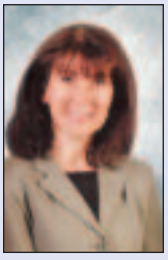
Vol. 3 • Issue 2 • December 2004

TSSA UPDATE

Fuels Safety Edition

ANNOUNCEMENTS



Appointment of TSSA President and CEO

TSSA's Board of Directors is pleased to announce the appointment of **Kathy Milsom**, P. Eng., as the new President and CEO of the Technical Standards and Safety Authority. Kathy joined TSSA in December 2004. Before joining TSSA, she was President and CEO of Canada Lands Company Limited.

Kathy brings executive management expertise from both public and private sectors to her new role at TSSA. Her government experience spans the City of Toronto as Director of Facility Planning, Design and Construction and Acting Commissioner of City Property, the Province of Ontario, as Project Manager of Government Services, and as President of the federal Canada Lands Company. Her experience in commercial enterprises includes regulated industry and service companies. She was President of Vestar Facility Management, a start-up business and subsidiary of the utility company Cinergy Corporation, and previously was the Director of Vertical Markets for North America with Johnson Controls World Services, Inc. and Regional Director, Healthcare Support Services leading the Toronto Hospital project in a multi-million service delivery organization.

Kathy has also served as a Board Member for the Riverdale Hospital (now Bridgepoint Health), the Rehab Choice, and chaired an Advisory Committee for Ryerson University. In November 2004, Kathy was honoured by the Ontario Professional Engineers as their Engineering Medal Recipient for Management.

The TSSA Board conducted a national competitive search for the President and CEO position, with more than 250 candidates in the field. The Board would like to express its great appreciation for the continuing contributions and leadership of Ted Dance, who graciously agreed to serve as Acting President and Interim CEO during the search process.

Appointment Notice

TSSA is pleased to announce that **Roland Hadaller** is the newly appointed Director of Fuels-Related Regulations. Regulations falling under his responsibility include Compressed Natural Gas (Ontario Regulation 214/01), Fuel Oil (Ontario Regulation 213/01), Gaseous Fuels (Ontario Regulation 212/01), Liquid Fuels (Ontario Regulation 217/01), Oil and Gas Pipeline Systems (Ontario Regulation 210/01), Fuel Industry Certificates (Ontario Regulation 215/01) and Certification of Petroleum Equipment Mechanics (Ontario Regulation 216/01).

Roland Hadaller, P. Eng., has been with the TSSA's Elevating and Amusement Devices Program since 2000 as the Engineering Manager. In June of 2002, the Fuels Engineering Program was added to his responsibilities.

Prior to joining TSSA, Roland spent 26 years in the elevator industry. His responsibilities included design, manufacturing, management and code development.

Recent Director's Order and Advisory on B-Vents

By Sandra Cooke, P. Eng.,
Technical Leader
Fuel Safety Program

All gaseous (natural gas and propane) contractors and certificate holders were mailed a copy of TSSA's recent Director's Order and Advisory regarding B-Vents (not certified for exterior applications) which have been installed outdoors. This article is a reminder – if you need the specific documentation, please visit our web site at www.tssa.org

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Stay Informed!

Get up-to-date safety information e-mailed to you with **TSSA's eMail Update service**. Visit **www.tssa.org** to sign up! Click on **subscribe** in the top banner.

Recent Director's...Continued from cover

for detailed information.

TSSA is concerned that certain natural gas and propane burning appliances are vented with B-Vents (not certified for exterior applications) which have been installed outdoors. This application may pose a carbon monoxide (CO) safety hazard in the home due to extreme cold temperature/atmospheric conditions; as well, these vents may be subject to accelerated deterioration.

This application may pose a carbon monoxide (CO) safety hazard in the home.

Options for Owners

Analysis of data regarding these outdoor B-Vent installations revealed that the likelihood of a safety hazard occurring is low. However, there is always the possibility of an incident occurring. With this information, TSSA has worked with industry to develop options for the owner/users who have a non-compliant B-Vent installed on the exterior of their premise.

These options are:

1) Replace the non-compliant B-Vent with a current code compliant venting system or,
2) Leave the non-compliant B-Vent in place with the following provisions:

- It is in safe operating condition as determined by a qualified certificate holder (gas technician)
- It continues to be in safe operating condition as determined through annual inspections by a qualified certificate holder (gas technician) which are arranged by the premise owner/user
- When a gas appliance is replaced, removed, or a new appliance installed, the non-compliant B-Vent shall be replaced with a current code compliant venting system.

Enclosed in the information package sent to you, you can find the following information to assist you in dealing with B-Vents (not certified for exterior applications) which have been installed outdoors:

- Director's Order
- Owner/User Notification
- Fuel distributor Notification
- Appliance Tag Requirements
- Step-by-step procedure for dealing with this issue

Within industry, there has been a misunderstanding that these existing non-compliant B-Vents can simply be enclosed or "boxed in" as a corrective measure. B-Vents certified for exterior applications must be initially installed according to the manufacturer's certified instructions so that the certification is valid. Simply enclosing the B-Vent installed outdoors, after it has been in service, will not make the system code compliant and may make future inspections difficult.

When you discover a B-Vent (not certified for exterior applications) which has been installed outdoors, the only options available are as outlined above.

TSSA and the associated industries thank you in advance for your co-operation in this regard. If you require further clarification or have questions, please contact your fuel distributor, or contact TSSA by telephone at **1-877-682-8772**, or email: **contactus@tssa.org** ■

Liquid Fuels Handling Code Under Review

The Fuels Safety program is currently reviewing the Liquid Fuels Handling Code. If you have any suggestions for change, please direct your comments to **Ann-Marie Barker** at fax **(416) 231-7525** or by email to **abarker@tssa.org**

Comments must be received by January 31, 2005.

We've Moved to Serve You Better!

Please take note of our new contact information:

Technical Standards & Safety Authority

3300 Bloor Street West, 14th Floor,
Centre Tower
Toronto, Ontario M8X 2X4
Main Phone: 416-734-3300
■ Toll-Free (Outside Toronto): 1-877-682-8772
Fax: 416-231-1626
■ Email: contactus@tssa.org

Putting Public Safety First

Use of Programmable Logic Controllers for Flame Safeguard Control

By Solomon Ko, P.Eng., Engineer, Fuels Safety Program

More gas-fired appliances use microprocessors (which are sometimes called programmable controller or programmable logic controllers [PLC]) for control. However, there are restrictions to such a use in CSA-B149.3-00, the Code for field approval of custom-made appliances.

Section A.8.7.1 of B149.3 specifies that "Programmable controllers may be used for the monitoring, sequencing and control of all aspects of the burner or process, or both, subject to Clause A.8.7.2". Section A.8.7.2.(b) specifies "Any certified combustion safety control(s) and all combustion safety interlocks shall be wired to directly de-energize the safety shut-off valve(s), and their operation shall result in a safe system shutdown."

It is also noted that Section A.8.7.4 allows the use of programmable controller-based systems approved for flame safeguard application to be directly applied and utilized for combustion safety despite Clause A.8.7.2.

This basically means that PLC not designed and approved for flame safeguard application may only be used for monitoring purposes.

Coming in 2005

To cope with the advancement of technology and in recognizing the reliability and the versatility of PLC, B149.3 Sub-Committee has developed a set of requirements for the use of PLC that are not approved for combustion safety.

It is planned that these new requirements will be part of the new edition of B149.3 to be published in 2005. New requirements include both the hardware and software that cover:

- control architecture
- memory mode
- watchdog timers
- monitoring
- emergency stops
- qualification of system designers
- documentation
- training and testing.

Presently, TSSA is accepting the use of PLC as a variance if it meets the requirements as approved by the B149.3 Sub-Committee.

When these requirements are formally approved and published in the new B149.3 in 2005, TSSA will consider the adoption of these requirements, with or without revisions. New field approval of appliances with PLC will be assessed based on the new adopted requirements.

Please call **Solomon Ko** at **(416) 734-3356** or email **sko @tssa.org** if you have any questions or comments on PLC requirements. ■

Identifying Risk

By Michelle Williamson, Risk Management Advisor, Risk Management Program

In the April 2004 issue of TSSA Update we introduced the risk management process as a means by which an organization could realize its strategic objectives. In this issue, we will explore Step One in the risk management process.

Before an organization can manage its risks, it must first identify them. Identify, in this context, means to understand what could happen.

Generally, it is not the risks that the company has identified that will threaten its survival; rather, it is those risk exposures that management did not anticipate. Minimizing the unknown is the first step in the risk management process:

There are a number of activities that an organization can undertake to identify risk. These activities include,

- Completion of surveys/ questionnaires
- Review historical information
- Review financial records and underlying accounting data
- Review other company documents (e.g. charters, patents, by-laws, Standard Operating Procedures, policies)
- Conduct personal/site inspections
- Seek input from persons, both internal and external to the organization, with knowledge/expertise

Every employee within an organization has information as it relates to a company's systems and operations. A piece of the risk puzzle, if you will. Identification of risk comes about when employees pool their information and begin to understand the linkages and gaps.

TSSA identifies risk within the industries it regulates by researching the outcomes of all its operational activities. These activities include engineering design submission reviews, installation, initial inspections, periodic and audit inspections as well as incident investigations. Built into our processes is a mechanism to facilitate the exchange of information which allows us to identify factors that may be predictive of risk.

As with any discipline, risk identification requires imagination and insight; but by implementing a structured process, companies can better understand and manage their risk.

In our next issue of TSSA Update we will discuss Step Two in the risk management process. ■

What's New in Field Approvals?

By Zenon Fraczkowski, Special Labels Engineer, Fuels Safety Program

Over the next little while you will see many significant changes in our Field Approval Program. One of the most visible will be adoption of the new CSA B149.3-05 Code in the spring of next year.

You can look forward to:

1) a Code organised more in line with the other B149 series codes and
2) a Code with many technical changes that will benefit everyone.

We will provide an overview of these changes once the Codes are published in early 2005.

The next meeting will be in Spring 2005. If you wish to offer any suggestions for improvements to the code, or propose discussion topics, please send an email to zfraczkowski@tssa.org.

To date we have modified the Field Approval Application Form to better define the required and optional documentation, service offerings and payment options.

Approval criteria used by Programmable Logic Controllers (PLCs) or microprocessor-based systems used for flame safeguard functions, continues to be reviewed and updated. In our opinion, it is not a question of if, but rather of when, these systems will migrate from the more elaborate and expensive systems we see today to the smaller and more common applications.

The use of flame rods on appliances that operate for longer than 24 hours without shutting down has been a concern for some time now. Clause A.8.4.4 of CSA B149.3-00 Code states:

"Flame detectors that can fail in a flame proving mode shall be of the self checking type when the burner firing cycle may last longer than 24 hours without cycling."

Our interpretation of this clause was that it applied to all flame detectors and detection systems including those using flame rods. In researching the issue we found that extended use of flame rods is also of concern to other authorities and standards writing organisations like the National Fire Protection Association (NFPA). Moreover it turns out that some manufacturers already have or are working on self-checking flame rod based detection systems.

The next meeting will be in Spring 2005. If you wish to offer any suggestions for improvement, or propose discussion topics, please send an email to (zfraczkowski@tssa.org).

Of note though is that they are working on systems i.e. flame rods, amplifiers and associated circuitry rather than just flame rod elements itself. The distinction being that flame rods are considered to be immune to failure in flame proving mode but the associated amplifiers and control circuitry is not. As a result of this distinction and a recommendation from the industry, it was agreed to limit application of clause A.8.4.4 to UV scanners only and to continue to monitor this issue.

Over the last few months we started to pay particular attention to appliances that may contain flammable atmospheres as a result of process conditions as opposed to some malfunction of a fuel control system. While CSA B149.3-00 code does coverat-mosphere generators quite extensively we found that other appliances such as paint curing ovens, printing presses, burn off ovens, oxidizers etc. are not covered adequately. For guidance we turned to NFPA 86-2003 that defines a class A oven as:

"An oven or furnace that has heat utilization equipment operating at approximately atmospheric pressure wherein there is a potential explosion or fire hazard that could be occasioned by the presence of flammable volatiles or combustible materials processed or heated in the furnace."

In evaluating this explosion potential one needs to consider what kind and the quantity of combustible/flammable vapors given off during a process and ask to what extent these vapors are diluted before being removed from an appliance. NFPA 86 describes in detail how to calculate the required safety ventilation rate, based on the quantity and type of volatile materials being used. Since the safe operation of an oven or a furnace depends on ventilation rate along with quantity and type of solvent/ flammable compound being processed, it follows that this information needs to be understood by appliance operators and maintenance personnel.

Class A ovens require: type of solvent, quantity of solvent and ventilation rates to be included on all rating plates.

To this end, in addition to the more common information such as fuel(s), pressures, firing rates etc., class A ovens require: type of solvent, quantity of solvent and ventilation rates to be included on their rating plates.

Purging remains to be a contentious topic. The issue relates not so much to how to calculate the time interval but rather what volume to purge. Our approach to date has been to purge all flue passages including vent stacks. Whether or not a stack is included does not cause any concerns in the majority of installations.

However, consider a large boiler connected to a 100 ft high brick stack 8 ft in diameter. Purging this boiler may take seconds but when stack is included, the purge may take half hour or so. In instances like these we agreed that purging of stacks would not contribute to the ultimate safety of the system. As such for boilers with vents that do not include any ignition sources such as heat reclaimers, precipitators or other emission control devices, purge time may be based on flue passages up to the boiler flue collar.

We will continue to review and, where safe, amend these purge requirements. For now though please include the venting system for all other appliances in your calculations unless you secure a variance from TSSA to do otherwise.

In the next issue I'll discuss our progress on moving towards objective or performance based code and regulations rather than the prescriptive requirements we have in place now. As with PLCs and microprocessor based control systems the question is when, rather than if, we will see them in place. In the meantime, enjoy the winter season, keep warm and keep safe! ■

The Importance of Audit Inspection and Compliance: The Peterborough Flood

By Stu Seaton, Team Leader, Inspection, Fuels Safety Program

All licensed facilities are subject to an audit inspection timed on a risk based model. Most facilities can expect to see a TSSA inspector at their site, once every three years. We come. We look. We check records. We make sure the big things are compliant with the Act, Regulation and Code and that the little things check out too. Sometimes it's the little things that make a huge difference between a dangerous incident or another safe and profitable business day.

Let me put this into perspective. Peterborough, just north-east of Toronto is, by all standards, a very quaint and picturesque city. This past July will go down in history as a special time because Peterborough got really rained on. Now this wasn't your average "water the lawn rain", this was a genuine "grab a life jacket" deluge. The city's Fire Chief put it best when he said: "It was worth your life to step out onto the street." He wasn't fooling; water was coursing down thoroughfares, in some places over a metre deep. The heart of the city was flooded and it all happened in less than six hours.

In the affected area is a high volume gas station that was severely impacted by the floodwaters. Just prior to the flood's arrival the station had undergone complete site renovations, new underground works, new pumps, islands, kiosk etc. When I arrived on site Mr. Ted Butson of Telar Maintenance and the station operator were in the process of getting the soggy site back up and running. I was amazed at the damage to the general area, mud was thick, in everything and everywhere, passages between buildings were so eroded that footings were visible. Debris of every description was strewn about.

While talking to the station's staff the operator directed me across the street from the station to where once stood a botanical garden and parkette, he pointed out a 900 litre oil tank propped up in the entrance trellis of the gardens, he said: "I was standing knee deep in water by the kiosk when I saw this oil tank come bobbing down the road, so I sloshed my way over to it and corralled it in this trellis, the valve was open too so I shut it off…" Good work I thought, I came to find out that it was just one of many tanks displaced by floodwaters.

We walked back over to the station where I was shown the high water mark on the kiosk and pumps. The main concern I had was how much fuel was displaced by water entering the underground storage tanks? Mr. Butson took me over to the fill location, popped off one of the fill caps and said: "Not a drop. Look, new gaskets, they didn't let any water enter." Water paste indicated no tank bottom water. The majority of the facility damage was confined to electronic pump and kiosk components.

I wonder if the story would have been the same if those inexpensive fill cap gaskets had been worn out?

So when a TSSA Inspector shows up to do your facility audit, be patient and let the Inspector check the little things because sometimes those little things can equal something much bigger. Better still, go out and check around your facility yourself, make sure all the little things are right, a few minutes each day can make the difference between mounting a successful defence against a natural disaster or being a victim of one. Remember, Mother Nature keeps no predictable schedule. ■

Fuel Oil frequent questions:

Q. Is the newly published 2004 Edition of CSA-B139 applicable in Ontario?

A. No. In Ontario, the previously published CSA-B139-00 is still applicable as it is the edition that is referenced in the Code Adoption Document. There are a number of changes between the new edition and current edition. These changes include clarifications of venting requirements with diagrams, guidelines for filling fuel tanks, and new requirements for tank installations. TSSA will be initiating a review of the 2004 edition with stakeholders for adoption in Ontario.

Q. Can a base-tee for a liner be installed outside a chimney?

A. The installation of a chimney liner must comply with the manufacturer's certified installation instructions. Many manufacturers prohibit the installation of chimney liner base-tees outside the chimney as the liners were not certified for such installation.

Q. What is an incident and when do I need to contact TSSA to report one?

A. See the Incident reporting criteria on our website.

Q. I am an OBT 1, can I remove an underground oil tank?

A. No. Current regulations stipulate this task be performed by a PM2.

Q. Where can I find info in the regulation regarding Red Tag procedures Immediate and non Immediate?

A. O. Reg. 212/01 s. 13 & s.14 ***or*** O.Reg. 213/01 s. 23 & s. 24.

Find out how safe your industry is...

TSSA's 2003 State of Public Safety Report is available for downloading on our website: **www.tssa.org**. This report gives you a comprehensive picture of safety for the fuels industry, including statistical information and analysis. **VISIT TODAY!**

NEWS FROM THE INSPECTION FIELD

Boiler Explosion

By Raphael Sumabat, P. Eng., Fuels Safety Program

Earlier this year, an explosion occurred that seriously injured a gas technician and also caused considerable property damage.

Backgroud

A Gas Technician 1 certificate holder was installing a certified gas burner to a commercial boiler. The burner was initially fired, however, combustion results indicated that some settings needed to be adjusted. The installation was such that wiring to the burner's terminals was disconnected in order to perform the necessary burner adjustments.

After reconnecting the wiring to the burners, the power to the boiler was turned on. The burner had completed a pre-purge cycle when the explosion occurred. The venting was blown apart. The gas burner separated from the boiler and landed approximately 6 feet from the front of the boiler. The Gas Technician was seriously injured.

Our investigation

TSSA's investigation noted that in the burner's terminal block, the live terminal, L, is immediately adjacent to the valve terminal, V11. The V11 terminal is energized after the pilot is proven while the L terminal receives power once power is supplied to the burner. It was also noted that the burner installation instructions did not recommend connections to the L terminal. The terminal's position should be fully closed.

An inspection of the burner revealed that the L terminal was slightly opened suggesting that prior to the explosion, a wire was connected to the L terminal. Testing showed that if the wires for the gas valves were connected to the L terminal, the gas valves would open as soon as the power was activated.

Findings

It was concluded that the explosion was likely caused by the gas technician accidentally wiring the gas valves into the L terminal. This resulted in the gas valves opening once power was activated allowing natural gas to accumulate in the combustion chamber. When the pre-purge period was completed, the accumulated natural gas was ignited resulting in the explosion.

Lessons Learned

No one's perfect. We all make mistakes. In order to avoid wiring errors, double-check all wiring after installation (particularly when gas valves are involved), and make use of manual valves and test firing valves.

TSSA is pursuing changes to the burner's design by asking the manufacturer to separate the gas valve terminal from the L terminal. This will ensure future accidents are not repeated. ■

PUBLIC EDUCATION & OUTREACH

New Web Site Delivers on Public Safety Education

Human error continues to be one of the most significant reasons for fuels-related incidents reported to TSSA. As a result, public education and outreach continue to be our main focus and one of the most effective ways we can increase public safety.

In 2004, TSSA created **www.safetyinfo.ca**, a one stop safety portal designed to raise awareness of a broad variety of public safety issues among both adults and children. The web site provides important safety information on everything from carbon monoxide (CO) prevention to bike helmet safety.

Links to our safety partner web sites are also available so that consumers can access other useful safety tips.

A Successful team approach

CSA's new web site has significantly expanded the reach of TSSA's public safety messaging in Ontario and across Canada. A special thanks to our strategic safety partners: the Office of the Fire Marshal, CSA International, Enbridge Consumers Gas, Direct Energy Essential Home Services, Garrison (Canadian Tire), Energizer Canada, Kidde, State Farm Insurance, and Union Gas – for their support in making this important public education tool a reality.

New this Fall/Winter

Check out the site for our new ***"Autumn Watch"*** safety program that focuses on carbon monoxide and fire prevention in the home. In support of this program, we have created an animated feature "Be in The Know About CO".

Visitors to www.safetyinfo.ca are offered a unique, visual, step-by-step approach to carbon monoxide hazards at home or at play.

When you visit

We invite you to sign up as a subscriber for the latest information to keep you and your family safe throughout the year. ■

What do YOU want to read about?

We want to provide you with information that you find useful. Please take a few moments to fill out this short questionnaire letting us know your thoughts about our **UPDATE** newsletters.

You can fax back your responses to **416-231-5366**.

1) How satisfied are you with the overall quality of information in TSSA's UPDATE Newsletter?

	Very dissatisfied				*Very satisfied*
	1	2	3	4	5

2) Please rate what you like about our newsletter using the following scale:

	Very dissatisfied				*Very satisfied*
Stories	1	2	3	4	5
Length of articles	1	2	3	4	5
Topics	1	2	3	4	5
Writing style	1	2	3	4	5
Layout	1	2	3	4	5
Photography	1	2	3	4	5

3) How useful do you find the following topics?

	Not at all useful				*Very useful*
Industry Trends	1	2	3	4	5
Safety Compliance	1	2	3	4	5
Customer Service	1	2	3	4	5
Regulations & Codes	1	2	3	4	5
TSSA Company News	1	2	3	4	5
Public Safety Tips/Advice	1	2	3	4	5
Safety Statistics & Analysis	1	2	3	4	5
Certification & Training	1	2	3	4	5
Guest Writers/Experts	1	2	3	4	5
Inspections	1	2	3	4	5
Case Studies	1	2	3	4	5

Topics you would like TSSA to cover: _____

_____

_____

_____

_____

4) To which extent do you agree with the following statements?

	Strongly Disagree				*Strongly Agree*
I enjoy reading the newsletter	1	2	3	4	5
I look forward to receiving **UPDATE**	1	2	3	4	5
Articles are relevant to me	1	2	3	4	5
UPDATE is my main source for safety information	1	2	3	4	5

5) How would you prefer to receive the newsletter?

❑ Via E-mail ❑ Via Mail ❑ I'll visit the web site

6) In what format would you prefer reading UPDATE?

❑ Computer screen ❑ Download and print

❑ Printed copy received by mail

7) How often would you prefer to receive newsletters?

❑ Once per month ❑ Weekly ❑ Twice a year

❑ 3 times a year ❑ 4 times a year

❑ Only when there is an important issue to communicate

8) Would you like to make any additional comments or suggestions about the UPDATE Newsletter?

_____

_____

About You

Program Group:

❑ Boilers and Pressure Vessels ❑ Fuels

❑ Upholstered and Stuffed Articles ❑ Operating Engineers

❑ Amusement Devices ❑ Elevating Devices ❑ Ski Lift

Please indicate your profession:

_____

Thank you for your participation.

Putting Public Safety First

TSSA Contacts

Main Switchboard

Telephone: **(416) 734-3300**
Fax: **(416)-231-1626**
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For inquiries about how to apply for a licence, registration, or certificate, or their status
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We welcome your comments and story ideas for future editions of this newsletter. Please contact:

TSSA UPDATE (Fuels Safety Edition)
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A new address to serve you better: **Fuels_Technical_Services@tssa.org**
Fax: (416) 231-1626

BCS-6181