

# SAFETY HAVEN

By **Jodi Di Menna**

When it comes to curbing incidents in the chemical industry, Canada's approach has always been largely voluntary. This is in contrast to much of the rest of the developed world where the actions required to manage risks in the process industry are explicitly legislated. But it has been decades since Canada has seen a major accident in the chemical or petrochemical industries. At least not on the scale of the U.S.'s 2005 Texas City oil refinery fire that killed 15 people, or, the same year, the explosion—the largest in peacetime Europe—at the Buncefield oil storage facility in Hertfordshire, U.K. So is Canada lagging behind, or leading the charge on process safety management?

**December 23, 1984 | BHOPAL, INDIA:** Nearly 4,000 people die, several thousand more suffer permanent disability and over 10,000 experience long-term health effects after some 40 tonnes of methyl isocyanate is released from a tank at Union Carbide's pesticide plant, and spreads over the city of 900,000 people shortly after midnight. Emergency sirens had been switched off. Many die in their beds, others die in the streets and later in hospital emergency rooms, largely from respiratory failure as their throats close and the burning gas causes their lungs to fill with fluid. The release had been caused by a large amount of water entering the storage tank where the chemical was held, a lapse that was noticed by employees less than an hour before the incident and which the supervisor notified failed to address. In addition, temperature and pressure gauges that had been found to be unreliable had been ignored, refrigeration units had not been working properly, a gas scrubber that would have neutralized the escaping gas had been shut off, as had the flare tower, the water curtain was not effective and the tank had been filled beyond the recommended capacity.

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The world had never experienced anything like Bhopal.

There had been flickers of recognition in the 1970s of the enormous scale of damage that could be inflicted when something went wrong in the chemical industry: in 1974, 28 people were killed and 36 seriously injured in Flixborough, England when cyclohexane leaked from a nylon-precursor plant and exploded; in 1979, 200,000 people in the Toronto suburb of Mississauga were evacuated from their homes after a freight train derailed, spilling styrene, toluene, propane, caustic soda and chlorine onto the tracks.

Bhopal was a wake up call. The omen of that terrible tragedy could not be ignored for many developed countries that looked around at their own bustling industries and wondered "Could it happen to us?" The decade that followed the catastrophe was transformational for how companies manage the risk their plants present to the people around them.

While Bhopal reeled, Canada's Minister of the Environment ordered an assessment of the adequacy of the measures that existed to prevent and respond to major industrial accidents in Canada. By March 1986, the depart-

stands out from the majority of industrialized countries around the world: it is voluntary.

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**May 9, 1992 | WESTRAY MINE, NOVA SCOTIA:** Twenty-six men die in an underground coal mine in Pictou County, N.S. when a cloud of methane gas suddenly erupts from the Foord coal seam and bursts into flames. The fire ignites coal dust in the air, causing a massive explosion. The force of the blast shatters windows and rattles houses in nearby towns. An inquiry later finds several lapses on the part of the private company that managed the mine and government inspectors who ignored obvious safety abuses: ventilation design and maintenance was inadequate to keep methane and coal dust at safe levels; the layout of the mine forced miners to work in dangerous tunnels; methane detectors had been disconnected because of frequent alarms; procedures to "stonedust" coal to render it non-explosive were done only sporadically, usually before inspections; there was an "appalling lack of safety training and indoctrination" of miners.

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The Westray story was "a complex mosaic of actions, omissions, mistakes, incompetence, apathy, cynicism, stupidity and neglect," according to Justice Peter Richard who conducted the inquiry. When police and the provincial government failed to secure a conviction against the mining company or any of its managers, the Canadian



UNITED STEELWORKERS

"No more Westrays" became the rallying cry in the late 1990s for activists lobbying for legislation to create more accountability for workplace safety. A granite memorial outside of New Glasgow, N.S. depicts rays from a miner's lamp containing the names of the 26 men who died in the Westray coal mine in 1992.

ment released a report titled "Bhopal Aftermath Review: Assessment of the Canadian Situation" which made 28 recommendations to prevent major loss of life due to an industrial incident in this country.

Process safety management (PSM), the term that in Canada refers to managing the risk of explosions, fires, releases of hazardous materials or any other event that could harm people, property or the environment, emerged as a new discipline. In practice, PSM is the efforts a company makes to reduce the possibility of an accident: it's proper design, checklists, procedures and fostering a culture of safety. And there's one thing about Canada's approach to PSM since Bhopal that

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Labour Congress led an intense lobbying effort to amend Canada's criminal code to hold managers and directors of corporations criminally liable if they failed to take steps to protect the lives of their employees. In late 2003, the federal government enacted Bill C-45, the "Westray Bill," that does just that.

In theory, the legislation encourages companies to carry out good PSM. But in practice, “it’s not likely to make a difference unless something goes seriously wrong,” says Graham Creedy, a recently retired consultant and senior manager at the Chemistry Industry Association of Canada (CIAC) and one of Canada’s foremost experts on PSM. That’s because many companies are in the dark on PSM: some companies know they should be doing something, but they don’t know exactly what; worse are the companies that “don’t know what they don’t know.” So something going “seriously wrong” might be what it takes for those companies to get the message. “If a director is personally charged and found guilty,” says Creedy, “corporations across Canada will sit up and take notice.”

Even then, Creedy points out, the criminal code doesn’t provide any advice on what companies can do differently. “It tells you you’re not supposed to murder anybody, but it doesn’t tell you how to not murder anybody. That guidance has to come from somewhere else.” Since 2000, after the dissolution of the Major Industrial Accidents Council of Canada (MIACC) — a voluntary organization put in place after Bhopal to create a public safety management framework — the PSM Subject Division of the CSChE has provided much of that guidance in the form of guidelines and assessment tools, with the newest additions — an updated *PSM Guide* and a new *PSM Standard* — launching this fall.

The weakness in this approach, says John Shrives, the recently-retired head of prevention in the environmental emergencies division of Environment Canada, is that the guidance provided isn’t referenced in any legislation. “It represents a great starting point, but would carry much more clout if it was a regulated requirement for industry.”

After the terrorist attacks of September 11, 2001, federal regulations governing chemical accidents were introduced into the Canadian Environmental Protection Act, but those deal mostly with emergency response plans after an incident occurs. Other legislation addresses the transportation of dangerous goods, but that aimed at the health and safety of workers doesn’t cover risks to the public “beyond the plant gates.” To date, there is no legal requirement for companies to carry out PSM either provincially or federally, a situation that leaves Canadians at the mercy of luck and the goodwill of companies.



**August 10, 2008 | TORONTO:** One man dies and 12,500 are evacuated from their homes after an explosion launches tanks twice the size of rail cars off their mounts. One tank lands 500 metres away, embedded in a road-salt dome, another ends up in a nearby city works yard. A series of smaller explosions send fireballs and clouds of smoke into the sky, along with pieces of metal from the exploding propane tanks that land on nearby streets and properties. Homes and businesses are damaged, windows shattered, and doors torn from their hinges. An investigation finds that propane was being transferred directly between tanker trucks, a practice that was both routine at the facility and prohibited in Ontario.

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One year after the Sunrise Propane explosion, a student-led report sponsored by the Canadian Chemical Producers’ Association (CCPA, now CIAC) was published that stated that “a comparison of policies aimed at preventing major

Investigators sift through the rubble amid tanker trucks and propane cylinders after the August 2008 explosion and fire at the Sunrise Propane facility near Toronto.

industrial accident hazards across first world countries shows that Canada is far below the levels of protection established by other jurisdictions.” The statement is emblematic of the notion that without prescriptive legislation obligating companies to carry out PSM, Canada is lagging behind the rest of the developed world.

But our safety record says otherwise according to Gerry Phillips, owner of an Alberta-based consulting firm that specializes in PSM. “If we are looking for a benchmark, we can use the U.S. experience,” he says. “Given that Canada’s population is about 10 per cent of the U.S.’s and assuming a manufacturing and processing sector that is of the same ratio, we would expect to experience about one tenth of the incidents that the U.S. experiences. In fact, Canada is probably much closer to one hundredth in comparison to the U.S.”

The success of Responsible Care, a voluntary charter launched in 1985 by the CCPA lends significant credibility to a non-legislative approach. Under the charter, chemical companies pledge to “do the right thing” in all aspects of their business including process safety.

## The trouble with voluntary initiatives, of course, is that they don’t apply to everyone.

“We know our process safety efforts are working. There’s absolutely no question. We can quantify it,” says Bob Masterson, vice president of Responsible Care at CIAC, citing a 60 per cent decrease over the past 27 years in both the number and severity of process safety incidents for companies that have signed on to Responsible Care. “I can’t tell you anything about the rest of industry in Canada.”

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**January 20, 2012 | BURNS LAKE, B.C.:** Two men die and nineteen others are injured, some critically, as a result of a fire and explosion at the Babine Forest Products sawmill. Four months later, on April 23, another fire and explosion, this time at the Lakeland Mills sawmill in Prince George, B.C., kills two workers and injures 24 others. In both cases, it is speculated that higher-than-normal levels of dust particles

suspended in the air may have been the cause of the incidents. Both mills were processing pine-beetle-killed wood, which is much drier than timber from live trees. A month after the Prince George incident, on May 19, a fire severely damages the Absolute Lumber Products Mill in Abbotsford, B.C. Three months later, the Waldun Forest Products cedar mill in Maple Ridge, B.C. is engulfed in flames.

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The trouble with voluntary initiatives, of course, is that they don’t apply to everyone. “We’ve had four explosions in mills in western Canada this year,” says Masterson, “and some have resulted in fatalities. My observation is that none of those have occurred in companies that are recognized as industry leaders. They weren’t in the Weyerhaeusers and the Tembecs and the Georgia-Pacific and the Canfors and the Cascades. As a society, we have leaders in all of our sectors, many of them know what the right thing to do is, most of them are probably doing the right thing. The question is, what about those that either don’t know or aren’t committed to doing the right things? What do you need to do?”

For those companies that don’t voluntarily institute PSM, perhaps regulation is part of the solution. In the meantime, at least for many industry leaders, our made-in-Canada approach to process safety seems to be working.

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**September 25, 2012 | ROCANVILLE, SASK.:** Twenty workers emerge from the Potash Corp mine unscathed after a fire breaks out around a set of wooden electrical cable reels. The blaze is quickly extinguished by crews using foam and water. The workers spend 18 hours in refuge stations waiting for the mine to cool and for massive fans to clear the air of smoke. They pass the time playing cards, phoning their spouses and talking. An additional nine people had been evacuated from refuge stations shortly after the fire started by workers wearing protective gear. The mine’s mill operations superintendent, Terry Daniel, tells reporters: “We’re very pleased. It seems like everything we’ve prepared for over the years with all our teams has happened much in the way it was anticipated. Everything is going to work out as we’d always hoped. Everyone’s going to come up fine.” 