suggests that new technologies will not create enough jobs to replace those that evaporate. In addition, an estimated two million more people will need and want to work in 1991. Moreover, the new technologies, such as microelectronics, use not only less

7 Canadian Press reported (August 28, 1985) that according to a management consultant report, employment in the auto industry will decline more than 25 per cent by 1990, and production costs must drop by a similar percentage if the industry is to remain competitive.

8 An unpublished and unofficial study by Statistics Canada shows that unemployment may reach 15 per cent by the late 1980s and go up to 20 per cent by the end of the century, even assuming reasonable economic growth. See Richard GWYN, «Our Children may Become a Lost Generation», *Times-Colonist*, April 10, 1983.

9 We can either spread the available work around, or those of us who are employed full-time can in effect «buy off» the unemployed with charity. One study, by Paul Grayson of York University, surveyed 310 employees who lost their jobs when the Swedish ball-bearing manufacturer, SKF, closed its plant in Toronto in 1981. The productin workers had a real pride, a true sense of craftsmanship about what they did. Now they have been left with no sense of selfworth. The most troubling effect is the «dulled acceptance» on the part of the unemployed. The employed accept it, as they seem to benefit from the plight of the unemployed. Personal services, such as a handyman, baby-sitters, house cleaners, become cheaper as do many goods and services.

10 William SERRIN, «Part-time: An Economic Boon — and a Labor Threat», *Times-Colonist*, July 21, 1986, p. A9, (Article originally appeared in *New York Times*).

11 The study, done for Economic Development Minister Donald Johnston, predicts that one-quarter of the jobs in business and financial services will be eliminated by the end of the decade.

labour but less capital equipment. A word processor, for instance, does not require large quantities of steel and machinery. The jobs lost when word processors are introduced — may not be replaced by other jobs in developing or producing new technologies in the machinery, steel or aluminum industries¹².

In summary, union members see several positive aspects of technological changes — the elimination of many boring jobs, the efficiencies offered by technologies, and the promise of a higher quality of life. On the other hand, they have serious concerns about what work will be like and what they will contribute. Will we find that new jobs are as demeaning as those which existed before? Will there be enough work to go around?

THE NEW TECHNOLOGIES AT B.C. TEL

B.C. Telephones (B.C. Tel) provides an illustration of technological change and its human consequences. Many of the specific changes are part of a more massive movement to computerization encompassing: customer services, electronic exchanges and centralized monitoring and control, directory assistance and long-distance switchboards, record keeping, and information-management functions such as forecasting and scheduling. In addition, B.C. Tel has continued to centralize its operations geographically.

The technological changes at B.C. Tel entail the introduction of common digital language and a centralized computer to replace manual record keeping systems. This digital language operates in the same way as the ASCII language operates for a computer system; however, it is specially designed for the telephone system. The change from analogue transmission to digital language will mean that large amounts of data will be handled by smaller scale, but more efficient digital equipment. Eventually, international T.V. programs will be transmitted in a standardized digital format. Digital transmission formats are almost completely universal (i.e. the ASCII system is considered to be the standard for computer information transmission). The digital language transmission media will also enhance the degree of security of these systems, as it is much easier to scramble digital than analogue signals.

Three groups of technologies stand out as key components of B.C. Tel's computerization strategy: (1) a digital switching system, (2) a com-

¹² Thomas WALKOM, «Technology will Cost Up to 2 Million Jobs, Report says», *Globe and Mail*, Wednesday, May 4, 1983, p. 1.

puterized records system, and a (3) computerized calling and billing system¹³. These new technologies are having a variety of effects on union members.

The digital switching system is an electronic stored program digital switch produced by General Telephone and Electronics, the parent company of B.C. Tel. This switch differs from the previous generation of electronic switches by its ability to accept standard format pulse code modulation at the rate of 1,544 megabits per second directly and switching the bits on an individual basis to specified paths or destinations. It is also one of the first switches to make use of a multi-layer system of large scale integrated circuitry controlled by sixteen bit microprocessors.

The system converts the caller's voice into discrete eight bit digital words and connects them to the number called; the system also transmits these eight bit words into an analog wave shape which the receiving subscriber recognizes as a human voice. Signalling by tones through the use of a touch call pad or pulses via the telephone dial are also converted into digital signals for determining the call's ultimate destination.

The system is fast and efficient and provides new standards of excellence of transmission quality to the telephone industry. It is easily interfaced with other systems and ideally suited for Fibre Optics Transmission. Central office maintenance-people monitor and control the system. They may be situated with the switch or may control it via remote systems from any control centre.

A computerized record system consists of a computer drive device¹⁴ which keeps track of subscribers' lines, numbers, and type of service supplied. It was devised to keep track of all the physical connections and customers records¹⁵. The ultimate goal is to be able to process telephone orders so that the customer can have his/her new phone service immediately upon request.

*A calling and billing system*¹⁶ staffed by the telephone operators is used as an interface whenever an operator is required to assist on the call. Normally, calls made from station-to-station are automatically billed under the automatic number identification and toll ticketing system. Should a caller

13 The digital switching system is the GTD-5 system; the records system is made up of three technologies — FMS, MAIS, & CRIS; the calling and billing system uses the TSPS and ACCS technologies.

14 MAIS (Mechanized Accounting Inventory System).

15 CRIS (Customer Record Information System); FMS (Facility Management System), will eventually eliminate the MAIS and CRIS systems.

16 TSPS (Traffic Service Position System).

wish to make a collect call or bill a third party, the prefix number alerts the TSPS operator. He/she responds to the call with an interactive device and records the information which is then tagged to the call in the toll ticketing phase of the call.

The calling habits of travelling business person has created a credit card system¹⁷ allowing the caller to touch-tone his/her credit card numbers in placing a call. This feature does not require the assistance of an operator.

THE UNION EXPERIENCE WITH TECHNOLOGICAL CHANGE

The First Wave. Until 1980, technological change at the telephone company has been fairly predictable. The transition from electro-mechanical switching to the newer electronic stored program controlling has been gradual. Newer machines — the IEAX and the 2EAX — can be characterized as the «first wave» of technological change in the company¹⁸. New machines were initially installed as pseudo-research and development projects in the 1970-1980 time period. Training programs were established and employees were recruited for training courses in Eastern Canada. Aptitude and general interest seemed to be balanced with seniority during much of this time, although seniority decreased in importance as higher levels of technology were expanded.

The training programs for the new technologies consisted of basic and advanced courses. Initially, the training seemed to motivate those involved; individuals developed friendships and began to associate together. Over time, employees felt that the training opportunities were restricted to management «favorites» or «company» people. Certain employees seemed to be picked over those with more seniority. Rigorous training and long-term use to the company were becoming the criteria for promotion.

Under the first wave of technological change, there had been a somewhat orderly rearrangement of staff. Several employees with a number of years of seniority chose to take jobs in the decentralized offices of the company which still maintained the old mechanical switching systems¹⁹. Older employees prepared for early retirement. Some frustration or bitterness occurred because of the perceived discrimination. On the whole, however, the first wave of technological change seemed to pass smoothly.

¹⁷ ACCS (Automatic Charge Card System).

¹⁸ These machines are part of the ESPC system (Electronically Stored Program Control). They use software to assist the mechanical switching.

¹⁹ These jobs were highly desirable as the general pace of office was slower and there tended to be less supervision.

The Second Wave. The 1980's have seen increased traffic and more complex routing, as more telephones are installed throughout the world. A world area code system was becoming a reality, telephones were being used for computer networking, and telecommunications facilities were promising to replace billing and letter writing.

The calling and billing system²⁰ was one of the first major technologies introduced to replace the older «31» boards²¹ where operators in each community would respond to all area calls. The individualized service to the community gave way to a system where all calls could be routed to the first available operator in the B.C. Tel system. Operators were no longer needed in the communities served by the company, as calls could be more centrally dispatched. Operators no longer timed long distance calls, and clerks were no longer needed to tally them²². What was once the human side of the operator's work was being reduced to a timed, rehearsed, and monitored response. The computer recorded all transactions, monitored the time of each call and the operator's down-time (for visits to the bathroom, coffee breaks, etc.), and allowed the supervisor to listen in on how the operator responded to the public. After the TSPS system became operational, engineers and drafts-people were no long needed in area locations²³. Drafting functions were being replaced by XY plotting devices directly driven by special software.

Beginning in the early 1980's the new standard of electronic switches entered the research and development stage. Parallel to this development, centralization seemed to becoming a key facet of the telephone company's overall strategy. Commencing in 1981, the company started to centralize its records, billing, and testing. The records and billing system for subscribers was hooked into the TSPS system, eliminating the vast record keeping functions required for manually billing a call or locating a problem. Testing facilities were moved to central locations and updated to operate with the central computer. Records of cable pairs and subscribers lines and a trouble reporting system were now operated through the central computer. This made it possible to monitor all problems from a central location called the Regional Network Control Centre (RNCC).

The company became a purchaser of the telephone system parts rather than a developer. Physical set-up of a switch involves snapping together preassembled, connectorized, functional blocks. The skills, manual labour,

²⁰ TSPS

²¹ With the «31» board, telephone operators manipulated cords and plugs to make long distance calls.

²² The operator work-force in Victoria could be reduced to 60 from 160.

²³ Initially, this staff was instrumental in assisting to implement the new technology.

and artistry of switch creation disappeared. The routine testing, adjusting, and parts repair and replacement, so vital to earlier generations of switches, was almost totally eliminated.

One common feature of these changes is the creation of a new form of «telephone person». He/she is a highly trained specialist who monitors a network of numerous offices interconnected by digital carrier equipment on fibre optic cable and interactive software programming. The central office maintenance staff is gradually disappearing, and replaced by software specialists who adapt software to the company's unique requirements.

There are some possible drastic effects resulting from the above changes. The most critical effects, from the standpoint of the B.C. Tel work force, are reductions made possible in the work time needed to install, maintain, and repair the equipment. Forecasts indicate that these transformations will be rather mild, in comparison with the next decade's changes and disruptions. The 11,700 people employed in the system could be reduced to approximately 6,000 by 1995-2000²⁴. Presently, about 900 workers carry out the work of installing, patrolling, and repairing the B.C. Tel switch system. Forecasts indicate that the system will need only 220 maintenance people, a reduction of 76% of the present work-force²⁵.

The company has been encouraging employees who are over 55, and have 25 years of service, to retire. Several positions — nearly 200, since 1985 — have not been filled. Selected employees are being trained to work with the new equipment. Several junior employees have been retrained, and are working in areas considered desirable by senior employees. A large number of older employees with seniority are not being trained for the new technology, and have been relegated to inferior positions, or are working in undesirable classifications just to hold a job and maintain their income.

Morale seems to be rather low among the group of employees who are too young to retire. They tend to be disappointed in their union for not enforcing the seniority clauses and bumping rights. They feel frustrated with management; they feel they have given their life to a company that has now betrayed them. These frustrations are expressed in some of the following statements:

I used to come home and have a drink to toast a job well done; now, I come home to have a drink so I can better cope with the day I have just finished.

The job is thankless, boring, valueless; I hate it... Where is there to go?

²⁴ J.C. TOOLEY, «Network Operations Five-Year Plan 1982-1986, Okanagan Division».

²⁵ A guide for costing the labour requirements for the company, «Manpower Requirements for the GTD-5» provides this data.

I am really confused about some of the new technologies they are introducing. I feel that the company is only training the people who were sympathetic to the company cause.

Generally, the impact of these introductions has required that workers transfer to new jobs and locations, learn new skills, and carry out more specialized work. However, the depressed economy of British Columbia has created a large disparity between prices in Victoria and Vancouver, where most workers whose jobs have disappeared have been forced to move, and those in outlying rural areas. Workers have expressed considerable anxiety about impending transfers.

It is just not possible to sell our house. I would have to sell at a loss.

The moves they are planning are part of a cold, calculated strategy to get rid of as many employees as possible.

A move to a new location may not be so bad, but what if they ask me to move again, and again?

Some expressed dismay about the financial losses they were facing.

We have worked our asses off for 12 years to buy a trailer and a lot to sit it on; it's all we have... it's worth nothing if we have to move... I feel like I've worked myself into a corner and there is no way out.

Union and management behavior during this period of technological change has been rather tentative. Both union and management have been unable to develop a general policy or plan about how technologies would be implemented. It appeared that both sides were afraid to commit themselves. While they met to deal with specific problems — job relocation, layoffs, and other contract issues — neither side was willing to develop a joint policy or set of principles for dealing with technological change. As a result, the membership really had no formal understanding of the potential impact of technological change. Rumors persisted to fill the void.

For most employees, the insecurity of their job's future was worse than the actual fate. As one employee stated:

It would be a lot easier if we only knew when we would lose our jobs, and where we were going to be relocated to... I wish the company would only tell us what jobs were going to change, and where and when they were to be changed.

The union appeared to be unclear about its own definition of seniority and where it should apply. Individual union locals were simply instructed to strike the best possible deal regarding personnel problems such as transfers, reclassifications, and the like. Seniority, in several cases, seemed to be compromised at the local level, because union leaders accepted that certain

employees did not have the required skills and abilities. This has never been formally accepted by the union's leadership nor by the membership. In fact, many personnel tradeoffs between company and union were carried out at local levels. However, the official company and union bargaining teams, in the most recent round of negotiations, did not admit that several local deals were being struck. Union locals, faced with the difficulty of apply general principles to particular cases, seemed to be more willing to admit that technological change was inevitable.

A UNION PERSPECTIVE ON FUTURE RESPONSES TO TECHNOLOGICAL CHANGE

What role can unions play in responding to technological change²⁶? Generally, few unions have had a significant direct impact on how technological change is introduced²⁷. Before unions can begin to develop their capacity to play a more active role in the technological change process, it will be necessary to come to terms with a number of crucial issues. The following discussion offers one union member's viewpoint on some of the key issues we face: whether we should accept or reject technological change; how our conception of our jobs will change; employee participation programs; employee education and training; and collective agreements.

Acceptance of New Technologies? Blindly accepting the touted benefits of new technologies will probably be as damaging to the organization's long-term survival as it is to the union's membership. A more constructive posture involve unions assisting in understanding how technological changes might be designed to improve the quality of our work lives, as well as offering greater economic productivity. In this role, unions can be a useful force, particularly in acting as a counterweight to those who believe that all technological changes will always offer greater productivity. Technological changes are not magical solutions to the problem of improving productivity, and many so called ventures have had to be terminated because they did not respond to the organization's needs, or provoked employee resistance.

²⁶ See Stephen G. PEITCHINIS, «The Attitude of Trade Unions Towards Technological Changes», *Relations Industrielles*, Vol. 38, no 1, 1983, pp. 104-119. This research suggests that labour unions have had little impact on the introduction of technological changes, have not provided the degree of employment security members assumed, and have not been successful in developing collective agreements which respond to technological change.

²⁷ See Elaine BERNARD, *The Long Distance Feeling: A History of the Telecommunications Workers Union*, Vancouver, New Star Books, 1982.

The union role could be one of assuring that technological changes respond to organizational and human needs for improving performance, and that employees — managers and union-members — have the capability to make the new technology work. This role requires unions to define the needs for new technologies, rather than being surprised by managerial initiatives. Thus, the policy regarding the acceptance or rejection of new technologies will undoubtedly depend on union problem-solving and research, and the implicit assumption that change «could» provide many opportunities for the organization and the membership.

Our Conceptions of a Job. The traditional union conception of a job might need to change. Those who do not work full time, because of choice or inability, have never really been thought of as full union members. This may change in light of recent trends. Countless employees have lost jobs, many younger workers have never had a full time job, and part-time and contract work now represents a larger percentage of the work force²⁸.

Because of technological change, unions may be forced to rethink or redefine work, using non-traditional concepts of work hours, days, schedules, time off, and performance. We may be forced to think about work sharing or group output, where a task is assigned to a group that is directly responsible for the research and development. Unions can also assist part-time workers to establish adequate benefits and standards of employment. There may be a need for both unions and management to redefine «jobs» in a more realistic up-to-date statement, so that classifications and job evaluations can be refined.

Employee participation programs have normally been a safe venture for managers, who have enjoyed certain advantages — in education, position, power, and wealth. One startling development is that employees are gaining in influence, because of the sophisticated knowledge required to operate new technologies. Computer systems, for example, are very exacting in their input and output, and thus provide a certain amount of influence to those who program them, regardless of how user-friendly the equipment is. It takes a great deal of time and skill to become completely proficient in the operation of any one machine or program, regardless of how simply it is laid out. The sheer size and complexity of today's systems are overwhelming for most people, and it is therefore not logical to expect that managers can know everything. Lower level employees are now required to operate most of our sophisticated computer interface devices.

²⁸ William SERRIN, «Part-time: An Economic Boon — and a Labor Threat», *Times-Colonist*, July 21, 1986, p. A9, (Article originally appeared in *New York Times*).

Many managerial employees are now realizing that their power is being eroded, and that they must rely on union members input and involvement. Employee participation programs might have been a good idea in the past to increase morale, improve the level of understanding, and the like. It is no longer a good idea, *per se*; rather, genuine participation programs will become more and more essential to good management.

Managerial methods will undoubtedly change as organizations adopt new technologies, just as unions are adapting their methods. The need for managers could decrease drastically, as workers take on the role of operating organizations.

Employee education is going to become increasingly essential for organizations that adopt sophisticated technologies. While university and college education may be an important background for many employees, organizationally specific training and development activities will play a key role in the introduction and operation of new technologies. A crucial component of such training is the need to understand long-term employee career aspirations and capabilities. Employee training and development is an evolutionary process, of constantly upgrading employees so that future technological changes will not be so harshly felt. In this regard, union leaders might take on a more proactive role.

Collective agreements in the past have been an indication of the financial health of the organization and the availability of funds improving the union management contract. In the last few years, compensation packages and employee benefits packages have decreased as organizational profits have declined, especially in British Columbia. To this end, future employee settlements may be as lean as they have been during the last few years. This future is most insecure as unions face new labour legislation and political parties seek ways to neutralize the labour movement.

Collective agreements will always be the «foundation» to guide union leaders and managers, and it would seem appropriate that union values with respect to technological change be incorporated in them. Future collective agreements must pay more attention to the financial health of the organization. However, in anticipating the future implications of new technologies, agreements also need to deal with more basic issues outlined in this paper — training and education needs, employee participation, job definitions, and the union's role of assisting in assessing the implications of technological changes.

THE STEPS AHEAD

Our union has been severely handicapped in discussions on technological change. We have accepted the fact, the technological change is occurring, and can potentially enhance our organization's ability to survive, as well as the quality of working life of our members. However, we are in the defender's role, without any power to guarantee that our ideals can be implemented. We do not have power that managers derive from information, budgets, and the like.

There are, however, certain ways that unions might increase their ability to influence the process of technological change. Our union members seem to be suggesting that our union should perform three roles: (1) A research role would help identify the technological changes which are more the most appropriate for organizational growth and survival; (2) A maintenance role would assure the integrity of our collective agreements; (3) A communication role would assist members in understanding the implications of technological change.

1. Unions should take a more active role in investigating the types of technological changes which might be appropriate for their organizations. This research role suggests that unions should be able to understand the potential social costs of new technologies, long before they are defined for them by management. This involves understanding the needs of the members — their career aspirations, their values, their capabilities. Technological change has different effects on different occupational groups, and there is the need to take this into account²⁹.

2. Only the collective agreement can effectively guarantee that employees and their unions will wield some influence in the technological change process. Unions should strive to ensure that collective agreements reflect the expectations of their members and officials. In particular, agreements should spell out the union's role and responsibilities in such matters as the implementation of change, training, job design, research, and job security. These philosophical issues are very basic and important to the employee's perception of his/her union. Unions must recognize that their collective agreements need to articulate the personal feelings of the membership.

3. The communication role is needed to deal with the many rumors and fears which surface during a period of change. This should not mean

²⁹ See Heather MENZIES, *Women and the Chip*, The Institute for Research on Public Policy, 1981, and Gordon BETCHERMAN and Kathryn MCMULLAN, *Working with Technology: A Survey of Automation in Canada*, Economic Council of Canada, 1986.

simply more newsletters and formal membership meetings. Rather, it should mean more information sessions which allow members to express their views in small groups, or union sponsored seminars on issues related to the collective agreement.

These general roles are intertwined. They encourage us to improve our understanding of the membership's needs, define our policies and practises in the collective agreement, and communicate to the membership to gain commitment. If we are effective in doing this, we may be more representative of their membership, and will have their loyalty and respect. If we fail to do this, unions will continue to get caught in solutions where one group triumphs at the expense of the other.

Le point de vue d'un syndiqué sur les changements technologiques

Les changements technologiques ont eu des conséquences profondes sur la façon dont le travail s'effectue. Des emplois ont disparu ou se sont modifiés au fur et à mesure que les robots et les ordinateurs ont envahi les milieux de travail. La connaissance du métier et l'exercice du jugement ont perdu de l'importance dans de nombreux postes où l'on a vu graduellement s'implanter des technologies sophistiquées. Étant donné les conditions actuelles et la forte récession économique mondiale, que peut-il arriver aux travailleurs syndiqués face aux changements technologiques? Cet article traite des expériences récentes touchant de pareilles transformations dans l'industrie des télécommunications.

Les travailleurs syndiqués décèlent plusieurs aspects positifs dans les changements technologiques: élimination de plusieurs postes ennuyeux, augmentation de l'efficacité qu'offrent les technologies et la promesse d'une meilleure qualité de vie. D'autre part, ils s'inquiètent beaucoup de ce à quoi le travail ressemblera dans l'avenir et au sujet de la manière dont les syndiqués auront à y participer. Y trouveront-ils des emplois aussi valorisants que ceux qu'ils occupaient auparavant? Y aura-t-il assez d'ouvrage pour tout le monde?

La situation à la Compagnie de téléphone de la Colombie-Britannique illustre bien les conséquences humaines des changements technologiques. Beaucoup de transformations comportent un mouvement massif vers l'informatisation des services à la clientèle, des échanges électroniques, de la vérification et du contrôle centralisé, de l'assistance-annuaire, des tableaux de distribution interurbains, de la tenue des dossiers, du service des renseignements, voir de fonctions comme la prévision et la programmation.

Les premières modifications

Jusqu'en 1980, les changements technologiques effectués ont été faciles à prévoir. La transition du standard électro-mécanique au nouveau système de contrôle électronique s'est faite graduellement. Ces nouveaux dispositifs furent ce qu'on peut appeler «la première vague» de changements technologiques dans l'entreprise. On a installé ces nouveaux mécanismes comme s'il s'agissait de pseudo-programmes de recherche et de développement au cours de la décennie 1970-1980. On a mis en place des programmes d'entraînement et les employés chargés de donner les cours de formation furent recrutés dans les provinces de l'Est. La plupart du temps, on s'efforçait d'établir une certaine équivalence entre les qualifications et l'intérêt général d'une part, et l'ancienneté, d'autre part, même si la règle de l'ancienneté perdait de l'importance au fur et à mesure que les exigences du savoir technologique augmentaient.

Les programmes de formation aux technologies nouvelles consistaient dans des cours de base et un enseignement plus avancé. Au départ, l'entraînement semblait motiver ceux qui y étaient engagés; les personnes se liaient d'amitié et commençaient à se regrouper entre elles. Avec le temps, les employés ont senti que les possibilités de formation étaient réservées aux favoris de la direction, à ce qu'on a convenu d'appeler des *company people*. On semblait préférer certains travailleurs à ceux qui avaient plus d'ancienneté. L'entraînement rigoureux et la durée du service dans l'entreprise devinrent les critères de promotion.

Au cours de la première phase de changements technologiques, il y eut un certain remaniement ordonné du personnel. Plusieurs employés, qui comptaient de nombreuses années d'ancienneté, choisirent d'accepter des postes dans les bureaux décentralisés de la firme où l'on maintenait encore l'ancien système de transmission mécanique des appels. Les plus vieux travailleurs se préparaient à la pré-retraite. On ressentait de la frustration et de l'amertume à cause de la discrimination dont les employés se rendaient compte. Dans l'ensemble, cependant, la première vague de changements technologiques sembla se réaliser sans trop de heurts.

La deuxième phase de transformations

La décennie 1980 a vu le nombre des appels se multiplier et leur acheminement est devenu plus compliqué alors que, de par le monde entier, le nombre des appareils augmentait de plus en plus. Le système des indicatifs régionaux devenait une réalité: on utilisait le téléphone entre les réseaux d'ordinateurs et la commodité des télécommunications s'apprêtait à remplacer la facturation et la correspondance.

Le réseau des lignes d'appels et les dispositifs de facturation furent les premières technologies qu'on mit en place pour remplacer les anciens tableaux «31» où, dans chaque localité, les standardistes avaient à répondre à tous les appels de la région. Le service individualisé à la population fit place à un système où tous les appels pouvaient être acheminés à la première standardiste disponible travaillant dans

l'entreprise. Les standardistes n'étaient donc plus nécessaires dans les villages desservis par la Compagnie, puisqu'il était possible d'acheminer les appels à partir d'un poste central. Celles-ci n'avaient plus à calculer la durée des appels interurbains non plus que les commis à en assurer le contrôle. Ce qui était autrefois l'aspect humain du travail de standardiste se résume maintenant à des réponses chronométrées, répétitives, enregistrées. L'ordinateur enregistrait toutes les opérations, calculait la durée des appels et les temps libres de la standardiste (passage aux salles de toilette et pause café) et il permettait aussi à la surveillante d'écouter de quelle manière la standardiste répondait au public. Après l'implantation du système «TSPS», les ingénieurs et les préposés aux plans n'étaient plus nécessaires dans les régions. Les fonctions de préposés aux plans furent remplacées par des dispositifs graphiques relevant directement d'une programmation spéciale.

Au début de la décennie 1980, le nouveau standard de commutateurs électroniques franchit le stade de la recherche et de la mise au point. En même temps, la centralisation devint un élément principal de la stratégie générale de l'entreprise. En 1981, elle s'engagea dans la centralisation des services des dossiers, de la facturation et de la vérification dans le nouveau système TSPS, ce qui eut pour effet d'éliminer de nombreux postes nécessaires à la facturation manuelle des appels ainsi qu'à la localisation des pannes. On déménagea les dispositifs essentiels à la vérification à des postes centralisés et modernisés de façon qu'ils puissent fonctionner à partir de l'ordinateur central. Il en fut de même en ce qui concernait le couplage des câbles et les pannes rapportées par les abonnés. Cela permit de contrôler toutes les difficultés à partir d'un endroit central désigné sous le nom de Centre de contrôle régional du réseau (*Regional Network Control Centre*).

Plutôt que de fabriquer elle-même comme auparavant les pièces des dispositifs de téléphone, l'entreprise commença à les acheter. Comme l'usinage d'un commutateur exige qu'on assemble en un tout ces pièces, les qualifications, le travail manuel et artistique de production de ces commutateurs ont disparu. De même, la vérification normale, l'ajustement, la réparation et le remplacement de ces accessoires furent presque totalement éliminés.

La résultante de ces changements a donné lieu à la création d'un nouveau type «d'employé du téléphone», c'est-à-dire d'un spécialiste très formé qui supervise un réseau de nombreux bureaux interreliés au moyen d'un ordinateur digital en fibre optique et à une programmation à action conjuguée. Le personnel d'entretien du bureau principal a fait graduellement place à des spécialistes qui adaptent la programmation aux exigences de l'entreprise.

Un certain nombre de conséquences incroyables résultent des transformations précédentes. Les effets les plus graves, en ce qui a trait au personnel, consistent dans des réductions considérables de la durée du travail nécessaire à l'installation, à l'entretien et à la réparation de l'équipement. Les prévisions indiquent que ces transformations seront plutôt légères si on les compare aux changements et aux chambardements de la prochaine décennie. Le personnel, qui est de 11 700 employés serait ramené à 6 000 environ entre 1995 et l'an deux mille. Présentement, 900 personnes

s'occupent à l'installation, à la surveillance et à la réparation du réseau des communications. Selon les prévisions, il n'y aura plus que 220 préposés à l'entretien, soit une diminution de 76% de la main-d'oeuvre actuelle.

L'entreprise a encouragé les employés de 55 ans et plus, qui avaient 25 ans de service, à prendre leur retraite. Plusieurs postes — presque 200 depuis 1985 — n'ont pas été comblés. Les employés sélectionnés sont formés à travailler avec les nouveaux équipements. On a recyclé plusieurs jeunes travailleurs et ils occupent des emplois attrayants pour les salariés plus âgés. Un grand nombre de ces derniers, qui avaient de l'ancienneté, n'ont pas reçu la formation requise par la nouvelle technologie. On les a relégués à des postes subalternes où les personnes travaillent dans des classes qu'ils n'apprécient guère, et cela uniquement pour avoir un emploi et conserver leurs revenus.

Les perspectives du syndicat pour l'avenir

Quel rôle les syndicats peuvent-ils jouer face aux changements technologiques?

Le présent article exprime le point de vue d'un syndiqué sur quelques-unes des questions clés qu'il faudra considérer dans les négociations avec la direction. Ce sont les suivantes: devons-nous accepter ou rejeter les changements technologiques? Dans quelle mesure nos emplois, les programmes de participation des employés, la formation et l'entraînement du personnel, de même que les conventions collectives devront-ils être modifiés?

Notre syndicat est sérieusement handicapé dans les discussions sur les changements technologiques. Nous avons accepté le fait qu'ils sont là et que ceci peut possiblement mettre en danger la survivance de notre association aussi bien que la qualité de vie des employés au travail. Malheureusement, nous nous retrouvons dans un rôle de défenseur sans être capables de garantir que nous pourrions réaliser nos aspirations. Nous n'avons pas la même facilité que l'employeur d'obtenir les connaissances, les budgets et les autres instruments requis pour atteindre nos objectifs.

Les syndicats disposent, toutefois, de certains moyens qui peuvent accroître leur capacité d'influer sur le déroulement des changements technologiques. Nos membres veulent suggérer un triple rôle au syndicat: (1) un rôle de recherche qui aiderait à découvrir les changements technologiques les plus appropriés pour assurer la survivance et le renforcement de l'organisation; (2) un rôle de soutien qui garantirait l'intégrité de nos conventions collectives; (3) un rôle d'information qui aiderait nos membres à comprendre les conséquences pour leur avenir de toutes ces transformations.