

Institut de recherche en santé et en sécurité du travail du Québec



IRSST

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en santé et en sécurité
du travail du Québec

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1995 ANNUAL REPORT

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PRESIDENT'S MESSAGE

This has been a stimulating year for the Institute. In the space of a few months, it confirmed its orientation, redefined its products and services, underwent in-depth restructuring, and reviewed its activities to ensure that all these changes cumulate in the desired goals. The tone for all these changes was set during comprehensive consultations conducted at the end of 1994 with workers, employers, and health and safety specialists. In 1995, we emphasized seven fields of research that reflect the research needs expressed by these participants. Our choice of projects and the manner in which they are implemented is eloquent testimony to our concern to not only respond to requests but also produce useful results and make them available.

This concern is also reflected through the harmonisation of our activities with those of the CSST and its network, an orientation that takes the Institute resolutely into the world of day-to-day operations. From now on, managers, inspectors, industrial hygienists, prevention consultants, rehabilitation consultants, and other specialists can count on the support of Institute researchers and experts as they develop and apply their action plans. The complementarity of the CSST's and IRSST's roles and activities is clearly reflected by the merger of the two organizations' magazines and will be strengthened by the various formal exchange and collaboration mechanisms already in place.

Workers and employers will of course be the first to benefit from this increased synergy of health and safety specialists, but this reorientation also augurs well for the research community. In fact, with the IRSST's reorientation, researchers and other experts have become key players in the CSST network, working at the sides of front-line intervenors. This increases their credibility, as does the importance now accorded to the application of research results.

This year, the Institute truly assumed its role as the CSST's research wing. From now on, its partners can rely on it to not only support their operations, but also to develop and implement winning strategies.



PIERRE SHEDLEUR

PRESIDENT

programme will also reflect our clients' strong interest in research on prevention practices, including those involving maintaining the link to work, and on industrial hygiene. To satisfy these expectations, we will continue to favour applied research that produces usable results and is conducted in the workplace in collaboration with employers and workers.

The Institute will also continue to redefine and reorganise its activities as a function of its products. Concretely, we offer four types of products and services: research, consulting and knowledge transfer, regular laboratory services, and the development of new expertise. Synergy with the CSST and its network will intensify, thanks to the implementation of several projects aimed at supporting the Commission's new approaches to return to work, medical aspects, and prevention and inspection activities. We are inspired by our new programme, and hope to motivate external researchers to help implement it.

It is with confidence that we prepare to meet these challenges.

We have many significant advantages to help us do so: a vast pool of researchers, solid expertise in several strategically important fields of research, the existence of a participatory research culture, and an appropriate management structure. Over the years, the Institute has evolved with its partners. Today, it has reached a state of maturity that allows it to take its place as a full-fledged member of the network.



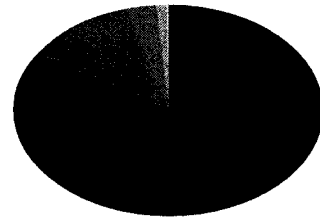
JEAN YVES SAVOIE

DIRECTOR GENERAL

Funding

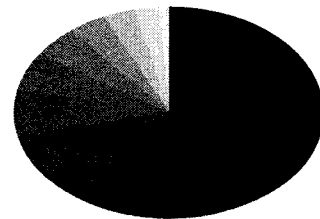
In 1995, the IRSST's total revenue was \$18,018,918

including a grant of \$15,045,000 from the CSST, while total expenditures were \$17,544,107.



REVENUES : \$18,018,918

▶ CSST	83.5 %
▶ Laboratory services	11.7 %
▶ External contracts	3.0 %
▶ Interest	1.0 %
▶ Other revenue	0.2 %



EXPENSES : \$17,544,107

▶ Internal research	40.1 %
▶ External research	19.8 %
▶ Laboratory services	11.3 %
▶ Administration	7.1 %
▶ Scientific management and coordination	5.8 %
▶ Communications	5.1 %
▶ Renovations	3.8 %
▶ External contracts	3.4 %
▶ Computer services	2.5 %
▶ Technology transfer	1.1 %

The Future

Our programme reflecting our new orientations was approved

by the Board of Directors at the end of 1995 and we now stand ready to implement it.

In keeping with this action plan, in 1996 the Institute will concentrate most of its scientific and technical activities in seven fields: cumulative trauma disorders, back disorders, chemical and biological contaminants, the safety of tools, machines and industrial processes, protective equipment, noise and vibration, and accidents. The fields, orientations within each field, and specific projects within each orientation were all selected on the basis of needs expressed by our clients. In light of our clients' high expectations with regard to back disorders and cumulative trauma disorders, we plan to be particularly proactive in these fields, educating the research community and soliciting appropriate projects. In 1996, our



REPORT OF ACTIVITIES
JEAN YVES SAVOIE,
DIRECTOR GENERAL

This past year saw the Institute lay the foundations for major and widespread changes.

The first steps were taken in June, when the Board of Directors approved the Institute's new orientations, whose guiding principle is the need to respond to the needs of the CSST, the CSST network, and the working community. To meet these needs, we developed a four-part strategy: align our research programme to reflect our clients' needs, refocus our research activities and services to take into account our new research programme, ensure that our clients apply our results and benefit from them, and improve our synergy with the CSST. The Institute's Board of Directors paved the way for these principles to become concrete realities when, six months later, they adopted the new research programme and approved an in-depth restructuring plan

These changes give the Institute new stature and confirm

the progress in health and safety research over the last 15 years in Québec. The knowledge and expertise that the Institute has acquired have transformed it into much more than merely an effective service provider. It is now a full-fledged partner of the CSST, the CSST network and the working community, capable of influencing its partners' strategies. The benefits of this approach are amply illustrated by the support we provided this year for the development and application of the CSST's action plan for the prevention of cumulative trauma disorders. This expanded role was inspired by models used in industry, where research groups not only support corporate operations but also advise decision-makers as they develop winning strategies.

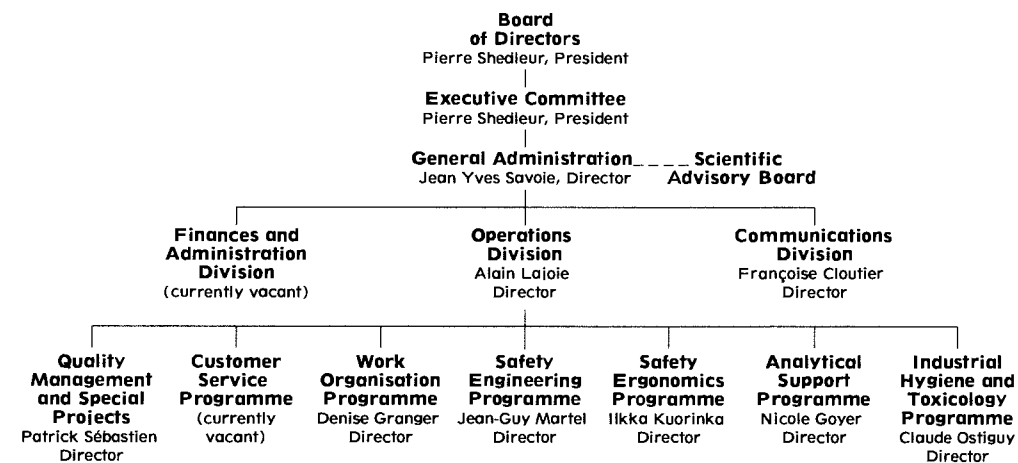
unions and companies, to maintain operational links with our network of external researchers and ensure that their activities complement and are consistent with our own, to develop applications of research results and identify clients who could act as knowledge-transfer intermediaries, and to provide scientific documentation and computer services support.

As far as scientific research and consulting activities are concerned, the five existing programmes - Work Organization, Safety Ergonomics, Safety Engineering, Analytical Support, Industrial Hygiene and Toxicology - continue to exist as the new Operations Division. The personnel of these programmes plan and perform various scientific and technical activities determined by the annual research programme and collaborate on external projects. Two of these programmes are responsible for the important laboratory-service contract with the CSST and its network.

The Communications Division will continue to plan and manage communication activities related to the Institute's promotion and visibility. Emphasis will be placed on supporting the new Operations Division through the promotion of scientific and technical activities and the dissemination 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 the scientific and technical operations and manages the secretariat.

In 1995, the Institute employed 130 people, of whom 94 were scientific staff members. During this period, over 100 researchers in our external network of universities, research institutes, and private-sector firms worked on projects funded by the Institute. A total of 122 projects were active during 1995, of which 30 were conducted by our own scientific personnel, 59 by external researchers and 33 by teams made up of internal and external researchers.



Our new structure innovates on many levels. One of the most important innovations is the creation of an Operations Division, which oversees all scientific and technical activities. The mandate of the Operations Division is to coordinate and apply the Institute's scientific programme, define research needs and produce an annual research programme that reflects requests from the working community, the CSST and the CSST network, and manage scientific and technical production. By centralizing responsibility for internal and external research and all aspects of customer service, programme development, and quality control, this reorganization provides the Institute with the tools necessary to ensure the excellence, efficiency, consistency and synergy of all its scientific activities.

The range of products and services that we now offer requires quality control and validation systems to be even more rigorous than those that existed previously. The mandate of the new Quality Management and Special Projects Programme is to ensure the scientific quality of our internal and external activities, from the analysis of clients' needs to the distribution 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, the CSST network, employers' association,

Priority Research Fields

The Institute

already exerts significant influence

in several fields in which it has accumulated a critical mass of knowledge and expertise over the years. In 1995, we consolidated this leadership. This year, the spotlight was on cumulative trauma disorders.

The Institute's status as a leader in this field was confirmed by the publication of a comprehensive reference document on this subject and by its hosting of the second International Conference on the Prevention of Work-Related Musculoskeletal Injuries (PREMUS 95). During this same period, our research teams con-

See Insert 1

tinued to develop models and tools which companies can use in participatory activities. In addition, the CSST and its network drew upon our expertise to an unprecedented degree in implementing industrial pilot projects and developing training programmes on cumulative trauma disorders.

INSERT 1

The Institute Organizes a Prestigious International Conference

"PREMUS 95 was a high-water mark for research on cumulative trauma disorders. The success with which the Institute organized this event attests to its leadership and afforded its researchers and practitioners the opportunity to explore new avenues. The research and intervention strategy applied in Québec aroused great interest."

Ilkka Kuorinka, Director, Safety Ergonomics Programme, IRSST,
Co-president of the Scientific Committee of PREMUS 95

Last September, Montréal welcomed over 500 researchers and practitioners from twenty countries to the second International Conference on the Prevention of Work-Related Musculoskeletal Injuries (PREMUS 95). This prestigious scientific event was organized by the Institute and presided over by its Director General.

The scientific programme offered almost 200 conferences and presentations, dealing primarily with studies whose results could prove useful in preventing these types of injuries. All facets of prevention were discussed, from the analysis of problems to the elimination of causal factors to the rehabilitation and return to work of injured workers.

Research on back disorders was also very active. Many projects were completed, including some which will significantly change the practices used in the case management of victims of back disorders. Ten years ago, the report of the Québec Task Force on Spinal Disorders, presided over by Dr. Walter Spitzer, propelled Québec to the forefront of research on back disorders, and the Institute remains at the cutting edge in this field.

In addition, the Institute enjoys a solid reputation for its expertise in biological and chemical contaminants. This year, our laboratories managed the amazing feat of revising almost 80 analytical methods, bringing them into line with standards mandated by the new regulation concerning contaminants. We also distributed the results of our studies on solvent substitution and carbon monoxide emissions by fork-lifts to our clients. Both these studies attempt to eliminate hazards at their source, in keeping with the intent of the law.

Research on cumulative trauma disorders, back disorders and contaminants consumed 40% of our scientific and technical resources in 1995. However, in other fields, including noise and vibration, protective equipment, and the more complex question of the accident process, we adopted a more tightly focussed, less global approach. In the field of the safety of industrial machines, tools and processes, projects that integrate multiple contributions are in the planning stages.

In 1995, the Institute conducted, funded or contracted 122 projects. Of these, 39 were completed during the course of the year, and 33 begun. A summary of the projects active in 1995 is available, in French only.

Synergy with the CSST

A review of our activities in 1995 reveals increased harmonisation with those of the CSST

and its partners. For the moment this is most noticeable in the Institute's consulting activities, but will also be reflected in the planning of our 1996 research programme.

During the year we collaborated with the CSST in establishing and administering various systems designed to reinforce this synergy. Our objective in all this was to ensure continuous interaction between the CSST, the CSST network and the working community on the one hand, and the Institute, its Scientific Advisory Board and its network of researchers on the other.

Formal structures were established to facilitate information exchange and coordination at various levels, especially with regard to CSST operations, Institute laboratory services, the purchase of measurement equipment, and the orientation of the *Prévention au travail* magazine. Regular meetings were also held with representatives of joint sectoral associations and the Department of Health and Social Services.

Turning to day-to-day operations, Institute experts help train CSST inspectors, and the two organizations collaborate on the adaptation and distribution of research results. The merger of L'IRSST and *Prévention au travail* is the natural outgrowth of this approach, allowing us to reach a larger readership in various sectors interested in occupational health and safety.

Organization

Our new orientations also necessitated a major reorganisation

of the Institute. The new structure was approved by the Board of Directors and came into force in December (see flow-chart).

ally induced hearing loss conducted by the Acoustics Group of the Université de Montréal into policies concerning prevention and return to work was determined in seven factories.

Services

The third way in which the Institute offers valuable support

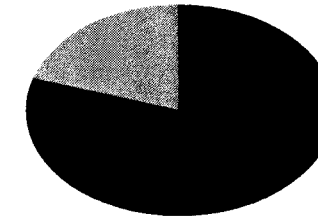
to the CSST and its network is through the provision of laboratory services. In 1995, our laboratories analysed over 50 000 environmental and toxicological samples and spent 4 500 hours providing services to the CSST prevention network. In all, 98% of analyses were performed to support the development of health programmes by local community service centres (CLSCs) and regional health boards for companies in economic sectors targeted by the CSST. Over 50% of analyses were of organic compounds, 10% of metals and ions, and 10% of dusts; toxicological and miscellaneous analyses accounted for 23% and 7% respectively.

With the adoption of new provincial regulations

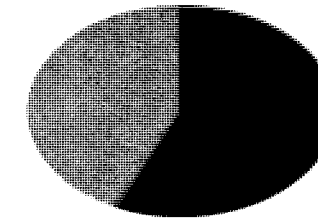
modifying the exposure limits for a wide variety of chemicals, our laboratories were confronted with the daunting challenge of revising their analytical methods for 87 substances. By the end of the year, over 90% of the new methods were available. As in preceding years, we calibrated, maintained, and repaired measurement equipment used by the prevention and inspection network. In fact, servicing the regional health and social services boards accounted for 80% of the 4 500 hours spent in these activities. Our experts also assisted the CSST in purchasing measurement equipment for specialists in its network, and produced technical guides for this equipment. It should be noted that the laboratory services provided to the CSST and its network are defined in a service contract with an annually established budget. Our laboratories also provide specialized services to employers' associations, unions, and other organizations.

Our statistical consulting and support department provides university and Institute researchers with information on methodology and statistical indices. In 1995, the department received 35 service requests, 17 of which were from researchers outside the Institute.

FIELD RESEARCH IN THE SPOTLIGHT



In 1995, the Institute allotted 80% of its research budgets to workplace projects conducted in collaboration with employers, workers, the CSST and the CSST network. These projects were undertaken in a wide variety of workplaces, including slaughterhouses, hospitals, construction sites, factories, transportation companies, warehouses, mines, and forestry companies.



Technological projects consumed over half the Institute's research budget in 1995. These dealt with the use or development of technology for prevention or medical diagnosis, and on the study of the hazards and impacts of new technologies.

Research

Research has always had pride of place amongst our many activities.

We can never overemphasize this fact - research is the bedrock upon which all our other services rest. In 1995, our research activities advanced scientific knowledge and led to breakthroughs that will help solve health and safety problems.

- ▶ The most ambitious of the Institute's research projects was no doubt the production of a reference document on cumulative trauma disorders, published in collaboration with a Québec publisher. The international expert group who authored the document was created in 1992 to review the scientific literature on current prevention practices and was headed by Ilkka Kuorinka, an Institute researcher. Designed with the general public as well as the scientist and practitioner in mind, this document significantly advances our understanding of this important and complex type of injury and how best to prevent it. It has been very well received, both in Quebec and internationally.
- ▶ Another literature review, this one in the field of chemical contaminants, provided industrial hygienists with a comprehensive, practical and user-friendly guide to the **substitution of solvents**, toxic substances that are in wide use in industry.

See Insert 2

- The Institute also studied carbon monoxide emissions by **propane-fed fork-lifts**. A standard sampling strategy for carbon monoxide and a systematic preventive maintenance programme were developed for industrial hygienists and mechanics respectively.
- The development of an innovative test method with which to evaluate the resistance to cuts of materials used to make **protective gloves** was a significant breakthrough in the Institute's research on protective equipment. It should be noted that researchers in several countries had previously tried without success to develop just such a method.
- We also made significant progress this year in our research on the resistance of gloves to chemicals, specifically to solvent mixtures. Up until now, information was only available for the resistance of pure products. The theoretical predictive model validated by our researchers will facilitate informed choices about protective gloves.
- Useful information on the prevention of back disorders among vehicle operators was provided by a study which determined the optimal seat adjustments for a given operator's height and weight. In laboratory studies using a vibration simulator designed for the study, researchers characterized various parameters affecting the adjustment of mechanically or pneumatically suspended seats. The project's results will help manufacturers and experts in universities and technical centres design better seats. A data sheet summarizing the project's practical recommendations was published and will help users select and adjust suspended seats.

At the request of the CSST committee on the Construction Safety Code, the Institute conducted a study of heavy-vehicle back-up alarms, often implicated in serious accidents. The report submitted this year covered the third phase of the project, and described the acoustic characteristics of safe alarms and their optimal location on vehicles. As a result of this study, both the sound propagation characteristics of alarms and their recognition by different categories of workers were optimized.

Turning to research on back disorders, there was great interest in the Institute's scientific evaluation of devices used for the diagnosis of lower back pain. The study concluded that clinical examination by a physician was adequate for the diagnosis of a lumbar

ics was highlighted during a colloquium on the stability on mine sites, organized in collaboration with the Québec Mining Association at the request of the Joint Sectoral Association, Mines. The results of six research projects that could help prevent potentially serious accidents caused by cave-ins and rock bursts were presented. We also organized two workshops in which international experts participated. The first, organized in collaboration with Preventex, the joint health and association for the textile sector, was on byssinosis, while the second, organized in collaboration with the CSST and the Joint Sectoral Association, Social Affairs Sector (ASSTAS) was on slipping. Finally, the Institute, in collaboration with the CSST and the Federation of General Practitioners, helped organize an important colloquium of the Québec Association of Occupational Physicians entitled "Lower back pain and work: 10 years after the Spitzer report".

In 1995, the Institute published 29 scientific documents, of which 24 were new research reports and guides. The Communications Division distributed over 17 500 documents in response to specific requests and at special events such as colloquia, conventions and expositions. This year, we reviewed the strategy underlying L'IRSST, the magazine we have published since 1984. The merger with the CSST's Prévention au travail, which now contains our "research" insert, has considerably increased our market penetration, increasing our readership from 5 400 to over 40 000 readers. In order to better reflect our new readers' needs we held focus groups with representative samples of our readership. As a result of these groups, we now publish more varied articles with greater emphasis on actual results and their application. A thematic index of the wealth of information published in L'IRSST since its inception was completed during the year.

Many of our scientists and funded researchers presented the results of their work during colloquia and conferences organized by the CSST and its regional offices, joint sectoral associations, and bodies such as the Human Factors Association of Canada and the Québec Association for Hygiene and Occupational Health and Safety. A summary of these presentations is available, in French only.

This year, the Institute also undertook demonstrations aimed at promoting the application of certain research results. In one such project, the feasibility of integrating the results of a study of occupation-

See Insert 3

See Insert 4

In the case of slip-clutch presses, it was first necessary to measure the effect of tonnage rating, cadence, and the dimensions and weight of press-bars on stop times. Thanks to the efforts of the Joint Sectoral Association, Transportation and Machine Fabrication Sector, the collaboration of workers and managers in a company producing household appliances was obtained. Not only were Institute scientists able to provide the company with the information it requested on ways to improve the safety of its twenty claw-clutch presses, but they also validated their method and collected data upon which the technical guides are based.

Regulation Respecting Health and Safety in Mines, the Regulation Respecting Industrial and Commercial Establishments, and the Construction Safety Code - and on working groups on abrasive blasting and reinforced polyester. Institute representatives also contributed to national and international standardization committees studying safety standards concerning protective equipment, airborne chemical contaminants, falls from heights, machine safety, and industrial robots. The Institute was also represented on a national committee responsible for the development of an information system to facilitate the prevention of occupational accidents.

Communication and Application of Results

Our preoccupation with providing our clients with useful results

has led us to establish application strategies for each project and conduct activities designed to communicate the Institute's most significant results and facilitate access to them. An example of this is the organization of two colloquia during the tenth Occupational Health and Safety Week. The first, on predictive acoustics, detailed the utility and ease of use of software designed to define and optimize acoustic conditioning of industrial spaces. The second, on training in safe handling practices, presented the results of research on the practical know-how of handlers who are recognized as experts by their peers, and who, despite lengthy occupational exposure, develop no musculoskeletal problems. Research on rock mechan-

INSERT 2

Replacements for Hundreds of Hazardous Solvents

'The researchers' readiness to collaborate with industry and pay heed to the needs of all the stakeholders has resulted in a report that reflects shared concerns and provides information on solvent substitution. The report is well suited to industry's needs.'

Daniel Huet, industrial hygienist, IBM Canada, representative of the Regional Inter-enterprise Industrial Hygiene Committee of Montréal

In light of new environmental regulations requiring companies to replace common industrial solvents, the Regional Inter-enterprise Industrial Hygiene Committee of Montréal asked a group of researchers, directed by Michel Gérin of the Université de Montréal's Department of Occupational Medicine and the Workplace Environment, to propose replacements which do not endanger workers' health.

The Institute funded this research and established a steering committee composed of members of the Institute's Scientific Committee, Institute experts, CSST experts, and a representative of the hygienists requesting the study. An initial field-study identified the eight sectors with the highest use of problematic solvents. The second phase of the project was a literature review on solvent substitution, which recommends replacement solvents in the targeted sectors, and includes 260 concrete examples of solvent substitution. All in all, a world-wide first!

These results have been widely distributed, through a round table discussion at the annual convention of the Québec Association for Hygiene and Occupational Health and Safety, a special edition of *Travail et Santé*, articles, conferences, and seminars. Everyone involved in making decisions about the use of industrial solvents, including industrial hygienists and occupational physicians, will find this report useful.

Strategies and Tools to Prevent Poisoning by Propane-fed Fork-lifts

“By providing precise recommendations on maximum gas concentrations, this study reinforced the expertise which we have developed over the last ten years. This is an effective complement to our overall approach towards source reduction of carbon monoxide levels. Thanks to concrete tools such as the data sheet and modified gas cooler, we can now intervene rapidly and effectively in industry.”

Guylaine Coulombe, Technician, Bois-Francs Occupational Health Department, CLSC Drummond

Odourless, colourless, and non-irritating, carbon monoxide is a treacherous enemy capable of causing discomfort and potentially serious poisoning. After observing serious problems of this kind in companies using propane-fed fork-lifts, industrial hygienists, especially those in the Mauricie-Bois-Francs region, asked the Institute to determine whether the methods used to measure emissions were appropriate.

During on-site visits, Brigitte Roberge of the Institute's Analytical Support Programme observed that mechanics' adjustments were often aimed at maximizing performance rather than minimizing toxic emissions. Furthermore, the method used to measure carbon monoxide levels was inappropriate. The Institute developed a systematic preventive maintenance programme for mechanics and tuned up the fork lifts using a "four-gas monitor." Health and safety specialists were encouraged to use a standard sampling method based on a modified gas cooler specifically developed for this purpose.

These results were rapidly communicated to interested parties through the distribution of the sampling method to industrial hygienists, production of a data sheet for mechanics, provision of gas coolers by local CSST offices, organization of a colloquium for mechanics and health and safety specialists in the Mauricie-Bois-Francs region, and production of a video by the CLSC Drummond. Further communication activities are in progress.

mixtures of chemicals. Finally, the Institute collaborated with the CSST on the development of a training programme on hazardous machine lock-out procedures, intended for CSST inspectors. The need for such a programme has been expressed on several occasions, particularly during investigations of serious accidents.

The distribution, in collaboration with joint sectoral associations, of guides based on recent research was yet another of the approaches we relied upon to transfer our expertise. The production of and distribution of the first two in a series of technical guides on various safety considerations related to the operation of **metal presses** is an example of this approach. These guides follow up on an extensive analysis of the hazards of metal presses published in 1994.

Technical guides were also produced on the maintenance of propane-fed fork-lifts, selection principles and criteria for suspension seats in vehicles, and the value of shielding as a control measure in dielectric presses.

Institute scientists sat on various committees reporting to the CSST's Board of Directors - including those responsible for updating the Regulation Respecting the Quality of the Work Environment, the

See Insert 6

Technical guides for the Safe Operation of Metal Presses

“By validating the technical guides, the Institute responded to an important need for expertise expressed by one of our member companies. The results of the study will help us develop training programmes and provide the necessary on-site technical support.”

Marc St-Marseille, Eng., Technical Consultant, Joint Sectoral Association, Transportation and Machine Fabrication Sector

In 1994, the Institute published the results of a vast study of the risks associated with the use of metal presses in Québec companies. One year later, following up on report recommendations, it published the first two in a series of technical guides aimed at reducing or eliminating these hazards. The guides, developed by a team in the Safety Engineering Programme directed by Raymond Bélanger, explain how to determine the optimal location of two-hand controls on full-stop clutch presses and slip-clutch presses.

new computerized systems in patrol cars. Our ventilation experts studied indoor air quality in a Montréal-area school experiencing problems. Using an innovative tracer gas technique, they were able to identify recirculation of exhaust air as the source of problems and develop appropriate solutions. The Institute's expertise in the prevention of falls from heights was again in strong demand in 1995, particularly by the CSST, for whom we evaluated several types of protective equipment. We also evaluated many types of protective equipment for joint sectoral associations and companies, and provided them with advice on ergonomic questions.

The goal of our consulting activities, far from being limited to the direct effects of our interventions, is to help the working community assume as much responsibility as possible for prevention activities. To this end, we strive to transfer our expertise to occupational health and safety specialists and consultants whenever possible. In fact, an Institute study reviewed the literature on knowledge transfer, analysed its components, and proposed a new model for the process.

In keeping with this philosophy of knowledge transfer, we offered many training sessions over the year for health and safety specialists. A group of researchers from the Safety Ergonomics Programme gave a four-day course to CSST inspectors on the prevention of cumulative trauma disorders. The course curriculum included physiological aspects, analysis of work activities, identification of high-risk workstations, solutions, and follow-up. The authors of the Guide for the Prevention of Microbial Proliferation in Ventilation Systems, published in 1994, gave seven training sessions on indoor air quality in non-industrial buildings. The Institute also organized a course on respiratory protection in collaboration with the Joint Sectoral Association, Transportation and Machine Fabrication Sector. The course was attended by over 300 people, including CSST inspectors, industrial hygienists, and corporate health and safety managers. Training was also offered on the resistance of gloves to

INSERT 4

An Innovative Method to Evaluate the Resistance of Gloves to Cuts

"Cuts are a serious problem in our factory. The Institute's mechanical method of testing glove resistance clears the way for a prevention programme which will affect almost one-third of our 650 employees. Collaboration on glove testing is already under way and we are not excluding the possibility of entering into development agreements with manufacturers."

Charles Beaudry, Director, Safety, Hygiene and Environment, Camco

Injuries to the upper limbs, usually involving the hands, account for almost one-third of accidents resulting in work absence. In most cases, the use of protective gloves could have avoided these accidents or reduced their severity. But how can the resistance of commercially available gloves be measured?

By developing a method to evaluate the resistance of protective gloves to cuts, the team in the Institute's Safety Engineering Programme directed by Jaime Lara has made important progress in answering this question. Thanks to this reliable and internationally recognized test method, users can now measure the resistance of gloves to cuts and rank gloves according to their effectiveness. Manufacturers, on the other hand, will find the report an important source of recommendations on glove materials and information on ways to improve their products.

To facilitate the adoption of the test method as a standard, an innovative test bed was also developed. This has been adopted by several international standardization committees, providing yet more proof of the Institute's laboratories' role as reference laboratories. In Québec, health and safety specialists involved in the selection of protective gloves were informed of the method in many ways, most notably through meetings with joint sectoral associations, presentations at joint sectoral association conferences, publication of articles, and distribution of the project report throughout the CSST network and in targeted workplaces.

sprain in honest subjects and in fact superior to that obtained with any of the devices. Although some devices were better at confirming or rejecting a diagnosis of lumbar sprain in dishonest subjects, the margin of error was so high that they cannot be recommended as the sole diagnostic modality.

These selected examples of research results delivered in 1995 are ample illustration of the variety, relevance, and utility of our work. The reception they enjoyed in Québec and abroad confirms the Institute's leadership and the high credibility enjoyed by its scientists.

Consulting

Consulting activities, the Institute's second major field of activity, accounted for almost 20% of scientific and technical resources. However, this year saw a major reorganization of our consulting activities, undertaken to ensure that they correspond to our clients' needs. As a result, we have intensified them and structured them more rigorously. Although we continued to perform isolated consultations aimed at resolving specific problems, this past year saw greater emphasis being put on supporting the CSST in the application of its new approaches to prevention and inspection, return-to-work and medical assistance, training of health and safety specialists, and the production of guides and technical guides.

Our consulting activities took on a new dimension with our participation in five **pilot projects** comprising part of the CSST's action plan aimed at preventing

cumulative trauma disorders. All five of these projects are based on models and tools we have been developing and refining since the early 1990s in studies of the participatory approach to prevention, particularly in slaughterhouses and the Metal and Electrical Products Fabrication Sector. Recognizing our expertise in this field, the CSST has asked us to determine the feasibility of applying this approach on a broader scale, through knowledge transfers to health and safety specialists and the working community.

Requests for our expertise came from many economic sectors during 1995. For example, the Department of Public Security asked our ergonomics experts to help define installation parameters for

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The Institute's Expertise in Support of Pilot Projects of the CSST's CTD Action Plan

"The Institute scientists' contribution to the pilot project, especially their role in training the members of the participatory ergonomics committee, characterizing the workplace, and systematically analysing work activities, was very valuable. They fully cooperated with the other project partners."

Yvon Lafleur, Director, Health and Safety, Eastern Township Regional Office, CSST

At the request of the CSST, the Institute actively participated in the implementation of a new approach to the prevention of cumulative trauma disorders in five companies targeted for pilot projects. This was the ideal situation to apply and extend our expertise acquired in recent years through research in participatory ergonomics and work organization.

The first of these pilot projects was conducted from May to December 1995 by two Institute ergonomists, Marie Bellemare and Claude Lechasseur, in collaboration with CSST specialists. The site of the project was a rubber-profile finishing factory in the Eastern Townships with a high rate of cumulative trauma disorders. The project's goals? To teach workers and employees how to jointly identify and discuss risk factors, to try out and validate new solutions, and to transfer the Institute's expertise to CSST personnel called upon to intervene in industry.

Project activities included the establishment of a joint health and safety committee, provision of training, development of appropriate tools, analysis of workstations, and identification and implementation of solutions. One year later, the initial results look promising. Throughout the project, the approach was monitored and scientifically evaluated by Institute personnel, thus furthering our understanding of the principles underlying the prevention of cumulative trauma disorders.

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