1998

Annual Report
Institut de recherche en santé et en sécurité du travail

Mission

The Institut de recherche en santé et en sécurité du travail du Québec (IRSST, Québec Occupational Health and Safety Research Institute) was created in 1980 to contribute, through research, to the prevention of occupational accidents and diseases and the rehabilitation of affected workers.

Its mandate is to ensure the development and dissemination of the scientific knowledge needed to achieve these goals.

The IRSST is a non-profit agency funded by the Commission de la santé et de la sécurité du travail du Québec (CSST, Québec Occupational Health and Safety Commission). Its board of directors is composed of an equal number of employer and union representatives.

Table of Contents

President's Message

Over the last twenty years, Québec has made great strides in occupational health and safety, thanks in large part to research. This progress, and the challenges that it brings, has impelled the Institute to reposition itself. Our clients are better prepared than ever, and our scientists find themselves called upon to answer increasingly complex questions in continuously evolving fields.

This annual report reflects this evolution. It reports the Institute's new approach and the priorities it has established in light of expressed or anticipated needs and available scientific and technical resources. Moreover, it reflects the Institute's dual challenge of providing immediate responses to specific problems while, over the longer term, acquiring the knowledge needed to support prevention and rehabilitation initiatives.

It should hardly be necessary to point out that health and safety research is a profitable investment which benefits workers and employers by arming specialists with more effective tools with which to improve working conditions. The Institute has every intention of continuing to live up to their expectations.

Trefflé Lacombe
President

Director General's Message

Throughout 1998, the Institute continued its efforts to position itself over the medium term as a reference centre that is not only an essential component of the CSST network's operations and strategic planning, but also a useful resource for its other partners. On the heels of a client-oriented reorganization that strengthened its ties to frontline actors and helped it assume its responsibilities within the health and safety network, the Institute maximised its impact by consolidating and refocussing its activities.

To this end, the Institute developed an integrated scientific programme for each of its priority research fields, and increased cross-pollination between fields by sharing common concerns, improving coordination and the complementarity of its research, and pooling results. In the same spirit, the Institute increased the collaboration of its internal research teams with university researchers, and encouraged interdisciplinarity whenever possible. The active participation of members of the CSST network and of the workplace community in research projects — particularly their participation in advisory committees — not only stimulated their appropriation of results but also contributed to the development of an integrated approach to health and safety research. In this way, the scientific and technical progress resulting from its research projects allows the Institute to consolidate the critical mass of knowledge needed to support prevention and rehabilitation efforts.

Jean Yves Savoie
Director General

Overview of 1998

In 1998, the Québec Occupational Health and Safety Research Institute continued to expand its repertory of strategies designed to increase the synergy between health and safety researchers and the workplace community. Its ongoing challenge is to marry scientific rigour to real-world needs, and provide robust solutions that employers, workers, and health and safety specialists can all endorse. Almost twenty years after its creation, the IRSST has attained the maturity needed to reorient its activities and optimise resources in order to ensure their maximum impact.

Repositioning

Following consultation with its partners and in-depth analysis, the Institute established health and safety research priorities and medium-term orientations. As a result, the Institute's programme for 1999, approved by its board at the end of the year, incorporates research orientations extending to the year 2002. The Institute's production continued unabated throughout this repositioning process: 164 research and expertise projects were active in 1998, 55 of which were completed and 52 begun.

Vision 2002

The Institute's vision of the future reflects its clientele's needs, discussions with its partners, and analysis of its strengths and weaknesses. Its new research orientations and management practices are testimony to its commitment to keeping this vision up to date.

"The IRSST is committed to building on its leadership in occupational health and safety research and becoming, no later than 2002, a bipartite reference centre that is not only an essential component of the CSST network's operations and strategic planning process, but also a useful resource for its other partners. This will strengthen the Institute's reputation nationally and internationally, and ensure the establishment of a network of research and development partners."

Six Research Fields

The past year's research priorities mirrored those established two years ago. Towards the end of the year, however, the merging of the priority research fields of back disorders and cumulative trauma disorders into one brought the number of fields to six. The IRSST is now concentrating on developing integrated research programmes in each of these fields: rather than authorising individual projects in response to specific needs, it will now plan its activities with an eye to fostering complementarity and maximising the impact of its projects by ensuring continuity of knowledge. This approach is readily apparent in the thematic review of the past year.

Management Practices

The stimulus to research will be supported by appropriate management practices. To this end, the continuous-improvement programme launched last year to maximise the consistency, quality, and impact of the Institute's activities was maintained. Six areas were targeted for improvement last year: leadership in research; practical value of results; recognition, motivation, and empowerment of personnel; quality of products and processes; and harmonisation of administrative and operational procedures. Work was begun in three of these areas in 1998.

Chairs and Scholarships

The Institute favours the establishment of structures that promote research synergy by attracting and centralising researchers and other experts interested in selected topics in occupational health and safety. Its support for the creation and maintenance of university chairs, e.g. the chair in acoustics at Université de Sherbrooke which it has long supported, reflects its commitment to this approach. This past year saw the creation of a chair in the management of prevention at Université Laval.

The graduate studies scholarship programme is yet another reflection of the Institute's preoccupation with increasing the pool of occupational health and safety researchers. This year, the Institute was pleased to note the success of its efforts to recruit doctoral students and post-doctoral fellows, with 18 of the 23 scholarships awarded in 1998 going to recipients at this level.

Joint IRSST-FCAR Activities

In 1992, the Institute, in collaboration with the provincial fund for researcher training and research support (Fonds pour la formation de chercheurs et l'aide à la recherche, FCAR) launched a research programme on the prevention of occupational accidents, with a budget of $720,000. This past year saw the submission of research reports on the participation of manufacturing-sector workers in prevention activities, the causes of accidents in the construction sector, and the effectiveness of training in the mining sector, and the conclusion of the programme.

Appropriation of Results

The Institute's concern for the dissemination and application of the results of its activities is apparent in its approach to project management, particularly its collaboration at every stage with potential intermediaries. In 1998, the standing committee for the application of research results collaborated with researchers on the application of results from some thirty projects. Joint sectoral associations, which are well entrenched in their sectors and often the ones to actually request research, once again proved to be valuable partners in applying Institute results. An eloquent example of such partnership was their publication of several technical guides, including ones on the new environmental industries. Similarly, collaboration between researchers and stakeholders on CSST intervention programmes continued to be very profitable.

Application

Agreements designed to facilitate the application of Institute-funded research were concluded with Québec universities in 1998. The universities of Montréal and Sherbrooke were the first to sign such agreements, which establish a framework for managing intellectual property rights and sharing the benefits and responsibilities related to the application and transfer of research findings.

Dissemination

The Institute not only promotes the appropriation of research results by intermediaries but also deploys a wide range of communication tools to ensure their broadest possible availability. Towards the end of the year, it considerably extended its communication strategy with the launching of a World Wide Web site containing extensive information on its mandate, services, and achievements.

The Institute continues to provide interested parties with pertinent documents. In 1998, it published 57 scientific documents, including 45 new research reports and guides, and 12 laboratory methods, and distributed 16,034 documents in response to special requests or at special events. *Prévention au travail*, the joint CSST-IRSST magazine, published 24 articles on research and expertise activities conducted or funded by the Institute.

Thematic Review of The Year

In 1998, the Institute concentrated its scientific and technical production in six priority research fields. These activities not only provide the CSST network and the workplace community with appropriate responses, but also help, over the long term, to develop a critical mass of knowledge in each field.

Safety of Industrial Tools, Machines and Processes

Chemical and Biological Agents

Noise and Vibration

Protective Equipment

Musculoskeletal Disorders

Accidents

A multimedia training package on rock bolting for miners

The quality of timbering in mines is a question of life and death — rock falls are responsible for half of all fatal accidents. Mining sector representatives made it clear during discussions with the Institute at a symposium on grounds control in 1997 and in a memorandum of the Québec mining association that they believe that solving this problem depends on training miners in rock bolting. The IRSST therefore funded Université Laval researchers John Hadjigeorgiou and Richard Poulin to develop an interactive multimedia software package to help train miners in rock bolting. To define the content of the training, they surveyed the types of timbering used in 14 Québec mines, and consulted industry representatives. The relevant technical information was then obtained from manufacturers and suppliers, and validated in mines.

"The pedagogical design exploits multimedia to the fullest, using voice, images, and animation. Thanks to this innovative tool, trainers now can devote more of their time to advising and guiding workers."

John Hadjigeorgiou
Researcher
Université Laval

Safety of industrial tools, machines and processes

Evolution of Concerns

The focus of IRSST research on the safety of tools, machines and processes is undergoing a transformation. Rather than emphasising the search for immediate and specific solutions to problems facing the workplace community and health and safety specialists, it now prioritises collaboration with its partners on the integration of safety considerations into the design, use, and maintenance of tools, and on knowledge transfer.

Integrating Safety Considerations into the Design Process

The Institute's broad approach to research on the safety of tools, machines and tools was spearheaded by its activities in the pulp and paper sector. The programme launched in 1996 to ensure the safe use of control systems in this sector continued in 1998. Workers and employers from some sixty pulp and paper mills, supported by an interdisciplinary team of researchers and experts, are participating in this project, whose ultimate objective is the transfer of acquired skills to the workplace community. The project is expected to be completed in 1999.
Other sectors, such as aluminum smelting and sawmilling, have expressed interest in participating in similar projects.
In a related development, the Institute is collaborating with several prestigious organisations to organise the International Conference on the Safety of Industrial Automated Systems, to be held in Montréal in October 1999.

Making Equipment Safer

In parallel to its work on integrating safety considerations into the design process, the Institute is conducting a number of projects to evaluate, improve, or develop collective and personal protective equipment. In 1998, the Institute designed a guard for industrial food mixers used by master pastry chefs, and produced a technical guide for it.
Development of a device to measure the stopping time of metal presses also continued.

Safety in Mines

In 1998, the Institute was prominent once again in the mining sector, where grounds control is the main concern.
The publication of the *Guide d'évaluation des coups de terrain dans les mines* (guide to the evaluation of rock bursts in mines) crowned ten years of IRSST-funded research in this sector. The ERP method described in the guide breaks new ground by predicting the potential for rock bursts *a priori* rather than on the basis of previous seismic activity.
The Institute also funded the production of a multimedia training program for miners on rock bolting. At the close of the year, some ten projects related to mine safety were under way.

See page 10

Scientific answers to concerns about paper-mill effluents

Microbiological treatment of wastewater is new to Québec. Given the lack of information on the effects of effluents from this process on the health of workers and riverside populations, the concern elicited by the decision of approximately 40 paper mills to use this technology to meet environmental standards in force since 1995 should not be surprising. Responding to a call for help, Institute researchers designed a systematic industrial hygiene survey to provide the needed answers.

A large-scale recruitment programme was launched in the sector, and 11 paper mills agreed to participate in the survey. Representatives of employers, workers, the CSST, regional health boards, and CLSCs participated in all stages of the project. Following comprehensive field sampling, the chemicals and microorganisms present in the environment were identified and quantified, the risk of exposure estimated, and appropriate recommendations formulated.

The concerns were due in large part to a misunderstanding of the effects of the treatment process. We were able to reassure workers, employers, and riverside populations because our answers were based on solid science and were part of a global approach to prevention. The key factors in the success of this approach were the active participation of all stakeholders and the widespread dissemination of the results.

Nicole Goyer
Director
Analytical Support Programme
IRSST

Chemical and Biological Agents

Maintaining Our Strengths

The IRSST's laboratories, recognized internationally for their reliability, quality, and innovative work on chemical and biological agents, are at the heart of our close ties with industrial hygienists, health professionals, and workplace technicians. In 1998, the Institute maintained the orientations that have led to its leadership in this field.

New Orientations

In 1998, the Institute announced its intention to undertake research in three new areas: toxicological risk assessment, where it hopes to bridge the gap between researchers and field specialists; dermatitis and skin allergies, for which a research programme will be developed with the help of an interdisciplinary team of researchers and experts; and the impact of regulatory changes concerning the quality of the work environment, in support of the committee, reporting to the CSST's board of directors, responsible for revising these regulations.

Solvent Substitution

In 1996, the Institute, drawing upon the results of research it funded, proposed approximately one hundred alternatives to the use of hazardous industrial solvents. Follow-up projects conducted in 1998 in collaboration with joint sectoral associations evaluated and promoted the implementation of these solutions, and sought new ones.

Ventilation

The Institute continued to develop its expertise in ventilation in 1998, turning its attention from office buildings to small and medium-sized companies. In collaboration with the CSST, the Québec association for energy management (Association québécoise pour la maîtrise de l'énergie (AQME)) and the Beaulier Inc. consulting firm, it developed a guide to the use of ventilation to ensure acceptable air quality in industrial settings. The guide identifies knowledge transfer as the method of choice for promoting the appropriation of ventilation-related prevention activities by companies and their partners.

Isocyanates

The Institute saw its leadership in research on isocyanates, a group of industrial chemicals responsible for many cases of occupational asthma, confirmed yet again in 1998. At the request of three prestigious American agencies, it coordinated a vast pooling of international expertise on isocyanates and organized a new course offered at the American Industrial Hygiene Association's conference in June 1998. Towards the end of the year, the Institute began work on a definitive guide to the safe use of isocyanates.

Environmental Trades

The submission in 1998 of a research report on the improvement of health conditions in recyclable-waste sorting centres completed a research cycle on the new environmental trades; previous work in this area included studies of domestic-waste composting centres and wastewater treatment facilities. Thanks to the partnership of the joint sectoral association for the municipal affairs sector, the results of these studies, particularly a series of technical guides, have been widely disseminated. The IRSST also concluded research on paper mill effluent-treatment emissions, in collaboration with industry and local community service centres (CLSCs), local health and social services boards, and the CSST.

See page 12

Exposure Indicators

The Institute's repertory of analytical tools was further enriched by the development of a new tool for the biological monitoring of toluene exposure. Faced with the challenge of a new permissible exposure limit for toluene which previous methods were incapable of measuring, the Institute scientifically validated a new biological marker — urinary ortho-cresol.

Metrology

The development of measurement and evaluation techniques to support environmental workplace monitoring was one of the Institute's most significant achievements in the field of chemical and biological agents. Several methods were perfected in 1998, including a technique to measure certain bacterial endotoxins present in the ambient air of workplaces. In addition to its role as a reference laboratory, the Institute also offered its expertise in field industrial hygiene, emphasising knowledge transfer.

CSST Intervention Programmes

The Institute was extremely active this year in CSST intervention programmes, including those concerned with abrasive blasting, electrostatic coating, fabrication of fibreglass articles, welding and cutting, and biological hazards. Institute support took the form of the provision of expertise to the programmes' coordinating committees, creation of training modules, and research. Its achievements in 1998 included the development of a ventilated work table equipped with a system that captures styrene emissions at their source during the fabrication of fibreglass articles, evaluation of the effectiveness of preventive measures used during abrasive blasting, and provision of training on the safety of work involving abrasive blasting and electrostatic coating. The Institute's also made a valuable contribution, at the request of the government of Quebec, to the joint programme on the prevention of pneumoconioses.

Environmental and Toxicological Analyses

In 1998, Institute laboratories conducted 56,644 analyses, 39,681 of which were for its partners in the prevention and inspection network, i.e. the CSST, regional health and social services boards, CLSCs and joint sectoral associations. These laboratory services were provided under the terms of an agreement with a specific annual budget. Contract analyses consisted of 8,077 analyses for employer and union associations, agencies, and companies, and 2,022 analyses for researchers developing new analytical methods and for quality control. The analyses not only responded to specific needs but also helped the IRSST and CSST orient their prevention activities.

Monitoring Equipment

The Institute also calibrates, maintains and repairs monitoring equipment used by the prevention and inspection network. In 1998, a total of 4,600 hours were spent on services of this kind, in large part for regional health and social services boards. The CSST also received support from Institute experts — most notably through the development of technical guides — when purchasing monitoring equipment for its prevention network.

Networking

Because of their special relationship with the Institute, the Laboratory Division's clients, especially the members of the provincial association of industrial hygienists, are the Institute's partners of choice when establishing research needs in the area of chemical and biological agents. The laboratory's Client Services Programme fosters this relationship by acting as the interface between laboratory personnel and laboratory clients in all matters related to sample analysis, instrument repair and calibration, equipment requests, and communication of results.

Noise and Vibration

Quieter Design and Production

The Université de Sherbrooke's Groupe d'acoustique et vibrations (GAUS, acoustics and vibration group) is the Institute's leading partner in noise research and its partner in funding the industrial chair in acoustics at Université de Sherbrooke. The Institute's objective in this field is to develop quieter design and production processes; to achieve this, it is focussing on developing new construction materials, design tools, and active-control devices.

New Materials

In 1998, the Institute approved an experimental research project that will evaluate the functional and economical feasibility of using porous heterogenous materials to attenuate low-frequency noise produced by some machines. Existing acoustic materials only effectively attenuate high and medium-range frequencies, and the development of an effective low-frequency attenuation material would be a major breakthrough with great practical potential.

Design Tools

The past year also saw the GAUS produce design-support software for low-noise assembled structures that helps resolve complex problems in the field of vibrational acoustics. The software was developed to meet the needs of industrial engineers who must develop models of acoustic propagation that take into account several design and output parameters, and has elicited great interest in the international scientific community.

Active Control of Noise

The first phase of a research project on a new active-control hearing protection device was completed in 1998. Active-control devices neutralise ambient noise by generating counter-noise. The device, which resembles a personal cassette player, differs from existing protective devices by virtue of its light weight and its ability to filter out undesirable noise from warning signals and other forms of communication.

Vibration: Standards and Control

Research on vibration went through a transition phase in 1998, and was marked by several developments in the areas of standardisation and control. The adoption and implementation of new international standards and the inclusion of vibration-related considerations in European guidelines on machine safety, for example, created new research opportunities. The Institute met this challenge by adopting a new orientation that emphasises the characterisation of vibration exposure, development of low-vibration products, and knowledge transfer.

Vibration Exposure

Toward the end of the year, the Institute, in collaboration with Concordia University's CONCAVE group — its partner in vibration research — completed a study that characterised the vibration generated by various types of vehicles, including municipal buses, snow-clearing caterpillar tractors, fork-lifts, and loaders. The results of this study could prove useful in evaluating suspension-equipped seats.

Development and Evaluation of Corrective Measures

The project evaluating the effectiveness of anti-vibration tools continued through 1998, and a new project that will attempt to reduce the effects of the bottoming-out of suspension-equipped seats was approved. This latter project could yield significant scientific breakthroughs and has elicited great interest in the international scientific community.

Development of a respirator guide thanks to Institute expertise

In Québec, approximately 400,000 workers use respirators to protect themselves from contaminants present in ambient air. The thousands of models on the market have all been tested and classified by the National Institute for Occupational Safety and Health (NIOSH) of the United States. Until recently, Québec regulations relied on the NIOSH list of approved respirators. When NIOSH announced that it would no longer be publishing the list, the committee responsible for the review of the Regulation Concerning the Quality of the Work Environment asked the IRSST to assume responsibility for such a list. The challenge was daunting: create a database based on a new classification system and integrating more than 1,500 models added since the publication of the last NIOSH list in 1993. However, Jaime Lara and Mireille Vennes, the project directors, wanted to go even farther and include notes on the respirators and propose selection criteria. The participation of a bipartite advisory committee ensured that the new guide met users' needs. This ambitious project has been completed and health and safety specialists now have a French-language guide that meets the needs of Québecers.

"The IRSST's expertise in protective equipment provided the foundation that allowed us to take over from NIOSH and fulfill our role of primary reference source. At the same time, the close ties between the Institute and health and safety specialists gave us privileged access to users and ensured that our product met their needs."

Jaime Lara
Researcher
Safety Engineering Programme
IRSST

Protective Equipment

Pushing Back the Frontiers

The IRSST's orientations in the field of protective equipment research reflect its commitment to remaining a primary reference source and pushing back the frontiers of knowledge. In addition to helping to develop protective equipment and adapt testing and evaluation methods, the Institute also attempts to shed light on protective mechanisms. His solid reputation in the international scientific community was confirmed by its hosting of a meeting of the American Society for Testing and Materials this past year.

Broadening the Context

The IRSST's reputation in this field is due to its success in broadening the scope of research on protective equipment. This new perspective has driven it beyond the study of mere effectiveness to the development of new materials and production processes and the analysis of the constellation of factors that influence the use of protective equipment. As a result, researchers now leave their laboratories to work in the field with specialists and workplace representatives. The work on the development of a method to evaluate the resistance of protective gloves is a good example of this approach; the method has been recognized by national and international standardisation agencies and is now commercially available. In a related matter, a research project conducted in partnership with the joint sectoral association for the metal products fabrication sector studied hand protection in a metal products factory

A Primary Reference

In 1998, the Institute multiplied the expertise and knowledge transfer activities that have made it a primary reference body in protective equipment research. The publication of a guide to respirators used in Quebec confirmed its leadership in this field.

Shoring

This past year's validation of a shoring system developed by the city of Montreal crowned many years of research in this area. The system is well suited to excavations in urban settings and provides protection at depths of up to 12 feet. This research, conducted in collaboration with the city of Montreal, a consulting engineer, and the joint sectoral association for the municipal affairs sector, provided municipalities throughout Québec with a system that ensures the safety of public works involving trenches. The results of this project were presented at a colloquium during the year.

Testing and Evaluation Methods

The IRSST continues to adapt the methods it uses to test and evaluate protective equipment. Two particularly noteworthy accomplishments in 1998 were the evaluation of protective footwear worn by forestry workers, and the development of method, based on a method used to evaluate gloves, to evaluate the resistance of protective footwear worn by firefighters.

The importance the Institute attaches to factors that influence the use of protective equipment was given concrete expression by its mandating the Centre des technologies textiles (textile technology centre) to resolve problems of thermal discomfort and diminished dexterity caused by the wearing of certain firefighting garments.

Protective Mechanisms

Through its research, the IRSST also attempts to elucidate the mechanisms by which protective equipment functions. The adoption of this new orientation in 1998 was triggered by a research report on the resistance of protective clothing to industrial solvents which drew attention to the absence of a model of trans-membrane solvent permeation in industrial settings. The IRSST, in keeping with its integrated approach to research on protective equipment, is following up this finding by validating a new model of permeation. The research is expected to result in significant scientific advances.

See page 16

Expertise

The IRSST supported the CSST's intervention programme on falls from heights, a field in which it has developed considerable expertise over the years, by offering three training sessions to approximately fifty inspectors. Institute experts also responded to many requests for information and support.

A rigorous scientific examination of ergo groups

The publication in 1998 of the guide *Les groupes ergo* crowned the end of a research cycle begun in 1991 in partnership with the joint sectoral association for the metal and electrical products fabrication sector. The ergo group approach allows workers and employers to jointly appropriate the prevention of musculoskeletal disorders, with appropriate professional support.

The fundamental principles of ergo groups were developped in two research projects. The first, conducted at an electrical appliance factory, resulted in the refinement of both a workstation-analysis tool and the very concept of ergo groups, at the heart of the approach. Both the tool and the approach were scientifically validated in the second project, conducted in two electrical products factories. In parallel with these projects, ergonomists from the joint sectoral association evaluated the method in the workplace.

Once this scientific approach was validated, the challenge was to render the information readily accessible and adapt it to the realities of actual workplaces. To achieve this, it was necessary to incorporate examples from real-life experiences, create tools, define determinants of success, and identify potential errors. The result was a clear and practical tool that is attractive, easy to use, and useful to both participants in ergo groups and ergonomists supporting groups interested in creating ergo groups.

"This guide is the culmination of several years of research, and its production provided researchers and their collaborators with a special opportunity to reflect and take a step back. This allowed us to formalise and describe our approach in detail, identify its limits and the determinants of its success, describe our methods, and begin thinking about new objectives."

Marie St-Vincent
Researcher
Safety Ergonomics Programme
IRSST

Musculoskeletal Disorders

Merger of Back and Cumulative Trauma Disorder Research Fields

Research on both cumulative trauma disorders (CTDs) and back disorders will benefit from the synergy resulting from the merger of these two fields into the new Musculoskeletal Disorders priority research field. The decision in late 1998 to merge the two fields was the outcome of a review involving the Institute, active researchers, and field specialists. The review process helped the Institute reorient its efforts in this area and condense the state of current knowledge and the needs of the workplace community and specialists into a coherent whole. Major research orientations related to prevention, management (clinical profiles, diagnosis, prognosis, therapy) and returned to work were defined. The IRSST began to communicate its vision of this new research field toward the end of the year.

Exposure to Risk Factors

As part of its new orientation, the IRSST will undertake research on the health effects of exposure to musculoskeletal risk factors. The results of projects active in 1998, including literature reviews of questionnaires used in research on musculoskeletal disorders and of quantitative measures of exposure to physical risk factors, will prove useful in the development of quantitative exposure assessment methods.

Intervention Strategies and Tools

The development and evaluation of intervention strategies and tools was at the heart of research projects related to musculoskeletal disorders in 1998. The highlights of the year were the publication of a guide on "ergo groups" and a report on floor cleaners. The guide to ergo groups provides a conceptual framework for an approach to the prevention of musculoskeletal problems based on workers' analysis of their own workstations.
The report on floor cleaners describes the optimal usage conditions for these products and provides information that will help prevent falls and slips caused by a loss of balance; accidents of this kind are often responsible for musculoskeletal problems in general, and back disorders in particular. Research on the innovative aspects of ergo groups continued in the metal products fabrication sector, in collaboration with the joint sectoral association.
Other research projects active in this field in 1998 were a study of the integration of biomechanical and ergonomic considerations into the evaluation of handling tasks, the production of tools to prevent musculoskeletal disorders in the poultry-rearing sector, and a study of task rotation in the automotive sector.

Diagnostic Tools

In 1998, the Institute published the third in a series of physicians' guides to the diagnosis of musculoskeletal disorders, this one on shoulder tendinitis. These guides, produced by an interdisciplinary team, facilitate the clinical and etiological diagnosis of these injuries. The first two guides discussed the diagnosis of carpal tunnel syndrome and De Quervain's tenosynovitis. The Institute also authorised a project to evaluate the utility of

See page 18

open-field magnetic resonance imaging as a tool for the diagnosis of low back pain.

See page 20

Recovery

The research project accepted in this field in 1998 will evaluate the effectiveness, efficiency, and relevance of systematic biopsychosocial intervention in the recovery process. This research will be integrated into the CSST's rehabilitation initiatives and will also assess the impact of this type of intervention on rehabilitation specialists' motivation, satisfaction, and competence.

CSST Intervention Programme

In 1998, Institute researchers and experts continued to provide active support for the CSST's intervention programme on cumulative trauma disorders, most notably through field interventions in participatory ergonomics, training in materials handling and participatory ergonomics, and the provision of expertise. In a related development, the Institute was an active partner in the organisation and hosting of a CSST symposium on CTDs in November.

Trials of floor cleaners to reduce falls and slips

Between 1993 and 1995, falls and slips were responsible for more than 12 800 occupational injuries, most of which were in the restaurant sector. Until recently, the emphasis in preventing this type of accident was on the use of anti-slip footwear. However, researchers at QI Recherche et Developpement Technologique wanted to go further and eliminate the hazards at their source by developing floor-cleaner-usage guidelines that would reduce the slipperiness of floors. The IRSST-funded laboratory research reproduced real-life conditions as closely as possible. The objective was to eliminate slippery cleaners, especially waxes likely to accumulate on kitchen and dining room floors. This required the development of a scientific method to evaluate the surface concentration of floor waxes. The project succeeded in defining optimal use conditions and a classification system for floor cleaners. This data will be used to develop worker-oriented prevention tools.

"Our biggest motivation in conducting occupational safety research is the feeling that we're playing a socially active role. Our biggest challenge was to adapt our approach and scientific methods to the specific workplace problem at hand. The participation of workplace stakeholders facilitates users' integration of the results of our experimental research."

François Quirion
Researcher
QI Recherche et Développement Technologique Inc.

Accidents

Shedding New Light

The IRSST's accident-research orientations are the extension of a new conceptual framework that incorporates all facets of the accident process, including health and safety indicators, accident scenarios, the technical and human organisation of work, and the management of prevention up to and including return to work.

Occupational Health and Safety Indicators

In 1998, the Institute continued to provide researchers and specialists with the statistical data they need on occupational injuries; these indicators also help guide the establishment of intervention priorities. Research on sectoral trends in compensated occupational injuries between 1986 and 1996 confirmed the conclusions of the Institute's five-year studies. Statistical data on back disorders was provided by two projects: the first studied the situation in the construction sector, while the second analysed back injuries in 41 economic sub-sectors with a higher-than-average incidence of this type of injury.

The Effect of Organisational Change on the Accident Process

Several Institute projects active in1998 investigated the impact of technological change, emergence of new types of accidents, and implementation of new forms of work organisation on the accident process. The results of an analysis of occupational accident scenarios in the forestry sector will help predict the impact of mechanisation on the accident process. This project, whose second phase was completed in 1998, is being conducted in partnership with a tripartite committee composed of the CSST, employer associations, and the unions in this sector.
Major restructuring of the health and social services sector led Institute researchers, in collaboration with a regional health and social services board and the joint sectoral association for the social affairs sectors, to conduct a pilot study of accident scenarios related to home care. The IRSST is also studying semi-autonomous work groups, a new form of work organisation.

Management of Prevention Activities

The Institute supported the creation of a chair in the management of prevention activities at Université Laval this year. The chair's expertise in management strategies and structures related to prevention activities will make it a valuable research partner and help the Institute broaden its approach. The analysis of the intervention strategies of prevention specialists, completed in 1998, was early evidence of this partnership.
The Institute's interest in health and safety in small and medium-sized companies (SMCs) was demonstrated by its support for projects that characterised occupational injuries in SMCs and

See page 23

analysed the appropriation of health and safety in SMCs in selected economic sectors. Due to their complementary nature, these two studies of the impact of the management of technological change also consolidated information that health and safety specialists will find useful.

Return to Work

The inclusion of research on return to work in the accident-research programme is evidence of the Institute's broadening of the scope of this programme to include organisational factors. The first project in this field will be a pilot study that will characterise companies that succeed in returning victims of occupational injury to work.

Communication of Results

Several strategies were used to communicate the results of accident-related research to the scientific community, workplace community, and specialists. Examples of this multi-pronged approach can be seen in the efforts expended to communicate the results of research on firefighter safety completed in 1997, presented in colloquia organised by the joint sectoral association for the municipal affairs sector throughout Québec, and on rotating shifts.

In order to encourage the integration of considerations related to the aging of the workforce and psychosocial aspects of health and safety into all its research, the Institute's scientific coordination and orientation committee kept researchers informed of developments in these fields. This demonstrates the interdisciplinary nature of the research on accidents and the close ties between this field and the other priority research fields.

An innovative look at the real-life experience of prevention specialists

The need for prevention specialists to possess a certain level of technical expertise has been accepted for some time. Today, thanks to a study by researchers at Université Laval, we know that they also need to possess skills in listening, mediation, and consensus-building, and remain accessible and visible in the field. These findings are the result of nine months of workplace observation in the pulp and paper, panel board, and sawmill sectors. This project produced a striking profile of the daily realities of prevention specialists — heavy workloads, bureaucracy, contradictory guidelines — and highlighted the most effective prevention practices and the skills needed to apply them. The project is described in detail in a book entitled *Le métier de préventionniste : entre l'arbre et l'écorce*, [The life of a prevention specialist: between a rock and a hard place]. Université Laval began offering custom training on prevention skills in September 1998.

"Our book is a concrete example of the potential impact of research involving universities, the workplace, and the Institute. Our project was the first to study the actual practice of prevention, and produced an innovative portrait of prevention and of partnership, one of the essential determinants of success. It is evidence of Québec's innovative approach to health and safety research and intervention."

Jean-Pierre Brun
Researcher
Université Laval

Organisation

The Institute's organisational structure is intended to ensure that all its research, expertise, immediate-response and service activities form part of a consistent and well-defined continuum, from analysis of client needs to the final delivery of results in the form of analyses, expertise, immediate responses, or services.

The IRSST's team comprises 138 people, including a scientific corps of 104 researchers, professionals, and technicians from disciplines as varied as ergonomics, industrial hygiene, chemistry, physics, engineering, sociology, anthropology, and demographics. In 1998, 135 researchers from its extramural network of universities, research centres, and the private sector were active on Institute projects.
The collective agreement covering working conditions of the IRSST's unionized employees was renewed for a three-year period at the end of 1998.
In 1998, the Institute doubled its investments in training and established a training programme designed to further knowledge and competence in four high-priority domains: continuous improvement, scientific and technical production, production support and management of research teams.

Communications Division

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.

Finances and Administration Division

The 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 to monitor programmes and assess performance.
It also provides administrative support for scientific and technical operations and manages the secretariat.

Organisational chart
as of December 31, 1998

Operations Division

The Operations Division is responsible for the Institute's scientific and technical production. Its mandate is to define research needs in response to the expectations of our partners in the workplace community and the CSST network, develop, coordinate, and apply the scientific research programme, and anticipate future needs. These activities culminate in the development of the Institute's annual scientific programme and ensure adequate production. By centralising responsibility for internal and external research, establishing an integrated client-service structure, and combining responsibility for programme development and quality control, the Institute has given itself with the tools it needs to ensure the excellence, efficiency, consistency and synergy of its scientific activities and projects.

Quality Management and Special Projects Programme

The mandate of the Quality Management and Special Projects Programme is to ensure the scientific quality of internal and external research projects and 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.

Client Services Programme

The Client Services Programme 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 the network of external researchers and ensure that their Institute-funded activities complement and are consistent with our own, develop applications of research results, and identify partners who can act as knowledge-transfer intermediaries.

Safety Ergonomics Programme

The Safety Ergonomics Programme develops and disseminates ergonomics methods and information that respond to real-world needs. The Programme's research focusses on two of the Institute's priority research fields: musculoskeletal disorders and the safety of industrial tools, machines and processes. The principal research concerns are the development and application of concrete analytical and intervention tools, effective strategies for incorporating safety considerations into the design process, and methodologies to measure the impact of intervention strategies. The team also develops and validates techniques and methods to identify and evaluate risk factors.

Safety Engineering Programme

The Safety Engineering Programme's mandate is to reduce or eliminate hazards related to industrial work. To this end, Programme members conduct field surveys and laboratory analyses in support of research on risk assessment and reduction. Programme activities centre on the following priority research fields: the safety of industrial tools, machines and processes, protective equipment, and noise and vibration.

Analytical Support Programme

The Analytical Support Programme conducts industrial hygiene research and development on chemical and biological agents, one of the Institute's priority research fields. As part of the laboratory services agreement concluded with the CSST, it provides the CSST network with microbiological analyses and ensures the maintenance, repair and calibration of all the industrial hygiene equipment it uses.

Industrial Hygiene and Toxicology Programme

The Industrial Hygiene and Toxicology Programme conducts applied research in two of the Institute's priority research fields: chemical and biological agents, and protective equipment. As part of the laboratory services agreement concluded with the CSST, it provides the CSST network with environmental and toxicological analyses and related expertise.

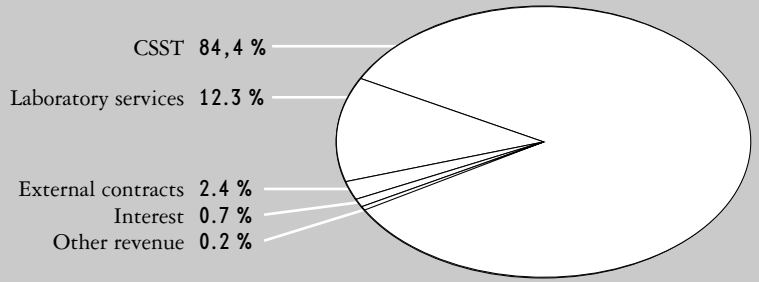
Work Organisation Programme

The majority of the Work Organisation Programme's research is concerned with accidents, one of the Institute's priority research fields. The research projects attempt to provide a clearer understanding of the impact of social, organisational and human factors on health and safety. Its mandate also includes the analysis of the process by which injured workers return to work and develop health and safety indicators to help establish research and intervention priorities.

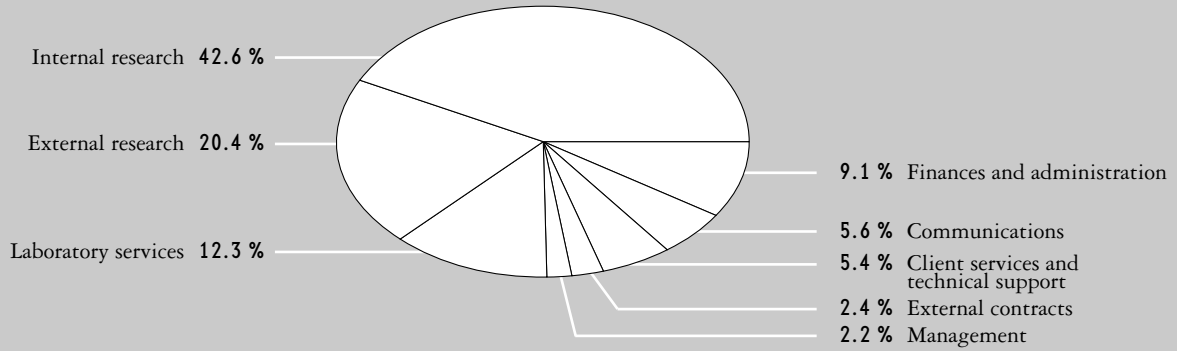
Financing

In 1998, the Institute's total revenue was $16,961,100, including a grant of $14,309,000 from the CSST. Expenditures over the same period were $16,896,238.

Revenues $16,961,100



Expenditures $16,896,238



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