Annual Report 1996

INSTITUT DE RECHERCHE EN SANTÉ ET EN SÉCURITÉ DU TRAVAIL DU QUÉBEC

I R S S T

RESEARCH, THE KEY TO UNDERSTANDING

Mission and goals

The Institut de recherche en santé et en sécurité du travail (IRSST, Québec Occupational Health and Safety Institute), created in 1980, is funded by the Commission de la santé et de la sécurité du travail du Québec (CSST, Québec Occupational Health and Safety Commission). Its mission is to contribute, through research and development, to the improvement of worker health and safety, and more specifically, to the elimination at source of hazards for workers' health, safety and physical well-being, and to the rehabilitation of workers having suffered occupational accidents or diseases.

To fulfil its mission, the Institute:

- conducts, funds and contracts research that responds to the needs of the CSST and the working community
- communicates the results of its research and consulting activities to the working community
- awards graduate scholarships in occupational health and safety
- under the terms of a contract with the CSST, provides the Québec public health and safety prevention network, the CSST, and joint sectoral associations with essential laboratory and consulting services.

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Pierre Gabrièle

PRESIDENT'S MESSAGE

The determination, openness and creativity with which the members of the Québec health and safety network carried out their activities in 1996 led them to implement extremely promising new ways of doing things. From now on, all of the stakeholders are working together towards common goals which reflect the needs of the working community and are aimed at producing concrete results.

Far from limiting itself to a traditional role, the Institut de recherche en santé et en sécurité du travail has chosen to be a driving force in this transformation. Over the past year, it participated in the planning or performance of every major project aimed at preventing occupational injuries and promoting the prompt return to work of workers who suffer them. Its influence was therefore felt at the planning stage as well as through workplace interventions. Whether supporting network or workplace specialists or developing necessary knowledge and tools, the Institute has established itself as an essential partner.

Its scientific credibility firmly established, the Institute gave a soul to health and safety research in 1996 by becoming a full-fledged partner in ongoing collective efforts and coordinating its activities with its partners. The increase in field studies conducted in collaboration with the workplace and the CSST network, as well as the range of consulting activities conducted in response to specific requests, is eloquent testimony to this.

The reorientation carried out in 1996 proved demanding and required the implementation of a new research programme, with themes and activities oriented toward the needs of the health and safety network. It has resulted in the complete reorganisation of the Institute's function and the sensitisation of researchers in other organizations to our priorities. This movement is well under way. The challenge was a daunting one, but the Institute succeeded in rising to it, to the great benefit of all Québec workers and employers.

The major achievements of recent years and the reorientation accomplished during 1996 were only possible thanks to the inspired vision and active support of the Institute's directors, and most especially Pierre Shedleur, Institute president from May, 1993 to February, 1997. We are immensely grateful to him for his exceptional contribution and his faith in the role of research that he transmitted to all our partners.

Pierre Gabrièle

Interim President

Jean Yves Savoie

REPORT OF ACTIVITIES BY THE DIRECTOR GENERAL

In 1996, the Institute gave new impetus to occupational health and safety research in Québec. We have set clear priorities, reflecting our clients' needs, for our researchers and our partners in universities and research centres, and implemented new procedures to ensure that our clients appropriate the results of our research and reap the expected benefits. The IRSST's synergy with the CSST network is making it an increasingly indispensable partner in the prevention of occupational injuries and promotion of the rehabilitation and return to work of injured workers. One mark of this is the fact that a review of the Institute's activities has become indistinguishable from that of the progess of health and safety in Québec.

Mobilise

Seven Top-Priority Fields of Research

Last year, we identified the seven fields of research in which we would focus our scientific and technical activities. The requests we received in 1996 and the results of extensive consultation with our partners have made it abundantly clear that these choices continue to reflect our clients' preoccupations. We will, therefore, continue to emphasize research in these areas. The quality of our achievements and volume of activity in each of these fields are eloquent proof of our success in mobilising the research community.

Research Resources

- **25%** Tools, machines, and processes
- **20%** CTDs
- **13%** Back problems
- **11%** Contaminants
- **9%** Protective equipment
- **8%** Noise and vibration
- **8%** Accidents
- **6%** Miscellaneous

This year, the spotlight was on research on the safety of tools, machines, and processes, with the launching of a major project on the ❶ → **integration of safety into the design of the control systems of paper-making equipment,** and the performance of several projects in response to requests from companies in the mining sector. These activities have helped orient health and safety research in these fields.

At the same time, we strove to reactivate research on cumulative trauma disorders (CTDs) and back problems, fields in which the Institute's previous achievements had earned it a reputation for scientific leadership. Our challenge in these fields is to communicate the results of previous research to our clients, while continuing to conduct projects which meet their needs. The transitional phase in which we find ourselves is responsible for the decreased resources allocated to these fields in 1996.

In the field of CTDs, we emphasized the transfer of research results and information on our participatory ergonomics method to specialists in the CSST network. We also made significant progress in our research on back problems, with the completion of a vast study which validated a model, designed to prevent back problems from becoming chronic, of the ❷ → **inter-disciplinary management of lower back pain.**

The Institute's activities related to contaminant exposure confirmed our reputation in this field. It was here that our activities were most extensive and our collaboration with other specialists most notable. Over the past year, the Institute participated in several CSST intervention programmes, conducted studies in response to requests from clients as well as training and information sessions, made significant breakthroughs related to health and safety in the new environmental industries, transferred technology, and developed analytical methods - all this in the face of a marked increase in laboratory analyses requested by the CSST network!

Our activities related to noise and vibration, protective equipment, and the accident process focussed on specific problems.

In 1996, 138 projects were active at the Institute, conducted by internal research groups, often in collaboration with others, or by external researchers funded or contracted by the Institute. Of these, 30 were completed in the course of the year and 45 begun. These figures are testimony to our success in orienting our research groups and external research partners towards the fields we have chosen to prioritize. One of our main objectives in our efforts to orient research was to give new impetus to external health and safety research, while ensuring that it reflects the priorities we have defined in response to our clients' needs.

In February 1996, 60 people attended a study day organized to examine the question of the revitalisation of external research. On the basis of that experience, we drew up an action plan designed to increase the number of external research projects supported by the Institute,

❶ → *see sheet nº 1, page 14*

❷ → *see sheet nº 2, page 15*

foster partnerships with research and development centres not affiliated with universities, and ensure that some of this external research will be conducted in collaboration with our in-house researchers.

This initiative has already had concrete results, in the form of the publication of a new newsletter *(Info-Chercheurs)*, development of network connectivity, and simplification of project-submission forms. We have also reviewed our bursary programme for graduate students, in order to increase the proportion of recipients at the doctoral and post-doctoral level.

Progress

Conclusive Research

In 1996, the Institute continued to give pride of place to its research activities. Our ability to respond to requests depends in large part on the accumulation of a critical mass of scientific knowledge in the fields which preoccupy our clients, and on continually updating our knowledge base to reflect changes in the work environment.

During 1996, research consumed almost two-thirds of the resources allocated to technical and scientific activities. Most of this involved applied field research aimed at producing usable results and was conducted in collaboration with employers, workers, and those requesting the research.

It is particularly interesting to note that most of the projects conducted in 1996 were direct responses to requests from the workplace and were supported by multiple stakeholders. Many of these were conducted in collaboration with advisory committees made up of representatives of the various stakeholders, especially employers and workers in the relevant economic sector and members of the health and safety network. This constant follow-up facilitates the interpretation, sharing and concrete application of results.

The highlights of the Institute's research activities reflect its new orientation. While the high points of 1995 were the publication of a major reference document on CTDs and of several literature reviews, and the distribution of tools developed in our laboratories, our most significant activities in 1996 were large-scale field projects conducted in collaboration with the working community and the CSST network.

→ Our research on the integration of safety into the design of control systems of paper-making equipment is a good example of this approach. One of the goals of this project, launched last October, was the mobilisation of 60 pulp and paper plants employing 25 000 workers. An inter-disciplinary research team is supporting this initiative.

→ The participation of the CSST's regional office and of accident victims, employers and workers from 31 companies in the Sherbrooke region made possible research on the inter-disciplinary management of workers with back problems, the results of which were published in 1996.

→ The Institute published a ❸ → **guide to help explain and prevent CTDs,** in collaboration with the Joint Sectoral Association, Metal and Electrical Products Fabrication Sector *(Association paritaire pour la santé et la sécurité du travail du secteur de la fabrication de produits en métal et de produits électriques)*. This collaboration was supported by interventions in several plants in which previous Institute projects had help create participatory ergonomics groups.

→ In other CTD-related developments, Institute researchers evaluated the current situation and need for preventive measures in poultry slaughterhouses. This activity was undertaken at the request of the Association of Poultry Slaughterhouses *(Association des abattoirs avicoles)*, and conducted in collaboration with employers and the union in this sector.

→ Research on contaminants focussed on the ❹ → **environmental industries,** where Institute researchers, in collaboration with the working community, examined composting of domestic waste, sorting of recyclable waste, and wastewater treatment.

→ An Institute field study conducted in collaboration with firefighters and authorities from two municipalities identified seven typical accident scenarios. Over half of all professional firefighters suffer accidents correspond-

❸ → *see sheet nº 3, page 16*

❹ → *see sheet nº 4, page 17*

ing to these scenarios every year. This research project recommended preventive measures and developed a tool with which members of the working community can collect and analyse data.

In parallel with these field studies, the Institute also conducted several other projects that resulted in the production of useful prevention tools. These include the development of two test beds for the evaluation of the effectiveness of protective equipment, the publication of the results of a study of electromagnetic fields *(Guide de mesure du rayonnement ultraviolet)*, and literature reviews on endotoxins and pesticides. The Institute also broadened its expertise in the field of microorganisms, an area of growing concern to members of the working community. We also pursued our analyses of statistical indicators, with our research on the ❺ → **link between aging and accidents** in the civil service sparking particular interest.

Inter vene

Expertise and Knowledge Transfer

The Institute's scientific and technical expertise is increasingly seen as an essential component of strategies aimed at improving occupational health and safety in Québec. Active participation in CSST intervention programmes, the provision of technical assistance in the workplace and of training, and participation in various committees were just some of the ways we were able to apply our expertise in 1996.

Much of our scientific and technical resources were consumed by our collaboration in the execution and preparation of CSST intervention programmes. The importance of those activities and the role we have been invited to play in them more than justifies this allocation of resources. The Institute thus not only provided the required support but was also able to influence intervention strategies and increase their effectiveness.

In 1996, as part of the CSST's continuing intervention programmes for CTDs, ergonomists in our Safety Ergonomics Programme undertook activities aimed at transferring our expertise to health and safety specialists and the working community. Contaminant specialists in the Industrial Hygiene and Toxicology and the Analytical Support programmes collaborated on five intervention programmes dealing with sandblasting, electrostatic powder-painting, fabrication of reinforced plastic articles, welding and cutting, and asbestos. We contributed to these programmes in many ways, including consulting and technical support, collaboration on the development of training programmes, provision of training, participation in committees and sub-committees, and intervention in the workplace. In some cases, programme needs required us to commission specific research projects, such as research on the effectiveness of preventive measures during sandblasting and a literature review on the health risks of styrene exposure. Other Institute contributions to CSST intervention programmes included the Safety Engineering Programme's training of specialists in the prevention of falls from heights and the Work Organisation Programme's collaboration on the development of an intervention programme for the construction sector.

In addition to the many training activities offered as part of the preparation of intervention programmes, the Institute organised several sessions on respiratory protection, in collaboration with the Joint Sectoral Association, Transportation and Machine Fabrication Sector *(Association sectorielle Fabrication d'équipement de transport et de machines)*. The audience for these training sessions was quite diverse, and included individuals from local community service centres (CLSCs), joint sectoral associations, CSST prevention and inspection departments, and companies. We also continued to train CSST inspectors on equipment lock-out procedures.

In 1996, the Institute also applied its expertise to the resolution of specific problems submitted by members of the working community or by health and safety specialists.

→ At the request of CSST inspectors, our researchers increased the sensitivity of an analytical method for airborne isocyanates we had previously de-

❺ → *see sheet nº 5, page 18*

veloped. Exposure data obtained with this method was used to support decisions concerning the reassignment of workers suffering from isocyanate-related occupational asthma.

→ Our experts developed a method to measure blind spots in trucks, and produced an accessible guide that includes kits for two types of spherometers. These tools are part of the training materials used by the Joint Sectoral Association, Transportation and Warehousing Sector *(Association sectorielle Transport et Entreposage)* in their courses on visibility at the wheel.

→ Several practical projects succeeded in reducing noise levels at various workstations, with particularly innovative solutions developed for noise reduction during rivetting. Other successes included the reduction of noise levels generated by drill bits, and the demonstration by simulation that internal muffling could reduce noise levels generated by hand grinders.

→ An assessment of suspended seats used in new models of city buses was completed and a project on the characterisation of vibration in vehicles launched.

→ The rear platform and hand grips on waste collection trucks were redesigned and the effectiveness of the modifications verified. As a result, waste collectors now suffer fewer falls and injuries and enjoy greater stability on trucks.

These are only a few examples of the practical consulting activities that the Institute conducted in response to specific requests. In the field of contaminants alone, we responded to more than 50 requests concerning such diverse subjects as air quality, ventilation, microorganisms, and electromagnetic fields.

Our expertise also served us well in our committee work. Institute scientists sat on committees reporting to the CSST's board of directors and responsible for updating various provincial regulations. The Institute also sat on national and international standardisation committees studying safety standards related to protective equipment, airborne chemical contaminants, falls from heights, machine safety, and industrial robots. We also sat on a national committee responsible for the development of an information system to facilitate the prevention of occupational accidents.

Develop

Communication and Application of Results

Our commitment to activities of material benefit to our clients prompted us to adopt a more systematic and highly integrated approach that optimises the application of research results. Furthermore, as part of our new client-based approach, we have established project-management policies that emphasize the communication and application of results from the moment a project begins, and a specific application strategy is required for each project.

Another aspect of our new approach is the improved identification of intermediaries with an interest in the results of our research. We are pleased to report that this choice has been amply rewarded.

The way we communicated the results of our study on the prevention of poisoning by propane-powered forklifts is a good illustration of these principles in action. In 1995, the Institute produced an exposure-assessment strategy for industrial hygienists and a technical guide for mechanics. In 1996, we organized twenty communication activities in collaboration with the Institute's partners, including fourteen training sessions offered to CSST inspectors, specialists in the public health network, and an employers' group.

We also continued our efforts to commercialise our research results through technology transfer agreements with private-sector partners. The negotiation of a commercial agreement with an American company for the production and distribution of our ❻ → **double-filter sampling system** for isocyanates and the recognition of this method by the American Standard Testing Methods (ASTM) confirmed our scientific leadership in the field of isocyanate exposure assessment. A pre-commercial prototype of a patient lift that we developed at the

❻ → *see sheet nº 6, page 19*

request of the Joint Sectoral Association, Social Affairs Sector *(Association sectorielle paritaire Affaires sociales)* was produced this year, and a technology transfer agreement is being negotiated with a manufacturer. Agreement was reached for the manufacture and distribution of the REMUSK hand rehabilitation device. The Institute also signed an agreement with the National Optics Institute *(Institut national d'optique)* for the commercialisation of technologies we developed to resolve problems related to service-life indicators in respiratory protection equipment.

More generally, the Institute took advantage of numerous opportunities to communicate and facilitate access to our most significant research results. During Health and Safety Week, for instance, we participated in mini-colloquia organized by our partners, including:

→ a study day on CTDs as part of a colloquium organized by the Québec Federation of Labour *(Fédération des travailleurs du Québec)*
→ a colloquium on prevention organised by Préventex, the joint sectoral association for the textile sector
→ a colloquium on CTDs organized by the Québec Occupational Nurses Association *(Association des infirmières et infirmiers en santé du travail au Québec)*
→ a mini-colloquium on the ergonomic adaptation of workstations organized by the Joint Sectoral Association, Metal Products and Electrical Products Fabrication Sector *(Association paritaire pour la santé et la sécurité du travail du secteur fabrication de produits en métal et de produits électriques)*
→ a workshop on fork-lifts during the annual convention of the Québec Pulp and Paper Industry Association for Occupational Health and Safety *(Association de santé et de sécurité du travail des pâtes et papiers du Québec).*

We also organised two round-tables during the annual convention of the Québec Association for Occupational Hygiene, Health and Safety *(Association québécoise pour l'hygiène, la santé et la sécurité du travail),* one on exposure to microorganisms in the environmental industries, the other on fork-lifts. In addition, several Institute-funded scientists and researchers, both internal and external, presented their findings to scientific bodies.

The past year also saw the Institute step up publication of the results of its health and safety research. In all, we published 41 scientific documents, of which 36 were new research reports and guides. The Communications Division distributed 22 577 documents at special events and in response to requests, an increase of 5 000 over last year, and published articles in *Prévention au travail,* the joint CSST-IRSST magazine, on 26 research and expertise-development projects conducted or funded by the Institute.

Although these activities all helped increase the application of our results, we want to go even further. We therefore held a study day in December 1996 to help us evaluate our research-application strategies and identify winning strategies. The 60 attendees included members of the Institute's scientific advisory board, internal and external researchers, members of the CSST network, and association representatives. The consensus they arrived at will serve as the basis for an action plan we are developing and will apply in 1997.

Support

Our Services in Great Demand

Demand for our laboratory services increased considerably in 1996. It should be recalled that the Institute's laboratories provide specialised services not only to the CSST network, by virtue of an agreement with a specific annual budget, but also to employer and union associations and a variety of agencies and companies.

In 1996, our laboratories performed 56 008 environmental and toxicological analyses for the CSST, an increase of 17% over 1995. Analyses were also performed to support the development of health programmes by local community service centres (CLSCs) and regional health boards for companies in economic sectors targeted by the CSST. Over 60% of these analyses were of organic compounds, 10% of metals and ions, and 10% of dusts. Toxicological and miscellaneous analyses accounted for 16% and 2%, respectively. The number of

analyses performed for clients outside the CSST network increased from 5 230 to 6 383. Another approximately 6 000 analyses were performed for our researchers, as part of quality control programmes or as part of CSST intervention programmes.

The publication, at the beginning of the year, of new analytical methods for 12 substances complemented the extensive review begun in 1995 to bring our methods in line with new exposure standards.

As in preceding years, we calibrated, maintained, and repaired monitoring equipment used by the CSST prevention and inspection network. In fact, the provision of these services to regional health and social services boards accounted for a large part of the 4 000 hours of service provided to the CSST network. Our experts were also consulted about the CSST's purchase of monitoring equipment for specialists in its network, and developed technical guides for these instruments.

Our Statistical Consulting and Support Group provides health and safety researchers, including those based in universities, with information on statistical methodology and indicators. In 1996, we responded to 50 such requests, almost half of which came from external researchers.

Participate

Synergy with the CSST Network

We are constantly striving to work more closely with the CSST and its partners. In 1996, improved coordination was particularly evident in the Institute's consulting activities – especially those involving the CSST's ten intervention programmes – and in its research programme. Our partners in the working community were the first to benefit from the tighter links that connect them and the CSST network to the Institute, its scientific advisory board, and its network of researchers.

Throughout the year, we aggressively applied procedures designed to reinforce this synergy, facilitate information exchange, and improve coordination. These far-reaching actions affected coordination with CSST operations, our laboratory services, the purchase of monitoring equipment, and the orientation of *Prévention au travail*, the joint IRSST-CSST magazine. In operational terms, the Institute collaborated with the CSST on the adaptation and communication of results and our experts helped train CSST inspectors.

In 1996, the Institute's management and scientists met with members of each of the CSST's regional offices, the 12 joint sectoral associations, and the 16 health and social services boards and gave a presentation introducing the Institute and its procedures. We took advantage of these opportunities to ask health and safety specialists in these organizations about their research and expertise needs and those of their working communities, and evaluate their satisfaction with the Institute's support. This series of consultations is a direct consequence of the emphasis we place on our clients' needs.

Organisation

❼ → **The major reorganisation of the Institute,** announced last year, is now complete. As a result, the Institute's administration has been wholly restructured, new procedures established, and a unified production chain implemented. From initial needs assessment to final delivery of results, all our activities are now part of a consistent and well-defined continuum.

The new Operations Division is responsible for all scientific and technical activities. Its mandate is to define research needs in response to the expectations of our partners in the working community and the CSST network, and develop, coordinate, and apply the scientific research programme. By centralizing responsibility for internal and external research, establishing an integrated client-service structure, and combining responsibility for programme development and quality control, this reorganization provides the Institute with the tools it needs to ensure the excellence, efficiency, consistency and synergy of all of its scientific activities.

The range of products and services that we now offer requires even stricter quality control and validation systems than in the past. The mandate of the new Quality Management and Special Projects Programme is to ensure the scientific quality of our internal and external

❼ → *see sheet nº 7, page 20*

activities, from the analysis of clients' needs to the dissemination of results. This programme is also responsible for the scientific life programme and management of special projects.

This same concern for consistency and efficiency led us to create the Customer Service Programme, which integrates all service-related activities. Its mandate is to respond to requests from the CSST network, employers' associations, unions and companies, maintain operational links with our network of external researchers and ensure that their activities complement and are consistent with our own, develop applications of research results and identify partners who can act as knowledge-transfer intermediaries, and provide support for scientific documentation and computer services.

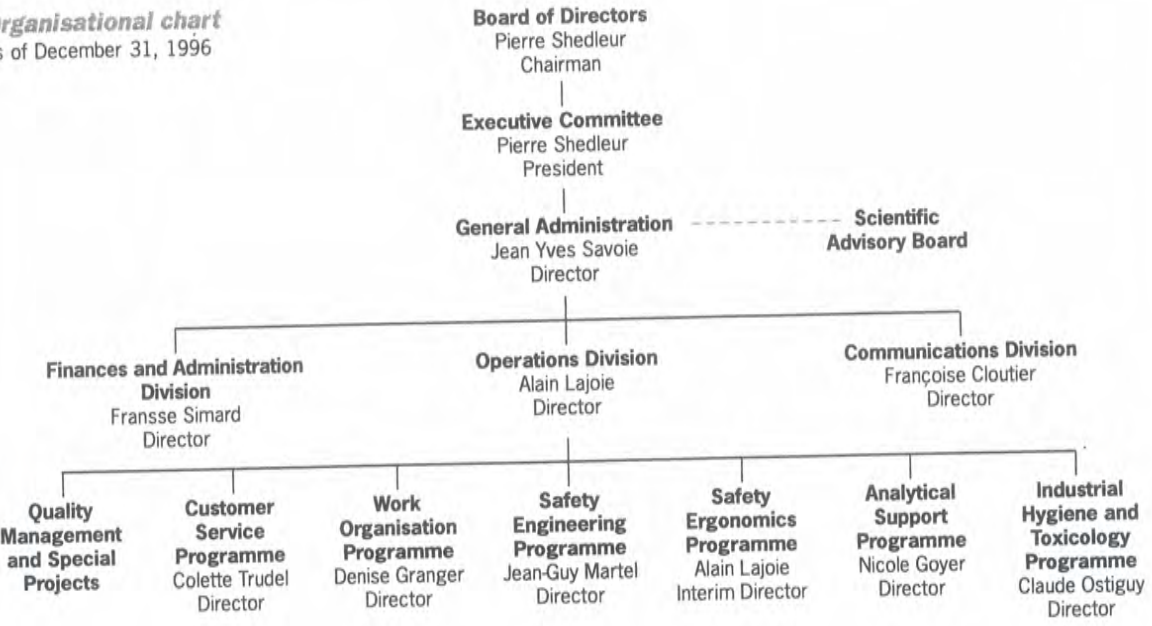
The new Operations Division is responsible for the Work Organization, Safety Ergonomics, Safety Engineering, Analytical Support, and Industrial Hygiene and Toxicology programmes, all of which conduct scientific research and provide expertise within the framework of the Institute's annual research programme, and collaborate with external researchers. Two of these programmes are responsible for the laboratory services contract with the CSST and its network.

The Communications Division plans and manages activities related to the Institute's promotion and visibility. It places special emphasis on supporting the Operations Division through the promotion of scientific and technical activities and the communication of results.

Finally, the new Finances and Administration Division is responsible for ensuring the Institute's administrative credibility. To this end, it plans and manages the Institute's finances and human and material resources, and develops and applies tools for the monitoring of programmes and the assessment of performance. It also provides administrative support for scientific and technical operations and manages the secretariat.

In 1996, the Institute employed 130 people, 94 of whom were scientific personnel. During this same period, over 100 of our external researchers, either in universities, private-sector research centres or companies, worked on Institute projects.

Organisational chart
as of December 31, 1996



Finances

In 1996, the Institute's total revenue was $16,975,581, including a grant of $14,088,000 from the CSST. Expenditures over the same period were $16,885,896.

Revenues: $16,975,581

- **83.0%** CSST
- **13.7%** Laboratory services
- **2.4%** External contracts
- **0.7%** Interest
- **0.2%** Other revenue

Expenditures $16,885,896

- **43.5%** Internal research
- **19.1%** External research
- **13.4%** Laboratory services
- **8.1%** Finances and administration
- **5.4%** Communications
- **5.1%** Customer service and technical support
- **3.0%** Management
- **2.4%** External contracts

Outlook

In 1996, we launched a major restructuring which affected all of our activities and procedures. In the coming year we will follow up on these changes by consolidating our new organisational structure and strengthening our relationship with our research clients and partners, with whom we hope to pursue a truly collaborative approach to needs assessment, project execution, and the application of results.

Last year, we committed ourselves to ensuring that our research programme reflected our clients' priorities. We can only do this by establishing or maintaining our scientific leadership in seven key research areas. Our main research challenges in 1997 will be in the fields of back problems and cumulative trauma disorders.

Our external research network will play a larger role in this mobilisation. The success of our research programme depends on the contribution of researchers in universities, research centres, and the private sector. At the same time, we will be sensitising researchers to our priorities and our clients' needs, maximising the flexibility of our procedures, and stimulating collaboration between external and internal researchers.

The Institute is increasingly positioning itself as a scientific forum where scientists from many disciplines help resolve specific problems defined by specialists from the CSST network and representatives of the working community. This synergy helps define more appropriate and accurate research needs and priorities, and stimulates the performance of extremely useful research and consultation activities.

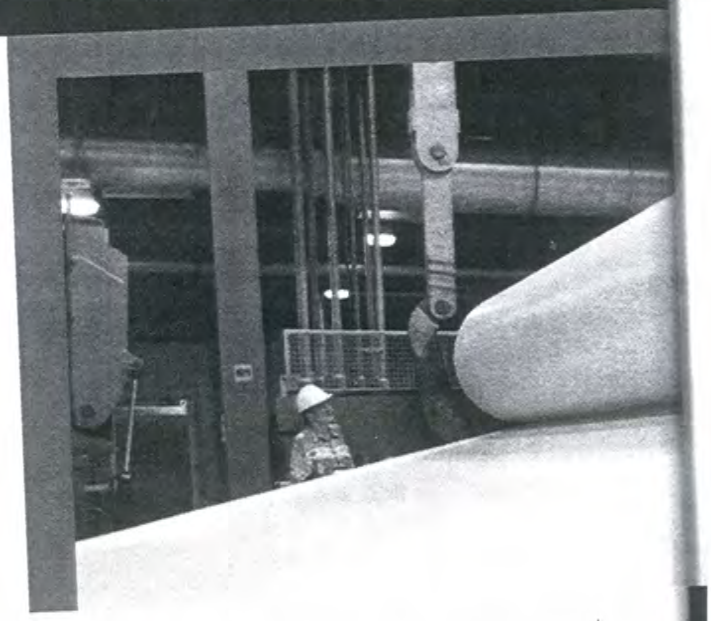
Jean Yves Savoie

Director General

sheet nº 1

Mobilisation to ensure the safety of control systems in the pulp and paper industry

"The safety and reliability of machine-lockout techniques has worried us. The Institute made us realise that the problem is much more complex than we imagined and that we have to review all of our systems relying on programmable industrial robots. The industry is eager to share its expertise with researchers and help develop the know-how necessary to prevent serious accidents."



J. Aurèle Saint-Pierre, President and Director General, Québec Pulp and Paper Industry Association for Occupational Health and Safety

"Workers welcomed the research on programmable control systems with relief and hope that it will give them concrete solutions to the troubling and often incomprehensible problem of safety failures of these systems. The workers appreciate the coordination between stakeholders, strategic training of everyone from designers to end-users, and orientation of risk management. This research fits in perfectly with prevention objectives aimed at eliminating hazards at their source."

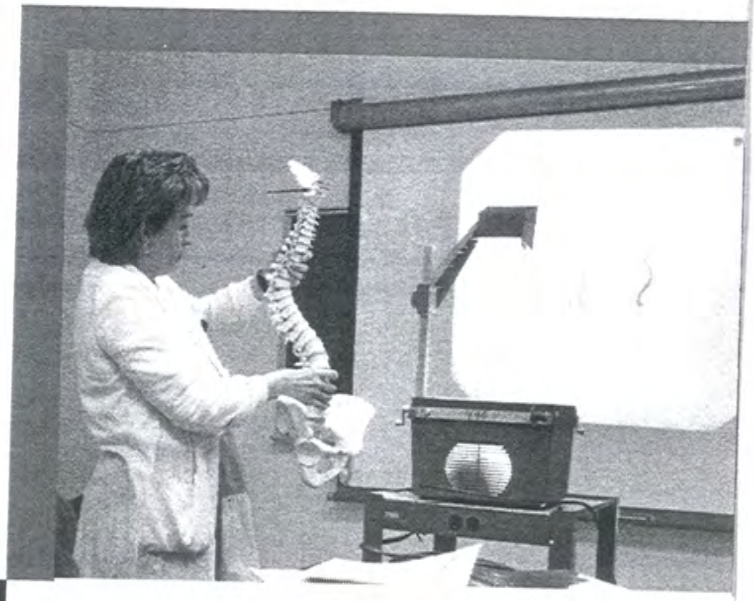
Claude Gagnon, National representative, Canadian Union of Communications, Energy and Paper Workers

The pulp and paper industry and the IRSST have set a deadline of two and a half years to improve the safety with which programmable control systems in this sector are operated and maintained. To achieve this objective, they are focussing on the in-plant design of these systems. This approach, begun in autumn 1996, requires the acquisition of as much information as possible on interacting factors, development of a safe-design methodology for control systems, and the development of a training programme for designers and other relevant personnel. The project draws on the expertise of specialists in the fields of safety, ergonomics, automation, control systems, pulp and paper, simultaneous engineering, and training. Agreements of participation have been negotiated at the sectoral, regional, and plant level, and employers and workers in approximately 60 plants with programmable control systems will have the opportunity to express their needs, share their expertise and influence the progress of the research.

→ sheet nº 2

Québec confirms its leadership in research on back problems

"The strategy of case management for occupational back problems that we developed and tested in Sherbrooke allowed workers to return to their regular work twice as fast and contributed to a significant improvement in their quality of life. Intervention in the workplace played a decisive role in this success."



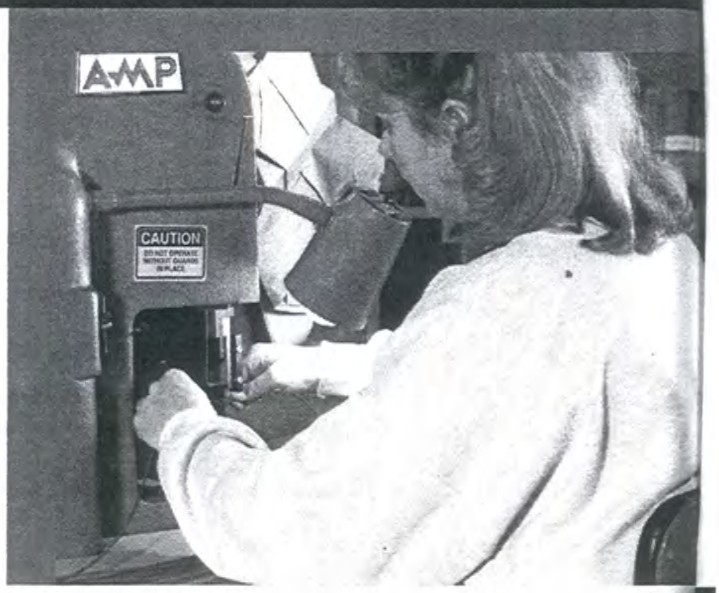
Patrick Loisel, M.D. Professor, Department of Surgery (Orthopaedics), Université de Sherbrooke

A vast study funded by the Institute has validated an innovative model of the comprehensive management of lower back pain. This research was conducted by researchers from the Back Clinic *(Clinique des maux de dos)* of the University of Sherbrooke Hospital Centre *(Centre hospitalier universitaire de Sherbrooke)*, in collaboration with 31 regional companies and the CSST's regional office. The results of this study, published in 1996, demonstrate that a management strategy that takes into account the range of ergonomic, psycho-social and physical factors responsible for back problems accelerates return to work, and may significantly improve the health of workers suffering from lower back pain. The key to this strategy is the "therapeutic return to work," carried out in collaboration with employers and managed by an inter-disciplinary team composed of specialists in the fields of clinical medicine, occupational medicine, ergonomics, and rehabilitation. Because it is a randomised clinical trial, the study is very credible and has attracted great interest internationally.

sheet nº 3 A guide to empower workplaces in the prevention of CTDs

This guide was a great help to us. The authors did a good job of making the information accessible. The presentation is dynamic and the information easy to find. The reminders help identify postures during video-based workstation analysis, and the guide simplifies interpretation of medical opinions. All in all, it gives us the independence to take control of the "Ergo" project for ourselves and adapt it to our company's needs. We were novices in ergonomics, and were lucky to have a tool like this when we were beginning our programme."

Liette Côté, Director of Human Resources, VKI Technologies inc.



"This guide encourages us to manage the challenges of occupational CTDs in a bipartite and participatory manner. Its advantages are its very objective approach and its ability to address real problems by demonstrating how multiple factors may interact. It is a valuable research tool that is easy to read and understand, and will prove extremely useful to companies that are just starting a participatory ergonomic approach, and to prevention representatives in particular."

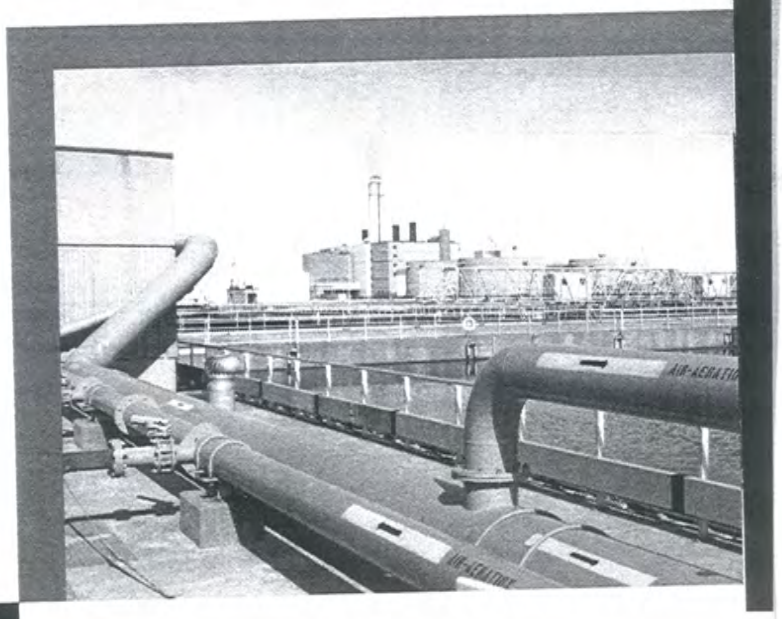
Diane Mimeault, Prevention Representative,
United Autoworkers of Canada, Marconi Canada

In 1996, the Institute provided companies in the Metal and Electrical Products Fabrication Sector *(Association paritaire pour la santé et la sécurité du travail du secteur de la fabrication de produits en métal et de produits électriques)* with a guide that helps them take control of the prevention of cumulative trauma disorders (CTDs) for themselves. This marks further progress in this sector's efforts at preventing CTDs, begun in the early 1990s with the Institute's support. This innovative and practical guide, the result of collaboration between the Institute and the joint sectoral association, answers four key questions: What are CTDs? What causes CTDs? How do you detect CTDs? and What steps should be taken? Information in the guide is drawn from two sources: a reference document on CTDs developed by an international group of experts at the request of the IRSST, and the experience of Institute researchers who developed and validated a participatory ergonomics approach in collaboration with employers and workers in two factories. This model has been implemented in several other plants, with the support of ergonomists from the relevant joint sectoral associations.

sheet nº 4

A significant breakthrough in health and safety research in the new environmental industries

"The study allowed us to reduce workers' concerns about bacterial hazards: now we can quantify these contaminants and choose more appropriate source-control measures, personal hygiene practices and personal protective equipment... All this thanks to collaboration between the health and safety committee, workers, and plant managers, and the support of the CLSC, regional board, IRSST and CSST."



Gerry Gwilliam, Health and Safety Prevention Advisor, Environment Department, Wastewater Treatment Plant Montréal Urban Community

Health and safety specialists, especially those in regional health and social services boards, the CSST, and several municipalities, have raised many questions about conditions in the new environmental industries. The IRSST has made this a priority research area and has become a leader in the field in Canada.

In 1996, an initial study characterised chemical and biological contaminants in domestic-waste composting plants and proposed a specific industrial hygiene strategy. A similar study of recyclable-waste sorting plants, with special attention to ergonomic problems, is currently under way. Institute research has demonstrated that preventive measures are necessary in wastewater treatment facilities even when the microbial contamination of ambient air is within acceptable limits. All of these results are useful for identifying appropriate preventive measures in existing plants and planning the design of new ones.

sheet nº 5

A reference tool for the evaluation of the impact of aging on accidents

"Statistical analysis is indispensable for the development of appropriate prevention strategies. The Institute study of the link between the aging of the municipal workforce and accidents sensitised us to a number of realities, such as the fact that very young workers suffer more accidents, but that older ones suffer more serious ones. It also revealed the high frequency of accidents related to horticultural work, and we intend to take appropriate action."

Alain Langlois, Director General, Joint Sectoral Association Municipal Civil Service

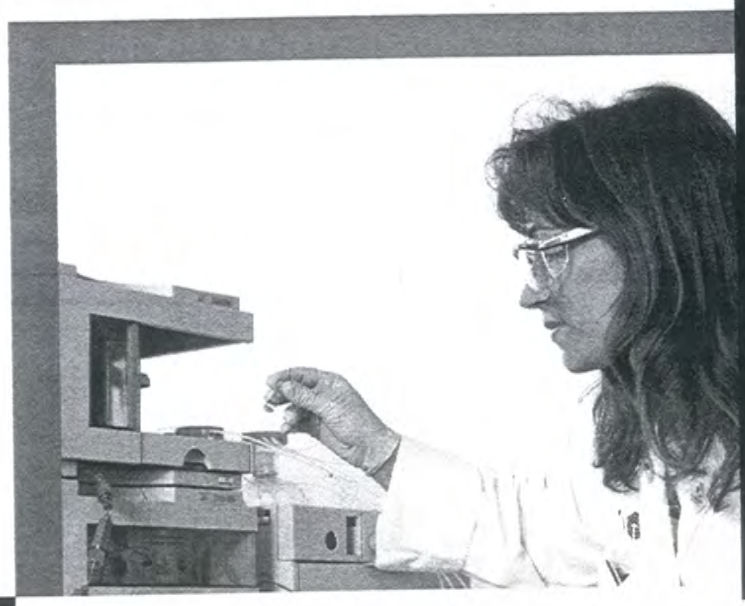
An Institute study conducted in 1996 shed light on the effect of the aging of a large proportion of the Québec workforce on occupational safety. The study looked at accidents in the health and social services sector, provincial civil service, and municipal civil service, sectors in which compensation costs suggested the existence of an age-related increase in the frequency and severity of injuries. Surprisingly, analysis of data on occupational accidents and population data for the period between 1982 and 1991 indicated that far from increasing, the incidence of occupational injuries actually decreased with age in most jobs. On the other hand, the type of accident suffered showed a dependency on age. The health and safety associations for each of the three sectors received a detailed reference document which included sex-specific analyses for 27 types of jobs.

sheet nº 6

The Institute's sampling technology for isocyanates known worldwide

"This new technique has greatly simplified the assessment of our workers' exposure and of environmental isocyanate emissions in our paint shops. These measures have proven very useful in the development of our prevention and health programmes. Knowledge of the true exposures and of residual concentrations has allowed us to optimise our preventive measures. Furthermore, this method allows us to easily monitor the effectiveness of our preventive measures."

Martin Thériault, Industrial Hygienist, Health and Safety, Bombardier Inc., Canadair



The Institute's sampling system for isocyanates, developed to meet its clients' needs, became commercially available in 1996 and has been officially adopted by the American Standard Testing Methods (ASTM). The system is distributed in 17 countries by the Omega Speciality Company of the United States. Coupled with a leading-edge analytical technique, the innovative sampling system, composed of a cassette containing filters to capture aerosols and gases, allows the level of oligomeric and polymeric isocyanates to be measured very accurately. Many Québec companies have used the system, developed at the end of the 1980s, as part of a larger research initiative aimed at preventing occupational asthma through the safer industrial use of isocyanates. The Institute's principal activities in this field in 1996 were the provision of technical support to the system's distributor and the transfer of the expertise necessary to analyse samples collected throughout Québec to a Montréal-area private laboratory.

sheet nº 7

The new Operations Division at the heart of a successful reorientation

"By offering them an exciting action plan including clear guidelines and, precise operational objectives, we were able to convince our personnel, our clients, and our research partners to participate in this large-scale mobilisation. By doing this, we succeeded, together, in successfully carrying out a decisive reorientation."

Alain Lajoie, Director of Operations, IRSST

The Institute's decision to make its Operations Division, created at the end of 1995, the key player in its major reorientation was a masterstroke. The challenge was to integrate all the Institute's technical and scientific activities into the same unit with additional responsibility for all the intermediate steps underlying these activities, from needs assessment to the application of results. This operation has proven successful. One sign of this is the increase in the number of projects conducted in close collaboration with the working community. Another is the Institute's synergy with the CSST network in developing integrated intervention programmes. Furthermore, most current Institute projects are being conducted by teams that include external researchers. The budget for external research in 1997 has been increased to sustain the growth of these activities – in keeping, as always, with Institute priorities. By remaining open to the Institute's clients and scientific partners, the Operation Division has succeeded masterfully in creating, in a very short time, the conditions essential for a lasting synergy in health and safety research.

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