



FIRE WATCH

ONTARIO INDUSTRIAL FIRE PROTECTION ASSOCIATION

Spring 2008 Issue

Changes to NFPA 68 **“Standard on Explosion Protection by Deflagration Venting”** **(2007 Edition)**

Those facilities handling flammable liquids or gases, or combustible dusts may already be familiar with the requirements of NFPA 68, which address the provision of explosion venting and damage-limiting construction typically provided in rooms where explosive mixtures in air are likely to be formed.

As with all fire protection Standards, NFPA 68 is reviewed and updated under a regular cycle to ensure that the latest available industry research, information and technology is reflected in its contents. The most current revision to the NFPA 68 Standard is the 2007 edition of the document. This document revision includes the following changes:

- The document has changed from a Guide to a Standard,
- Changes have been made to the venting parameter, C , which is now calculated from the fundamental burning velocity of a flammable vapour or gas,
- Revisions to calculations for the venting of dust deflagrations in buildings, which can result in a 70% increase in the vent area for buildings/rooms containing explosive dust/air mixtures^[1], and
- The addition of a new Chapter specifically addressing inspection and maintenance, including checklists to record these activities.

It is important to note that the 2007 Ontario Fire Code currently references the 1994 edition of NFPA 68 and therefore compliance with the requirements in the 1994 edition of the Standard is the minimum legal requirement in situations where explosion venting is required by the 2007 Ontario Fire Code (O.Reg. 213/07). References to NFPA 68 in the 2007 OFC are found:

- For flammable liquids in 4.1.5.9.(4), 4.2.9.6, 4.3.13.3, 4.8.3.1 and 4.8.4.2.(1),
- For flammable compressed gases in 5.6.2.4.(1),
- For combustible dusts in 5.10.1.5.(2) and 5.10.1.7.(2), and
- For industrial ovens using flammable liquids in 5.18.3.3.(2) and (3).

However, since the issue of the 1994 edition of NFPA 68, three subsequent editions of the document have been published, in 1998, 2002 and most recently in 2007. Over the course of these revision cycles, the trend within the document has been towards an increase to the amount of explosion vent



FIRE WATCH

ONTARIO INDUSTRIAL FIRE PROTECTION ASSOCIATION

area required in order to satisfactorily prevent structural damage by venting an explosion to the exterior of the building. Such additions and improvements to the Standard have included increased to vent area requirements where vent ducts are used (in the 1998 edition), and a revision to the treatment of hybrid mixtures in the 2002 edition.

The most dramatic of these changes appears to come in the 2007 edition of the Standard. These changes are based on six sets of experimental data^[1], which indicate that the previous empirical equations used to calculate the required explosion vent area underpredict the required area in certain cases (low K_{St} dust in low P_{red} enclosures). In an attempt to remedy this discrepancy, the committee has increased the required vent area for dust deflagrations in buildings by 70% (NFPA 68, Equation 8.2.6.8). For flammable vapours and gases, the change to NFPA 68 requiring calculation of the venting parameter directly from the fundamental burning velocity of the material also appears to increase the required vent area for deflagration venting in a number of cases.

It is important that attention be paid to the new requirements in the most recent edition of the NFPA 68 Standard. Whether building a new facility or a room to contain a process involving hazardous materials or evaluating the level of safety in an existing room, due diligence as professionals suggests that consideration be given to the direction that industrial fire protection is headed and what it means for our particular industry. Whether we strive to meet the more stringent vent area requirements for new rooms, adding additional vent area to supplement existing explosion protection in rooms designed to older standards, or investigate compliance options to be used in lieu of explosion venting will depend on the operation in question.

^[1] Zalosh, R., *Explosion Venting Data and Modelling Research Project*, The Fire Protection Research Foundation, Quincy, Massachusetts, February, 2008.

- Mark Harrop, P.Eng., CFPS, Project Engineer, Randal Brown & Associates Ltd.



FIRE WATCH

ONTARIO INDUSTRIAL FIRE PROTECTION ASSOCIATION

Crack down on fire 'victims,' marshal says...

THORNHILL -- Courts and society must get tough with adults who risk or cause fires through negligence -- especially deaths because they refused to install detectors or teach children to escape -- Ontario's fire marshal says.

At the last of six forums promoting more sprinklers in high-rises and new homes, Pat Burke said, "We've seen a real decline in fire deaths."

But he said many people still do not recognize the benefits and some stubbornly refuse.

'GET AGGRESSIVE'

"We have to get aggressive with these people," Burke told about 30 Toronto fire officials and a few members of the public.

"Instead of being sorry for parents who kill their children, we've got to put them in jail," he said. "There are people who just won't listen any other way."

In the wake of fatal fires, including the deaths last month of three children and two adults in a Hamilton home without smoke alarms, Burke said, "there is a strange lack of outrage by the public."

Since Jan. 1, 39 people have died in Ontario fires and the annual average is 100, with 95% in homes, he said.

Despite studies of North American fires and increased public education about precautions, Burke said myths and ignorance continue about home smoke detectors, which are required by law.

"It's up to the fire services and the public" to seek tough sentences and promote safety devices plus pre-fire planning, he said.

Careless smoking, abandoned cooking and candles, and careless use of matches were the leading causes of home fires from 1995 to 2006, assistant fire marshal Doug Crawford said.

Most people -- especially kids and the elderly -- die unless they are out 90 seconds after an alarm, but none were working or present in 48% of the cases, he said. "You don't have time to make up your mind about how to get out.

"Unless you have an escape plan, you'll find your kids under beds, hiding, their lives snuffed out because they didn't know what to do or where to go".



Fire Investigation Services

Executive Summary

Investigation No.:

146-015-



2007

Investigation No.: 145-015-2007
 Occurrence Date: 26-Jul-2007
 Alarm Time: 01:41:00
 Street #: 36
 Street: Head Street
 Apt. #:
 City: Dundas
 Municipality: Hamilton
 Province: ON

John Benedetti
FI Coordinator

Date

08/01/07 Jan 7/08

Bernie Silvestri, P. Eng. Date
Assistant Deputy Fire Marshal



Fire investigation Services

Executive Summary

Investigation No.: 145-015-2007

Preliminary Cimitmoance

At 1:41 am on July 26th, 2007 the Hamilton Fire Services responded to a fire at Biedermann Packaging Incorporated located at 36 Head Street, Dundas (City of Hamilton). This factory, which contained numerous chemicals, was primarily involved in the manufacturing and packaging of pesticides/insecticides for rodents. The ensuing fire resulted in roof collapse at the south section and burning of hazardous materials.

A significant amount of contaminated water run-off from firefighting activities entered storm drains. The storm drains emptied into nearby Spencer Creek resulting in the death of a large number of fish and other water borne organisms.

The scene was declared a HAZMAT incident requiring the involvement of multiple agencies and resulting in intense media coverage and public concern. As a result, this matter was elevated to a "Major Fire Investigation."

Components of a Major Fire Investigation and Conclusions:

Office of the Fire Marshal (OFM) Fire Investigator Tom Hutton conducted an origin and cause investigation and determined that the fire originated in the southwest area of the shipping/receiving section of the building. The cause of the fire was "Undetermined" as electrical ignition sources and the intentional application of an open flame to materials present could not be eliminated. (See Fire Investigation Report.)

Officials from the Ministry of the Environment (MOE) attended the fire incident to undertake water and air sampling. Results from air quality testing taken between 9:01 am and 1:17 pm on July 26th, 2007 were considered safe and evacuation of residents was deemed unnecessary.

The Hamilton Fire Services used approximately 5 million litres of water during suppression activities. There were no plant floor drains and the building was constructed with sills to provide containment. According to the plant emergency manual, total site containment including the building and outside storage area was 986,000 litres. The total amount of firefighting run-off collected by vacuum trucks was approximately 330,000 litres. The outflow from street storm sewers was into Spencer Creek.

Random water samples from Spencer Creek were collected by MOE between July 26th and July 30th. The samples were analyzed for pesticides; specifically malathion, diazinon, carbaryl and bendiocarb. Values that were obtained were either below detection limits, or in the case of diazinon, described as trace amounts. However, these samples were taken several hours and days after initial run-off.

OFM Applied Research Engineer David Home was assigned to report on the impact of the fire on the community and the natural environment. He reported that 200 mm fire separation constructed within the building was effective in combination with fire department suppression operations in confining the fire to the south side of the building.



Fire investigation Services

Executive Summary

Investigation No.: 145-015-2007

However, as a result of suppression efforts, considerable firefighting run-off entered the natural environment and resulted in a fish kill in nearby Spencer Creek.

A strong fire department response was unable to arrest fire growth because of combustible construction, the fire load of combustibles present within the plant and the absence of automatic (fire) sprinkler systems.

Finally, responding fire crews were not aware that the fire scene involved pesticides. The availability of this information at the time of dispatch and at the fire scene would have assisted with decisions affecting firefighting safety and allow for earlier consideration of the impact of fire on the community and the natural environment. (See Report of D. Home, P Eng)

Case Status:

The OFM investigation is closed.



October 2007

ADVISORY BULLETIN

Re: NFPA 1851, 2008 Edition Standard on Selection, Care and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting. Revisions Made to the Standard

The new 2008 Edition of NFPA 1851 has been published and is now in effect. This Standard has gone through a large revision not the least of which is found in the new chapter 10 “*Retirement, Disposition and Special Incident Procedure*”.

Section 10.1.2 of this chapter states: “*Structural fire fighting ensembles and ensemble elements shall be retired in accordance with 10.2.1, no more than 10 years from the date the ensembles or ensemble elements were manufactured*”.

Section 10.2.2 of this chapter states:” *Retired structural fire fighting ensembles and ensemble elementsas determined in section 10.1.8 shall be permitted to be used as follows:*

1. *For training that does not involve live-fire, provided the ensembles and ensemble elements are appropriately marked as being for non live-fire only.*
2. *As determined by the organization (Fire Department)*

This new addition to the standard will come as a surprise and serious financial concern for many Fire Services. The following will explain Fireservice Management’s official position in dealing with this new section.

Within the Province of Ontario, the requisite Standard of record is CAN/CGSB 155.1-01 “*Fire Fighters’ Protective Clothing Against Heat and Flame*” as well as relevant sections of “*Section 21 Guidance Notes Published by the Ontario Ministry of Labour*”.

NFPA Standards as they relate to Fire Fighting activities and the Fire Services are an Internationally recognized “Standard of NFPA codes, minimum performance standards, recommended practices and guidelines”. As all manufacturers of fire fighter’s protective ensembles and ensemble elements in North America must be NFPA 1971, 2007 edition certified, all garments entering the Canadian market are NFPA 1971 Certified and in Ontario specifically, must be CGSB 155.1 certified and labeled.

“Notices and Disclaimers Concerning NFPA Documents” appear on the inside of the cover page of each Standard with one such *notice* stating, *“Anyone using this document should rely on his or her own judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstance.”*

As the above referenced information relates to *““Structural fire fighting ensembles and ensemble elements shall be retired in accordance with 10.2.1, no more than 10 years from the date the ensembles or ensemble were manufactured”* the ultimate and final decision of retiring your departments Bunker Suits rests solely with the decision makers within the each Fire Service.

Fireservice Management Ltd., as an Independent Service Provider (ISP) for the cleaning, inspection and repair of Bunker Suits, has a responsibility to its customers of notifying them of relevant changes to industry standards so our customers can make informed decisions.

As an ISP, Fireservice Management is subject to adhering to the **new** Verification Requirements for ISP’s within the Revised 2008 Edition of NFPA 1851 in accordance with fulfilling our functions in cleaning, decontaminating, inspecting, repairing and the record keeping of fire fighters’ Bunker Suits. We can only advise and make recommendations when it comes to imparting information. As is our common practice, we will not make any repairs to garments when the cost effectiveness of such repairs considering the levels and degrees of contamination, the age of the garment or the overall condition of the garment is suspect, until we have contacted a decision maker within the department for final approval to proceed or not. The ultimate and final decision is not ours; it is yours. This includes the issue of the retirement of Bunker Suits.

If there are any questions or further clarification is required, please contact Fireservice Management Ltd. directly.

Sincerely
Fire service Management Ltd.



FIRE WATCH

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Confined Space Seminar

As with any OIFPA seminar I've attended, the coffee was fresh and lunch was delicious! That's 2 great components of any successful seminar!

The seminar was likely shortened somewhat due to there only being 4 attendees, but overall, the group was knowledgeable and still provided opportunity to learn from each other's backgrounds and experiences.

It was a bit disappointing Scott Connor was not available - the bio on Scott described in the OIFPA notice was quite impressive and added to the appeal of the seminar, having said that, Roger Blake was clearly more than qualified to step in. He offered a wealth of knowledge and was able to draw on his established career to share real life experiences in illustrating how the material can affect our workplaces on any given day. Roger is an excellent trainer and we were fortunate to have him fill in.

The presentation was thorough, informative and was still a worthwhile review for those who may have already been familiar with the new regs - which I believe our group was. I walked away with some ideas to bring back to the plant to better our Confined Space Program, so it was certainly a beneficial function.

Thanks,

JEREMY BONDY
LOSS PREVENTION SUPERVISOR
Navistar International Corporation

jeremy.bondy@navistar.com

OIFPA Membership

Thank you to those who have paid their membership for 2008,
However, there are a few who have forgotten.

A new invoice has been recently sent to remind you of payment.

Contact the office at 905-527-5651 or oifpa@interlynx.net if you have any questions



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We need to hear from you....

As a member and/or recipient of our **FireWatch** newsletter we welcome your comments and ideas.

We would like to hear from you with regards to seminar topics that would interest you and your company or problems or concerns that a member of the association could help you with.

Our Board of Directors has a wealth of knowledge that could assist you.

This is your association and networking is the key to success for everyone.

Don't hesitate in any way to contact our office either by phone 905-527-0700, or email oifpa@interlynx.net We would be glad to hear your comments and/or help you get in contact with others that could assist.

Board of Directors 2008.

Roy Graham, Petro Canada, Mississauga
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FIRE WATCH

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Sale of T-shirts (as seen below or Golf Shirts (Black or Blue with OIFPA logo on the left front side).... \$30.00 each for L & XL , \$35.00 for XXL and XXXL
Your purchase of these shirts assists the association. Thank you.



Call to order your shirts !!!!