SAFETY MATTERS
Sharing our insights to promote safety.

This year’s summary of the Annual State of Public Safety Report has been completely redesigned to paint a clearer picture of the state of safety in TSSA’s regulated sectors and the strategies TSSA has undertaken to make them even safer.

Whether you are an operator wanting to improve workplace safety, a homeowner looking to prevent accidents, or a public safety advocate seeking to better understand TSSA’s safety strategies, we are committed to providing relevant and succinct information.

The report contains safety information about TSSA’s regulated sectors – Elevating and Amusement Devices and Ski Lifts; Fuels; Boilers and Pressure Vessels and Operating Engineers; and, Upholstered and Stuffed Articles – for the fiscal year May 1, 2014 to April 30, 2015. It includes trend analysis on occurrences and resulting injuries and insight into the full scope of TSSA’s oversight activities aimed at enforcing and promoting public safety – from the design of a device through to its installation, operation and decommissioning.

This report is one facet of TSSA’s annual public reporting and should be read in conjunction with our corporate and financial achievements in the Annual Report, our safety risk analysis in the complete Annual State of Public Safety Report, and our strategic priorities for the next fiscal year in our Business Plan. All reports are available at tssa.org.
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>President and CEO’s Message</td>
<td>2</td>
</tr>
<tr>
<td>The Public Safety Risk Management Team</td>
<td>4</td>
</tr>
<tr>
<td>The State of Safety</td>
<td>6</td>
</tr>
<tr>
<td>A Day in the Life of TSSA</td>
<td>8</td>
</tr>
<tr>
<td>Elevating Devices</td>
<td>10</td>
</tr>
<tr>
<td>Amusement Devices</td>
<td>20</td>
</tr>
<tr>
<td>Fuels Safety</td>
<td>26</td>
</tr>
<tr>
<td>Operating Engineers</td>
<td>36</td>
</tr>
<tr>
<td>Boilers and Pressure Vessels</td>
<td>40</td>
</tr>
<tr>
<td>Upholstered and Stuffed Articles</td>
<td>44</td>
</tr>
<tr>
<td>Moving Forward</td>
<td>48</td>
</tr>
</tbody>
</table>

---

**Technical Standards and Safety Authority**

The Technical Standards and Safety Authority (TSSA) is Ontario’s public safety regulator mandated by the Government of Ontario to enforce the *Technical Standards and Safety Act* and its associated regulations in four key areas: Elevating and Amusement Devices and Ski Lifts; Fuels; Boilers and Pressure Vessels and Operating Engineers; and, Upholstered and Stuffed Articles. Founded in 1997, TSSA works in partnership with our regulated industries, the government and the public to identify opportunities to prevent and mitigate safety risks. Our activities aim to both promote and enforce public safety and include licensing, certification and examinations, engineering reviews, inspections, audits, investigations, prosecutions, public policy analysis, research and public education.
“We hope that the insights presented in this report become the basis for future engagement and deeper partnerships in order to keep Ontario safe.”
Here in Ontario, we have the luxury of taking safety for granted. But at TSSA safety is front of mind, day in and day out.

When it comes to the sectors we regulate – Fuels; Boilers and Pressure Vessels and Operating Engineers; Elevating and Amusement Devices and Ski Lifts; and Upholstered and Stuffed Articles – Ontario is one of the safest jurisdictions in the world. This report outlines why.

Of course, safety risks can never be completely eliminated. This requires us to identify the most significant risks that exist in our regulated sectors and to develop strategies to mitigate them. As in previous years, our top safety priorities continue to be risks related to carbon monoxide, explosion or fire in private homes, commercial establishments and institutions and risk of injury on passenger elevators.

TSSA cannot solve these problems alone. We cannot enter every home to inspect furnaces and we cannot be there every time someone gets on an elevator. What we can do is work harder to form partnerships, identify potential technical and regulatory solutions, and educate the public.

Partnerships can only be as effective as the information that is shared. That is why our focus in this report is on presenting safety information about the sectors we regulate as clearly, simply and accurately as possible. We hope that the insights presented in this report become the basis for future engagement and deeper partnerships in order to keep Ontario safe.

This year, we undertook a complete redesign of the summary version of the Annual State of Public Safety Report to make it more accessible. We took to heart stakeholder comments on past versions and focused on simplifying the report by making it more visual and intuitive.

As pleased as I am with the redesign of the report, I am more pleased with the results of our safety performance over the past fiscal year. As the report outlines, we’ve seen a 5% decrease in the overall level of risk in the sectors regulated by TSSA over the previous year. We continue to maintain our enviable reputation as a safe jurisdiction with our exceptional safety record and the low number of occurrences relative to the scope and scale of the industries we regulate.

One of the key insights of this report is the positive impact that TSSA’s many proactive activities have on safety, from annual inspections and public education, to engaging in national and international committees developing safety codes and standards. The 8-year decreasing trend in the number of occurrences caused by operators’ non-compliance with the laws we enforce speaks to our effectiveness as a safety regulator.

I hope that you find that the results of the redesign of this report—both in content and look—are more useful to you, and I look forward to your comments so that we can continue to improve our communications and more importantly our accountability.

Michael Beard
President and Chief Executive Officer
Which is safer: A residential gas furnace or a steam boiler? A gas station or a waterslide? The answer is not always straightforward.

To answer this question, TSSA’s Public Safety Risk Management team (PSRM) has developed an innovative methodology called Risk Informed Decision Making (RIDM). RIDM allows TSSA to assess the state of safety in TSSA’s regulated sectors and develop prevention and education strategies where they are needed most.

The summary results of the PSRM team’s safety analysis are detailed in the following pages of this report. The report also outlines the key risk mitigation strategies TSSA’s safety programs are pursuing to maintain Ontario’s exceptional safety record.

By reporting publicly on the state of safety we hope to enhance transparency and deepen public understanding of safety as well as ensure greater accountability for our activities and actions.

More information about the RIDM methodology and a detailed safety analysis of TSSA’s regulated sectors is contained in the full technical Annual State of Public Safety Report available on TSSA’s website at tssa.org.

And, the answer to the question posed above is: Currently, steam boilers are safer than gas furnaces and gas stations are safer than waterslides.

TSSA’s Public Safety Risk Management team is (clockwise from left): Lency Abraham; Srikanth Mangalam; Jorge Larez; Robert Wiersma; Dwight Reid; Supraja Sridharan; and Christine Ho. Not pictured: Arun Veeramany, Kavitha Ravindran.
SAFETY AT A GLANCE

TSSA analyzes occurrences, injuries and fatalities to evaluate risk, identify trends and evaluate safety priorities. This year’s analysis shows the overall injury rate across TSSA’s regulated sectors is low, affirming a high level of safety. The level of risk is also low across all of TSSA’s program areas, except for Fuels, which continues to face a high level of risk related specifically to carbon monoxide poisoning.

Injury Rate

Risk Assessment

There are insufficient occurrences and injuries reported in the BPV, OE, and USA sectors to enable a risk assessment. Consult the full technical Annual State of Public Safety Report for additional information.

Reported Occurrences

Reported numbers include completed incident investigations only and are subject to change as investigations are concluded.
TOP SAFETY PRIORITIES

TSSA's risk assessment indicates that the overall state of safety across all sectors has improved over the previous year with a 5% decrease in risk. The analysis also shows that although the level of risk in the fuels sector has declined from the previous year, it remains high. As such, fuels-related issues comprise three of the top four safety priorities for the year.

1. Carbon Monoxide in Homes
Carbon monoxide (CO) poisoning continues to be the single largest source of risk across all TSSA-regulated sectors. The high level of CO risk in homes is particularly concerning. Because TSSA does not have jurisdiction in people's homes, TSSA has developed a comprehensive public education strategy to raise awareness of CO risks to educate homeowners about the steps they can take to protect themselves and their families. Additionally, TSSA is exploring potential regulatory and technical solutions, as well as public health partnerships, to enhance its public education strategy.

2. User Behaviour on Elevators
The number of occurrences related to user behaviour on passenger elevators has been steadily increasing at a rate of 21% each year over the past eight years. In particular, elevator doors closing on distracted riders has been identified as a growing concern and safety risk. In addition to launching public education and research initiatives to educate the public about safe riding practices, TSSA is currently assessing the effectiveness of improved door detection systems to better protect the public.

3. Fuels Safety at Commercial Establishments
Although fuels-related risks associated with commercial establishments have decreased slightly from the previous year, the risk of fire, explosion and CO poisoning in restaurants and bakeries remains a safety priority. TSSA is developing a number of strategies to improve compliance with maintenance and installation requirements of fuel-burning equipment to reduce this safety risk.

4. Institutions Housing Vulnerable Populations
The elderly, sick and very young all face additional challenges in evacuating a building during an emergency. As such, TSSA has identified institutions housing vulnerable populations such as schools, hospitals and nursing homes as a safety priority. TSSA has launched a pilot inspection program of retirement and long-term care homes to further assess safety risks and develop mitigation strategies.
SAFETY EVERY HOUR OF THE DAY

The work of TSSA’s inspectors, engineers and certificate holders touches the lives of Ontarians every hour of every day. Whether you are at work, play or at home, TSSA is there to ensure your safety and provide peace of mind.

TSSA PROFILE

42
Engineers

201
Inspectors

100,000 +
TSSA Certificate Holders

STARTING YOUR DAY
From the boiler that heats your morning shower to the gas stove that cooks your breakfast, our Fuels Safety program ensures that the fuel-fired appliances in your home are safe.

FACT Reducing risk related to carbon monoxide poisoning is TSSA’s top safety priority.

KEEPING FOOD FRESH
TSSA’s Operating Engineers program oversees the safety of 3,062 power plants in Ontario, from huge natural gas plants to the refrigerators at your local grocery store.

MANUFACTURING PRODUCTS
From lumber mills to auto manufacturers, TSSA inspectors ensure safety in the industries that are building Ontario’s economy.

WORKING FOR YOU 24/7
While many Ontarians are asleep, TSSA remains on call to respond to any incident or emergency in our regulated sectors.

FACT TSSA investigators are designated Provincial Offences Officers, giving them the authority to investigate scenes where safety violations are suspected.
DRESSING FOR WARMTH
TSSA’s Upholstered and Stuffed Articles program ensures that the stuffing in your winter clothing and sporting equipment is labelled accurately and contains the materials you paid for.
FACT TSSA inspected over 1,900 retailers and manufacturers of stuffed articles this year.

FUELING YOUR COMMUTE
TSSA oversees the safe transportation, handling, storage and use of fuels, including the gas station where you fuel your car for your morning commute to work.
FACT TSSA licenses and inspects over 3,700 gas stations in Ontario.

GETTING TO THE OFFICE
When you ride an elevator you can expect to arrive safely because TSSA is responsible for licensing and inspecting every one of the more than 56,000 elevating devices in Ontario.
FACT Unsafe riding practices are the leading cause of accidents on elevators.

HEATING YOUR SCHOOL
Our engineers and inspectors make sure the boilers that heat large buildings such as schools, condominiums and office towers are properly designed and installed.
FACT Ontario’s Boilers and Pressure Vessels sector is one of the safest in North America.

GETTING YOU HOME
Over two million Ontarians take public transit to work every day, and many rely on the escalators licensed and inspected by TSSA at transit stations.
FACT The majority of injuries on escalators are caused by users not following safe riding guidelines.

GRILLING YOUR DINNER
TSSA licenses and inspects the facilities where you fill up your propane tank, so you can keep the sizzle in your barbecue.
FACT There are over 1,000 propane dispensing facilities in Ontario.

HAVING FUN
From waterslides to roller coasters, TSSA’s Amusement Devices safety program makes sure your fun times are also safe times.
FACT TSSA reviews about 200 designs for new amusement devices each year.

GOING TO BED
At bedtime, you can sleep easy knowing that TSSA works with manufacturers in Canada and all over the world to make sure your mattress and pillow are clean and free of contaminants.
FACT Over 95% of manufacturers registered with TSSA are located overseas.
ELEVATING DEVICES

ELEVATING SAFETY
In recent years, the skyline of many urban centres in Ontario has been dotted with construction cranes and new high-rise buildings. This construction boom has led to a significant increase in the number of elevators and elevating devices in the province. Over the past five years, the number of elevating devices has increased by 10% to 56,341 as of May 1, 2015. There has also been an increase in the number of injuries on elevating devices each year, primarily injuries caused by unsafe passenger behaviour.

As both the number and height of buildings have grown, lengthy elevator and escalator journeys have become a central part of many Ontarians’ daily commute. Increasing numbers of passengers have developed unsafe riding habits such as charging closing elevator doors and running on escalators. With over 90% of the safety risk associated with elevating devices attributed to unsafe passenger behaviour, TSSA’s comprehensive risk prevention strategy includes developing codes and standards to mandate increased safety features, inspecting devices to remove safety hazards and promoting safe riding behaviour through public outreach and education.

A GROWING PROGRAM

56,341 Elevating Devices In Ontario

1,936 New Devices Authorized

22,661 Inspections
ELEVATING DEVICES

SAFETY FROM THE GROUND UP

TSSA oversights safety during the entire lifecycle of every elevating device from the initial blueprint to the final ride.

1. DESIGN
TSSA conducts engineering reviews of all new elevating devices to ensure the design is in compliance with existing safety standards. Last year, our engineers reviewed designs for 2,095 new elevating devices, including:
- 1,032 passenger elevators
- 129 escalators and moving walks
- 302 lifts for persons with disabilities
- 632 other elevating devices
That’s a 20% increase in the number of engineering design reviews compared to 2014.

2. INSTALLATION
Before TSSA licenses elevating devices for operation, our inspectors perform an installation inspection to verify that it conforms with its registered design submission and applicable safety standards. A license to operate is only granted for elevating devices that meet the highest level of safety. TSSA authorized 1,936 new devices in 2015, compared to 1,721 in the previous year, a 13% increase.

3. INSPECTIONS
Once a device is licensed for operation, it is inspected by a TSSA inspector periodically at a frequency dependent on the risk profile of the device. This can range from every six months for high-risk devices to every five years for low-risk devices. Based on past occurrence information and inspection performance, less than 1% of elevating devices in Ontario have been assessed as high risk. TSSA conducted 22,661 inspections this past year, a 12% increase from 2014.
TSSA’s Elevating Devices Safety Program regulates all 56,341 elevating devices in Ontario. In addition to elevators and escalators, TSSA regulates most devices that transport people and/or freight including moving walkways, shopping cart conveyors, freight and material lifts, lifts for persons with disabilities, construction hoists, gondolas, ski lifts, and even wind turbine elevators.

From the initial design of a new device until it is taken out of service, TSSA ensures that every elevating device conforms to safety regulations during the entire lifecycle of the device. TSSA reviews and registers new designs, issues licenses, conducts installation and periodic inspections and carries out incident investigations. TSSA is also responsible for administering the examination and certification of every elevating device mechanic in Ontario.

**4. INCIDENT INVESTIGATION**

Owners and operators of elevating devices are required to report to TSSA incidents resulting in death or injury to a person that requires medical attention. Our investigators are designated Provincial Offences Officers, trained to investigate the scene of an incident to determine the cause and report on possible breaches of provincial safety rules. TSSA has observed an 8-year increasing trend in reported minor injuries on elevators of 6% per year, primarily related to user behaviour. In serious cases of non-compliance, TSSA can prosecute offenders under the Technical Standards and Safety Act.

**6. PUBLIC EDUCATION**

Recognizing that safety is a shared responsibility, TSSA has developed user engagement and public education initiatives to educate elevating device users about safe riding practices to combat distraction and complacency. This past year, 255,000 elevator, escalator, and ski lift safety sheets were delivered to schools and daycare centres to educate children on safer riding practices. Our RideSmart program instructed 51,208 new skiers and snowboarders on safe ski lift riding, a 29% increase from the previous year.

**5. CERTIFICATIONS**

TSSA certifies all elevating device contractors and administers examinations and certifications for all elevating device mechanics in Ontario. This past year, there were 297 TSSA-certified contractors in Ontario, an 8% increase from 274 in 2014. These contractors currently employ 4,704 certified elevator mechanics.
Despite over 56,000 devices currently operating in the province, making hundreds of thousands of trips, carrying millions of Ontarians each and every day, accidents on elevating devices are infrequent. Ontario’s safety record for elevating devices exceeds comparable jurisdictions. Ontario’s injury rate associated with elevators, for example, is 10.2 injuries/million people per year compared to 13.39 for British Colombia and 34.4 in the United States. TSSA analyzes incident and associated injury reports to assess the current state of safety in the elevating devices sector and identify new and emerging safety risks. The following assessments are based on completed incident investigations only.

**ELEVATORS**

TSSA has observed an 8-year increasing trend of 15% per year in the number of occurrences on elevators. This increase can be partially attributed to improved reporting practices of occurrences that resulted in either minor or no injuries and an increase in occurrences related to user behaviour on elevators. There is an increasing trend of 6% per year in the number of minor injuries reported over the past eight years. The most common cause of injury stems from occurrences of elevator doors closing on passengers, an increasing trend of 9% per year. Other causes include occurrences where the elevator was not level with the floor, and uncontrolled movement of elevators. These incidents occur most often with older elevating devices, such as those with single-speed motor control, which TSSA has addressed by mandating upgrades to single-speed elevators to solve levelling issues.

**ESCALATORS AND MOVING WALKS**

Improvements to reporting have also contributed to an increase in the reported occurrence rate on escalators and moving walks of 4% per year over the past three years. Out of 2,168 escalators and moving walks in Ontario, there were 579 occurrences reported in 2015, with the majority occurring at mass transit locations. Trips and falls and entrapment of body parts and clothing in escalators are the leading causes of reported injuries. To address this specific risk, TSSA tests the functioning of mandatory safety features designed to prevent entrapments during routine inspections of escalators and moving walks.

---

1 From “Benchmarking Risk of Injury and Death from TSSA-Regulated Activities Against Other Jurisdictions” available at tssa.org
**RISK ASSESSMENT**

TSSA evaluates information about occurrences and associated injuries to assess the current state of safety in the elevating devices sector and proactively mitigate emerging safety risks.

**FATALITIES**
- Elevators: 0
- Escalators/Moving Walks: 0
- Ski Lifts: 0

Based on completed investigations only, no fatalities occurred in the elevating devices sector this past year. In the past eight years there have been five fatalities involving elevators and none involving escalators, moving walks or ski lifts.

**SERIOUS INJURIES**
- Elevators: 8
- Escalators/Moving Walks: 7
- Ski Lifts: 2

Serious injuries such as bone fractures and head injuries continue to be infrequent across all areas of the elevating devices sector this past year, consistent with previous years. Given that the majority of victims suffering serious injuries on elevators, escalators and moving walks are seniors, TSSA has developed outreach and education initiatives targeted to this key risk group.

**MINOR INJURIES**
- Elevators: 119
- Escalators/Moving Walks: 375
- Ski Lifts: 47

TSSA has observed an 8-year increasing trend in minor injuries on elevators of 6% per year, mainly due to unsafe rider behaviour. The majority of injuries sustained from elevators are cuts and bruises to arms and legs from closing elevator doors. The number of minor injuries on escalators and moving walks has increased 2% since 2013, with falls and hands or clothing getting caught in the device the most frequent causes of injury. For ski lifts, the number of injuries has decreased by 11% since 2012. The majority of injuries on ski lifts occur from falls during loading and unloading of the lift.

**OCCURRENCES**
- Elevators: 444
- Escalators/Moving Walks: 579
- Ski Lifts: 60

There is an increasing trend of 15% per year in the number of reported occurrences involving elevators over the past eight years, and the annual rate of occurrence for escalators and moving walks has increased by 4% since 2013. These increasing trends include an increase in the number of occurrences related to passenger behaviour such as charging into the closing door of an elevator or loose clothing becoming entangled in escalators. For ski lifts, the rate of occurrence has decreased by 9% since 2012, paralleled by an increase in our public outreach to instruct young skiers and snowboarders on safe riding practices.
ELEVATING DEVICES

ROOT CAUSE OF OCCURRENCES

TSSA categorizes the root cause of occurrences in order to conduct trend analysis and establish safety strategies.

- **1%** ROOT CAUSE NOT ESTABLISHED
  - In a small number of cases it is not possible to determine the root cause of an occurrence.

- **1.1%** OTHER CAUSES
  - Includes damage from flooding and other weather-related events.

- **6.8%** NON-COMPLIANCE
  - Causes in this category are attributed to owners and operators not adhering to legislation, codes or standards.

- **0.6%** HEALTH CONDITION OF USER
  - Occurrences where an individual has been impaired by a medical condition, or the use of drugs or alcohol.

- **0.3%** REGULATORY GAP
  - Occurrences caused by safety issues not currently addressed in legislation, codes or standards.

- **90.2%** USER BEHAVIOUR
  - This includes users failing to follow safe riding practices. Elevator doors closing on passengers and trips and falls entering or exiting elevating devices are the most prevalent causes of injury.

- **1%** ROOT CAUSE NOT ESTABLISHED
  - In a small number of cases it is not possible to determine the root cause of an occurrence.

- **0.6%** HEALTH CONDITION OF USER
  - Occurrences where an individual has been impaired by a medical condition, or the use of drugs or alcohol.

- **0.3%** REGULATORY GAP
  - Occurrences caused by safety issues not currently addressed in legislation, codes or standards.

- **90.2%** USER BEHAVIOUR
  - This includes users failing to follow safe riding practices. Elevator doors closing on passengers and trips and falls entering or exiting elevating devices are the most prevalent causes of injury.
SAFETY TRENDS

Elevators

15%

TSSA has observed an 8-year increasing trend of 15% per year in the number of occurrences on elevators, primarily caused by unsafe passenger behaviour.

Ski Lifts

9%

The occurrence rate for ski lifts has decreased by 9% since 2012. TSSA continues to increase public outreach initiatives focused on safe riding practices.

SKI LIFTS

Approximately 97% of occurrences on ski lifts over the past eight years were caused by rider behaviour, with occurrences on chairlifts accounting for 72% and bar lifts accounting for 21% of all ski lift occurrences. Given that the majority of incidents resulted in passengers sustaining injuries from falls during passenger loading and unloading, TSSA’s safety strategies are aimed at educating skiers and snowboarders on safe riding practices and working with ski resort operators to improve ski lift loading and unloading procedures.

SAFETY STRATEGIES

TSSA seeks to continuously improve safety through both promotion and enforcement activities. While conducting periodic inspections and issuing orders to remedy non-compliances remains one of our top proactive strategies for reducing safety risks, TSSA has developed a number of public education and outreach activities to address the risks caused by user behaviour on elevating devices.

COMPLIANCE FIRST

Out of 94,627 non-compliance orders issued since 2013, 15% of the orders were categorized as high risk, with the top three non-compliances found for elevators related to top guard rail requirements, annual examination requirements of driving-machine brakes and annual testing requirements of landing and car doors. Notably, only 19 devices in the province have been issued high-risk orders through two separate periodic inspections, an indication of the effectiveness of TSSA’s inspections to prevent future lapses in safety.

While there is a decreasing trend in compliance for escalators and moving walks of 3% per year over the past five years, it should be noted that only 14% of orders issued were considered high risk. The top three non-compliance orders issued related to repairing or replacing damaged skirt panels, machine space lighting requirements and material requirements for the exposed surface of skirt panels.

TSSA has observed an increasing trend in compliance on ski chairlifts of 6% per year. About 23% of orders issued for ski lifts were deemed high risk. The top three non-compliances related to operational requirements for ground fault protection, sheave assembly alignment and conveyor dimension requirements.

ELEVATOR SAFETY TIPS

1. Don’t charge or run through closing doors
2. Use button – not hands or legs – to stop a closing door
3. Watch your step

Distracted riding practices have contributed to an increase in occurrences and injuries. Remember these three tips the next time you step on an elevator to ensure a safe ride.
DIRECTOR’S SAFETY ORDERS

TSSA addresses risks not covered by current regulations, codes and standards in a number of ways including: issuing a director’s safety order, amending the code adoption document or, where necessary, recommending a regulatory amendment to the government.

In May 2014, TSSA issued Director’s Order 267/14 to address a significant risk to public safety related to levelling issues with older single-speed elevators. Since 2008, close to 55 occurrences related to cars being out of level and/or unintended movement of single and two-speed traction elevators have been reported to TSSA, resulting in 1 fatality and 38 injuries. A risk assessment conducted by TSSA estimated that the risks due to levelling hazards on single-speed elevators are nearly twice as high as modern elevators with variable speeds. The director’s order will ensure that all single-speed elevators are upgraded to eliminate this safety risk by 2022.

PUBLIC EDUCATION AND AWARENESS

Failure to follow user instructions is the leading cause of occurrences and injuries across all elevating devices. Leading causes of injury include doors closing on users attempting to enter closing elevators, trips and falls entering and exiting an elevator, escalator or ski lift, and riders distracted while using smartphones or other handheld electronics. To understand why people engage in these unsafe practices, TSSA conducted focus groups of a cross-section of users including owners and tenants in residential buildings, adults with children, and seniors. While overall, those interviewed had a good understanding of the proper way to ride an elevating device, inconvenience, distraction and complacency were cited as reasons why a user may not ride safely.

In 2014, TSSA launched elevatorsafetyontario.ca, a website and social media campaign to deliver key elevator safety messaging. We also continued our partnership with commercial property management firms to produce safety signage next to elevators and escalators in office towers, shopping malls and other commercial buildings.

By including TSSA safety tips in publications targeted to key risk groups of children and seniors, our safety messaging reached 1.2 million children reading Chirp and ChickaDEE magazines and 400,000 seniors reading Fifty-Five Plus both in print and online. We continue to collaborate with the Association of Day Care Providers to distribute over 255,000 elevator, escalator, and ski lift activity sheets. Our RideSmart program delivered in-person safety messaging to 51,208 young skiers and snowboarders at 13 ski resorts in 2015, and we partnered with the Canadian Ski Instructors’ Alliance to ensure instructors include ski lift safety messaging during lessons.

Recognizing that safety is a shared responsibility, TSSA has developed user engagement and public education initiatives to educate elevating device users about safe riding practices.

29%

Increase in the number of skiers and snowboarders who received in-person instruction on safe ski lift riding through our RideSmart program over the previous year.
DESIGNED FOR SAFETY
The Amusement Devices Safety Program regulates a wide variety of devices designed to entertain thrill-seekers including roller coasters, ferris wheels, carousels, waterslides, flume rides, dry slides, go-karts, bumper cars, inflatables, bungee devices and zip lines. Long before the first passenger goes for a ride, our engineers review the initial design of each device to make sure it conforms to safety laws and standards.

Job number one is to determine whether the design fits the definition of an amusement device in Ontario. In general, the definition requires amusement devices to be structures or machines designed to move people for the purpose of entertainment. For example, a large inflatable slide would count if it requires mechanical inflation and is used by the public. A zorb — an inflatable bubble that a person stands inside — does not meet the definition because it is propelled by the person wearing it.

Once our engineers approve the design, the ride can be built and tested — a favourite task for our engineers and inspectors. The program also conducts inspections, issues permits for the rides to operate and issues certificates to qualified mechanics. The regulatory framework for amusement devices ensures high levels of both thrills and safety.

Amusement device engineers Matthew Chan and Entela Lagji consult on a design submission.
Improvements to incident reporting protocols have contributed to the increase in reported occurrences since 2012, allowing TSSA to better assess safety risks in the sector.

Ontario has not had a fatality in the Amusement Devices sector since 1998 and incidents involving the malfunction of a ride are rare. Nonetheless, improved reporting by major amusement park operators has contributed to an increasing trend in reported occurrences over the past eight years. While the majority of reported injuries are minor in nature, TSSA analyzes every accident report to improve incident prevention strategies.

Amusement device operators in Ontario are required to report information about all safety occurrences to TSSA.
The vast majority of occurrences (94%) on amusement devices are related to rider behaviour, and the vast majority of injuries sustained (95%) are minor in nature. Physical impact with rides and falls during loading and unloading are the leading causes of incidents.

A small percentage of occurrences (4%) are due to non-compliant devices or operators. The number of occurrences and injuries caused by operator error and equipment-related issues is following a decreasing trend of 9% per year over the past eight years.

**FREQUENTLY REPORTED INJURIES**

**HEAD INJURIES**
- Bumping against slides, ride restraints and passenger carrying units
- Trips and falls during ride loading and unloading operations

**HAND INJURIES**
- Grabbing zip line or ride pulleys
- Bumping against cables and restraints

**LEG INJURIES**
- Colliding with landings, trees and passenger carrying units
- Trips and falls while entering/exiting rides
In recent years, TSSA has worked to remind amusement device operators of the legal requirement to report incidents. As a result, TSSA has received an increased number of reports of occurrences resulting in minor injuries, and near-miss incidents where nobody was injured. Based on enhanced reporting, there are increasing trends in the number of occurrences and minor injuries of 8% per year over the past eight years.

The vast majority of those occurrences (94%) were due to rider behaviour, as opposed to equipment malfunction or inadequate maintenance. Just over 40% of all rider behaviour incidents resulted in injuries caused by riders hitting or bumping against waterslides, roller coasters, circular rides, and trees or landings while on zip lines. A further 20% of incidents resulted in injuries caused by riders falling during loading or unloading of amusement devices. The vast majority of injuries reported were minor, including bumps and bruises to head, hands and legs.

TSSA has launched a number of initiatives to educate the public about safety at amusement parks. In addition to including safety information in our seasonal newsletters and on the safetyinfo.ca website, our waterslide safety activity page was printed in magazines that reach 1.2 million children.

Waterslides make up only 10% of the number of amusement devices but account for 32% of all occurrences, the vast majority of which are related to rider behaviour. To address waterslide safety, TSSA conducts an annual public education campaign at waterparks across the province targeting children aged 10-14, the age group that faces the highest risk of injury. Last summer, TSSA reached over 100,000 children at seven waterparks. Over 20% discontinued unsafe behaviours that lead to injuries once they were educated about safer riding practices. We also expanded our Safety Ambassador Program, training over 550 staff members at four waterparks on TSSA’s approach to delivering positive safety messaging to visitors.

In addition to public education, TSSA conducted 1,847 periodic inspections of amusement devices in FY 2015 to ensure compliance with safety laws. Because ride operators perform an important role in rider safety, part of TSSA’s inspection assesses the operation of the ride and verifies that proper operating procedures are being followed. The effectiveness of this approach is evident in the decreasing trend in the number of occurrences due to non-compliance of 9% per year over the past eight years.

When incidents due to non-compliance occur, TSSA investigates and, in serious cases, takes legal action. In 2011 and 2012, non-compliance with safety laws resulted in serious injuries to patrons of Calypso Waterpark in Ottawa. As a result of a lengthy investigation and prosecution by TSSA, the park was found guilty in April 2014 of failing to operate rides in a safe manner and improper training of ride operators.

A complete analysis of incidents and causes of risk is included in the full Annual State of Public Safety report available at tssa.org.
KEEPING SAFE WHILE HAVING FUN

Knowing the leading causes of accidents and how you can prevent them will help ensure that your next ride on an amusement device is a safe one.

49%
AMUSEMENT RIDES
Roller coasters, circular rides, and other types of rides at theme parks and fairs currently account for 49% of all occurrences, with an increasing trend of 16% each year observed over the past eight years. This is driven specifically by unsafe rider behaviour on roller coasters and circular rides. Practice safe riding by following age, height and weight restrictions before deciding to ride and by keeping arms and legs inside the ride at all times.

32%
WATERSLIDES
Although waterslides make up 10% of the total number of amusement devices, they account for 32% of all occurrences. Our research has identified children aged 10-14 as the most at risk of injury due to unsafe riding practices such as going headfirst down the slide or not clearing the splashdown area.

11%
ZIP LINES
Zip lines account for approximately 11% of all occurrences on amusement devices, primarily abrasions to hands from grabbing ropes and head and leg injuries from colliding with trees and landings. To prevent injuries, wear provided safety gear and follow the operator’s instructions on safe riding positions.

6%
GO-KARTS
Go-karts account for nearly 6% of amusement device occurrences. It is important to always wear the approved helmet provided and use your seatbelt at all times. Following the track’s instructions for safely entering, exiting and driving around the track will keep you in the driver’s seat and out of harm’s way.
FUELED BY SAFETY

From the natural gas furnace in your home to the tank of diesel in the bus you take on your morning commute, most people in the province rely on safe access to fuels to power them through their day. TSSA’s Fuels Safety Program ensures the fuels we rely on for everyday living, including natural gas, propane, butane, hydrogen, digester gas, landfill gas, fuel oil, gasoline and diesel, are safe. TSSA achieves this by regulating safety throughout the fuels lifecycle and making sure safety rules are being followed every step of the way from storage to transportation to dispensing to utilization. TSSA licenses fuel facilities and registers contractors and fuels industry professionals who install and service equipment. Additionally, TSSA reviews and approves facility plans for licensed sites and performs custom equipment approvals and inspection services to ensure fuel is handled and used in a safe manner.

Although TSSA has observed a decrease in risk in the fuels sector of 5% over the previous year, the overall level of risk continues to exceed acceptable standards — driven by safety risks associated with carbon monoxide (CO) poisoning, a by-product of fuels combustion. Ensuring the safety of fuels, in particular mitigating CO risks, remains TSSA’s top safety priority.

COMPREHENSIVE OVERSIGHT

57,700
Certified Fuels Professionals

9,752
Licensed Facilities

11,095
Inspections
FUELS SAFETY RISK ASSESSMENT

TSSA’s analysis of fuels-related occurrences determines the level of risk by location. The risk of carbon monoxide (CO) from fuel-fired appliances in private homes remains the top safety priority. TSSA continues to implement its comprehensive public education strategy to increase public awareness of the dangers of CO and will develop a more comprehensive strategy that includes potential regulatory and technical solutions, as well as exploring public health partnerships. TSSA’s risk assessment has also identified fuels-related risks in institutions housing vulnerable populations such as schools, hospitals and daycares is reaching unacceptable levels. Children, hospital patients and the elderly are particularly vulnerable to injury or fatality in the event of a fuels-related emergency, in large part because they face challenges in the event an evacuation is necessary. To account for this heightened risk, TSSA has launched a pilot inspection program focusing on retirement and long-term care homes to further assess safety risks and develop mitigation strategies.

RISK BY LOCATION

HIGH RISK

Private Homes

MEDIUM RISK

Institutions with Vulnerable Populations

Commercial Establishments

LOW RISK

Multi-unit residences
Construction sites
Manufacturing facilities
Retail fuels sites
FUELS RISK AT HOME

Understanding the leading causes of injuries and fatalities from fuel-burning appliances in your home can help protect you and your loved ones.

- CO release in private dwellings is the leading safety risk across all of TSSA’s regulated technologies. Over 66% of all occurrences of CO release investigated by TSSA occurred in private homes, resulting in 18 fatalities in the past eight years.

- Incidents of fires and explosions caused by fuel-burning appliances in homes account for 56% and 48% of all fire and explosion related occurrences investigated by TSSA.

- The primary cause of occurrence involving fuel-burning appliances in homes is related to non-compliance with maintenance requirements for these devices, particularly with furnaces, boilers and water heaters.

- Protect yourself and your family. Have a TSSA-certified fuel technician inspect and maintain your fuel-burning appliances every year. Install a smoke detector and CO alarm on every level of your home and replace the batteries at least once a year.

Percentage of Fuels Occurrences by Causation in Private Homes

- 66% Carbon monoxide releases
- 56% Fires
- 48% Explosions

Annual State of Public Safety Report  FY 2015
Technical Standards and Safety Authority

TSSA analyzes occurrence and associated injury reports to assess the current state of safety in the fuels sector and identify new and emerging safety risks. The following assessment is based on completed investigations only. Last year there were 475 fuel related occurrences reported to the TSSA, which resulted in 0 fatalities, 11 serious injuries and 15 minor injuries corresponding to a 13%, 1%, and 8% decrease in their respective categories over the previous year. Additionally, there has been a decreasing trend in the number of occurrences of 6% over the past eight years. The complete Annual State of Public Safety Report contains a year-over-year comparison of occurrences and injuries.

Over 72% of risks related to fuels were due to non-compliance with safety rules. While the majority of occurrences happened in private dwellings and commercial establishments and were caused by improper maintenance or usage of fuel-burning appliances, TSSA’s risk mitigation strategies cover all stages of the fuels lifecycle.

TRANSMISSION AND TRANSPORTATION
TSSA plays an integral role in the safety of fuel transmission and transportation by certifying professionals transporting fuel by tanker truck, gas pipeline inspectors, and all other fuels industry professionals in the province, totalling 57,700 certificate holders as of the end of FY 2015.

Our Fuels Safety program engineers also ensure the safety of oil transmission pipelines and natural gas transmission and distribution pipelines in Ontario by reviewing the designs of proposed pipelines and verifying that they conform to mandated safety, operation, maintenance, and risk management standards.

In the event of an incident where a pipeline is damaged, TSSA attends the scene to assist emergency services in managing health, safety, and environmental risks and conducts an investigation to determine the cause of the damage. There were approximately 1,500 occurrences in FY 2015 of excavators striking and damaging gas pipeline in Ontario, mainly because they did not follow safe excavation practices. To reduce risks of pipeline strikes, TSSA continues to work in partnership with safety regulators and industry to inform contractors, excavators and homeowners on safe digging practices. Visit on1call.com for more information on how to dig safe.

STORAGE AND DISPENSING
TSSA licenses and inspects all facilities where fuels are stored and dispensed. There are currently 9,752 licensed fuels facilities in Ontario, including 1,132 propane facilities, 3,885 cylinder exchanges and 3,707 gas stations. Before licensing a facility, TSSA conducts a thorough evaluation of potential health, safety and environmental hazards. Our engineers completed over 400 design reviews of fuels sites and equipment in FY 2015.

Utilization
Once fuel is ready to be used, contractors certified by TSSA are responsible for installing the necessary fuel-burning equipment – including furnaces, fireplaces and stoves – in private homes and commercial establishments. In addition to administering examinations and issuing certifications, our Fuels Safety Program conducts periodic audits of all 9,305 contractors to make sure fuel-burning appliances are being installed and maintained to the highest safety standards.
In the event of an incident where a pipeline is damaged, TSSA attends the scene to assist emergency services in managing health, safety, and environmental risks and conducts an investigation to determine the cause of the damage.

Risk-informed inspections of propane distribution facilities lead to better use of regulatory resources by targeting inspections at facilities that present the greatest risk, which maximizes both safety and efficiency.

Improper installation, maintenance or use of fuel-burning appliances can lead to carbon monoxide (CO) poisoning, fire, or explosion. Unlike licensed fuel storage and dispensing sites that are required to undergo periodic inspections, TSSA is limited in its ability to inspect private homes and establishments where the majority of safety risks occur. Our primary safety strategies for the utilization phase of the fuels lifecycle therefore focus on forming partnerships with safety advocates and educating the public on the steps they can take to protect themselves and their loved ones from the risks associated with fuels.

**INSTITUTIONS WITH VULNERABLE POPULATIONS**

TSSA uses a lower risk threshold when assessing safety risks at institutions housing vulnerable populations because children, hospital patients and the elderly face additional challenges when evacuating a building in the event of an emergency. While risks in this category have been reduced by 13% over the previous year, the risks associated with fuel-burning equipment in use at institutions housing vulnerable populations are significant enough to warrant the creation of a pilot project to better understand and manage the risk. Phase I of the Special Buildings Pilot Inspection Project was launched in June 2014 and focused on retirement and long-term care homes. Phase
II of the project, which will begin in the fall of 2015, will assess the effectiveness of a communications strategy as well as the roles and responsibilities of fuels contractors in ensuring safety in retirement and long-term care homes.

FUELS SAFETY AT COMMERCIAL ESTABLISHMENTS

Safety risks associated with fuel-burning equipment at commercial establishments such as restaurants have decreased by 3% from the previous year. Nonetheless, the risk of fire, CO poisoning or explosion at these locations remains a safety priority with 34% of occurrences involving damage to unprotected gas risers and regulators, gas supply and related piping and the remaining 66% of occurrences involving fuel-burning appliances. The three top issues identified are risk of grease fire from restaurant stoves and fryers, explosions resulting from delayed ignition in ovens, and vapour release from stove burners left on overnight.

TSSA continues to collaborate with industry stakeholders to communicate the need for maintenance of commercial appliances and training and education of kitchen staff to address improper use of commercial cooking equipment to mitigate these risks.

CARBON MONOXIDE IN PRIVATE HOMES

The risk of CO in private homes is over three times the acceptable level, making it TSSA’s top safety priority. CO risks at multi-unit residences are approaching unacceptable levels as well. Sources of CO release in homes are primarily furnaces, gas supply and piping, water heaters and boilers. Occurrences involving natural gas-fired natural draft boilers in particular demonstrate an increasing trend of 11% per year over the past eight years due to poor installation and inadequate maintenance. TSSA will explore strategies to address this risk, including enhanced communications to homeowners and exploring opportunities to strengthen regulatory requirements for mandatory maintenance and inspection programs.

TSSA has established a comprehensive strategy to increase public awareness of risks related to CO. Consistent with its proactive preventative strategy philosophy, TSSA’s approach focuses on changing the public’s behaviour in the way they use and maintain fuel-burning appliances in their home. As part of this strategy, TSSA publishes seasonal safety handbooks delivered to over 1.3 million households across Ontario. TSSA continued a collaboration with the Ontario Fire Marshal to train over 120 fire prevention and public education officers and create a series of CO public education materials for use by fire services across Ontario. We also partnered with utility companies to include CO safety messaging in communications with their customers. Finally, TSSA was honoured that Paul Rampersaud and John Gignac volunteered to share their personal stories of the devastating impact of CO poisoning in videos produced for CO awareness month. Hear their stories and learn how you can protect yourself and your family by visiting cosafety.ca.

Non-compliance with mandated installation, maintenance or use of fuel-burning appliances is the leading source of risk in the fuels sector.

---

**Sources of Risk**

- **72%** Non-Compliance
- **14%** User Behaviour
- **13%** Cause Not Determined
- **1%** Regulatory Gap
Fuel equipment used in food trucks, hot dog carts and other mobile food service equipment must be approved by TSSA and inspected annually by a licensed gas technician.

156

Approvals issued by TSSA for mobile food service equipment in FY 2015, compared to 87 in the previous year.
ENFORCING THE LAW

Each year, TSSA successfully prosecutes offenders who put the public at risk by contravening safety laws. Highlights from this year include:

- **50**
  Number of TSSA prosecuted cases of violations of fuels safety laws in FY 2015

- **$10,000**
  The amount a food truck manufacturer was fined after being found guilty of selling unapproved equipment and disturbing the scene of an incident.

- **$10,000**
  The amount an unlicensed gas technician was fined after being found guilty of improperly installing a natural gas furnace in a home and causing a serious carbon monoxide hazard.

- **$15,000**
  The amount an excavator found guilty of unsafe digging practices was fined. The contractor damaged a natural gas pipeline by digging without first obtaining the required locates to determine the location of the pipeline.

“Potentially lethal carbon monoxide risks can be created if a fuel-fired appliance is not properly installed or serviced. Anyone installing, repairing or servicing fuel-fired appliances must possess a valid TSSA certification.”

John Marshall,
Director – Fuels Safety
TSSA's Operating Engineers Safety Program oversees the registration, inspection and safety of power plants in Ontario. There are currently 3,062 registered power plants in Ontario, a slight increase from 3,021 registered plants in FY 2014. These plants range from steam turbine power plants that generate electricity to refrigeration units at the local ice skating rink and grocery store to heating and cooling systems in hospitals, schools and shopping malls.

Operating engineers—also known as power engineers in jurisdictions outside Ontario—are the certified professionals who manage power plant operations. Managing, operating and maintaining the boilers, steam turbines and engines that generate power requires a combination of technical expertise and problem-solving ability to act quickly to resolve any issue before an incident occurs. Operating engineers and operators therefore undergo extensive training and examination before obtaining their certification from TSSA, which currently number 12,665 operating engineers, refrigeration, steam-traction and compressor operators.

TSSA’s comprehensive registration, inspection and certification activities ensure that that these engineers and operators have the skills and knowledge to run the plants that power Ontario and maintain Ontario’s exceptional safety record in this sector.

**SAFETY IN NUMBERS**

- **3,062** Registered Plants
- **2,965** Inspections
- **12,665** Engineers and Operators
Refrigeration plants use gas, liquid and mechanical energy to keep things cool. This includes ice rinks, food processing plants, grocery stores, and large building cooling systems. Most of the 1,151 registered refrigeration plants in Ontario are ammonia-based systems, which require careful monitoring and maintenance by certified refrigeration operators or operating engineers.

A boiler is a device used to create steam or hot water for a variety of uses including heating, manufacturing, or power generation. There are currently 1,063 registered steam or water plants — the majority are classified as heating plants for schools, universities and hospitals — keeping Ontario warm through the cold winter months.

SAFETY PERFORMANCE
The safety record for registered plants in Ontario is exceptional. There have been six occurrences and one serious injury reported in the past eight years. In FY 2015 there was one reported occurrence, where an operator error resulted in an ammonia leak. TSSA’s investigation of this occurrence uncovered a design flaw where a plug connection was confused as a valve. To prevent this type of mistake from happening in the future, our inspectors will issue orders to correct the piping whenever they encounter this design flaw.

INSPECTION ACTIVITIES
Key to maintaining safety at registered plants is the proactive inspection of all 3,062 registered operating plants in Ontario. In addition to initial authorization inspections and consultations, TSSA conducts periodic inspections to ensure plants, engineers and operators are working in compliance with safety laws, codes and standards. Using a risk-based inspection scheduling process to determine the frequency of inspections, the entire inventory of Ontario’s power plants is inspected at least once every two years.

In FY 2015, TSSA conducted 2,965 initial, consultation and periodic inspections. Non-compliances found during periodic inspection are addressed by issuing inspection orders to the owner/operator to fix the issue within an appropriate timeframe. Of the orders issued over the past five years, 93% have been classified as low to medium risk.

TRAINING AND CERTIFICATION
Requirements for the number of staff and level of certification required to operate and manage a registered plant are determined by legislation. Depending on the type of facility and power output, plants can be run by a refrigeration, steam traction or compressor operator or an operating engineer.
As of FY 2015 the number of certified professionals are:

- 182 Steam Traction Operators
- 515 Compressor Operators
- 2,461 Refrigeration Operators
- 9,507 Operating Engineers

There are four classes of operating engineer, with a 1st class certification the highest level in the province. 1st and 2nd class operating engineers are required to manage the operation of the boiler and power plants with the largest power output, including the power plants that generate electricity throughout the province.

**GROWING THE PROFESSION**

The operating engineer profession, as with other engineering sectors and skilled trades, currently faces a labour shortage. TSSA’s Operating Engineers Risk Reduction Group, made up of technical and safety experts, conducted a study of the current shortage of operating engineers and the future challenges related to shortages of qualified personnel to manage plants in the province. Their assessment found that the need for 1st and 2nd class operating engineers is expected to be greater than the available workforce in the near future. The analysis indicates that the average age of 1st and 2nd class operating engineers is 58, and the majority will retire within the next seven years. Given that the average age of 3rd class engineers is 52, the study concluded that it will be necessary to grow the profession in order to maintain Ontario’s critical infrastructure in the years to come.

TSSA has identified the need to promote the profession as a safety priority in the operating engineering sector. Working with the Institute of Power Engineers, industry, training providers, associations and the government, TSSA continues to develop initiatives to encourage young people to choose the operating engineering profession.
TSSA is responsible for overseeing the safe design, construction, maintenance, use, operation, repair and service of all devices covered by the Boilers and Pressure Vessels regulation in Ontario. This includes equipment that produces and distributes hot water, steam, compressed air, and other compressed liquids and gases used everywhere from heating apartment buildings and schools to manufacturing consumer products.

Ontario boasts an excellent safety record in the sector and incidents involving boilers, pressure vessels and associated piping are rare. In the past eight years, there have been 12 reported occurrences in Ontario that resulted in two major injuries and one minor injury. This past year, the BPV sector maintained its exceptional safety record with one occurrence reported in which no injuries were sustained. Even though reported incidents are rare, TSSA has recognized the potential for serious injury or death from improperly maintained boilers and pressure vessels. Cracked and corroded vessels or piping can leak or rupture, producing a variety of safety problems, including poisonings, suffocations, fires or explosions. TSSA’s enforcement activities therefore aim to ensure the safety of boilers and pressure vessels throughout their lifecycle, from approving the initial design to de-authorizing a decommissioned device.

<table>
<thead>
<tr>
<th>ACHIEVEMENTS IN FY 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5,278</strong> Designs Approved</td>
</tr>
<tr>
<td><strong>1,395</strong> Installations Approved</td>
</tr>
<tr>
<td><strong>15,495</strong> Total Inspections Conducted</td>
</tr>
</tbody>
</table>
“From approving the initial design to de-authorizing an old device, TSSA’s proactive enforcement activities ensure the safety of boilers and pressure vessels throughout their lifecycle.”

Inspections form the basis of TSSA’s proactive strategy to maintain safety in the sector. In addition to inspecting manufacturing facilities, piping and welding installations, repairs, and alterations, TSSA conducts periodic inspections on uninsured boilers and pressure vessels in Ontario. In FY 2015, TSSA conducted 1,896 periodic inspections and issued 75 orders of non-compliance, compared to 1,794 inspections and 111 orders issued in the previous year.

The compliance rate for periodic inspections of boilers and pressure vessels conducted by TSSA over the past five years is 96%, exceeding the compliance rate of 90% reported by the National Board of Boilers and Pressure Vessels Inspectors, the body that sets inspection standards for jurisdictions across North America. The vast majority of boilers and pressure vessels in the province are insured and therefore periodically inspected by insurance companies licensed to underwrite...
boiler and machinery insurance or by authorized inspection service providers. Inspectors employed by insurance companies and inspection providers are certified by TSSA and play a key role in making sure insured boilers and pressure vessels are operating according to the law.

Collaborating with power agencies to protect the safety of Ontarians is also a key component of TSSA’s oversight activities in the nuclear sector. Nuclear power provides more than fifty percent of Ontario’s energy needs. While most power generating plants in Ontario are regulated by TSSA, nuclear power plants are regulated federally by the Canadian Nuclear Safety Commission (CNSC). Nonetheless, TSSA’s safety program plays an integral role in maintaining safety at every nuclear generating facility in Ontario. TSSA is contracted by Ontario Power Generation and Bruce Power to ensure the safety of all pressurized vessels, piping systems and containment vessels over a certain pressure gauge (15 psig) on behalf of CNSC at Pickering A & B, Darlington, and Bruce A & B generating stations.

TSSA also administers the quality assurance program to accredit all manufacturers of boiler and pressure vessel components used in nuclear power plants in the province, and registers the design of new installations, modifications and repairs. Eight TSSA inspectors work fulltime at nuclear facilities to inspect and approve the work plan and installation process for the approved designs. The inspectors then test all new devices and repairs to the highest safety standard before TSSA can approve the device to be put into service. Our inspectors also conduct periodic inspections of the 5,000-7,000 vessels and piping systems on a three-year cycle – over 2,000 inspections each year – maintaining Ontario’s stellar nuclear safety record.

Our role as a recognized safety authority in the boilers and pressure vessels sector extends beyond the borders of Ontario, with TSSA engineers holding leadership positions on committees that set national codes and safety standards. These committees are currently developing assessment and oversight requirements for aging devices to ensure that they are maintained to the same safety standard as new devices – a project that TSSA looks forward to working on with our safety partners at the provincial and national level into the next fiscal year.

Periodic inspections of boilers and pressure vessels ensure that safety risks are managed before an accident can occur.

96%

Compliance rate for periodic inspections of boilers and pressure vessels conducted by TSSA over the past five years.
When regulations governing the manufacture and sale of upholstered and stuffed articles were implemented in the 1930’s, their intent was to prohibit manufacturers in Ontario from using soiled or contaminated filling materials in their products. At the time, the majority of products were manufactured in Ontario and local factories were inspected to ensure safety standards were met. The manufacturing landscape in Ontario is very different today, with most upholstered and stuffed articles manufactured overseas. TSSA has had to adapt our oversight activities to meet the challenges posed by foreign manufacturing to maintain the high levels of safety and consumer protection the program was founded on.

TSSA’s Upholstered and Stuffed Articles Safety Program works collaboratively with manufacturers, importers, distributors, large multinational retailers and local retailers to ensure compliance with the law throughout the supply chain. Because manufacturers—both domestic and foreign—producing upholstered and stuffed articles for the Ontario market are required to be registered with TSSA, our inspectors are able to identify and trace the source of contaminated products to ensure Ontario consumers are getting the safe and clean products they paid for.

A worker in an overseas mattress factory operates an industrial sewing machine.

AN INTERNATIONAL FOCUS

11,859
Registered Manufacturers

96%
Of Registered Manufacturers Located Outside Canada

1,937
Inspections Conducted
UPHOLSTERED AND STUFFED ARTICLES

WHAT’S HIDING IN YOUR MATTRESS?

TSSA registers manufacturers and conducts inspections of retailers, warehouses and manufacturers to help protect Ontarians from common safety concerns associated with upholstered and stuffed articles.

INFESTATION

Manufacturers and retailers are responsible for making sure upholstered and stuffed articles are free from infestation of rodents, bugs, or other vermin. Bedbugs, which can contaminate a large number of items in a short period, are a particular concern to TSSA because they are difficult to get rid of and their bites can cause itchy red welts on the skin. Used mattresses and furniture are a common source of infestation from bedbugs. As a result, it is prohibited in Ontario to recover or reupholster used items and sell them as new. Retailers must also properly label items that are being resold as second-hand.

MOULD

Improper protection from moisture during shipping and storage can result in contamination from mould. Potential health impacts from mould vary from a sore throat or headache to chest tightness and breathing difficulties. TSSA inspects the storage of filling materials at domestic manufacturing facilities and warehouses to ensure they are kept clean, dry and free from moulds and mildew. When an item contaminated with mould is reported or discovered during an inspection, TSSA can order that all items from the same shipment or storage facility be removed from sale and destroyed.

ALLERGIES

Many people have allergies to common filling materials including wool, feathers, latex or other synthetics. Even nut shells – which can cause life-threatening reactions – have been used as a filling material. Allergic reactions can range from minor skin irritations to life-threatening breathing difficulties and anaphylaxis. Labelling requirements in Ontario therefore stipulate that all filling materials must be disclosed, using the generic name. This ensures that consumers can make informed choices about the products they purchase to keep themselves and their families safe.

UNCLEAN FILLING

In Ontario, all materials used as filling must be new and clean. Causes of unclean filling include infestation and improper storage as well as inadequate cleaning and sterilization of down and feathers used in pillows, bedding and clothing. This can lead to the growth and spread of harmful bacteria that can result in illness and infections. Inspectors investigate reports of unclean filling by opening up the items, inspecting the filling, and ordering all unclean articles to be destroyed. TSSA can also prosecute individuals who intentionally manufacture or sell articles containing unclean materials.
The role of the Upholstered and Stuffed Articles Safety Program is to protect the public from potential hazards associated with the use of unclean or unsafe filling materials in upholstered and stuffed articles in Ontario including: toys, sporting goods, pet items, furniture, mattresses, clothing, bedding items, handbags, luggage and seasonal ornaments.

All filling materials in these items must be new and free from contaminants. Items are also required to be labelled with the contents of the product and the manufacturer’s valid TSSA-issued registration number. In addition to promoting health and safety, these requirements have the benefit of protecting consumers against fraud and misrepresentation of filling materials.

TSSA’s team of upholstered and stuffed articles inspectors have conducted over 6,000 inspections over the past five years, including 1,937 inspections in 2015, with the majority completed at retail locations. During an inspection, items are checked to make sure they are labelled properly, clean, free of vermin or contamination, and that manufacturers are registered with TSSA. 21,973 orders of non-compliance were issued in 2015. The majority of orders issued were for lack of provincial label or valid registration number, mainly due to manufacturers not familiar with TSSA’s licensing requirements introducing new products to the marketplace. Listed below are the top safety concerns TSSA has identified for upholstered and stuffed articles.

**SECOND-HAND GOODS**
TSSA defines a second-hand article as an upholstered and stuffed article purchased and then returned to the seller. Retailers, liquidators, auction houses and other distributors are prohibited from then reselling the article to the public as new. Health and safety concerns with second-hand goods include infestation and soiling. These items must be affixed with a prescribed second-hand label in a conspicuous location prior to being resold, so that consumers can make an informed purchasing decision. TSSA continues to educate retailers and resellers of this requirement.

**PROPER LABELLING**
A standard label must be securely affixed to every upholstered and stuffed article before it can be sold in Ontario. This label confirms that the article can be legally sold and identifies all filling materials by generic name. It also states that the item contains new material only and identifies the manufacturer's registration number. Proper labelling enables TSSA to trace back any unsafe article to the facility where it was made. Where necessary, TSSA can order that all other articles from that facility be removed from sale and we can prohibit retailers from selling additional products from that facility in the future.

**OVERSEAS MANUFACTURING**
Currently, only 4% of manufacturers are located in Canada, while 86% are located in Asia, 6% in the US and Mexico, and the remaining 4% located in Europe. Given the limitations of inspecting manufacturing facilities around the world, TSSA conducts the majority of inspections at retail locations to ensure that all items sold to Ontarians contain clean and safe filling materials. TSSA’s team of upholstered and stuffed articles inspectors have conducted over 6,000 inspections over the past five years, including 1,937 inspections in 2015, with the majority completed at retail locations. During an inspection, items are checked to make sure they are labelled properly, clean, free of vermin or contamination, and that manufacturers are registered with TSSA. 21,973 orders of non-compliance were issued in 2015. The majority of orders issued were for lack of provincial label or valid registration number, mainly due to manufacturers not familiar with TSSA’s licensing requirements introducing new products to the marketplace. Listed below are the top safety concerns TSSA has identified for upholstered and stuffed articles.

**SEASONAL ITEMS**
Many stuffed articles are only sold during certain times of the year – such as holiday decorations or winter clothing. TSSA therefore conducts targeted inspections year-round to ensure that a representative sample of all upholstered and stuffed articles sold in the province are safe. In spring/summer, our inspectors target sporting goods, patio furniture and back to school backpacks and lunch boxes. Our inspections in the fall and winter focus on holiday decorations, Halloween costumes, sporting goods and winter clothing.
SAFETY STRATEGIES

TSSA leverages the knowledge attained through our safety risk analysis to develop strategies for the next fiscal year. Here are some highlights from each program area:

ELEVATING DEVICES

The Elevating Devices Safety Program will work with TSSA’s Public Education and Research Department to conduct additional research to develop public awareness initiatives that encourage safe elevator, escalator and ski lift riding to reach target audiences. The program will also continue to participate in an expert task group set up to enhance elevator door detection standards across North America to prevent passengers from being hit by closing doors. Increasing compliance continues to be a priority and will be addressed through periodic reporting to major contractors on their safety inspection performance.

AMUSEMENT DEVICES

Working with TSSA’s Public Education and Research department, the Amusement Devices Safety Program will explore additional engagement opportunities specifically related to 10-14 year old waterpark users, as they remain the group most vulnerable to injury. This includes expanding our in-person education program to day camps throughout the province. The program will also continue to work with major operators of theme parks and fairs to improve incident reporting and to obtain ridership data in order to enhance safety risk analysis.

FUELS

The Fuels Safety Program will expand its carbon monoxide (CO) safety strategy—currently focused on public education—by exploring technical and regulatory enhancements in coordination with stakeholders from international jurisdictions and the health sector. The program will also be launching the second phase of its Special Buildings Pilot Inspection Program to assist in developing CO risk mitigation strategies for both institutions and commercial establishments. With the expanded use of liquefied natural gas (LNG) for small plants, refuelling and vehicles, TSSA and the provincial government are engaged in a regulatory review to assess the need for a specific regulation for LNG.
A comprehensive review of the laws governing upholstered and stuffed articles was initiated in FY 2015 and will continue next year. The review aims to develop a modern, risk-informed approach to inspections and safety oversight that considers current manufacturing and retail and wholesale distribution practices.

TSSA and the government of Ontario will initiate a comprehensive review of the laws governing the operating engineering sector in order to modernize the regulatory framework. This will include engagement with stakeholders from industry, training providers and safety regulators in other jurisdictions to address labour shortages, industry practices and impacts of technological advancements on the operation of registered plants.

TSSA will work with insurance companies and third-party inspection providers to improve inspection support. This includes the development of standardized inspection orders and engaging with the government to enhance regulations governing the periodic inspection cycle.