2015 ACTIVITY REPORT

# COMMITTED TO PREVENTION SINCE 1980

Institut de recherche
Robert-Sauvé en santé
et en sécurité du travail

## DECLARATION OF DATA RELIABILITY

I declare that I have every reason to believe that the observable facts and measurable data presented in this activity report accurately reflect the situation as at December 31, 2015. This information falls under my responsibility as president and CEO of the Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST). I hereby attest to its accuracy and the reliability of the controls relating thereto.

The indicators retained are developed using reliable and accurate data and allow us to assess the IRSST's production over the course of the year.

Recommended by the members of the Institute's Scientific Advisory Board and approved by the Board of Directors, the 2015 activity report faithfully describes the Institute's mission, vision and principal achievements.

**MARIE LARUE**
President and CEO

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# MESSAGE FROM THE PRESIDENT AND CEO

On November 28, 1980, the first occupational health and safety (OHS) research centre in Canada came into being in Montréal. The IRSST is now celebrating its 35th year of operation. This anniversary, like others, provides an opportune time to look back. While many take pride in saying that today the Institute is well established and enjoys high credibility, much of the credit goes to the people who helped create and shape it. As we celebrate this landmark anniversary, I therefore wish, on behalf of the entire IRSST staff, to pay special tribute to all those who laid the first cornerstones.

With clear vision and strong resolve, a number of individuals contributed to the founding and growth of the Institute. They fully deserve the honorific title of *builder*. First among these is **Pierre Marois**, who, as Minister of State for Social Development, unveiled the *Politique québécoise de la santé et de la sécurité des travailleurs*, a White Paper containing a chapter on research. He later motivated the National Assembly to adopt the *Act Respecting Occupational Health and Safety* (AOHS), in which section 169 states that the "Government may [...] establish a body whose function is research..." We must also mention the key role played by **Yves Martin**, Rector of Université de Sherbrooke, whom the government named chair of the working group responsible for paving the way for the creation of the IRSST and who thus laid its foundations and went on to become its first Chief Executive Officer. Next is the legacy left by **Jean Yves Savoie**, the architect of the IRSST's laboratories, who then dedicated the next 22 years of his life – including 12 as Chief Executive Officer – to shaping the Institute's future. A quick look at the IRSST's Letters Patent also reveals the signatures of **Ghislain Dufour**, head of the employer delegation on the Institute's Board of Directors for 18 years; of his union counterpart, **Louis Laberge**, President of the Fédération des travailleurs du Québec (FTQ), who sat on the Board of Directors for 11 years; and of **Robert Sauvé**, who crafted the monumental changes that would take place in OHS and was an unconditional champion of research.

“If the IRSST’s influence and reputation have grown over the past 35 years, it is largely because employers, workers, preventionists, and health professionals have collaborated with us and incorporated into their preventive and therapeutic actions the evidence-based data generated by studies carried out or funded by the Institute.”

Judge Sauvé’s contribution was deemed so significant that, by way of tribute, his name was integrated into the Institute’s official designation in 2000. Each of these builders left an indelible mark on the organization’s development and growth. Several other names are also associated with the birth of the IRSST, including **Yves Dumont**, **Clifford Baronet**, **Lionel Boulet**, **Maurice Brossard**, **Fernand Daoust**, **Germain Lavigne** and **Jean Rochon**. Added to this roster of builders are, of course, the members of the governing bodies at the time and the IRSST’s very first employees, who were guided by the equal (labour/management) representation principle, set the benchmarks for OHS research in Québec, and blazed the trail so others could follow in their footsteps.

Robert Sauvé regarded the creation of the Institute as “an extremely significant step in the major reform launched in Québec with the adoption of the AOHS, a reform as important as the major social transformations that took place in the 1960s and 1970s in the fields of education and social affairs.” In the words of this builder, “research is an investment that may not have immediate benefits, but that nonetheless remains a vital step.”

Without all these individuals from the early days, but also those who have followed since – and again, there are many – the Institute would not be what it is today. By celebrating this 35th anniversary, we salute their accomplishments and offer our gratitude. And I must add, as I often do, that if the IRSST’s influence and reputation have grown over the past 35 years, it is largely because employers, workers, preventionists, and health professionals have collaborated with us and incorporated into their preventive and therapeutic actions the evidence-based data generated by studies carried out or funded by the Institute. We derive great pride and immense satisfaction from this uptake of our research results by workplaces.

In closing, allow me to reassure all those who believe in our mission that we are committed to continuing this collaborative relationship in order to provide you, through research, with ever-better support in the prevention of occupational injuries and the rehabilitation of affected workers so that they can resume productive lives.

**MARIE LARUE**

Robert Sauvé

# THE IRSST REMEMBERS

Judge Robert Sauvé – a visionary, staunch advocate of prevention, and promoter of equal representation – had a major impact on the working world.

Judge Robert Sauvé – a visionary, staunch advocate of prevention, and promoter of equal representation – had a major impact on the working world through his key role in the reforms made in the OHS system with the adoption of the *Act Respecting Occupational Health and Safety* and the *Act Respecting Industrial Accidents and Occupational Diseases*.

Member of the Québec Bar, Deputy Labour Minister, Provincial Court judge, Founding President of the Commission des services juridiques, and President of the Commission des accidents du travail (CAT), in 1980 he became President of the CSST, but also Founding President of the IRSST. If Robert Sauvé's name was incorporated into the IRSST's official designation in 2000, it was because he was also an ardent advocate of creating a research institute that would serve as the bedrock for supporting the prevention of employment injuries. Were he still alive today, he would undoubtedly be proud to see that the Institute bearing his name continues to serve workers and employers to ensure that science supports them in their mission of prevention in the workplace. He will always be held in the highest esteem by the IRSST and its partners.

# 35th Anniversary

The former Minister of State for Social Development, **Pierre Marois**, is the father of the *Politique de la santé et de la sécurité des travailleurs* and the *Act Respecting Occupational Health and Safety*, both of which led to the creation of the IRSST.

"Today your institute is a reference point. It is in fact *the* reference point, not just in Québec and Canada, but around the globe."

# 2015 IN NUMBERS

## PRODUCTION

### ACTIVE PROJECTS AND ACTIVITIES

**165**

**31** projects being developed

**27** projects began
(**14** joint, **5** external, **8** internal)

**36** completed projects

**71** projects in progress

### PARTNER ORGANIZATIONS FROM THE OHS NETWORK WERE INVOLVED IN ACTIVE PROJECTS

**198**

### NEW REQUESTS FOR EXPERTISE

**107**

### EXTERNAL COMMITTEES INCLUDED AT LEAST ONE IRSST REPRESENTATIVE

**32**

**9** committees of the CSST and its network, including regulatory committees

**10** national and international standards committees

**13** other local, national, and international committees

### EXTERNAL RESEARCHERS

**192**

from **21** universities and **33** research centres formed part of the IRSST's network of scientific research collaborators

# LABORATORY PRODUCTION

## ENVIRONMENTAL, TOXICOLOGICAL AND MICROBIOLOGICAL ANALYSES

**61,340** were performed, including **74.5%** for partners in the prevention-inspection network: CSST, integrated health and social services centres, and joint sector-based associations. Our laboratories reported an **18%** decrease in the total number of analyses performed compared to the previous year. This circumstantial drop is attributable to a decrease in requests from the health network, among others.

## HOURS WERE SPENT ON THE CALIBRATION, MAINTENANCE, AND REPAIR

**8,531** of direct-reading and sampling instruments, of which **75%** were for the OHS and prevention-inspection network. This number represents an increase of less than **1%** in the number of hours over the previous year.

# 35th Anniversary

Former administrator and Rector of Université de Sherbrooke, **Yves Martin** headed the working group that presided over the creation of the IRSST and became its first Chief Executive Officer.

"Before the IRSST, there was nothing, or almost nothing. We believed it necessary to create an organization dedicated solely to meeting the research needs of Québec workplaces regarding the prevention of occupational injuries. And that is exactly what we did."

## 2015 IN NUMBERS

### GRADUATE STUDIES SCHOLARSHIPS AND POSTDOCTORAL FELLOWSHIPS

**32** were awarded to master's, doctoral, and postdoctoral candidates whose research programs dealt specifically with the prevention of industrial accidents and occupational disease or the rehabilitation of affected workers.

### BUDGET ALLOCATED FOR THE SCHOLARSHIP AND FELLOWSHIP PROGRAM

**$422,483**

# OUTREACH

## PUBLICATIONS

**55**

**43** research reports, including **28** in French and **15** in English

**9** guides and technical awareness-raising tools, including **7** in French and **2** in English

**3** laboratory methods, including **2** in French and **1** in English

## SCIENTIFIC PUBLICATIONS RELATED TO PROJECTS CARRIED OUT OR FUNDED BY THE IRSST

**72**

**49** peer-reviewed journal articles

**20** peer-reviewed articles published in conference proceedings

**3** other publications: a book, book chapter, and doctoral thesis

## PRESENTATIONS

**89**

given by IRSST personnel or IRSST-funded researchers at scientific conferences or events organized by partners.

## OTHER SIMPLIFIED ARTICLES, EXPERTS' REPORTS, ETC.

**9**

**SIMPLIFIED ARTICLES**

**24** + **37**

**NEWS BRIEFS**

published in the *Actualités* column of *Prévention au travail*, the magazine published by the CSST and the IRSST

**VIDEOS POSTED ONLINE**

**94**

**SESSIONS ON THE IRSST'S WEB SITES**

**419,719**

**DOWNLOADS OF PUBLICATIONS DISSEMINATED ON THE IRSST'S WEB SITES**

**63,779**

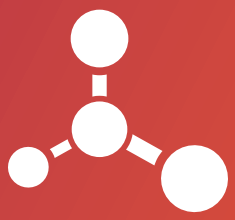
**SUBSCRIBERS TO *INFOIRSST*, THE INSTITUTE'S ELECTRONIC NEWSLETTER**

**4,451**

# 35th Anniversary

Former president of the Conseil du patronat du Québec, **Ghislain Dufour** was one of the three signatories of the Letters Patent that officially created the IRSST in 1980. Mr. Dufour headed the employer delegation on the Institute's Board of Directors for 18 years.

"Right from the time of Québec's economic summit in 1977, employers were unanimous in asking the government to promote the use of research to more effectively prevent occupational injuries, the costs of which were already very high."



# RESEARCH AND ITS PRACTITIONERS

# THE STARTING POINT

PHOTO FROM

**1988**

"Enormous gaps in OHS research in Québec and a clear shortage of researchers in this field…"

This twofold observation formed the basis of the strategy for developing the brand new organization, the IRSST. To redress the situation, the IRSST's management gave priority to the mechanisms needed to coordinate existing resources in the universities and speed up the pace of researcher training. Three mechanisms were introduced:

1) The status of "associated research team" was granted to university groups and funding was offered for their work;

2) A funded research program was created to attract external researchers;

3) A major grant and scholarship program was launched to train researchers.

With time and experience, some mechanisms (such as that of associated research teams) were dropped and replaced by new initiatives aimed at expanding this network and grooming the next generation of OHS researchers.

# 2015 STATUS REPORT

## INTERNAL RESOURCES

Now, 35 years since its creation, the IRSST boasts a solid internal team of scientists, professionals, and technicians with strong credentials in disciplines as varied as chemistry, physics, engineering, ergonomics, industrial hygiene, psychology, sociology, anthropology, and demographics. As at December 31, 2015, the Institute had 144 employees whose average age was 49. These included 20 researchers, 43 scientific professionals, and 27 technicians.

During the year, 11 new employees were added to our human resources in order to fill gaps left by retirements and meet needs. **Sylvain Pelletier** was named Director of the Research and Expertise Division, while **Blaise Labrecque** was recruited to fill the post of Director of the Mechanical and Physical Risk Prevention Department. For his part, **Michel Asselin** was promoted to Director of the Chemical and Biological Hazard Prevention Department.

As is the yearly custom, the IRSST opened its offices and laboratories to a large number of trainees. In 2015, there were 29, including four students at the bachelor's level, five at the master's level, four at the doctoral level, eight on postdoctoral fellowships, and eight collaborators with whom IRSST personnel shared their passion for OHS research in the hopes of inducing them to opt for careers in this field.

## EXTERNAL RESOURCES

The internal team of scientists is complemented by a potential pool of 192 active researchers who form part of the Institute's external research network. In this regard, an external evaluation committee concluded in 2005 that the OHS research environment in Québec "had been greatly strengthened under the primary and decisive impetus of the IRSST since its founding, while the number of OHS researchers is greater outside the Institute than within, and very high-calibre university research teams have been formed…" Despite recurrent difficulties finding enough new-generation researchers in certain fields, the gaps observed in the 1980s have been narrowed through mitigation measures and the number of research activities has been steadily rising.

**Since the creation of the IRSST, nearly 2,500 research and knowledge transfer projects and activities have been recorded in its project information and management system. Each of these has, in its own way, helped further knowledge in the area of OHS-related prevention and rehabilitation.**

Internal and external researchers have worked together over the years and through networking, and have much appreciated the experience. In fact, in 2015, half of the **165 active research projects** (86 to be exact) were designed and carried out by teams comprising both internal and external researchers, while 44 were piloted exclusively by external researchers and 35 by internal researchers alone. The Institute favours this combination of its staff members with members of its external research network because it provides a better critical mass and ultimately allows the Institute to fulfill its mission more effectively.

SYLVAIN PELLETIER

BLAISE LABRECQUE

MICHEL ASSELIN

The alliance between its scientists and those of other organizations also helps enrich research projects, broaden expertise to a larger number of fields and areas of activity, increase skills, and improve access to multidisciplinarity or interdisciplinarity, to name but a few of the benefits.

## THE EXTERNAL NETWORK* INCLUDES:

**192 researchers** whose OHS studies are funded by the IRSST.

They come from **21 universities** and

**33 research centres and private or public organizations.**

* Excluding international collaborative undertakings related to its partnership agreements (NIOSH, INRS, HSL, IFA, JNIOSH, etc.).

## COLLABORATING RESEARCH ORGANIZATIONS

Polytechnique Montréal, École de technologie supérieure, TÉLUQ, Concordia University, Université Laval, McGill University, Université de Montréal, University of Ottawa, Université de Sherbrooke, Université du Québec à Montréal, Université du Québec en Outaouais, Université du Québec à Trois-Rivières, Centre for Action in Work Disability Prevention and Rehabilitation (CAPRIT), Centre de santé et de services sociaux de la Vieille Capitale (university-affiliated centre), Centre hospitalier universitaire Sainte-Justine, Centre hospitalier de l'Université de Montréal, Centre intégré de santé et des services sociaux de Chaudière-Appalaches, National Research Council Canada, Centre de recherche du Centre hospitalier de l'Université de Montréal, Centre de recherche industrielle du Québec, Centre de recherche de l'Institut universitaire de cardiologie et de pneumologie de Québec, Groupe CTT, National Optics Institute, Institut national de la recherche scientifique, Institut Armand-Frappier, Institut national de santé publique du Québec, Institut de recherche et de développement en agroenvironnement, Institut de réadaptation en déficience physique de Québec, Institut de réadaptation Gingras-Lindsay de Montréal, Institut de recherche sur l'hydrogène de l'Université du Québec à Trois-Rivières, Institut universitaire de cardiologie et de pneumologie de Québec, Direction de la santé publique de Montréal-Centre, Centre de recherche de l'Hôpital Maisonneuve-Rosemont, Centre de recherche de l'Hôpital du Sacré-Cœur de Montréal, Douglas Mental Health University Institute, Centre de recherche de l'Institut universitaire de santé mentale de Montréal, Jewish Rehabilitation Hospital, Merinov – Centre d'innovation de l'aquaculture et des pêches du Québec, Cégep de Jonquière, University of Toronto, Trent University in Ontario, University of Vermont in the United States, VU University in the Netherlands, Université de Lyon in France, McMaster University in Ontario, Alberta Health, Canada Centre for Mineral and Energy Technology, Centre for Disability Research of Lancaster University in the United Kingdom, University of British Columbia, Institute for Work & Health in Toronto, Ontario, Sharif University of Technology in Iran, and Cancer Care Ontario.

## THEMATIC PROGRAMS

As agreed in its action plan for year 3 of the 2013-2017 Five-Year Plan, the Institute developed, presented, and adopted three new thematic programs. The Chemical and Biological Hazard Prevention research field was therefore asked to conduct studies on the hazards associated with **green jobs**; the Sustainable Prevention and Work Environment field piloted the **work-related road safety** theme; and the Occupational Rehabilitation field was given responsibility for studying the **aging workers** component of the "protection and support for workers in vulnerable situations" theme.

The 2013-2017 Five-Year Plan envisaged 14 new thematic programs for the research fields. They included research topics as diverse as occupational cancers, respiratory protection, slips and falls on outdoor surfaces, automation and control systems, and OHS in small businesses, among others. By the end of 2015, six of the 14 new thematic programs identified in the Five-year Plan were under way.

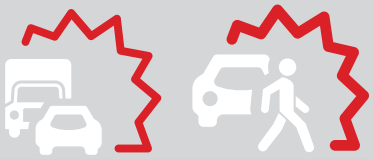
## CALLS FOR PROPOSALS

The IRSST sometimes issues calls for proposals to meet specific needs, develop new niches, and encourage researchers who have never worked in occupational health and safety to become involved in the field, and ultimately to enhance its research portfolio.

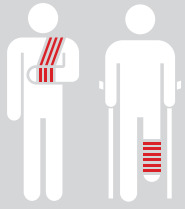
### THREE CALLS FOR PROPOSALS LAUNCHED IN 2015



**1)** The theme of the first proposal was the rehabilitation of **aging workers**; it sparked the interest of three research teams, which submitted proposals.



**2)** The second concerned the prevention of **work-related road accidents**, which are the leading cause of work-related deaths; four proposals were received in this regard.



**3)** The third proposal was launched in collaboration with the Réseau provincial de recherche en adaptation-réadaptation (REPAR-FRQS) and concerned support for research focused on **occupational rehabilitation priorities**; four proposals were received.

# 35th Anniversary

A miner by trade, **Clément Godbout** spent his career in the union movement, where he held the post of Secretary General of the Fédération des travailleurs et des travailleuses du Québec (FTQ), among others. He sat on the IRSST's Board of Directors from 1982 to 1999.

"When you look at the IRSST's achievements over the past 35 years, they represent a veritable goldmine. There is much to be proud of, for this is a true Québec success story. Not everything is perfect, but the advancement of knowledge plays a vital role in the prevention of occupational injuries."

# EXPERTISE AND PARTNERSHIPS

# THE STARTING POINT

PHOTO FROM **1991**

"The Institute's activities would not be possible were it not for the relationships it maintains with the various occupational health and safety professionals and practitioners."

Of the IRSST's guiding principles, three in particular clearly illustrate the importance placed on its relationships with its partners:

1) Its activities must be closely aligned with the current needs of the CSST, its partners, and the Québec workplace community, while also anticipating future needs;

2) Projects carried out in workplaces are conducted using a collaborative approach, with the agreement and participation of the employers and workers in the companies involved;

3) The Institute promotes the active participation of intermediaries throughout the process of developing and conducting research activities and utilizing the results, in order to maximize their usefulness and spinoffs for Québec workplaces.

Solid organic links (equal representation, mixed committees, boards of directors composed of the same members, etc.) have inextricably bound the IRSST and CSST right from day one. The Institute also forges close relationships with its other partners in the prevention-inspection network – mainly integrated health and social services centres and joint sector-based associations (ASP) – but also with the university community.

# 2015 STATUS REPORT

What was said in 1980 still applies today. While carrying out its annual research agenda, the IRSST also puts its knowledge to use for its partners every year through its role as a scientific reference centre. Drawing on the latest OHS knowledge, our partners can ground their operations and strategies in evidence-based data and state-of-the-art expertise in order to eliminate occupational risks and hazards at the source. To meet specific needs, the Institute responded to **107 new requests for expertise** in 2015.

The services requested took various forms, including literature reviews, expert evaluations, status reports, employment injury indicators, presentations of evidence-based data to a target public, development of analytical methods, sampling campaigns, and scientific evaluation. By way of example of the types of situations in which the IRSST's expertise was required, in 2015, the Institute's researchers supported and enlightened the CSST on subjects such as worker exposure to airborne asbestos fibres and safety catches on conveyances in the mining sector.

## RELATION BETWEEN AIRBORNE AND SOIL CONCENTRATIONS OF ASBESTOS FIBRES

At the CSST's request, the IRSST carried out a literature review on the relation between airborne and soil concentrations of asbestos fibres in the context of work with materials containing asbestos or on contaminated sites.

The scant data found in the literature made it difficult to reach any firm conclusion, leading the IRSST to undertake a sampling campaign in the field.

The new transmission electron microscope acquired by the Institute's laboratories in 2015 enabled it to improve services to customers.

The high power of the microscope (200 Kilowatts) allows the Institute to better define worker exposure and provide leading-edge expertise in the area of characterization and quantification, because the microscope can discern miniscule mineral fibres.

## SAFETY CATCHES ON CONVEYANCES IN THE MINING SECTOR

At the CSST's request, the Institute evaluated the conveyance systems used in the mining industry in light of recent advances in knowledge regarding the mandatory safety catches designed to prevent cages from being crushed in situations where a retaining rope breaks. These conveyances are essential to underground mining operations both to transport miners and remove extracted ore from the mines, but they can also cause serious (even fatal) accidents when ropes break or control of the cage is lost.

The IRSST's expert services consisted of (1) performing a literature review that gave a state-of-the art picture of accidents associated with conveyances, hoisting ropes, safety catches, systems for preventing loss of control of cages, and Canadian legislation, (2) identifying potential solutions to prevent hoisting ropes from breaking and cages from being crushed, and (3) documenting incidents involving loss of control of cages and the reliability of control and safety systems for drum hoists.

CSST-ASP meeting: Christine Bureau, Lise Laplante, Arnold Dugas, Diane Parent, Nathalie Laurenzi, Marie Larue, Bernard Dufour, Mona St-Jean, Denise Soucy, Marie Ménard, Isabelle Lessard, Jean Bureau, Paul Héroux, Paul Potvin, Jean-Yves Héroux, Jonathan-L. Pageon.

## CSST-ASP MEETING

Our partners held an increasing number of meetings with a view to optimizing their preventive actions. For example, in 2015, the Institute hosted one of the meetings of the CSST-ASP liaison committee, of which it is a member. At this meeting, the partners embarked on a preliminary discussion of their common priorities for the years ahead. Such discussions facilitate a closer fit between the partners' action plans and the CSST's main orientations regarding prevention. The challenge for the IRSST is to ensure that its five-year plan addresses the research needs of the CSST and its partners. The Institute counts on the latter to promote workplace uptake of the results of prevention research.

## NEW PARTNERSHIPS

The IRSST favours partnerships, whether to increase its research capacity, share its expertise, or meet specific needs. In 2015, **44 national and international agreements** of this type were in effect, including six new ones and three renewals. Eleven other draft agreements were also being negotiated.

The following new collaborative agreements were ratified in 2015:

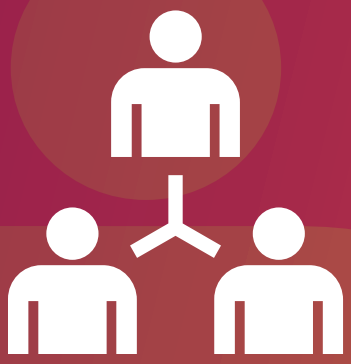
- a master partnership agreement with Japan's **National Institute of Occupational Safety and Health** (JNIOSH);
- a master partnership agreement with Singapore's **Work Safety and Health Institute** (WSHI);
- an agreement with the **Réseau provincial de recherche en adaptation-réadaptation** (REPAR/FRQS) regarding the funding of research activities on disabilities of musculoskeletal origin in the context of occupational rehabilitation;
- a master agreement with the **École de santé publique** of Université de Montréal aimed at carrying out joint research, expert evaluation, and knowledge transfer and promotion activities;
- an agreement with **Équipe Renard** of Université de Montréal on the transfer and use of new knowledge;
- a partnership agreement with **PRIMA Québec** that provides for the Institute's participation in an exhibition on nanotechnologies at the Musée de la civilisation de Québec.


The Executive Director of Singapore's Workplace Safety and Health Institute (WSHI), Dr. Gan Siok Lin, and the President and CEO of the IRSST, Marie Larue, signed a master agreement for the sharing of resources aimed at generating and funding research and expertise activities, communication, and knowledge transfer activities.

# 35th Anniversary

**Jean Yves Savoie** worked at the Institute for 22 years, first heading the working group on the organization of laboratory services, then moving on to become Scientific Director and later Chief Executive Officer of the IRSST, a post he held for 12 years.

"At the time, knowledge transfer was not a customary practice. We were innovative in this respect and were recognized for being so. Employers, unions, and OHS practitioners and professionals all had needs. As an equal representation research centre created specifically to support them, we could not imagine simply producing scientific publications and not making substantial efforts to adapt and simplify their content, and support their application. After all, if no one applies the results, we can hardly say we contribute to prevention."



# KNOWLEDGE TRANSFER AND DISSEMINATION

# THE STARTING POINT

PHOTO FROM

**1992**

"[…] a twofold challenge: carrying out activities that meet the needs of workplaces and producing results they can use. We therefore had to […] step up our efforts to disseminate our research results and ensure their application in the workplace."

A pioneer in its field, the Institute realized very early on that to truly contribute to the prevention of occupational injuries and leverage its investments in research, it had to implement measures that would facilitate the transfer of knowledge to workplaces and ensure uptake by employers and workers. As early as 1989, it launched the Service de transfert des applications de la recherche (or STAR, the research applications transfer unit), which worked to promote the advancement of knowledge on subjects for which OHS professionals and practitioners expressed urgent needs. Its first publications concerned subjects such as leg protection, shingle machines, falls from heights, and noise control. With time and experience, the Institute has come to use various formulas, including the recruitment of intermediaries who are able to ensure effective knowledge transfer due to their expertise and credibility in the workplace.

Knowledge transfer achieved "institutional priority" status in 2006 with the creation of the Knowledge Transfer and Partner Relations Department, which in turn became the new Communications and Knowledge Transfer Division following an administrative merger in 2012.

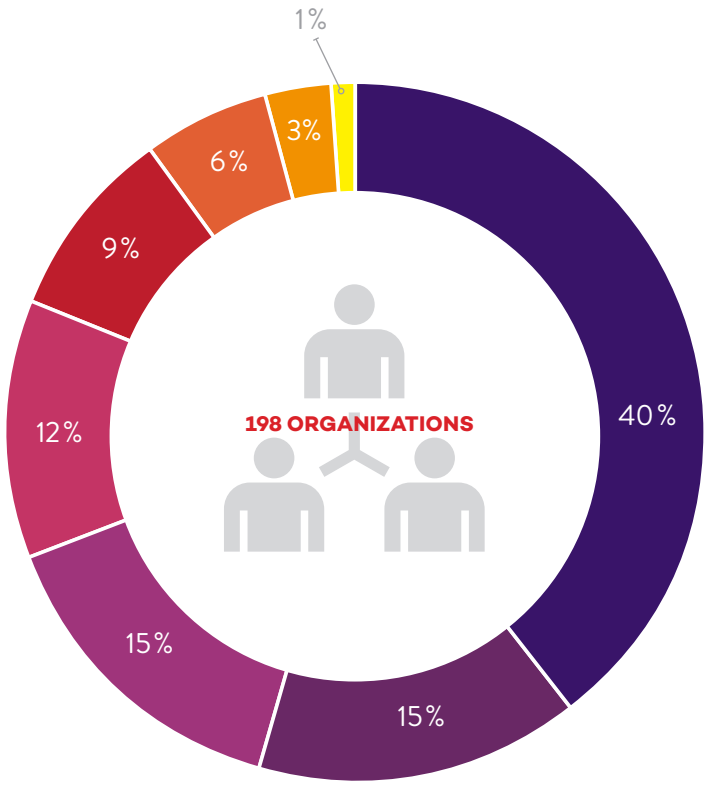
# 2015 STATUS REPORT

Knowledge translation is now an integral part of most of the IRSST's research activities and projects, including external projects. The main objective is to ensure continuous interaction among researchers and potential end users throughout the research process, from project development to results application. Project follow-up committees and knowledge transfer advisors are the prime movers of the knowledge transfer and promotion process.

Working in conjunction with partners, the members of these committees ensure that the knowledge acquired is presented in various formats and adapted to the workplace. **Technical fact sheets**, **checklists, guides**, **computer-based tools**, **awareness-raising tools**, **videos**, and **Web sites** form part of a broad range of means made available to preventionists to maximize use of OHS-related prevention knowledge.

In 2015, **198 organizations** were represented on the follow-up committees, and included 5 community associations, 29 employer associations, 23 union associations, 30 private companies, 79 government departments and agencies, 12 professional orders and associations, 2 research centres, and 18 OHS professionals and practitioners.

**ORGANIZATIONS REPRESENTED ON THE FOLLOW-UP COMMITTEES**



The formulas may have changed over time, but the aim has not. It remains that of ensuring that research results are *actually used* to prevent occupational injuries.

One of the key factors in successful knowledge transfer is an organization's ability to simplify the new knowledge and transpose it into a form adapted to the end-users' profile and the needs of the different workplaces. In other words, the knowledge must be made accessible to preventionists, workers, and employers by simplifying the content and presenting it in a form that facilitates uptake. Here are some compelling examples.

## WATER AND AIR AT INDOOR SWIMMING POOLS

The two research projects on exposure to disinfection by-products (DBPs) at indoor swimming pools provide prime examples of successful knowledge transfer efforts in 2015. The researchers were assisted by a follow-up committee from the outset. To ensure that all needs were taken into account, the committee members came from three different activity sectors: the municipal sector (Association paritaire pour la santé et la sécurité du travail, secteur « Affaires municipales » [known as APSAM]; the cities of Montréal, Québec and Gatineau; the Union des municipalités du Québec [UMQ]); the aquatics sector (Association des responsables aquatiques du Québec [ARAQ], the Red Cross, Québec's Lifesaving Society); and the public health sector (Montréal's public health department [DSP], Institut national de santé publique du Québec).

In the main project, 41 swimming pools in Québec City and Montréal participated in a broad sampling campaign to determine their levels of environmental (water and air) contamination and the degree of biological contamination (urine and exhaled air) to which pool staff are exposed. The researchers thus sought results that would reflect the situation in a broad spectrum of pools. In addition, one indoor pool participated in an exploratory study aimed at verifying the impact of various water treatment processes on DBP levels.

Lastly, the extensive involvement of the follow-up committee sparked the interest of the workplaces concerned, not to mention that of the Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC) and the Ministère de la Santé et des Services sociaux (MSSS), which in turn generated spinoffs in terms of results appropriation. The research results obtained were in fact incorporated into the objectives and content of the MDDELCC'S awareness-raising campaign on water quality in swimming pools directed at municipalities and associations using indoor swimming pools.

Moreover, the CSST and the Réseau de santé publique en santé au travail chose chloramines (potentially toxic by-products of the reaction between chlorine and ammonia) as an intervention priority with respect to indoor pool maintenance workers in Québec in the Programme de santé sectoriel de l'Administration publique (public administration sector-based health program) (phase 3).

## CHOOSING A BLOW GUN

The updating of the *Répertoire des silencieux, soufflettes et pistolets aspirateurs* (directory of compressed-air mufflers, blow guns, and vacuum guns) inspired the knowledge transfer team to go further. After discussion with advisors from joint sector-based associations and people from the Montérégie public health department, it highlighted the need to disseminate information via means likely to promote safe use of the various compressed-air tools that are prevalent in the workplace and pose risks for workers. In collaboration with the CSST and Université de Sherbrooke's Groupe d'acoustique, a working committee composed of representatives of four joint sector-based associations (ASPHME, Auto-Prévention, ASP Mines, ASFETM) and IRSST personnel agreed to produce two deliverables to promote the uptake of knowledge by workplaces. The first involved drafting a technical guide entitled *Choosing a safe, efficient blow gun*, which defines this type of tool, determines the risks associated with its use, explains what a safe blow gun means, presents criteria for selecting a blow gun and for selecting a task-appropriate nozzle, alternatives to blow guns, and the relevant legislation. The working group improved the content of the guide and had it validated by the researcher and the CSST. The second deliverable was a short video illustrating the blow-gun problem in a simple way and in a variety of work situations. After developing a first scenario, the working group decided to produce two visual documents. The first focused on safety criteria for blow guns; the second, on how to select a blow gun suited to the user's needs. The filming took place in workplaces and the documents were validated by users.

This project also provided an opportunity to pool several partners' expertise and resources and clarify regulations in light of the OSHA standard. In addition, a team from the Montérégie public health department (DSP) updated the blow-gun sample case.

## EXPOSURE TO BIOAEROSOLS

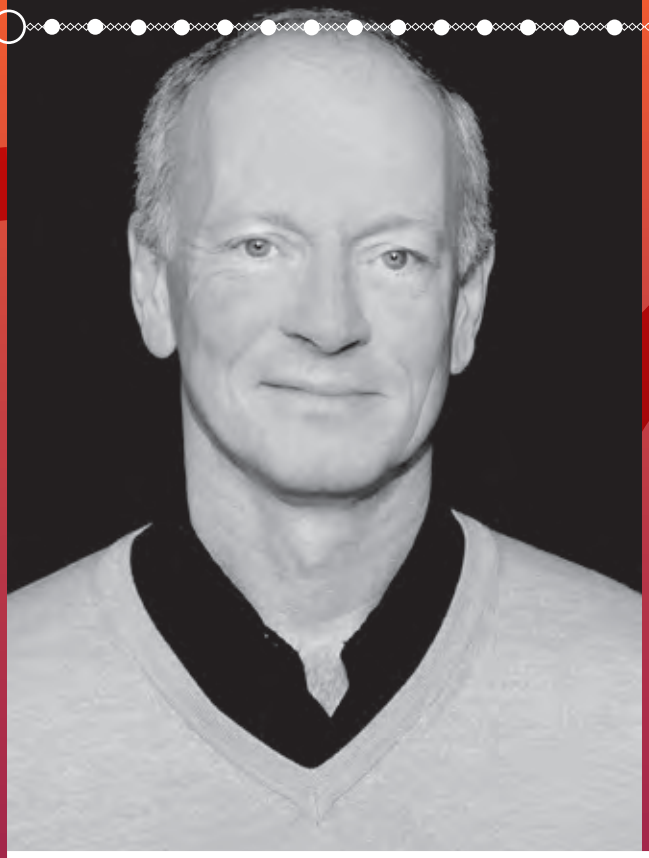

Based on the control banding model, a support tool for choosing appropriate respiratory protection against bioaerosols (toxins, bacteria, viruses, mould spores, etc.) was made available online. The tool was designed by occupational hygienists, doctors, and health professionals, and offers a user-friendly method of choosing respiratory protection appropriate for the work environment based on the hazards associated with the bioaerosols, infectious or not, and on the workers' degree of exposure. Potential users were consulted and invited to test the tool to ensure that it was user-friendly and that it effectively promoted a client-based approach adapted to their activity sector. In six easy steps, the tool helps the user identify the type of workplace involved and determine the risk of exposure, the air quality control measures in place, the bioaerosol generation rate, and the assigned protection factor (APF). Lastly, it proposes a list of suitable respirators in light of the APF calculated. Several examples taken from case studies illustrate the process.

## WORK/STUDY BALANCE

Groupe ÉCOBES – Recherche et transfert du Cégep de Jonquière, the Instances régionales de concertation (IRC) sur la persévérance scolaire et la réussite éducative du Québec, Réunir Réussir (R2), and the IRSST joined forces to promote the OHS of young people who study and work concurrently. Together these organizations launched a new diagnostic tool on work/study balance through a webinar that welcomed more than 450 participants. The tool consists of an online questionnaire that can be completed by young students to give them an overview of their situation regarding their studies, work, health and safety. This online tool for student workers offers them practical advice, strategies, and food for thought adapted to their user profile.

To ensure that the content of the **Jeconcilie.com** Web site was suitably adapted, a team of scientists validated the information on concurrent work/study activity that was developed using the results of several studies conducted since 2006.

# 35th Anniversary



**Alain Lajoie** worked at the IRSST from 1981 to 2008. During that time, he held the positions of Coordinator of Analytical Support, Laboratory Director, Director of Operations, and Director of Research and Expertise.

"A concern for quality and consistency was paramount in the creation of the laboratories. The personnel had to be able to give one and the same response to OHS practitioners and professionals. It was a question of building the credibility of a brand new institute."

# ESSENTIAL LABORATORIES

# THE STARTING POINT

PHOTO FROM

# 2014

"One of the top priorities retained by the Institute right from day one was the creation and operation of laboratory services. Here too, it meant starting from scratch."

Given the urgency of the needs faced, it was imperative, right from early 1981, to create laboratories that would provide the essential services required by the CSST, including occupational hygiene-toxicology and analytical support. The CSST was responsible for inspection services for several government departments – the ministères de l'Environnement, du Travail, et de l'Énergie et des Ressources – and for the Office de la construction du Québec. Each department had varying degrees of analytical needs that the IRSST was required to meet. These needs consisted of more than simply handling requests for sample analysis. The laboratories also had to take into account the growing variety of new chemical substances used in the workplace and comply with newly adopted standards and regulations. This meant hiring and training staff qualified to perform analyses and a core group of scientists capable both of ensuring relatively standardized sample collection, preservation and transportation procedures and protocols, and of developing analytical, quality control and results interpretation methods. The laboratories were also responsible for providing, calibrating, and maintaining a bank of specialized direct-reading and sampling instruments and for keeping abreast of new instruments arriving on the market and requiring evaluation and testing. Lastly, they were obliged to provide analytical support to various partners to enable them to take autonomous action regarding industrial hygiene.

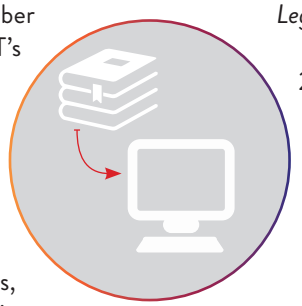
In 2008, an institutional evaluation committee reported that the "IRSST's Laboratory Services and Expertise Department was greatly appreciated by its partners and users, and that it had an excellent reputation for its competence and prompt service delivery."

# 2015 STATUS REPORT

Over the years, the Laboratory Division has met a growing and increasingly diversified demand for analytical services. Not only does it receive ever-larger numbers of samples from its partners and clients, but the analyses it performs must characterize and evaluate the presence of a larger number of pollutants. During their first year of activity, in 1981, the IRSST's laboratories performed 9,805 analyses on 117 different substances. In 2015, the number of analyses had risen to over 61,000 and the services offered covered more than 700 contaminants found in workplaces in the form of gases, dusts, fumes, vapours or mists and for which exposure limits are subject to the *Regulation respecting occupational health and safety*. The reliability of the results is assured by quality control programs whose effectiveness has been confirmed by national and international certifications and accreditations.

**Since the laboratories began operating, the Institute has developed 390 analytical methods – approximately 240 of which are still used today – and numerous calibration methods. These methods involve carrying out the environmental, toxicological, and microbiological analyses requested by its public and private clients, and performing maintenance on the direct-reading instruments it supplies to the prevention-inspection network. In addition to contributing to the advancement of knowledge, several of these methods have been adopted as references by other laboratories, further enhancing the IRSST's reputation.**

In 2015, the Laboratory Division improved its service offer when its scientists developed or validated three new analytical methods and published three others.



**The following three new methods were developed:**

1) A method for determining the presence of subtilisin in cleaning products;

2) An analytical method for quantifying respirable combustible dust;

3) NIOSH Method 5040 for determining total carbon.

**The following microbiological method and two environmental methods were also published:**

1) *Detection and identification of bacteria of the genus Legionella*, Analytical Methods / MA-370A, 2015, 19 p.

2) *Caractérisation des fibres dans les poussières déposées ou dans les matériaux en vrac*, Méthodes analytiques / MA-244, Montréal, IRSST, 2015, 23 p.

3) *Détermination des poussières de fraction inhalable dans l'air*, Méthodes analytiques / MA-373, Montréal, IRSST, 14 p.

## CQ FIBRES

The Institute deployed a brand new version of the CQ Fibres Fibre Counting Quality Control Program using samples originating from various workplaces in Québec. The homogeneity and density of these samples were analyzed and compared. The participants' files were computerized to facilitate use of the upgraded program.

Participants can now manage their personal information online and submit certain requests. A calculation module and a decision-making support system were also introduced to assist participants, while the processes of assigning slides to participating companies and of generating reports for counters were computerized. Invoices and credit notes are now generated automatically and can be consulted and downloaded directly online.

# COMMUNICATION


## A NEW WEB SITE

Present on the Web since 1998, the IRSST launched its third-generation Web site in 2015. The graphics and architecture were completely revamped and improved (essentially in-house) to make it easier to locate and access various documents. Links between publications on the same subject were created to better showcase the advancement of knowledge. Technological changes also allowed content presentation to be adapted for mobile devices. Additions included the Directory of IRSST Scientists as well as information on the Documentation Centre and human resources. In addition, improvements were made to the computer-based tools, all of which are gradually being designed in HTML format. The first two to benefit from this redesign process were the computer-based tool for calculating the service life of respirator cartridges for organic vapours, *Saturisk*, and the decision-making support tool, *Choosing respiratory protection against bioaerosols*. The IRSST also formed a committee composed of employees in all types of jobs (support staff, technicians, professionals, researchers, and directors), affiliated with all the Institute's administrative and scientific divisions and departments, and from various age groups and fields of interest, to support this Web site modernization project aimed at better meeting user needs.

## INSTITUTIONAL COLLOQUIUM

Mindful of the spinoffs that its studies generate in workplaces, the IRSST held its 10th institutional colloquium under the theme *L'impact des recherches : mesures, approches et application au domaine de la SST* (the impact of research: measures, strategies and application in the OHS field). Speakers talked about issues such as the scope and limitations of measures of the spinoffs of the advancement of knowledge, the difficulties of evaluating these spinoffs, the role of researchers in knowledge translation, and the IRSST's practices in this area. Case studies were also presented. One hundred sixty people took part in the colloquium, and the Institute posted online videos of the lectures delivered in order to reach a broader public.

François Ouellet, Paul-Émile Boileau, Louis Lazure, Jean Arteau, Laurence Plouffe, Vincent Larivière, Marie Larue, Yves Gingras, Charles Gagné and Jacques Lavoie. Jean-Pierre Robitaille and Christian Dagenais missing from the photo.

# ACTIVITIES RELATED TO THE INSTITUTE'S 35TH ANNIVERSARY

MAUDE GENDRON-ROLLAND

The IRSST celebrated its 35th anniversary on November 28, 2015. To mark the occasion, it launched an in-house contest to find a slogan. The winning entry was that proposed by **Maude Gendron-Rolland**, a human resources advisor: *Engagé en prévention depuis 1980* (committed to prevention since 1980). Her slogan in fact graces the cover of this activity report and informs its content.

## HISTORICAL OVERVIEW


In the context of its 35th anniversary, the IRSST retraced and compiled the highlights that led to the Institute's creation and key events that have marked its growth since that time. This extensively illustrated and user-friendly historical overview was published on its Web site in the form of a timeline. Complementing this chronology of the Institute is a series of video interviews with individuals who, each in his or her own way, have helped build and shape the organization since the 1978 publication of the *Politique québécoise de la santé et de la sécurité des travailleurs*.

***Prévention au travail*** magazine also marked the anniversary by publishing articles in a column headed *Spécial 35e* in each 2015 issue as reminders of some of the achievements of the Institute's scientists or scientists it funds.

PUBLICOM | Tool for collecting scientific publication and communication references

## PUBLICOM

Scientific research is closely associated with the publication of articles in scholarly journals and the dissemination of results in a variety of forums. The Institute recurrently seeks to provide, among other things, the most accurate picture possible of the number of scientific articles published each year and generated by its own research projects or those it funds. A new system for collecting scientific publication and communication references (PUBLICOM) was developed and implemented to facilitate this operation and ensure that this information is kept up to date. Accessible to both internal and external researchers, this software was designed entirely by the IRSST's Information Technology resources. It allows researchers to enter, save, and view the references pertaining to their publications. It contains information on peer-reviewed journal articles and peer-reviewed articles published in conference proceedings, detailed articles/summaries, posters, issue numbers of peer-reviewed journals, books and book chapters, theses, etc.

# STEWARDSHIP

## PROJECT MANAGEMENT

The IRSST continued its research project management program, which essentially consists of implementing a follow-up system called *passage de portes* (passing project milestones, including pre-project planning, start-up, progress, special, and post-project evaluation milestones) in order to increase the scientific merit and organizational efficiency of research activities.

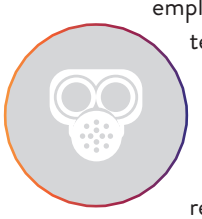
In 2015, the program facilitators made a first assessment and determined that numerous projects had passed a total of 16 milestones. Moreover, management decided that from then on, external projects would also be included in the project management program, which in fact reduced the average project-authorization time from 16 months in 2011 to 13 months in 2015. The program also promotes coherence between objectives, methods, and deliverables; optimal start-up conditions; solid anchoring of the projects in workplaces; and a better understanding of project content by all team members, research field leaders, and managers. In addition, the new crop of researchers learn about the proper project management process, which in turn enhances their letters of intent and research project designs on several levels.

## OHSC Activities

### OUR EMPLOYEES' OCCUPATIONAL HEALTH AND SAFETY

Dedicated to OHS, the Institute has its own volunteer occupational health and safety committee (OHSC), which met nine times in 2015. It did not have a single occupational injury involving IRSST employees to report during the year.

The OHSC updated and amended 11 policies and procedures and conducted an ergonomic study. Regarding respiratory protection, 42 employees and trainees participated in **protective-mask** adjustment tests, while two trainees were given appropriate training on the adjustment, maintenance, and use of respiratory protection equipment.



The IRSST's excellent occupational injury record for the year resulted in a CSST assessment rate lower than the unit rate paid by companies operating in the same activity sector.

# HONOUR ROLL

**Benoit Lévesque**, a member of the IRSST's Scientific Advisory Board, was one of the winners of the 2015 *Prix du Québec*. Professor Emeritus at Université du Québec à Montréal (UQAM) and Associate Professor at Québec's École nationale d'administration publique (ÉNAP), he was awarded the Prix Marie-Andrée-Bertrand by the Québec government. The award is bestowed on a person whose research work, through its scope and scientific calibre, has led to the development and implementation of important social innovations that enhance individual and collective well-being.

Representing the scientific and technical communities on the IRSST's Scientific Advisory Board, Mr. Lévesque has distinguished himself by, among other things, his outstanding contributions in the areas of social economy and social innovations. He was the co-founder of the Centre de recherche sur les innovations sociales (CRISES), the only centre of its kind in Canada.

Mr. Lévesque also received an honorary doctorate from the Institut des sciences humaines et sociales of Université de Liège (Belgium) in recognition of his prominent involvement in the development of economic sociology and his contribution to the public recognition enjoyed by social economy in Québec today.

**André Dufresne**, Honorary Professor at the École de santé publique of Université de Montréal, a former IRSST researcher, and a member of its Scientific Advisory Board, received a prestigious award in the field of industrial hygiene in the form of the Donald E. Cummings Memorial Award 2015.

This annual award given by the American Industrial Hygiene Association (AIHA) officially recognized Dr. Dufresne's outstanding contribution to the advancement of knowledge and industrial hygiene practice. Established in 1943, the award pays tribute to Donald E. Cummings, AIHA'S third president.

Epidemiologist **France Labrèche** was invited by the Occupational Cancer Research Centre (OCRC) to join its team of affiliated scientists. This invitation signifies the OCRC's recognition of the high quality of her work and her contribution to the prevention of occupational diseases.

# HONOUR ROLL

As part of the Journées de la relève en recherche organized by the Association francophone pour le savoir (ACFAS) and the Fonds de recherche du Québec, the IRSST's Scientific Director, **Paul-Émile Boileau**, handed out two *ACFAS-IRSST-Santé et sécurité du travail* awards, one to a master's student and the other to a doctoral student, to underscore their excellent academic track records.

The *ACFAS-IRSST-maîtrise* (master's) award went to **Pascale Maillette**, a student at the École de réadaptation of Université de Sherbrooke. The aim of her thesis was to identify how individuals who have undergone knee arthroplasty see their occupational disability in order to determine the trajectories of workers who might be hesitant about returning to work and offer them occupational rehabilitation support.

The *ACFAS-IRSST-doctorat* (doctoral) award went to **Axelle Marchand**, a student in the Département de santé environnementale et santé au travail of Université de Montréal. Her thesis investigates the pulmonary and toxicokinetic absorption of three organic solvents in the presence of heat stress in order to gain a better understanding of the relationship between temperature and physiological changes and determine to what degree they influence solvent absorption and kinetics.

Ergonomist **Caroline Jolly** was awarded a recruitment scholarship under UQAM's Bourses d'excellence program. She received this financial aid based on the high quality of her university file submitted for admission to the interdisciplinary doctoral program in health and society in UQAM's Faculté des sciences humaines.

Anthropologist **Daniel Côté** was named an associate researcher at the Centre for Interdisciplinary Research in Rehabilitation of Greater Montreal (CRIR). Recommended by members of CRIR's Research Orientation Committee and by the General Assembly of its permanent researchers, this appointment is a form of recognition of the merit of his contribution to worker rehabilitation.

To encourage the creation of a new generation of scientists in certain targeted occupational health and safety sectors, the IRSST and Québec's three research funds together award three significant career scholarships to young researchers. These scholarships cover a four-year period and total nearly $840,000 over that period. They are supplemented by an annual establishment grant of $25,000 for three years.

**THE 2015 RECIPIENTS WERE:**

**Marie Laberge** of the École de réadaptation of Université de Montréal, who heads a research program on OHS in teens transitioning to the world of work, as a matter of sustainable prevention;

**Eva Suarthana** of the Centre de recherche of Hôpital du Sacré-Cœur de Montréal, who designs prognostic models for the appearance of respiratory symptoms in the workplace and of an abnormal decline in respiratory function in individuals exposed to sensitizing agents in the workplace;

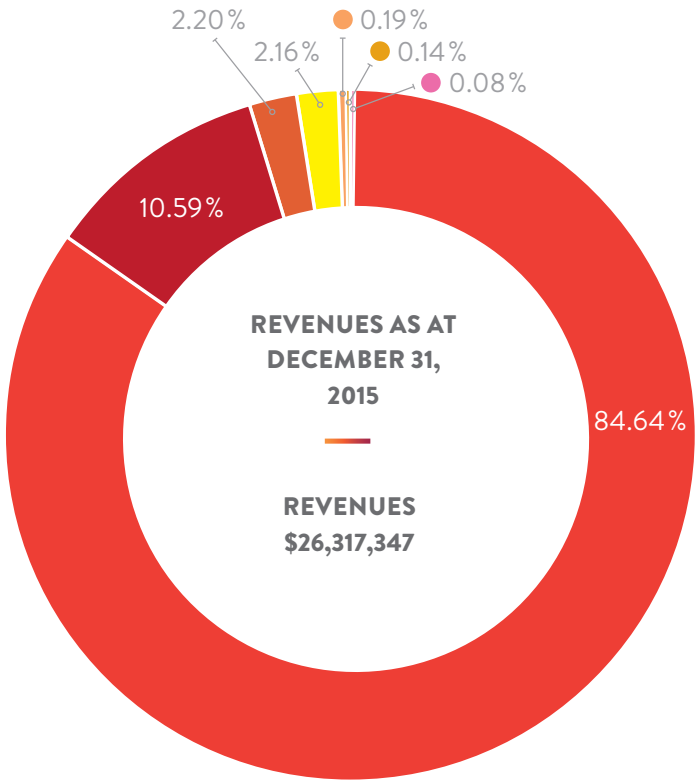
**Maximilien Debia** of the Département de santé environnementale et santé au travail of Université de Montréal, who is carrying out a research program on the evaluation and characterization of occupational exposure to nanometric particles.

The applications of these three young researchers were selected for the high quality of the research programs proposed.

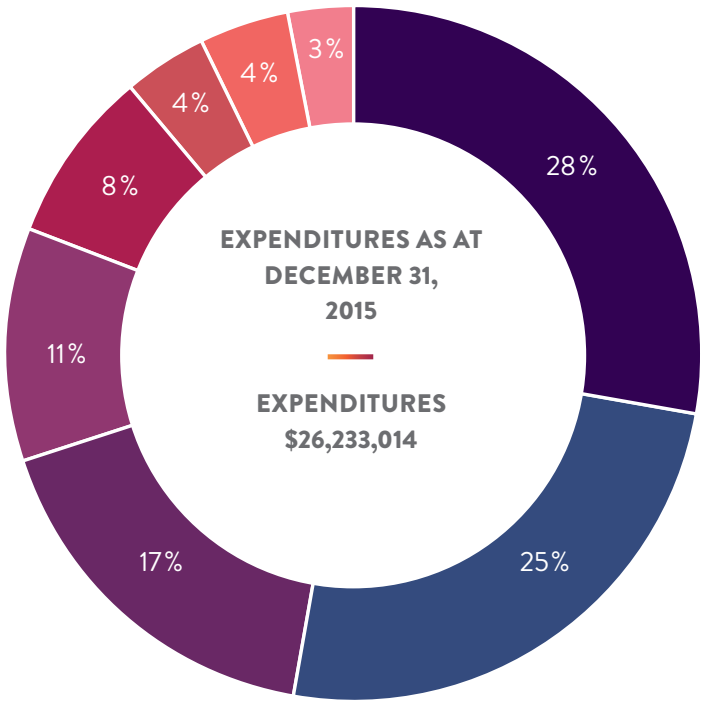
*Applied Ergonomics*, a well-regarded academic journal in the field of applied ergonomics and human factors engineering (which takes account of human factors in the design of technical or social systems in the workplace), invited IRSST researcher **André Plamondon** to join the ranks of its international editorial committee. An experienced biomechanist, Mr. Plamondon heads the IRSST's biomechanics laboratory.

**Damien Burlet-Vienney**, who benefitted from the IRSST's special program aimed at grooming the next generation of OHS researchers, successfully defended his thesis before a jury at Polytechnique Montréal. Entitled *Conception et évaluation d'un outil pour analyser et catégoriser les risques multifactoriels encourus par les travailleurs lors des interventions en espace clos* (design and evaluation of a tool for analyzing and categorizing multifactorial risk factors to which workers are exposed during confined space interventions), his thesis led to the publication of four scientific articles.

# FINANCIAL OVERVIEW




- CSST
- Laboratory services
- External contracts
- Special projects
- Interest income
- Beryllium project
- Other




- Internal research
- Laboratories
- External research and grants
- Finance and administration, physical and computer resources
- Scientific support for internal and external research
- Knowledge transfer service
- Executive Office
- Communications and institutional events

# GOVERNANCE

## BOARD OF DIRECTORS

The IRSST's affairs, including its orientations, development framework, and budget, are managed by an equal representation (labour/management) board of directors composed of 15 members, specifically, the chair and seven representatives each of worker and employer associations. In 2015, its members held **six meetings** (including one on the Institute's premises), while the members of the Executive Committee met on **nine occasions**.

**CHAIR**
Michel Després*

**EMPLOYER REPRESENTATIVES**
Françoise Bertrand
Yves-Thomas Dorval*
France Dupéré
Martine Hébert
Patricia Jean
Carmel Laflamme
*Vacancy*

**WORKER REPRESENTATIVES**
Andrée Bouchard
Serge Cadieux*
Jean Lacharité
Lucie Levasseur
Yves Ouellet
Daniel Roy
*Vacancy*

**OBSERVER**
Jean Poirier

**IRSST REPRESENTATIVE**
Marie Larue

**DEPARTURES**
Claude Faucher, Suzanne Thérien (observer)

* Member of the Executive Committee

## SCIENTIFIC ADVISORY BOARD

Composed of the IRSST's president and CEO, six members of the scientific and technical community, four worker representatives and four union representatives, the Scientific Advisory Board (SAB) is a tri-partite advisory body serving the president and CEO. It judges the relevance, priority, and scientific merit of internal and external research programs and projects. In 2015, the SAB held **eight meetings**.

**CHAIR**
Marie Larue

**EMPLOYER REPRESENTATIVES**
Lionel Bernier
Dominique Malo
Gilles Rousseau
Marie-France Turcotte

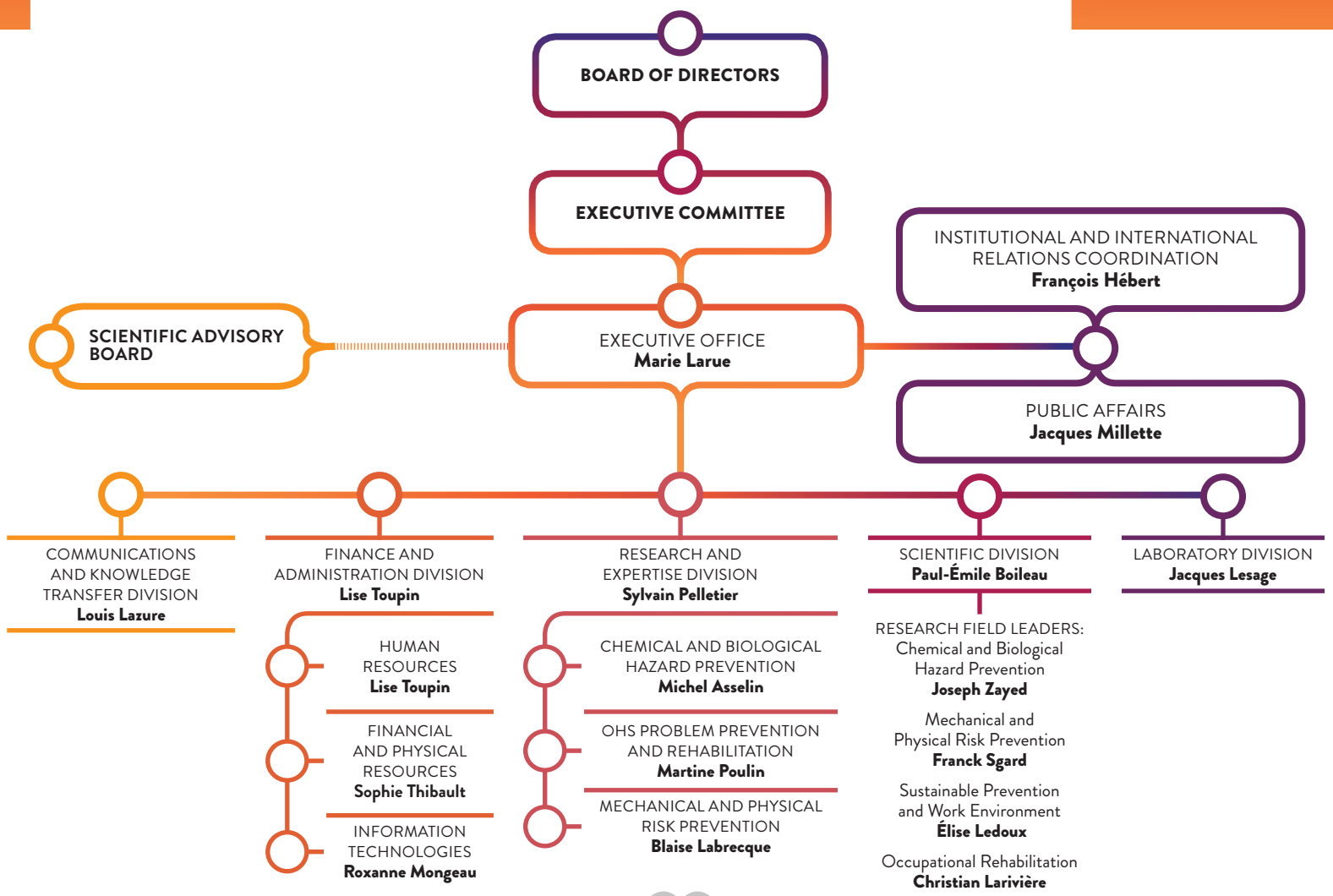
**WORKER REPRESENTATIVES**
Jean Dussault
André Grandchamps
Denis Mailloux
Ana Maria Seifert

**MEMBERS OF THE SCIENTIFIC AND TECHNICAL COMMUNITY**
Léonard Aucoin
Louis Cloutier
Louise Dandurand
André Dufresne
Benoît Lévesque
Alain Rondeau

**OBSERVER**
Claude Sicard

**APPOINTMENTS**
André Grandchamps, Gilles Rousseau

# ORGANIZATION CHART



# 2015 CATALOGUE

**This section lists IRSST-funded projects and the resulting publications.**
**It includes:**

PRODUCTION BY RESEARCH FIELD

# CHEMICAL AND BIOLOGICAL HAZARD PREVENTION

RESEARCH FIELD LEADER

JOSEPH ZAYED

PH.D. PUBLIC HEALTH – ENVIRONMENTAL TOXICOLOGY

**THE RESEARCH ORIENTATIONS OF THIS FIELD ARE:**

1) Development of strategies and methods for evaluating exposure and estimating health risks using toxicological and epidemiological approaches, among others;
2) Development and validation of technologies and tools designed to reduce and control exposure;
3) Development of methods for sampling and analyzing chemical substances and biological agents.

## LIST OF PROJECTS FOR WHICH WORK BEGAN IN 2015

Investigating the impact of typical workplace thermal stress on the pulmonary absorption and toxicokinetics of three organic solvents, Sami Haddad, Ginette Truchon, 2013-0012.

Exploratory evaluation of occupational exposure to chemical and organic contaminants in biomethanation plants for putrescible organic matter, Jacques Lavoie, Geneviève Marchand, Caroline Duchaine, Yves Cloutier, Joseph Zayed, 2013-0013.

Chemical protective clothing against solid aerosols: Performances of materials under various exposure conditions and characterization of determinants, Ludovic Tuduri, Ali Bahloul, Yves Cloutier, Stéphane Hallé, Patricia Dolez, 2013-0055.

Evaluation of worker exposure to bioaerosols during use of biological fountains in mechanical maintenance shops, Maximilien Debia, Jacques Lavoie, Geneviève Marchand, 2014-0022.

Characterization of emissions of bitumen with high stripping resistance and containing polyamine anti-stripping agents, Simon Aubin, Mélanie Huard, Huu Van Tra, 2014-0040.

Use of molecular tools to study the fungal diversity of aerosols, Caroline Duchaine, 2014-0057.

Reducing worker exposure to gases, odours, dust and human pathogenic agents in pig farm buildings, Stéphane Lemay, Caroline Duchaine, 2014-0058.

Webexpo: Toward a sounder interpretation of measurements of exposure to chemical products in industrial hygiene, Jérôme Lavoué, 2014-0073.

Revision of the *Guide de surveillance biologique de l'exposition : Stratégie de prélèvement et interprétation des résultats* [Guide for biological exposure monitoring: sampling strategy and interpretation of results], Ginette Truchon, Jérôme Lavoué, 2015-0002.

Lambda-cyhalothrine as a preferred agricultural insecticide: investigation of the biomarker toxicokinetics for monitoring worker exposure, Michèle Bouchard, 2015-0013.

## LIST OF IRSST PUBLICATIONS

Stathopoulos, T., Hajra, B., Chavez, M., Bahloul, A., *A Wind Tunnel Study of the Effect of Adjacent Buildings on Near-Field Pollutant Dispersion from Rooftop Emissions*, Studies and Research Projects / **R-848**, Montréal, IRSST, 2015, 76 p.

Bahloul, A., Stathopoulos, T., Chavez, M., Hajra, B., *The Effect of Upstream and Downstream Buildings on Dispersion of Effluents: A Computational Fluid Dynamics (CFD) Approach*, Studies and Research Projects / **R-849**, Montréal, IRSST, 2015, 65 p.

Stathopoulos, T., Hajra, B., Chavez, M., Bahloul, A, *Étude en soufflerie de l'effet des bâtiments adjacents sur la dispersion en champ proche des émissions polluantes de cheminées de toit*, Études et recherches / **R-851**, Montréal, IRSST, 2015, 82 p.

Bahloul, A., Stathopoulos, T., Chavez, M., Hajra, B., *L'effet de bâtiments en amont et en aval sur la dispersion des effluents : une approche axée sur la mécanique des fluides numérique (CFD)*, Études et recherches / **R-852**, Montréal, IRSST, 2015, 71 p.

Endo, C-A., Ostiguy, C., Dossa, N. I., Emond, C., *Portrait de la nanotechnologie au Québec dans les milieux industriels et de la recherche universitaire et publique*, Études et recherches / **R-854**, Montréal, IRSST, 2015, 104 p.

Tardif, R., Catto, C., Rodriguez, M., *Impact de quatre filières de traitement de l'eau en piscine sur les concentrations des sous-produits de désinfection – Une étude exploratoire*, Études et recherches / **R-859**, Montréal, IRSST, 2015, 49 p.

Tardif, R., Catto, C., Haddad, S., Rodriguez, M., *Évaluation de l'exposition des travailleurs aux sous-produits de désinfection en piscine intérieure au Québec*, Études et recherches / **R-860**, Montréal, IRSST, 2015, 100 p.

Duchaine, C., Veillette, M., Jean, J., Longtin, Y., Bonifait, L., Turgeon, N., Charlebois, R., *Détection des virus respiratoires et entériques en milieu hospitalier : Une étude pilote*, Études et recherches / **R-861**, Montréal, IRSST, 2015, 44 p.

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Lavastre, V., Gonçalves, D., Girard, D., *Procédures et évaluation du potentiel pro-inflammatoire des nanoparticules*, Études et recherches / **R-886**, Montréal, IRSST, 2015, 48 p.

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PRODUCTION BY RESEARCH FIELD

# MECHANICAL AND PHYSICAL RISK PREVENTION

RESEARCH FIELD LEADER

FRANCK SGARD

PH.D. MECHANICAL ENGINEERING

**THE RESEARCH ORIENTATIONS OF THIS FIELD ARE:**

1) Assessment of the mechanical and physical risks generated by machines or the work environment;
2) Reduction of mechanical and physical risks;
3) Taking the human factor into account in the evaluation and control of mechanical and physical risks.

## LIST OF PROJECTS FOR WHICH WORK BEGAN IN 2015

Development of a method for measuring effective intra-aural noise exposure for use in the workplace, Jérémie Voix, Hugues Nélisse, 2013-0017.

Comparative analysis of machine accidents in the maintenance and production phase, Laurent Giraud, 2013-0045.

Developing an innovative methodology for laboratory characterization of absorbent treatments and analyzing its applicability in the field, Alain Berry, U SHER / Noureddine Atalla, Olivier Robin, Olivier Doutres, U SHER / Franck Sgard, 2014-0006.

Collaborative robotics: feedback from workers, users and integrators in Québec, Sabrina Jocelyn, Damien Burlet-Vienney, Laurent Giraud, Adel Sghaier, 2014-0046.

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Montreuil, S., Coulombe, F., Richard, J.-G., Tremblay, M., *Overboard Falls of Crew Members on Québec Lobster Boats: Risk Analysis and Prevention Solutions*, Studies and Research Projects / **R-869**, Montréal, IRSST, 2015, 113 p.

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Rakheja, S., Dewangan, K., Marcotte, P., Shahmir, A., Patra, S., *Étude exploratoire sur la caractérisation de la masse apparente d'un système couplé corps assis – siège élastique soumis à des vibrations dans l'axe vertical*, Études et recherches / **R-883**, Montréal, IRSST, 2015, 120 p.

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Chinniah, Y., Aucourt, B., Bourbonnière, R., *Étude sur la sécurité des machines lors des interventions en mode vitesse ou d'efforts réduits*, Études et recherches / **R-888**, Montréal, IRSST, 2015, 112 p.

Marchand, D., Gauvin, C., Brien-Breton, A., Aubertin-Leheudre, M., Tessier, D., Sadier, Y., *Évaluation de nouvelles technologies visant à réduire le stress thermophysiologique associé au port de vêtements individuels de protection pour les pompiers*, Études et recherches / **R-891**, Montréal, IRSST, 2015, 71 p.

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PRODUCTION BY RESEARCH FIELD

# SUSTAINABLE PREVENTION AND WORK ENVIRONMENT

RESEARCH FIELD LEADER

ÉLISE LEDOUX
PH.D. ERGONOMICS

**THE RESEARCH ORIENTATIONS OF THIS FIELD ARE:**

1) Analysis of OHS problems and assessment of risks in relation to social, organizational, and demographic aspects, and technological changes;
2) Development and application of measurement methods and evaluation tools (measurement of exposures and risk and protection factors, activity analyses, surveys, and data collection tools);
3) Interventions pertinent to, and management of, OHS problems (OHS management in small enterprises, knowledge transfer and training, OHS management steps and tools, adjustment of work situations).

## LIST OF PROJECTS FOR WHICH WORK BEGAN IN 2015

Developing and assessing an employer-employee primary prevention approach to offset the effects of emotionally demanding Youth Centre work, Nathalie Jauvin, Caroline Biron, 2013-0089.

Developing a personalized decision-making tool to minimize handling risks associated with symmetrical and asymmetrical postures, Aboulfazl Shirazi-Adl, André Plamondon, 2014-0009.

Critical Literature Review on Material Handling Training Quality, Denys Denis, Martin Lauzier, 2014-0036.

Overview of the role of managers and worker representatives and conditions conducive to OHS management in mines, Élise Ledoux, Sylvie Beaugrand, 2015-0032.

Using PPE to prevent skin exposure to pesticides: identifying factors facilitating and hindering the use of skin protection clothing by Québec apple producers, Danièle Champoux, Caroline Jolly, 2015-0036.

Knowledge transfer activity: Appropriation Process to Support Management of Difficult Calls in 911 Emergency Call Centres, Charles Gagné, Georges Toulouse, 2015-0048.

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Plamondon, A., Larivière, C., Arjmand, N., Gagnon, D., El Ouaaid, Z., Shahvarpour, A., Shirazi-Adl, A., *Estimation du chargement lombaire au moyen de modèles biomécaniques articulaires – Évaluation et application*, Études et recherches / R-866, Montréal, IRSST, 2015, 121 p.

Toulouse, G., St-Arnaud, L., Pelletier, M., *Troubles musculosquelettiques et santé psychologique – Démarche de soutien aux activités de prise et de répartition des appels d'urgence 9-1-1*, Études et recherches / **R-868**, Montréal, IRSST, 69 p.

St-Vincent, M., Montreuil, S., Toulouse, G., Trudeau, R., *Portrait des pratiques de prévention primaire et secondaire en bureautique au Québec chez les intervenants et dans les milieux de travail*, Études et recherches / **R-874**, Montréal, IRSST, 115 p.

Laberge, M., Tondoux, A., Calvet, B., Bayard, D., Breslin, C. *Risques à la SST – Les stratégies mises en œuvre par des adolescents apprentis en métier semi-spécialisé lors d'évènements imprévus*, Études et recherches / **R-878**, Montréal, IRSST, 83 p.

Toulouse, G., St-Arnaud, L., Pelletier, M., *Development of a Support Approach for 911 Call Centre Work with a View to Preventing Musculoskeletal Disorders and Psychological Health Problems*, Studies and Research Projects / **R-881**, Montréal, IRSST, 67 p.

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Gagné, C., Bergeron, J., Arbour, N., Ledoux, É., Laberge, L., (December 10, 2015). *Webinaire – Conciliation études-travail – Un nouvel outil Web à découvrir!* [Video file]. Retrieved from http://www.irsst.qc.ca/publications-et-outils/video/i/100277/n/conciliation-etudes-travail.

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Vinet, É., (May 12, 2015). *Les pratiques gagnantes en gestion et en SST – État de la question*. [Video file]. Retrieved from http://www.irsst.qc.ca/publications-et-outils/video/i/100266/n/etat-de-la-question-sur-les-modeles-de-gestion-en-sst.

PRODUCTION BY RESEARCH FIELD

# OCCUPATIONAL REHABILITATION

RESEARCH FIELD LEADER

CHRISTIAN LARIVIÈRE

PH.D. CLINICAL SCIENCES

**THE RESEARCH ORIENTATIONS FOR THIS FIELD ARE:**

1) Development of tools for assessing the health of workers who have sustained work-related injuries and are at risk of disability;
2) Study of the personal, clinical, organizational, and administrative determinants of a return to work;
3) Development and implementation of rehabilitation and return-to-work interventions;
4) Development and implementation of strategies designed for rehabilitation and return-to-work professionals.

## LIST OF PROJECTS FOR WHICH WORK BEGAN IN 2015

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# SPECIAL PROJECTS

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# MISSION

**To contribute**, through research, to the prevention of industrial accidents and occupational diseases and to the rehabilitation of affected workers;

**To disseminate** knowledge and serve as a scientific reference centre and expert;

**To provide** the laboratory services and expertise required to support the public occupational health and safety network.

### TO FULFILL THIS MISSION, THE IRSST:

- carries out and funds research in its priority research fields;
- supports the development of research and new knowledge in occupational health and safety, in collaboration with the scientific community;
- disseminates and promotes knowledge generated through research, in both the workplace and scientific communities;
- plays a leadership role in anticipating emerging needs, raising awareness, and creating synergy in the area of occupational health and safety;
- contributes to researcher training in occupational health and safety;
- provides laboratory services to the CSST and its network;
- contributes to the development of standards and regulations governing occupational health and safety;
- responds to ad hoc requests for specific expertise originating from various occupational health and safety stakeholders.

# VISION

Through its leadership in occupational health and safety research, the IRSST seeks to:

- consolidate its role as a reference centre vital to the operations and strategies of the CSST and its network;
- be used by its social partners in a spirit of joint collaboration;
- win recognition at the national and international levels;
- derive maximum benefit from a well-established network of research and development collaborators.

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