



RESEARCH FOR A CHANGING WORLD



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DECLARATION OF DATA RELIABILITY

As president and CEO of the Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST), I am responsible for the information contained in this activity report. I attest to its accuracy and the reliability of the controls carried out.

Recommended by the IRSST's Scientific Advisory Board and approved by its Board of Directors, this 2008 activity report faithfully describes the Institute's mission, vision, and main achievements. It presents the indicators used to assess production and provides accurate and reliable data on the results obtained.

I therefore declare that I have every reason to believe that the observable facts and measurable data presented in this activity report correspond to the situation as at December 31, 2008.



Marie Larue
President and CEO
IRSST

MONTH-BY-MONTH ACHIEVEMENTS



January

Responding to a request from the Canadian Standards Association (CSA), the IRSST appointed **Yuvin Chinniah**, a mechanical engineering expert, to serve on the CSA Technical Committee responsible for developing a standard for occupational injury and illness risk assessment and management (CSA Z1002). This researcher was actually involved in a project involving the theoretical analysis of tools used to estimate the risks associated with industrial machines.

At the invitation of IRSST biomechanist **Alain Délisle**, Dr. Rolf Ellegast of Germany's BGIA came to Montréal to present the CUELA system (computer-supported registration and long-term analysis of musculoskeletal loads). A similar system is under development at the IRSST. Its purpose is to quantify trunk postures and movements during prolonged task performance in real work situations. This type of system is expected to help improve understanding of the causes of MSDs, evaluate the effectiveness of workplace interventions, and better identify the appropriate prevention procedures.

May

Organized by the Comité CSST-IRSST de la recherche en réadaptation au travail (CRERAT), a forum under the theme *La réadaptation au travail: de la recherche à la pratique* (work rehabilitation: from research to practice) provided researchers and rehabilitation professionals with an opportunity to share ideas on the development of knowledge and its translation into practice. This first gathering served to demystify the research process and its requirements for the 115 participants, giving them a better understanding of the context in which the CSST's rehabilitation counsellors work.

The IRSST did not go unnoticed at the annual conference of the Association québécoise pour l'hygiène, la santé et la sécurité du travail (AQHSST). The Association gave the Antoine-Aumont Award to **Esther Cloutier** as tribute to the impact and scientific merit of her OHS work. For her part, **Élise Ledoux** received the 3M Award given to the author of the best presentation, while the Fondation de l'AQHSST scholarship was awarded to **Sylvie Ouellet** for the best student presentation. Nor did the IRSST's laboratories go unnoticed: a method developed by **Pierre Larivière** and **Lucile Richard** for sampling hexavalent chromium in electroplating processes also attracted attention.

The IRSST's annual colloquium was held under the theme *Les grands enjeux de recherche en santé et en sécurité du travail* (the key issues in occupational health and safety research development). The guest speakers were Emmanuelle Brun from the European Risk Observatory of the European Agency for Safety and Health at Work, in Bilbao, Spain; Peter Ellwood, section head of the Horizon Scanning Team of the Health and Safety Laboratory (HSL) in the United Kingdom; and Sidney C. Soderholm, coordinator of the National Occupational Research Agenda (NORA) in the United States. Some 128 people attended. A round table discussion, followed by the ceremony naming the IRSST's Graduate Studies Scholarship recipients, brought the event to a close.

Camille Limoges was named to the IRSST's Scientific Advisory Board as a representative of the scientific and technical communities. Well-known in the research world, Mr. Limoges has spent as much of his career in the university environment as in public administration. He replaces **Charles Terreault**, who completed five terms on the IRSST's Scientific Advisory Board. The mandates of two worker representatives—**Micheline Boucher**, union advisor with the Confederation of National Trade Unions (CSN), and **Jean Dussault**, consultant at Occupational Health and Safety Services of the Québec Federation of Labour (FTQ)—were also renewed.

June

The publisher Elsevier Limited congratulated doctoral student Wenping Wang, **Paul-Émile Boileau**, director of the IRSST's Scientific Division, and Subhash Rakheja, a professor at Concordia University, for the popularity of an article they published in the *International Journal of Industrial Ergonomics*, under the title "Effects of Sitting Postures on Biodynamic Response of Seated Occupants under Vertical Vibration." Though published in 2004, the article was one of the most often cited in the world of research during the 2002-2005 period.

In June, the IRSST participated, in Finland, in the annual meeting of the Sheffield Group, which brings together the directors of the world's leading OHS research institutes. Attending for the first time, President and CEO **Marie Larue** established contacts that led her to consider whether the IRSST should seek recognition as a World Health Organization (WHO) collaborating centre. WHO collaborating centres are mainly university institutions and research centres.

Marie St-Vincent of the IRSST was elected co-coordinator of the community of researchers on work-related musculoskeletal disorders, by the members of the community of researchers at the Réseau de chercheurs en SST du Québec. As such, her mandate is to stimulate the development of research, act in the capacity of scientific coordinator, and keep abreast of research project funding opportunities.

A team comprised of IRSST researcher **Iuliana Nastasia**, Sandra Van Oostrom and Ross Iles was honoured for its excellent synthesis work on the return-to-work process, in the context of the Work Disability Prevention CIHR Strategic Training Program of the Canadian Institutes of Health Research (CIHR). They were awarded a certificate of excellence for their outstanding work.

The chairman of the IRSST's Board of Directors, **Luc Meunier**, confirmed the appointment of **Marie Larue** as president and CEO. She had been serving on an interim basis since **Diane Gaudet's** retirement.

September

Some 50 people gathered to discuss the research issues and opportunities related to hand-arm vibration exposure in the workplace. Organized by the IRSST's **Franck Sgard**, **Pierre Marcotte**, **Hugues Nelisse**, **Jérôme Boutin**, and **Denis Turcot**, together with Dr. Susan Stock and Dr. Alice Turcot of the Institut national de santé publique du Québec (INSPQ), the event's goal was to inform workplace representatives of the existing methods for evaluating and reducing vibration exposure and to raise their awareness of the medical problems associated with this phenomenon.

Pascale Gauthier was named an employer representative to the IRSST's Scientific Advisory Board. Legal counsel to the Conseil du patronat du Québec, she replaced Maître Robert Borduas. In addition, the worker representative mandate held by the FTQ's Daniel Flynn was renewed.

February

In order to offer its members scientifically validated information, the Group for prevention and promotion strategies—GP²S—entered into an agreement with the IRSST to enhance and expand the information provided to Québec companies. The research reports, guides and technical fact sheets developed or funded by the IRSST thus found a new dissemination channel for reaching Québec employers and workers.

The Canadian Institutes of Health Research (CIHR) in collaboration with various partners, including the IRSST, launched a strategic initiative aimed at injury prevention and treatment. Its purpose is to support the training of interdisciplinary teams on injury-related themes. In the case of occupational injuries, research teams that apply for funding must focus on risk factors in the workplace and the determinants of effective prevention strategies, as well as rehabilitation and the return to work.

The IRSST also issued a call for proposals aimed at developing design criteria for wheel chocks for retaining trucks and semi-trailers on transfer docks. To qualify for selection, the project had to take into account the characteristics of tires used on the types of trucks, semi-trailers, and lift trucks most commonly found on the Québec trucking market. This project also had to cover situations causing the unexpected movement of trucks and slipping of semi-trailers when they have been unhooked from trucks but are still sitting on their legs. The \$125,000 grant was awarded to Denis Rancourt at the Université de Sherbrooke.

July

As Secretary General of the Section on Education and Training for Prevention at the International Social Security Association (ISSA), IRSST president and CEO **Marie Larue** was invited to attend the 18th World Congress on Safety and Health at Work, held in Seoul, Korea. There she gave a presentation on the theme *The Knowledge Perspective: New Technology and Automatization Requires Lifelong Learning at Work*.

The IRSST's Scientific Division held a special meeting of its research field leaders for the purpose of mapping out the next three-year scientific and technical production plan.

October

The IRSST hosted a training seminar of the Americas Section of the International Society for Respiratory Protection (ISRP). Given that the ISRP holds few activities in Canada, this gathering in Montréal served as a recognition of the IRSST's vanguard position in the field of respiratory protection. Some 50 people took part in the seminar.

Capitalizing on the presence of ISRP personnel in Montréal, **Chantal Tellier** and **Jaime Lara** of the IRSST invited 80 professionals to a colloquium on respiratory protection aimed at providing participants with a state-of-the-art review and taking stock of research needs.

The European Agency for Safety and Health at Work invited the IRSST's **Jean-Claude Martin** to participate in the capacity of expert, in a workshop held in Bilbao, Spain, and organized by the European Risk Observatory under the theme "Shaping the Future of OSH – A Workshop on Foresight Methodologies." The guests shared their expertise on the methodology that the Agency plans to develop in order to anticipate emerging OHS risks associated with the development of new technologies.

CALENDRIER

March

At its Annual General Meeting held in Vancouver, the Canadian College of Microbiologists (CCM) elected scientist **Geneviève Marchand** to its Board of Directors. An expert in the characterization of moulds and bacteria, Ms. Marchand heads the IRSST's microbiology laboratory, which is accredited by the American Industrial Hygiene Association (AIHA).

April

Interested in the mineralogical analysis of lung tissue, chemist **Chantal Dion** and laboratory technician **Annie Ouellet** did a stint at the Laboratoire d'études des particules inhalées (LEPI) in Paris. In fact, the IRSST is in the process of developing an analytical method to respond to the CSST's request that from now on the IRSST conduct the mineralogical analyses of lung tissue samples taken from workers to confirm prior exposure to asbestos. The expertise of LEPI, which performs more than 1,000 such analyses a year, is enabling the IRSST's laboratory personnel to make more rapid progress in their efforts to develop an appropriate analytical method.

Roger M. Laporte's mandate as an employer representative on the Institute's Scientific Advisory Board was renewed. Embarking on his fourth term, he reiterated the importance he places on bringing the OHS concerns of small and medium-sized enterprises to the Board's attention.

August

The Guide *Machine Safety – Prevention of Mechanical Hazards, Fixed Guards and Safety Distances*, authored by IRSST researcher **Laurent Giraud** also met with huge success. The 12,000 copies of this guide, a joint CSST-IRSST publication, disappeared immediately, and an additional 10,000 copies had to be printed to meet demand.

November

The IRSST also made its mark in numerous ways at the CSST's Grand Rendez-vous santé et sécurité du travail 2008, still the largest exhibition of its kind in Québec. The IRSST's participation in the event organizing committee, the official opening, presentations, an information booth, and sponsorship, as well as its advertising on the outside back cover of the official guide and its launch of the Web site on manual load handling all served to promote the Institute, its personnel, and its scientific and technical production.

December

The members of the Board of Directors officially ratified the *Three-Year Scientific and Technical Production Plan*.





Message from the President and CEO

KNOWLEDGE: THE BASIS FOR ACTION

While each economic activity sector has its own distinct job profiles, trades, processes, and tools, they all face similar challenges to varying degrees when it comes to occupational health and safety. These include eliminating hazards, controlling risks, ensuring machine safety, and training workers and employers. The ultimate goal is to prevent occupational injuries. However, in both cutting-edge and more traditional sectors, the effective resolution of occupational health and safety (OHS) problems often depends on the results of research projects, scientific developments, or knowledge transfer. This is where scientific research can play a determining role.

Looking back on 2008—my first year at the helm of the IRSST—I was truly proud to note the diverse range of its scientific and technical output and the many needs it met in numerous workplaces. In addition, most of the activities outlined in the 2006–2008 three-year scientific and technical production plan *Pour une recherche porteuse de changements* and the 2006–2010 strategic plan, both developed under the informed leadership of Diane Gaudet, former IRSST president and CEO, were either carried out or initiated.

This activity report does not purport to itemize each and every one of the Institute's achievements, but instead paints a faithful portrait of all its endeavours. It provides an overview of the broad spectrum covered by our research work, while sketching a general picture of institutional life in 2008. Our 2008 activity portfolio featured new thematic programs; the development of analytical methods, maps, and an information monitoring process for each research field; statistical profiles; a new electron microscopy service; calls for research proposals on specific issues; the development of a framework of practice for knowledge transfer; responses to requests for expertise; partnerships; and the organization of strategic and scientific benchmarking meetings. These achievements were the result of the combined efforts of IRSST personnel and external researchers whose work is funded by the Institute. I also wish to underscore the work done by our support department staff, whose daily efforts enable the Institute to pursue its mission. Lastly, I wish to pay special tribute to the director of the Research and Expertise Division, Alain Lajoie, who, after many years of devoted service has left the Institute to take up other challenges.



With 2008 signalling the end of a production cycle, management drafted the *2009–2011 Three-Year Scientific and Technical Production Plan*, which opens up new avenues of research in order to meet the needs of an ever-changing world. This new plan focuses on the major research issues arising from the structural, social, and technological changes faced by organizations today. As we embark on a new year, it is clear to me that the IRSST's success in achieving its mission depends largely on its ability to anticipate changes and adapt to the emerging realities of the workplace. It is this goal that we are striving to achieve in Québec in collaboration with workers, employers, and all other stakeholders concerned with OHS. We believe that by working together, the outcomes of our research are more likely to meet our governing bodies' expectations and our clients' and partners' needs.

Marie Larue

Marie Larue shown here with the Management Committee: from left to right, Jean-Guy Martel, Jacques Millette, and Paul-Émile Boileau.

2008 IN NUMBERS

RESEARCH

183 **projects and activities** were active in 2008¹.

56 **projects** were completed.

48 **projects were approved**, broken down as follows:
9 joint, 18 internal, 21 external.

55 **other projects** were being developed.

103 **partner organizations** in the network were involved in active projects.

99 **new requests for expertise** were received.

30 **committees of the CSST and its network**, including regulatory committees, had at least one IRSST representative.

15 **national and international standards development committees** invited the IRSST to serve on them in an expert capacity.

41 **scholarships were awarded**, for a total of \$423,875¹.

1. Summaries of all the projects carried out or funded by the IRSST and a complete list of all scholarship recipients are available on its Web site at www.irsst.qc.ca.

DISSEMINATION

80 **publications**, including **66 research reports**, technical fact sheets and guides published by the IRSST, **6 technical fact sheets and guides**, published in collaboration with partners, **8 laboratory methods**.

138 **scientific publications** (peer-reviewed) related to projects carried out or funded by the IRSST: **54 journal articles, 82 articles published** in conference proceedings, **2 other publications**, such as book chapters, briefs, and theses.

50 **presentations** given by IRSST personnel or funded researchers at scientific conferences or events organized by partners.

32 **popularized articles** in *Prévention au travail*, the magazine published by the CSST and IRSST, with a circulation of over 45,000.

8,317 **publications** distributed in response to requests.

365,244 **downloads** of research reports from the IRSST's Web site.

1,023,182 **visits to the Institute's Web site**, representing an average of 2,532 unique visitors per day.

12,159 **subscribers** periodically received news regarding the IRSST's laboratory activities, new research projects, and the latest publications via the electronic newsletter *Info IRSST*, prepared by the Communications Division.

LABORATORY SERVICES AND EXPERTISE

62,771 **environmental, toxicological, and microbiological analyses** were performed, **82% of which were for our partners** in the prevention-inspection network: the CSST, local health and social services network development agencies, and joint sector-based associations.

6,974 **hours were devoted to the calibration, maintenance, and repair** of direct-reading and sampling instruments, and **85% of these hours were dedicated to the prevention-inspection network**. This represents a 29% increase in the total number of hours compared to 2006, the year preceding the start of the implementation of the instrument replacement plan.

SCIENTIFIC DIVISION

THE CHANGES MADE AND THE ACTIVITIES AND PROJECTS CARRIED OUT BY THE IRSST IN 2008 TOOK MANY DIFFERENT FORMS. GENERALLY SPEAKING, THE RESULTS AND OUTCOMES FELL INTO TWO CATEGORIES:

1 RESULTS OR EXPERTISE APPLICABLE TO THE WORKPLACE, OR ANALYSES AND PRODUCTS INTENDED FOR OHS PROFESSIONALS;

2 KNOWLEDGE DEVELOPED AND DOCUMENTS PRODUCED TO SUPPORT SCIENTIFIC RESEARCH.

New scientific policy

The IRSST adopted a new Scientific Policy that better reflects its current realities. In fact, the Board of Directors ratified the major revamping proposal that was drawn up by the Scientific Division and enhanced by feedback from members of the Scientific Advisory Board. The new policy takes into account the IRSST's expanded mission, the implementation of a new organizational structure, and the diversification of our grant and research support programs.

A game plan resulting from a collective effort

In 2008, the IRSST adopted a three-year scientific and technical production plan for 2009 to 2011 developed through a collective effort and meticulous collaboration process. Over and above information obtained through consultations with the IRSST's personnel, governing bodies, and partners, this planning exercise drew for the first time upon data from two administrative units formed in 2006: the Strategic Watch and Quality Management Department and the Statistical Knowledge and Surveillance Group. Another source of inspiration was a spring conference organized by the IRSST on the key issues in OHS research. In addition to OHS researchers and stakeholders from Québec, representatives of the European Risk Observatory of the European Agency for Safety and Health at Work (EU-OSHA), the Horizon Scanning Team of the Health and Safety Laboratory (HSL) in the United Kingdom, and the Coordination Office of the National Occupational Research Agenda (NORA) of the National Institute for Occupational Safety and Health (NIOSH) in the United States took part in this conference. All the participants had an opportunity to familiarize themselves with emerging issues in Europe and America and with the approaches used by these international organizations to set their research priorities. Soon after this conference, the IRSST organized a "horizon



scanning” day on OHS research needs and priorities in Québec. It was attended by some 60 researchers, professionals, and employer and union representatives, as well as research partners. The IRSST subsequently convened its research field leaders for the purpose of identifying research avenues warranting priority. By increasing exchanges among a substantial number of stakeholders, the Institute was able to finalize a work plan for the next three years, a plan that is closely aligned with priority needs and designed to ensure useful results for workplaces in the three years ahead.

Initial outcomes of scientific watch activities

The Institute’s scientific watch activities involve collecting, analyzing, classifying, and transferring value-added information. As such, they constitute a vital tool for developing our research program, while enabling us to identify research work under way elsewhere in the world, discern work that has already yielded results adaptable to the Québec context, and better focus our research development efforts.

One of the main purposes of creating the IRSST’s Strategic Watch and Quality Management Department was to produce maps for each research field. This imposing challenge was met and is now bearing its first fruit for six of the Institute’s seven research fields. Having drawn up a classification plan, compiled information, and developed a database, the Strategic Watch and Quality Management Department has catalogued over 2,000 research projects and indexed more than 1,700 abstracts of projects carried out between 2002 and 2007 by four of the world’s leading OHS research organizations: the National Institute for Occupational Safety and Health (NIOSH) in the United States, the Institut national de recherche et de sécurité (INRS) in France, the Health and Safety Executive in the United Kingdom, and the IRSST. Even if this initial exercise had its limitations, it provided an overview of “who was doing what” in the research community. The maps highlighted the fact that the themes covered in the Work Context and OHS research field top the lists of concerns of the organizations consulted, judging from the number of projects focusing on this theme. Next on their lists came the themes covered in the Chemical Substances and Biological Agents field and the Safety of Industrial Tools, Machines, and Processes field.

Based on the projects analyzed, the IRSST appears to be performing well, despite being smaller in size than the organizations surveyed. The IRSST contributes significantly in terms of the number of projects conducted in all research fields, and it ranks as the organization that places the greatest emphasis on musculoskeletal disorders.

In 2008, the Strategic Watch team also produced a variety of documents, status reports, and information capsules depicting the situation for a variety of OHS issues in order to allow for clearer definition of research needs or to

address pressing current issues:

- OHS and wind energy
- Occupational asthma
- Silica
- Diacetyl and artificial flavours in food products
- Ultrafine particles and printers.

Results obtained in statistical knowledge and surveillance

Closely aligned with the Strategic Watch and Quality Management Department, the Statistical Knowledge and Surveillance Group contributes important added value by helping to better define the IRSST’s statistical surveillance needs, to produce indicators to support the orientations of each research field, and to provide data for its scientific program. In 2008, the SKSG provided tools to three of our research fields, specifically, Work Context and OHS, Musculoskeletal Disorders, and Noise and Vibration, in the form of specific five-year indicators.

The group also drew up situational profiles on several topics of interest:

- Young workers
- Work-related fatalities
- Raynaud’s syndrome
- Falls from heights
- Noise and hearing loss in young people
- Worker rehabilitation
- Occupational mental health.

In addition, the SKSG prepared statistical profiles on topics for which the Strategic Watch and Quality Management Department produced status reports:

- Occupational road accidents
- Falls at the same level and falls due to slipping.

These profiles cast a different and clearer light on the characteristics of compensated workers (age, gender) and the injuries sustained (duration of compensation, payouts, type of accident, injury site, etc.). They also identify the economic activity sectors or sub-sectors and occupations most affected by a given issue.

Members of the SKSG also assisted in carrying out research projects such as the study on the indicators of occupational injuries compensated in 2000–2002 and the Québec Study on Working, Employment and OHS Conditions (EQCOTESST).

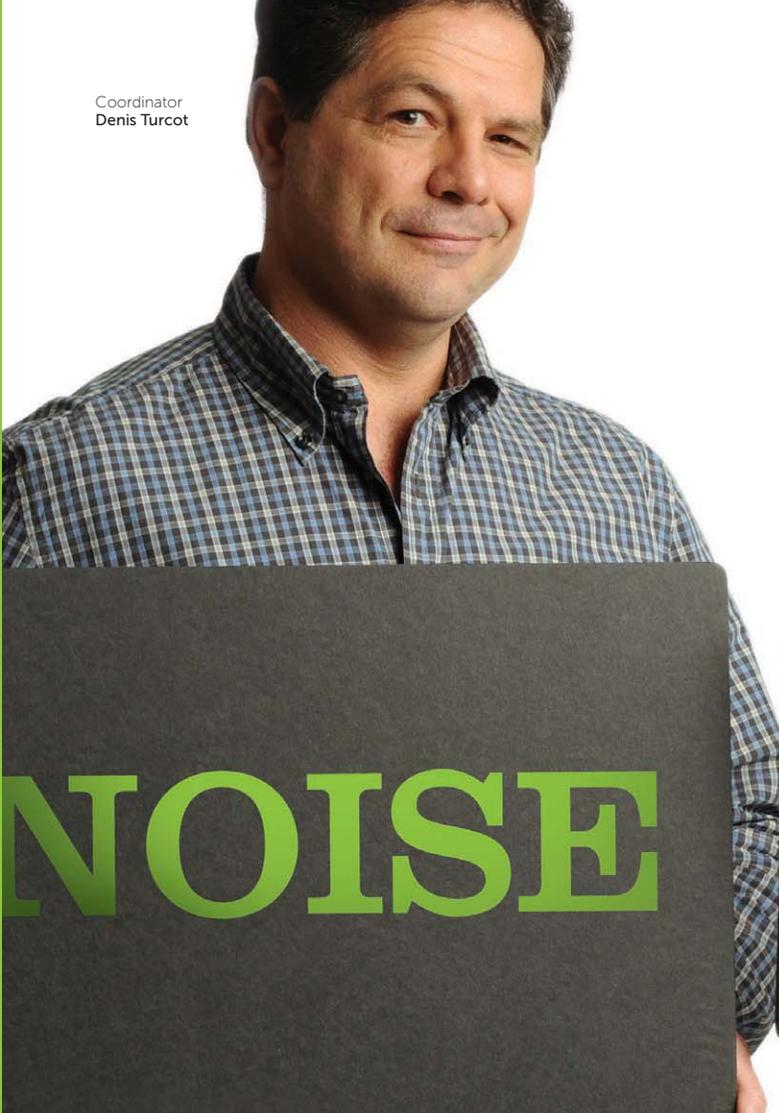
RESULTS OBTAINED BY RESEARCH FIELD

THE DEVELOPMENT OF NEW THEMATIC PROGRAMS IS ONE OF THE PREFERRED STRATEGIES USED TO CONSOLIDATE THE SEVEN RESEARCH FIELDS. IN 2008, PROGRAMS ON NOISE, ASBESTOS, AND NANOPARTICLES WERE THEREFORE ADDED TO THE 31 EXISTING PROGRAMS.

OTHER ACHIEVEMENTS IN 2008 INCLUDE THE FOLLOWING RESULTS AND OUTCOMES, WHICH ILLUSTRATE THE CONTRIBUTION MADE BY EACH RESEARCH FIELD.

Coordinator
Denis Turcot

Research field leader
Franck Sgard

A man with dark hair, wearing a blue and white checkered button-down shirt, is smiling and holding a large black sign with the word "NOISE" written in large, bold, green capital letters.

NOISE

A man with a shaved head, wearing a dark blue and black striped button-down shirt, is smiling and holding a large black sign with the word "VIBRATION" written in large, bold, green capital letters.

VIBRATION

Tools and people

Workers in the automobile repair industry make daily use of tools that expose them to noise and vibration. Applying field observations, the researchers performed laboratory evaluations of the noise and vibration emissions of classes of tools frequently used in automobile repair shops, namely, ratchets, air impact wrenches, grinders and die grinders, sanders, and air hammers. Test benches representative of the main tasks performed by workers allowed constraints related to the interaction between tool and workpiece to be taken into account, an aspect that is not currently factored into the main standards. Based on the results obtained and observations made, several recommendations aimed at minimizing exposure to noise and hand-arm vibration among automobile sector workers were made.

Anechoic chamber

The need for a cutting-edge acoustic laboratory to successfully conduct noise prevention studies was felt by scientists at both the IRSST and the École de technologie supérieure (ÉTS). Discussions were therefore initiated with a view to co-funding the joint acquisition of an anechoic chamber. This purchase will promote research on means of eliminating noise at source or reducing noise propagation in the workplace, and will allow the IRSST to attract new researchers.

Research field leader
Jaime Lara

Coordinator
Chantal Tellier

PROTECTIVE

EQUIPMENT

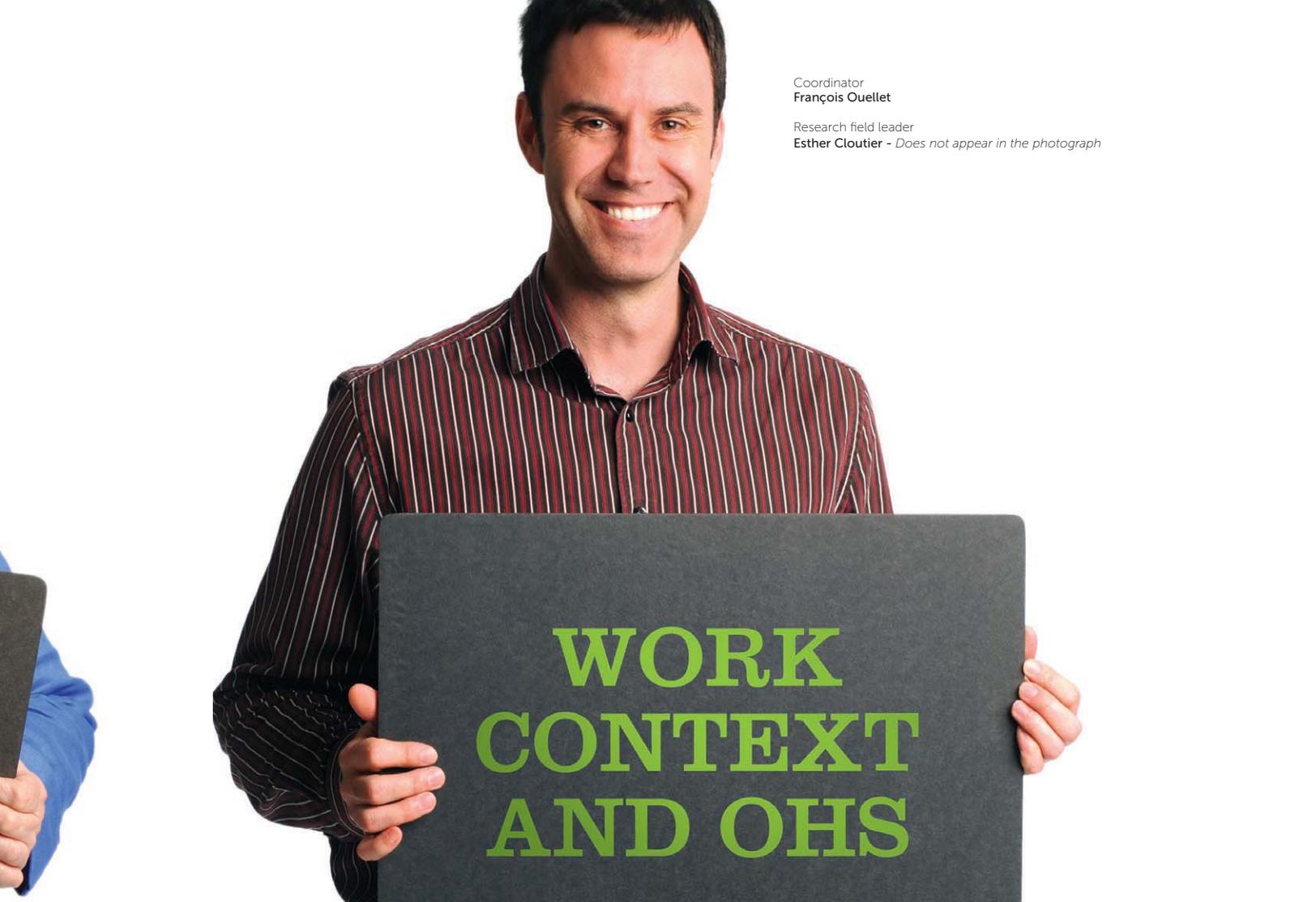
Computer-based tool: Saturisk

This was not the first time that the IRSST studied the filtration capacity and service life of respiratory protective cartridges. Our researchers have already shown that in the case of mixtures of pollutants, using a mask with saturated cartridges may be more dangerous than using no mask at all. This time, working in collaboration with the Hydrogen Research Institute (HRI), they developed a software program for calculating the service life of six organic vapour filter cartridges used with 145 regulated solvents in Québec and for determining a cartridge replacement sequence. Under the name *Saturisk*, this computer-based tool helps occupational hygienists working in the context of a respiratory protection program, and is accessible on the Institute's Web site.



Hazards in trenches

Every year, workers die as the result of the collapse of excavation walls. In order to identify the shoring systems that are adapted to the smaller-size trenches found mainly in urban environments, the researchers involved in this project surveyed, catalogued, and classified the prefabricated shoring and shielding systems available on the market. Compiling technical and commercial information, the study provides a directory of all North American suppliers, thus enabling users to find the system that best suits their requirements.



Coordinator
François Ouellet

Research field leader
Esther Cloutier - *Does not appear in the photograph*

WORK CONTEXT AND OHS

The research orientations of the Accident field were redefined and its name was changed. It was renamed Work Context and OHS to better reflect the scope of its work. The main goal of this research field is to contribute to the sustainable prevention of problems by producing knowledge on the social and organizational determinants of OHS. The research results obtained support the development of approaches and tools that facilitate prevention management by workplaces.

Students in the workplace

An exploratory study on this subject was conducted in collaboration with the Groupe ÉCOBES (Groupe d'étude des conditions de vie et des besoins de la population) from the Saguenay area's Cégep de Jonquière. It produced a profile of the characteristics of jobs held by young people, the organizational and physical constraints to which they are exposed, and the accident scenarios and large number of MSD symptoms affecting this population. The study showed that the work/study combination witnessed among young people may lead to the onset of symptoms that are precursors to occupational injuries.

Occupational risks in the performing arts

A summary of the risks associated with jobs in the performing arts field was published. The development of a model for analyzing the prevention and OHS determinants in this sector will help the professionals concerned to better discern the issues that have an impact on prevention. The importance of planning in all activities carried out by cultural organizations, of stability in work teams, and of training programs are some of the aspects covered.

Coordinator
Denis Turcot

Research field leader
Paul-Émile Boileau (interim)

SAFETY

**OF INDUSTRIAL
TOOLS,
MACHINES AND
PROCESSES**

Danger zones

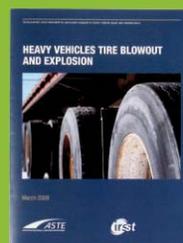
A prevention guide designed to improve understanding of the mechanical hazards associated with industrial machines was developed in collaboration with the CSST. In addition to describing the different ways of providing protection in the danger zones around machines and a risk management process, this guide proposes solutions for eliminating these hazards at source or for reducing them. The guide is useful for engineers, foremen, workers, and equipment suppliers, as well as for any professionals concerned about machine safety.

Lethal tires

Did you know that Québec reported no fewer than 360 accidents in a 10-year period that were attributable to vehicle tires? Based on an exploratory study of the phenomena of the blowout or explosion of tires on heavy trucks, a technical fact sheet was published in collaboration with the Association sectorielle transport entreposage (ASTE). Suggesting preventive measures, this fact sheet also describes the mechanical blowout of wheel-mounted tires on heavy trucks, as well as the events leading to their blowout or explosion under the effect of heat.

Machine lockout

By doing a comparative analysis of lockout programs and procedures applied to industrial machines, the researchers showed that the lockout concept is given different meanings or definitions in the literature. The lockout requirements prescribed by law vary from one Canadian province to another. Moreover, the content of the lockout programs studied differs, and some of the programs are not fully compliant with provincial legislation.



A photograph of two men, Bertrand Arsenault and Daniel Côté, holding a large black sign with green text. Bertrand Arsenault is on the left, wearing a light blue shirt and a dark tie. Daniel Côté is on the right, wearing a grey and black checkered sweater over a light blue shirt and glasses. The sign they are holding reads "OCCUPATIONAL REHABILITATION" in large, bold, green capital letters.

Research field leader
Bertrand Arsenault

Coordinator
Daniel Côté

OCCUPATIONAL REHABILITATION

When we are deterred by what others think

The researchers involved in this study stressed that in order to better understand the rehabilitation process of workers with MSDs, it is important to take their social reality into account. This observation was based on the understanding gained of the representations of health, illness, and pain held by workers unable to return to work due to musculoskeletal-related pain. The application of the results of this innovative study regarding the rehabilitation of workers with MSDs will allow for the drafting of action plans better adapted to the reality of people living with MSDs.

Differences between worker and clinician representations

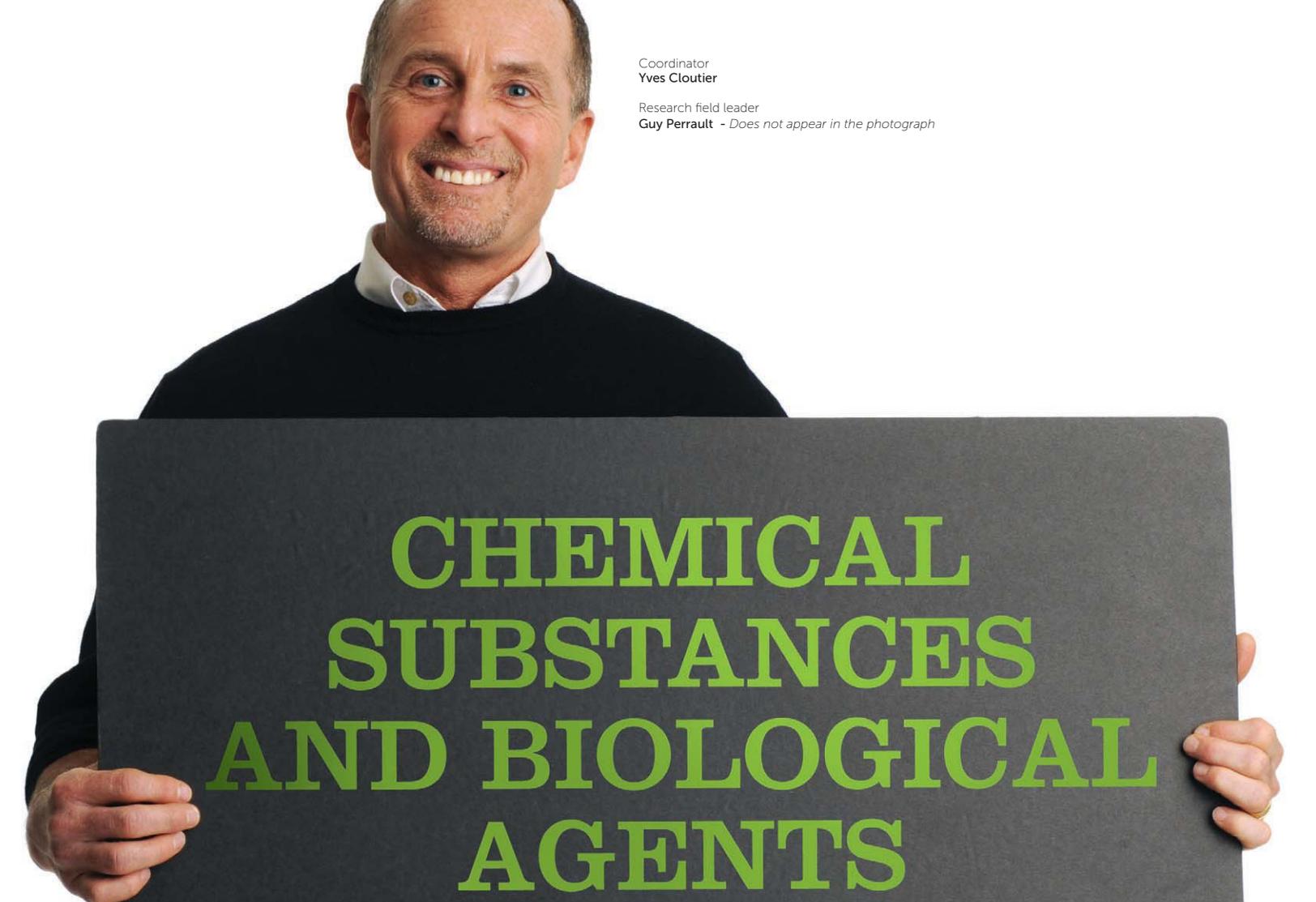
This study explored the relationship between clinician and worker during the rehabilitation process. Using case analysis, the researchers conducted an exploratory study aimed at providing a detailed description of the possible differences between the representations held by clinicians and those held by workers suffering from an MSD regarding various aspects of the rehabilitation process, something that had never been done before. The results of the study indicate that some differences can have a negative impact on the process, and confirm the importance of the clinician understanding the worker's representations and establishing shared objectives and strategies.

Margin of manoeuvre and return to work

For one of the first times in the OHS field, a study has attempted to transpose the margin of manoeuvre concept, widely used in ergonomics, to an occupational rehabilitation context. Margin of manoeuvre is defined as the opportunity that workers have to develop different ways to perform their tasks that allow them to meet production requirements without harming their health. This new study clarifies the indicators likely to facilitate the process of estimating an appropriate margin of manoeuvre taking into account the particular aspects of the return-to-work process of individuals with musculoskeletal-related disabilities.

Working toward improved services

One of the themes of this research field is that of helping the CSST improve its services. A forum organized under the theme *La réadaptation au travail: de la recherche à la pratique* (occupational rehabilitation: from research to practice) was held in April for the express purpose of promoting exchanges between researchers and the CSST's rehabilitation counsellors, while also providing the latter with useful tools. One hundred fifteen individuals participated in the event. Given its resounding success, the participants expressed their desire for a repeat experience on a regular basis.



Coordinator
Yves Cloutier

Research field leader
Guy Perrault - Does not appear in the photograph

CHEMICAL SUBSTANCES AND BIOLOGICAL AGENTS

Substitution and absorption

A specific project was carried out for the purpose of cataloguing the solvent comparison tools used, taking into account the health, safety, environmental, and technical aspects of a particular product-substitution project.

In addition, a laboratory study on human volunteers showed the impact of workload on the biological exposure indicators for five solvents. The results revealed that an increased workload translates into increased solvent absorption, particularly in the case of toluene.

Heat stroke

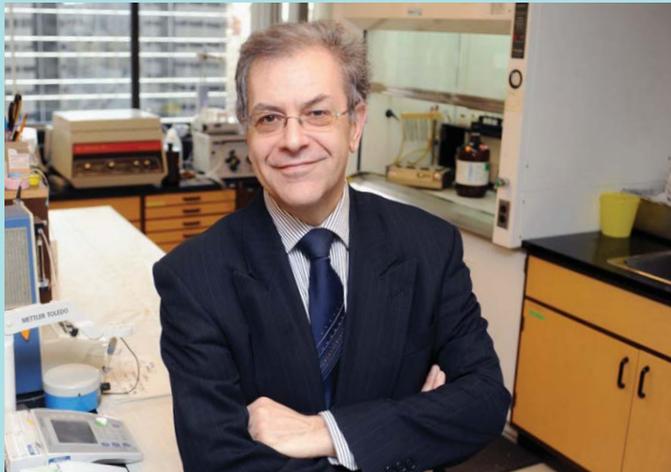
Work in hot environments and during heat waves both place their own stresses on workers and can lead to heat stroke. To support occupational hygienists, the IRSST's internal and external scientists developed computer-based tools for calculating the corrected air temperature (CAT) without having to use specialized instruments. Other tools were designed to establish an alternating work/rest regimen in compliance with the provisions of the *Regulation respecting occupational health and safety* and the recommendations of the American Conference of Governmental Industrial Hygienists (ACGIH).

Results obtained in nanotoxicology

Nanotechnologies constitute a prime example of an emerging issue. For a number of years now, the IRSST has been using its knowledge to gain a better understanding of the effects of nanoparticles on OHS and to formulate relevant safety rules. In addition to initiating a thematic program on nanoparticles and nanotoxicology in 2008, the Institute's efforts in this area take a variety of forms.

Publications

The very first Québec guide to synthetic nanoparticle risk management was published. Developed jointly by the IRSST, CSST, and NanoQuébec, the guide takes stock of current knowledge on this subject, while offering recommendations to promote risk factor management and control. It identifies the related health, safety and environmental hazards, documents current practices worldwide, and specifies the content that should be included in prevention programs. Furthermore, the publication of the second edition of the literature review *Health Effects of Nanoparticles* sparked enormous interest, and the document soon headed the list of the most frequently downloaded publications on the Institute's Web site (www.irsst.qc.ca).



Claude Ostiguy, principal author of the *Best Practices Guide to Synthetic Nanoparticle Risk Management*.

Collaborative undertakings

The IRSST made its presence felt within the Québec delegation participating in Canada's trade and scientific mission at the 2008 International Nanotechnology Exhibition and Conference (Nano Tech 2008) in Tokyo. In addition to exchanges with members of the Nano Business Creation Initiative, which is an umbrella group comprising 300 Japanese companies, the delegation participated in numerous meetings with representatives of the Japanese government, industry, and the scientific community. Work sessions with scientists from the National Institute of Occupational Safety and Health, Japan (JNIOSH), opened up prospects of collaborative endeavours between the two organizations.

Joining forces with the Industrial Materials Institute of the National Research Council of Canada, NanoQuébec, and the Association de la recherche industrielle du Québec, the IRSST organized a major event in Montréal: INNO-08. The Day Two Plenary Session of the OHS conference opened with remarks by a researcher of international renown, Dr. Günter Oberdöster, a professor in the Department of Environmental Medicine and director of the Ultrafine Particle Centre at the University of Rochester, who presented the potential health risks of engineered nanoparticles. INNO-08, which brought together nearly 500 participants, was an ideal forum for promoting the IRSST's expertise and work, as well as the role it plays in standards development within the ISO/TC229 Committee.

Call for proposals

Given that the usual risk evaluation procedures no longer suffice for quantifying exposure to nanoparticles, the IRSST hopes to spark the development of new strategies for ensuring workers' occupational health and safety. Joining forces with NanoQuébec to financially support nanoparticle projects, it issued a call for proposals to Québec researchers regarding metrology and methods for controlling the risks associated with nanoparticles.

Research field leader
Marie St-Vincent

Coordinator
Denise Chicoine

MUSCULOSKELETAL DISORDERS

To curb MSDs

A number of scientific disciplines must be mobilized if we are to successfully tackle an issue as complex as MSD prevention. Therefore, in partnership with the Groupe de recherche francophone sur les TMS, and sponsored by the Société d'ergonomie de langue française (SELF) and the Association of Canadian Ergonomists (ACE), the IRSST organized the 2^e Congrès francophone sur les TMS (French-language conference on MSDs) in June 2008. Under the theme *De la recherche à l'action* (from research to action), the event assembled 300 researchers and occupational health professionals, who had the opportunity to discuss and compare knowledge and practices, evaluate scientific advances, and reflect on the avenues to pursue to curb MSDs.

Results obtained in manual load handling

If there is one research topic that has rallied both internal and external researchers, multidisciplinary approaches, numerous partners, and a large number of intermediaries, it is that of manual load handling. In 2008, the IRSST carried out four projects in this regard, including one on a patient-handling training program and several activities aimed at transferring research results.

Manual load-handling hazards

At the Grand rendez-vous SST held in November in Montréal, the IRSST launched a satellite Web site undoubtedly ranking as the most comprehensive site on the manual load-handling theme in the French-speaking world. It contains a wide range of information on topics such as the nature of injuries, risk factors, hazard assessment, analytical models, diagnoses, case studies, means of prevention, and research here and abroad.

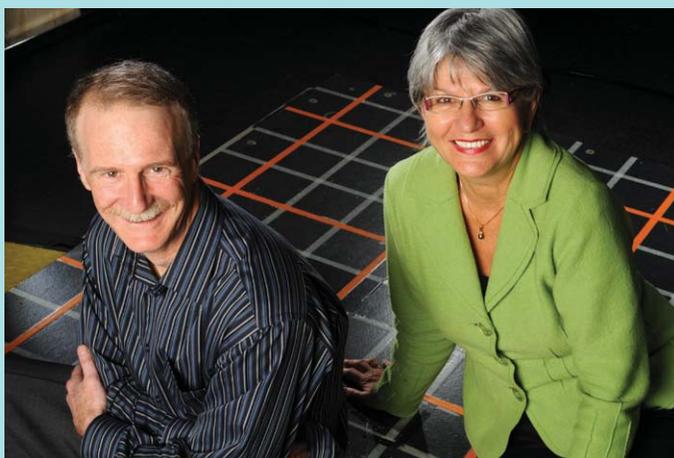


Sharing the load

In collaboration with the CSST, the IRSST organized a discussion day in January. Under the theme *Manutention – La charge, on la partage* (load handling – a shared task), this event brought together some 60 representatives of companies, joint sector-based associations, employer and union associations, vocational training centres, and researchers.

It led to the creation of the Réseau d'échange sur la manutention (REM), whose mandate is to help workplaces manage prevention in order to reduce the risks associated with manual load handling. REM also implemented a first information-exchange mechanism by launching an electronic newsletter to keep its 225 members informed.

In October, REM held its first conference luncheon on the theme of women and manual load handling. The participants benefited from the presentation of a state-of-the-art review and had the opportunity to exchange ideas and knowledge with the researchers present.



From left to right: **André Plamondon**, researcher, and **Renée Liboiron**, knowledge transfer advisor, are both very actively involved in the "Materials Handling" research theme.

OCCUPATIONAL MENTAL HEALTH

During a consultation process led by the IRSST with a view to developing an action plan, partners expressed their need for tools to support their workplace interventions. In the spring of 2007, the IRSST therefore issued a call for proposals in this regard, and two of the six project proposals submitted were given the go-ahead in 2008.

The goal of the first project is to develop a comprehensive solution to support prevention and intervention efforts targeting psychosocial risks in the workplace. The objectives are to inform, equip, train, and support workplaces in order to increase their effectiveness in preventing psychosocial risks. The solution will be made available to workplaces through the development of Internet-accessible tools, practice guides, and a training and post-training follow-up program.

The aim of the second project is to promote the use of an organizational diagnostic tool for psychosocial risks that was developed by the Université du Québec à Montréal. It also focuses on an approach that is more preventive than curative, notably by offering a training kit that includes a survey of existing knowledge on psychosocial risk prevention, a user guide, and a training DVD.

IF WORK IS PERCEIVED AS MEANINGFUL...

An interesting observation emerged from one study conducted on the meaning of work, mental health, and organizational commitment: work perceived as meaningful has beneficial effects on workers' mental health and strengthens their commitment to their organization, whereas work not perceived as meaningful induces symptoms of stress and even distress. Based on the results of questionnaires administered to the personnel of four organizations, the researchers showed that factors such as the usefulness and moral rectitude of work, learning and develop-



Estelle Morin, a full professor at HEC Montréal, heads this research project.

ment opportunities, autonomy, recognition, and the quality of human relations all have an impact on the meaning that people give to their work.

LABORATORY SERVICES AND EXPERTISE ENHANCED SERVICE OFFER

Laboratory Services and Expertise (LSE) is responsible for calibrating, maintaining, and repairing the direct-reading and sampling instruments made available to the IRSST's partners in the prevention-inspection network regarding matters related to occupational hygiene. LSE personnel also analyze tens of thousands of samples sent to them by their clients every year. In addition to analyzing these samples and developing analytical methods, they collaborate on research projects on the chemical resistance of gloves to solvents, beryllium toxicity, the determination of blood beryllium levels, and dismantling work involving asbestos-containing materials.

Expanded accreditation portfolio

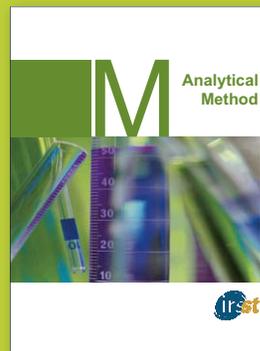
The IRSST's laboratories have distinguished themselves not only for the skills and expertise of their scientific and technical personnel, but also for the certifications and accreditations they hold. In 2008, they welcomed representatives of the American Industrial Hygiene Association (AIHA) and the Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada to their premises for the purpose of renewing their accreditations. They also obtained a broader CLAS accreditation that includes stop-watch calibration.

Development of new analytical methods

In light of an amendment to the *Regulation respecting occupational health and safety* (ROHS) that tightened the exposure standards applicable to hexavalent chromium Cr(VI), the laboratories had to define a different approach to dosing these substances to take into account the solubility and nature of the compounds. Until 2008, the method used by the laboratories to analyze hexavalent chromium Cr(VI) served solely to determine total Cr(VI), without differentiating between the water-soluble and water-insoluble fractions. This method did not allow for dust recovery from the inside wall

of the cassette during sample processing. The LSE laboratories therefore developed a new method that distinguished itself for the originality of its sampling system, its sensitivity, and its ease of use.

At the CSST's request, the laboratories also developed a method for analyzing a class of chemical compounds that is not regulated in Québec, specifically, nitrosamines. This new method makes it possible to measure the nitrosamines that are formed during rubber vulcanization.



During the course of the year, the IRSST developed a number of analytical methods. Several underwent revision and eight of these were published, further strengthening the laboratories' reference role.

New services

The creation of a new service to better support the CSST's medical services was another highlight of 2008.

The electron microscopy analysis of asbestos fibres in lung tissue taken from workers now counts among the services offered by the IRSST's laboratories.

RESULTS OBTAINED IN KNOWLEDGE TRANSFER

An institutional priority and essential component of the 2006-2010 strategic plan, the transfer of knowledge is now an integral part of research. The Knowledge Transfer and Partner Relations Department (KTPRD) therefore developed and implemented a framework of practice defining the research and knowledge transfer cycle and serving as a reference for the implementation of effective strategies. This reference framework emphasizes the need to ensure that research projects are firmly grounded in workplace realities, and encourages the participation of both worker and employer representatives at all stages of the knowledge generation and transfer process. The KTPRD therefore seeks the support of partners and intermediaries with a view to creating a context conducive to the assimilation and application of research results. The diversity present among the roughly 100 partners who serve on the various research project follow-up committees attests to this effort. The framework of practice also includes evaluation of the actual impact of results in workplaces. A researcher is therefore mandated to evaluate the impacts of the research.

Lift truck operators and lift trucks

A number of activities were initiated by the IRSST in 2008. The most important included colloquia in Laval, Drummondville, and Québec City on the safe driving of lift trucks. These events were organized in collaboration with the joint sector-based associations Préventex, Transport et entreposage, Métal Électrique, and Fabrication d'équipements de transport et de machines, as well as the Association de santé et sécurité des pâtes et papiers du Québec (ASSPPQ) and the CSST. Coinciding with the coming into force of several regulatory amendments, these colloquia drew 450 participants, mainly lift truck operators, foremen, and preventionists. They promoted the transfer of the results of some 20 IRSST research projects, including one whose results were made into a compelling video on the risks of lateral tipovers and the effectiveness of seatbelts in keeping lift truck operators in their seats during such accidents.

Franco-Québec experiences

Taking advantage of the 2^e Congrès francophone sur les troubles musculo-squelettiques, which it co-organized, the IRSST hosted a French delegation comprising company representatives and members of the Agence nationale pour l'amélioration des conditions de travail (ANACT) network. Discussion sessions were held for scientists, preventionists, and company representatives from both continents on the best MSD prevention practices, with the aim of improving their mutual understanding of the French and Québec realities.

Practical tools

Based on the latest advances in knowledge, two brochures were designed and disseminated for the purpose of raising worker awareness about the best ways for them to protect themselves against bioaerosols. The first, entitled *Agricultural Bioaerosols – Protect Yourself*, addressed farmers, while the second, *Bioaerosols in Dental Offices – Choosing the Right Mask*, targeted dentists and dental hygienists. These publications explain the respective risks involved and recommend the appropriate means of protection.



Results...for the future

Another of the KTPRD's mandates is that of managing the Graduate Studies Scholarship Program. In 2008, this program was evaluated by an external expert, with the result that changes will be made to the applicant acceptance process in the next competition: from now on, the scientific merit of the proposals will be evaluated by a single multidisciplinary committee rather than by several specialized committees.

For the IRSST, this scholarship program provides a compelling way of attracting young people to OHS research by helping to bring graduate studies within their reach. In 2008, the IRSST received 68 applications. Of these, 41 research proposals met the program's eligibility criteria, as well as the project relevance and scientific merit criteria. A thematic scholarship was awarded to one of these applicants whose subject of study was related to the Protective Equipment field.

PRODUCTIVE PARTNERSHIPS

Joint funding of projects, expertise sharing, more in-depth exchanges, networking, knowledge brokering, and supporting knowledge transfer: these are but some of the main multiplier effects generated by the IRSST's partnerships. By systematizing these types of collaborative agreements, the IRSST increased its research capacity tenfold, while benefiting from contributions in the form of financial, human and physical resources, and partner expertise.

In 2008, the projects arising from partnerships accounted for total investments of \$4.3 million. Partner contributions stood at \$2,750,767, while the IRSST contributed \$1,604,145.

Agreements with an eye to future results

Approximately ten new agreements were signed by the IRSST in 2008. These include the following:

- A memorandum of understanding was initialled with the Ministère de la Santé et des Services sociaux, the Fonds de la recherche en santé du Québec, the Association québécoise d'établissements de santé et de services sociaux, the Association des établissements de réadaptation en déficience physique du Québec, and the Réseau provincial de recherche en adaptation-réadaptation pour la formation d'un consortium pour le développement de la recherche en traumatologie. These partners committed to spending \$5,250,000 over five years, including a \$500,000 pledge from the IRSST. The consortium's main goals are to train new researchers, promote a research infrastructure enabling scientists to be more competitive in national and international grant competitions, and develop new knowledge in the field of traumatology.
- The framework agreement between the IRSST and the Institut national de recherche et de sécurité (INRS-France) concerning the prevention of work-related accidents and occupational diseases was renewed for a five-year period. This agreement sets out the parameters governing bilateral collaborative undertakings in terms of research activities and expertise.
- A specific three-year partnership agreement was signed with the INRS-France for the purpose of biometrology information monitoring. It provides for the pooling of resources and the building of an international francophone multidisciplinary bibliographic watch network on the biological monitoring of worker exposure to chemical products.
- A three-year cooperation agreement was initialled with the German Institute for Occupational Safety and Health (BGIA) on MSD measurement instruments. This partnership allows comparisons to be made between prototypes developed by the two research centres so that they can be further refined and enhanced.
- The partnership agreement between the IRSST and the Industrial Accident Prevention Association (IAPA) was renewed. This agreement facilitates knowledge transfer and access to information on the prevention of work-related injuries.
- A specific partnership agreement was signed with NanoQuébec for the purpose of carrying out research projects on the health impact of nanoparticles, and on metrology and methods of control. The two organizations have each committed \$300,000.
- A research agreement was concluded with Rio Tinto Alcan Inc. (RTA) for the purpose of conducting an epidemiological study on mortality and the incidence of cancer.
- A five-year agreement aimed at transferring a technology developed by the IRSST's laboratories to SCL Medtech was also signed. This Montréal company uses the IRSST's automatic testing technology for sampling pumps in order to market its products, in return for paying royalties to the IRSST.



On January 23, 2008, IRSST president and CEO **Marie Larue** signed an agreement with **Simon Leblond**, president of SCL Medtech, allowing for the transfer of a technology developed by the IRSST's laboratories.

RESULTS OBTAINED IN EXPERTISE ACTIVITIES

Large private companies and government-owned corporations turn to the IRSST in its capacity as a scientific reference centre and expert. Every year, the KTPRD responds to some 100 requests for expertise, each requiring a half-day or more of work, and ensures that they are handled by competent, qualified personnel. Whether the requests come from partners such as the CSST, the MSSS, joint sector-based associations, employer, union and professional associations, or research centres, universities, or private companies, they all seek an expert opinion based on scientific knowledge. The diversity of users is paralleled by the variety and complexity of the subjects investigated: from nanoparticles, tire pyrolysis, lockout programs, bacteria in filtration systems, measurement of radiofrequencies or magnetic fields, vibro-acoustic simulation, to toxicokinetics, among others. These requests may translate into laboratory tests, methodological support, field expertise training sessions, or scientific evaluations.

This expertise was also called upon in three CSST investigations conducted following three serious industrial accidents. These accidents were the result of, respectively, carbon monoxide poisoning, a tire blowout, and a situation that required the wearing of respiratory protection equipment.

In 2008, IRSST personnel spent the equivalent of 347 work days responding to requests for expertise.

Table 1:
TIME SPENT PROVIDING EXPERTISE, BY SERVICE USER (IN %)

SERVICE USER	%
CSST	50 %
RESEARCH CENTRES, UNIVERSITIES, SCIENTIFIC PUBLICATIONS	25 %
JOINT SECTOR-BASED ASSOCIATIONS	14 %
MSSS	4 %
PRIVATE COMPANIES	4 %
EMPLOYER/UNION ASSOCIATIONS	2 %
PROFESSIONAL ASSOCIATIONS	1 %

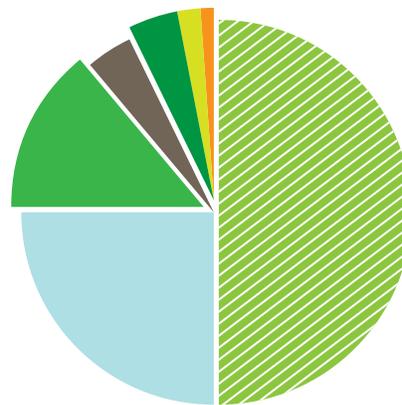
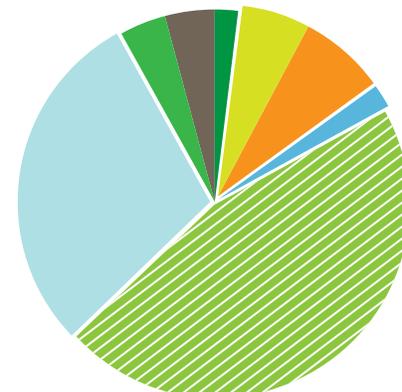


Table 2:
TIME SPENT PROVIDING EXPERTISE, BY RESEARCH FIELD (IN %)

RESEARCH FIELD	%
WORK CONTEXT AND OHS	2%
NOISE AND VIBRATION	6%
PROTECTIVE EQUIPMENT	7%
OCCUPATIONAL REHABILITATION	2%
SAFETY OF INDUSTRIAL TOOLS, MACHINES AND PROCESSES	46%
CHEMICAL SUBSTANCES AND BIOLOGICAL AGENTS	29%
MUSCULOSKELETAL DISORDERS	4%
OTHER	4%



RESULTS OBTAINED IN COMMUNICATION ACTIVITIES

A record year

The IRSST's scientific production generated an unprecedented number of publications in 2008. The Communications Division released no fewer than 80 documents, the highest number seen since the Institute's inception. The 2008 catalogue lists 66 research reports, technical fact sheets and guides published by IRSST, 6 technical fact sheets and guides published in collaboration with partners, and 8 laboratory methods. This led to a significant increase in the number of peer-reviewed scientific publications, which totalled 138 (of which 54 were journal articles), compared to a total of 111 in 2007 (including 41 journal articles).

In addition, coupled with a strategy of using interrelated but diverse communication tools, the Institute's scientific production significantly bolstered the information dissemination and media coverage results obtained. Efforts to present information appropriately adapted to the different clienteles visiting the IRSST's Web site and reading the magazine *Prévention au travail* and the *Info IRSST* electronic newsletter led to a major increase in all indicators. Thus, for the first time ever, the IRSST Web site at www.irsst.qc.ca recorded more than one million visits, up 65% from the previous year. Initiatives taken to promote the Institute's publications also had a healthy impact on the number of document downloads from the site, which totalled 365,244. These results impacted on media coverage, and in turn, on the number of articles published in magazines and newspapers, on Web sites, and elsewhere, that cited the IRSST work. The following subjects garnered the most media attention: the health effects of nanoparticles, lift truck safety, and the OHS problems associated with young student-workers.

The most frequently downloaded publications

- Health Effects of Nanoparticles, Claude Ostiguy et al.
- Nanoparticles – Current Knowledge About Occupational Health and Safety Risks and Prevention Measures, Claude Ostiguy et al.
- Manuel d'ergonomie pratique en 128 points - Solutions pratiques et faciles à mettre en œuvre pour améliorer la sécurité et la santé au travail et les conditions de travail, publication en collaboration BIT, IEA, IRSST et ANACT-France. (in French only)
- The Meaning of Work, Mental Health and Organizational Commitment, Estelle Morin.
- Formaldehyde in the Workplace: Prevention Guide, Nicole Goyer et al.
- MSDs – The Impact of Health, Illness, Pain and Recovery Strategy Representations on the Work Rehabilitation Process, Raymond Baril et al.
- Strategic Approach to Preventing Occupational Stress, Jean-Pierre Brun et al.
- Sampling Guide for Air Contaminants in the Workplace, Daniel Drolet et al.
- Exposition au formaldéhyde en milieu de travail – Fabrication de meubles en bois, Nicole Goyer.
- La substitution des solvants par l'alcool benzylique, Denis Bégin et al. (in French only)



FOR QUALITY RESULTS... QUALIFIED PERSONNEL

In 2008, the IRSST took on 27 new employees, 7 of whom filled regular positions. It also renewed 15 contractual agreements. The wise use of financial resources made it possible to meet personnel needs, particularly the need for staff to carry out research work. The IRSST team now comprises 159 people, including 117 researchers, professionals, and technicians.

Also during the year, the Institute opened its doors to 25 students and collaborators. Benefitting from the guidance and expertise of scientists, these trainees had the opportunity to enhance their knowledge, and in return, provided valuable assistance in carrying out research projects.

All the IRSST's researchers hold adjunct professor appointments. As such, they are qualified to supervise the writing of master's theses or doctoral dissertations, and to host graduate students.

Like many organizations, the Institute is witnessing its first wave of retirements, a trend that will only accelerate in the years ahead. While these departures necessitate the adoption of a forward-looking age-management plan, they also provide an ideal occasion for re-assessing the vacated positions and allocating new resources where needed.

A pilot project aimed at improving research-project management practices was also launched. Supported by specialists from the École Polytechnique de Montréal, a group of volunteers made up of five researchers and four managers identified project management needs and evaluated the Institute's current practices relative to best practices in the field. The objective is to implement a method of project management that takes the IRSST's particular characteristics into account.

Health and safety of personnel

The IRSST's Health and Safety Committee (HSC) works hard to integrate prevention values and safe practices into the Institute's daily operations. In 2008, 14 reports were entered in the accident, incident, and first-aid register, but none were the subject of an HSC investigation. Compared to other enterprises classified in the same activity sector, the IRSST's assessment rate at the CSST is lower than its unit's rate, thanks to its superior performance in terms of occupational injury prevention.

New tools were also designed by Institute personnel to facilitate task performance by its laboratory technicians, who are required to cut, open, and handle thousands of sampling tubes every year and to perform repetitive tasks. They are thus exposed to factors that can lead to arm, hand, or shoulder problems. The new tools eliminate or mitigate risks by doing away with vibration or limiting the number of manual handling operations required. Some of these tools were presented at a workshop on passive dosimeters held at the most recent conference of the American Industrial Hygiene Association (AIHA).

In both laboratories and workshops, emergency stop devices were installed on tools to make them safer, and workplace signs were put in place to warn personnel when welding work was underway.



Assembling the cassettes needed for nitrosamine analysis previously required repetitive fine-motor manipulations and the exertion of force. Thanks to the above device, which was developed in the IRSST's laboratories, these gestures are no longer necessary.

FINANCING

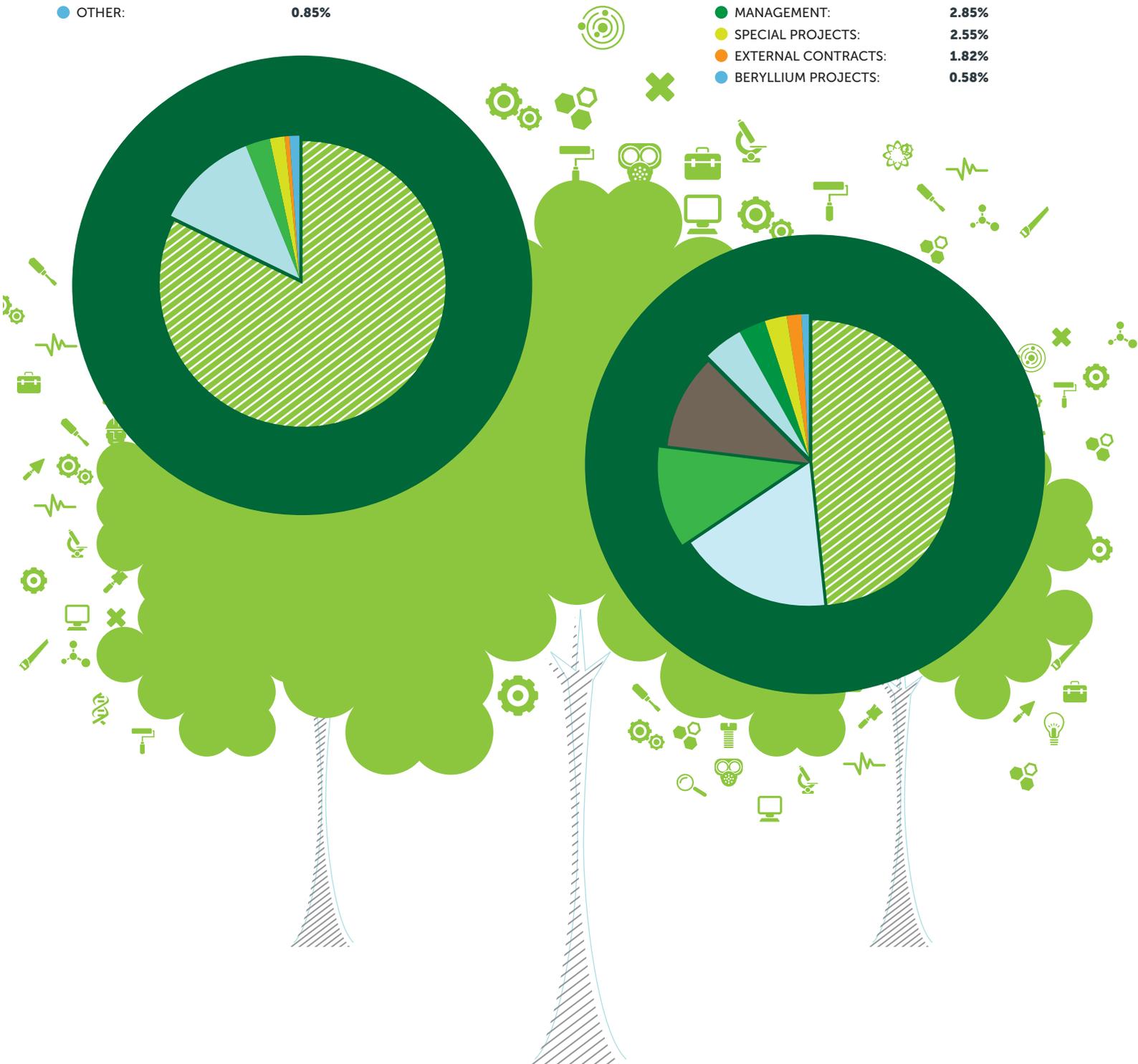
(as at December 31, 2008)

REVENUES \$21,879,059

CSST:	82.27%
LABORATORY SERVICES:	11.68%
SPECIAL PROJECTS:	2.73%
EXTERNAL CONTRACTS:	1.89%
BERYLLIUM:	0.58%
OTHER:	0.85%

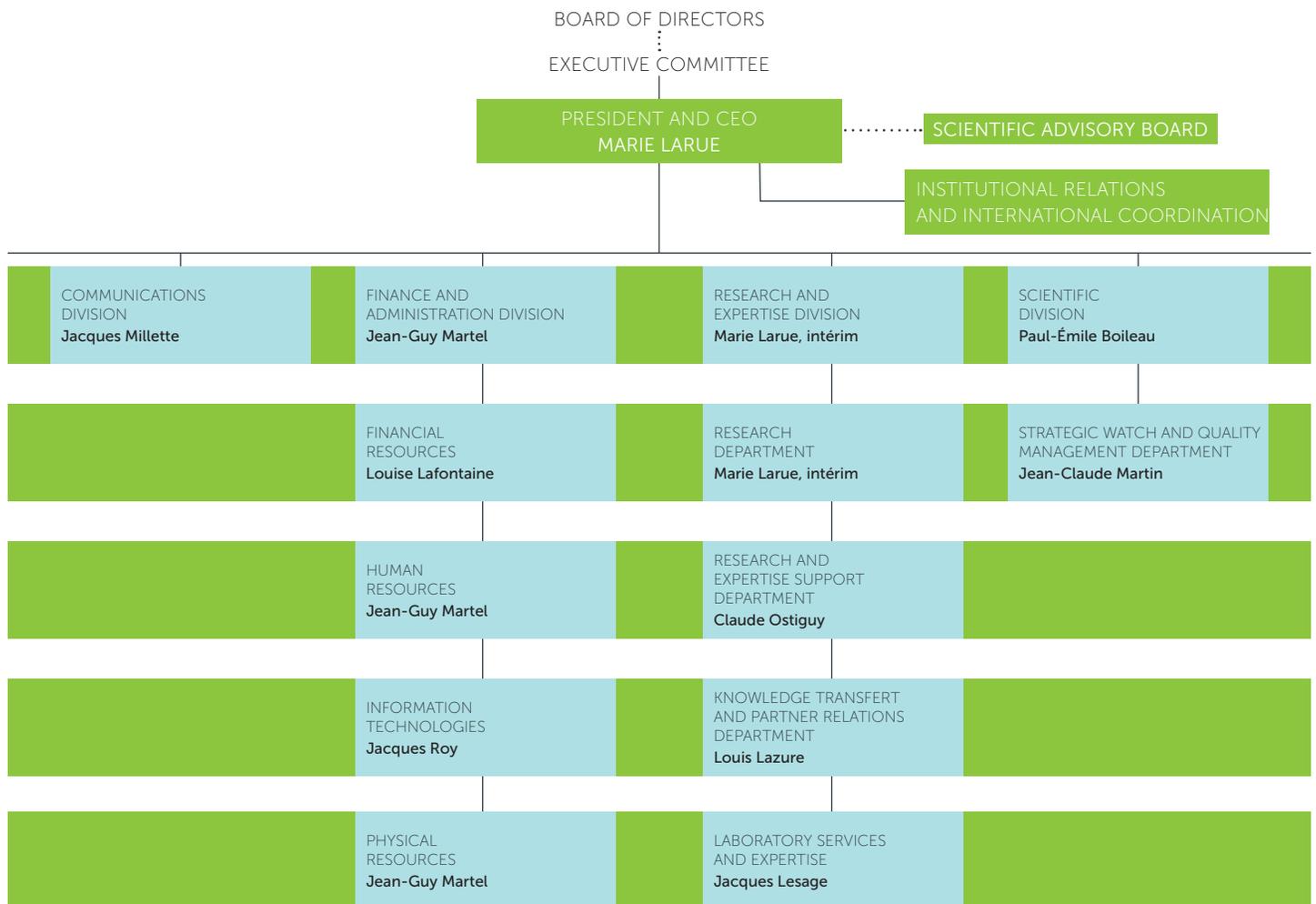
EXPENSES \$21,836,477

INTERNAL RESEARCH:	48.58%
EXTERNAL RESEARCH:	17.17%
LABORATORY SERVICES:	11.39%
FINANCE AND ADMINISTRATION:	10.54%
COMMUNICATIONS:	4.52%
MANAGEMENT:	2.85%
SPECIAL PROJECTS:	2.55%
EXTERNAL CONTRACTS:	1.82%
BERYLLIUM PROJECTS:	0.58%



ORGANIZATIONAL CHART

(as at December 31, 2008)



THE COMMITTEES

(as at December 31, 2008)

Board of Directors

In 2008, the members met 9 times while the Administrative Committee* held 8 work sessions.

CHAIR

Luc Meunier*

EMPLOYER REPRESENTATIVES

Françoise Bertrand
Bernard Brassard
François Cliche
France Dupéré
Michel Kelly-Gagnon*
Simon Prévost

WORKER REPRESENTATIVES

Michel Arsenault*
Andrée Bouchard
Claude Faucher
Jean Lavallée
Michel Poirier
Daniel Roy
Roger Valois

OBSERVER

Suzanne Therrien

IRSST MANAGEMENT

Marie Larue

DEPARTURES

Robert Borduas, Daniel Charbonneau,
Céline Dugré-Charron, Fanco Fava, Yves Gilbert,
François Pelletier.

Scientific Advisory Board

The members met 9 times, including one special meeting.

CHAIR

Marie Larue

EMPLOYER REPRESENTATIVES

Pascale Gauthier
Richard Lapointe
Roger M. Laporte
Alain Neveu

WORKER REPRESENTATIVES

Micheline Boucher
Jean Dussault
Daniel Flynn
Denis Mailloux

MEMBERS OF THE SCIENTIFIC AND TECHNICAL COMMUNITIES

Jean-Marc Brodeur
Christine Colin
Camille Limoges
Mireille Mathieu
Yves Rousseau
André Van Neste

OBSERVERS

Guylaine Rioux
Alain Lajoie
Paul-Émile Boileau

DEPARTURES

Robert Borduas, Alain Lajoie, Charles Terreault

APPOINTMENTS

Pascale Gauthier, Camille Limoges

APPOINTMENT RENEWALS

Micheline Boucher, Jean Dussault, Daniel Flynn,
Roger M. Laporte, André Van Neste

On behalf of the IRSST and its personnel, president and CEO Marie Larue welcomes the new members of the boards and offers her sincerest thanks to outgoing members for jobs well done.

LIST OF 2008 PUBLICATIONS

IRST PUBLICATIONS

AUSTIN C., Risques pour la santé des pompiers forestiers et protection respiratoire, R-571, 2008, 96 pages.

AUSTIN C., Wildland firefighter health risks and respiratory protection, R-572, 2008, 94 pages.

BAHLOUL A., B. ROBERGE, R. GRAVEL, Faisabilité de l'étude sur les gaz de fermentation et sur la ventilation en silo à échelle réduite, R-553, 2008, 35 pages.

BARIL R., M.-J. DURAND, M.-F. COUTU, D. CÔTÉ, G. CADIEUX, A. ROULEAU, S. NGOMO, MSDs The Impact of Health, Illness, Pain and Recovery-Strategy Representations on the Work Rehabilitation Process, R-592, 2008, 114 pages.

BARIL R., M.-J. DURAND, M.-F. COUTU, D. CÔTÉ, G. CADIEUX, A. ROULEAU, S. NGOMO, TMS - L'influence des représentations de la maladie, de la douleur et de la guérison sur le processus de réadaptation au travail, R-544, 2008, 112 pages.

BÉGIN D., M. DEBIA, M. GÉRIN, Recension des outils de comparaison de solvants, R-567, 2008, 106 pages.

BOURRET, P.-É., S. MARTEL, M. KOUTCHOUK, M.-A. ROUX, M. GOU, C.-É. AUBIN, D. RANCOURT, Sécurité des chariots élévateurs : Étude de l'efficacité de la ceinture de sécurité, R-541, 2008, 139 pages.

BOUSQUET L., J. LAVOIE, J. ASSELIN, Agricultural Bioaerosols - Protect Yourself (Print version not available, RF-565, 2008, 2 pages.

BOUSQUET L., J. LAVOIE, J. ASSELIN, Les bioaérosols en milieu agricole - Comment se protéger (Version papier non disponible), RF-562, 2008, 2 pages.

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