# BULLETIN

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The National Board of Boiler and Pressure Vessel Inspectors was organized for the purpose of promoting greater safety by securing concerted action and maintaining uniformity in the construction, installation, inspection, and repair of boilers and other pressure vessels and their appurtenances, thereby assuring acceptance and interchangeability among jurisdictional authorities empowered to assure adherence to code construction and repair of boilers and pressure vessels.

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Steam and clocks don't mix! Or do they?

Find out on page 14.


BULLETIN *cover photograph by Ed Araquel.*

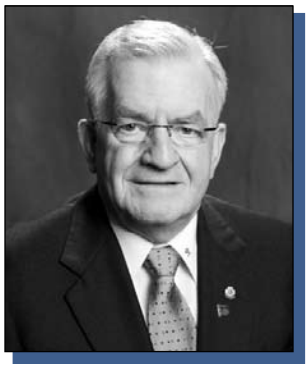
## Cover Story



## Features



## Departments



# "It Ain't What You Don't Know . . ."

BY DONALD E. TANNER, EXECUTIVE DIRECTOR

It was American science fiction writer Theodore Sturgeon who observed: "It ain't what you don't know that will kill you. It's what you know that ain't so."

Mr. Sturgeon's perception (despite his contractions) is a disturbing truism that deserves closer examination — particularly as it relates to the pressure equipment industry.

As we all know, ours is a constantly evolving business. One need only point to the *National Board Inspection Code* or the ASME Code to understand that several times a year, both are scrutinized by the best technical minds in our industry. Some changes are major. Some minor. But in the end, each modification reflects improvement in the codes, as well as the latest thinking based on real experiences.

I mention this because there are quite a few in the pressure equipment business who fail to keep pace with industry developments.

Granted, ours is an information-driven society. Each day the amount of data each of us is required to process is daunting. Separating useful information from irrelevant information is a challenge that seemingly grows with each passing day.

And that is why I find Mr. Sturgeon's observation disconcerting. The endless sifting of data day-in and day-out sometimes encourages a false sense of security suggesting what we know is sufficient for the job at hand.

While such conviction might be acceptable in commerce where safety is not the primary focus, it is foolish to assume a similar temperament should apply to our industry.

Communication is critical when working around boilers and pressure vessels. Just about every accident brought to the attention of the National Board can be traced to someone not sharing information. Many times, we call the person with whom this information was not shared: "victim." Sometimes: "the deceased."

Thusly, "It's what you know that ain't so."

While victims sometimes become so as a result of their own actions, they may have been acting on information the company did not make available. Hence, the importance of communication.

While keeping up on latest developments can be time-consuming, as well as challenging, we are obligated to seek out important information relevant to the operation, repair, and alteration of pressure equipment. It is a personal and professional responsibility each of us assumes by joining a rapidly evolving industry in which there can be no compromise on safety.

So how does one stay on top of his/her informational obligation?

There is a variety of media that can help industry professionals. But perhaps the most important is training. *Timely* training.

I am always taken aback by the number of individuals who have put their training days behind them. While most cite lack of time, this excuse today is increasingly irrelevant. For example: online courses are becoming more plentiful and cover a large cross section of industry codes and issues easily accessed from home or office.

Prefer in-person courses? The National Board offers a variety of custom courses that can be conducted on premises at company-specified locations. While less expensive than traveling, say, to Columbus, these courses also save time by eliminating the displacement of an entire department for an extended period.

Another way to access important industry information is through committee participation. With all that is happening professionally, committee and subcommittee volunteers are always in demand. Being a contributor to the process means having access to the latest technical data and industry perspective.

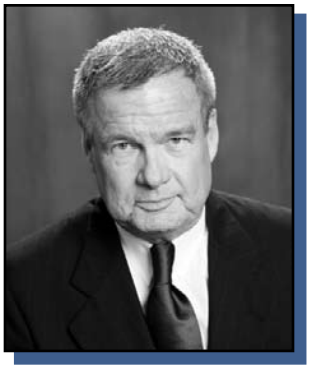
Of course, an excellent resource for up-to-the-moment information is the Internet. There are a variety of fine Web sites addressing just about every facet of the boiler and pressure vessel profession. Some, such as the National Board Web site, post timely announcements. Visitors can even follow developments and add to the public review of the NBIC.

While communication may be an elusive commodity for most, it is essential to the boiler and pressure vessel community. But sharing information is only as effective as the way it is received.

That said, take a few moments from your busy day and reflect on the quality and quantity of the information available to you.

Then, and only then, will you come to understand the perspective and wisdom of Ben Franklin, who astutely opined: "By failing to prepare, you are preparing to fail."

Think about it. ❖



# When Is a Boiler Explosion *Not* a Boiler Explosion?

BY PAUL BRENNAN, DIRECTOR OF PUBLIC AFFAIRS

I have a thing about words. One of my favorites is *verisimilitude*.

Quite simply, verisimilitude means having the appearance of truth.

Example: if you believe everything you read, natural gas explosions are often caused by faulty boilers or water heaters. The fact it has been reported so many times lends a certain credibility to what is in reality a leap of significant expanse. That credibility is verisimilitude.

Gas *is* used to fuel pressure equipment. But does that mean a flawed boiler or water heater *causes* a gas explosion? Those of you who are purists (and you know who you are) argue gas leaks are a consequence of using pressure equipment, but seldom the root cause of a boiler explosion.

So why are so many gas explosions reported as malfunctioning pressure equipment?

Problems — and explosions — occur when escaping gas collects in a confined space and is ignited by a furnace employed to heat the water in the boiler.

The difference between furnace and boiler explosions is unmistakable: a boiler explosion occurs when the contained water and/or steam is suddenly released to the atmosphere. The result is a lethal concussion instantly dispatching shards of metal and scalding steam — *but with no resulting fire*. Furnace explosions occur when a furnace ignites a pocket of confined gas, thereby provoking fire and blowing everything — everything — to hell.

That said, how can it be argued explosions involving leaking gas are genuine *boiler* explosions? After all, insurance companies distinguish furnace and boiler explosions by writing fire policies for the former and machinery policies for the latter (woe unto those who don't know the difference). Another rationale for differentiating the two: a furnace explosion *can* cause a boiler explosion. It is extremely unlikely a boiler explosion *can* cause a furnace explosion.

Given a lack of understanding (as well as its pursuit of simplicity and convenience), the media is wont to call any explosion within close proximity of a boiler, "a boiler explosion."

> *"Some published accounts to this day refer to an explosion in the boiler room. But . . . New London School had no central steam heating plant or boiler room . . ."*

This point is perhaps best validated by the catastrophic "boiler explosion" at Michigan's Ford Rouge plant in 1999. That tragic incident was prompted by a buildup of gas in the boiler plant. Although the gas accumulated in the plant and not *inside* the boiler (which was shut down for maintenance), it was — according to the media — "the Ford Rouge *Boiler* Explosion."

That dreadful event, resulting in six fatalities and 20 injuries, was caused by "inadequate controls for the shutdown of the boiler," according to the state inspection report. Translation: there was nothing a boiler inspector could have done to pre-empt this tragedy of errors.

The Rouge incident lends perspective to yet another distorted perception that regularly confounds purists: the boiler room as a location of ominous repute. Indeed, being a boiler's address of record, it stands to reason boiler accidents occur in, well, the *boiler room*. But accidents do occur even without a boiler room.

One of the twentieth century's most devastating accidents occurred March 18, 1932, in the East Texas oil field community of New London. The New London School, as it had always done, tapped into a residue gas line through its basement to heat classrooms with individual boiler-type steam radiators (72 in total) — fueled by separate connectors. A leak in the basement allowed colorless, odorless gas to collect in the basement area, mix with air, and seep into the school wood shop located on the first floor. A spark generated when the shop instructor plugged an electric sander into a receptacle created an explosion that literally lifted the high school — including auditorium — off its foundation.

Impact of the blast launched the main structure floor (an 8-inch concrete slab) through the roof by way of occupied classrooms. Many of those killed were crushed under falling debris. A total of 294 students (fifth to eleventh grade) and teachers perished.

Some published accounts to this day refer to an explosion in the boiler room. But according to a 1937 NFPA report, New London School had no central steam heating plant or boiler room (both casualties of efforts to control construction costs).

So oft repeated was the boiler room reference that it today remains gospel for many. Hence, another example of the evil-boding boiler room *and* the boilers occupying same.

> *"Maybe we should now read between the lines: taking a hard, long look at specific content of accident reports rather than just the numbers."*

These are but two examples of verisimilitude. Others are too numerous to recount. And that is a problem.

Many would reason that whether a furnace or boiler explosion, such accidents underscore the dangers of pressure equipment. So why should we care?

*Maybe* — just *maybe* — the performance of commissioned boiler inspectors over the years has been much better than statistics suggest. *Maybe* we should now read between the lines: taking a hard, long look at specific content of accident reports rather than just the numbers.

And *maybe* the real safety message of the pressure equipment industry should be: "Hey, we're doing a pretty good job, and *that* is why *what we do* is important!"

According to the World Health Organization, the number of boiler explosion/rupture fatalities in 2004 worldwide was 51. The United States reported only 3 deaths with Mexico (5) and Brazil (8) recording the most. While the U.S. did not have the lowest tally of fatalities, it did boast — more significantly — the lowest number of deaths per capita (.0101443 per million) among 26 industrialized nations.

Truth is, our industry should be proud of its safety record. However, as one National Board pundit reminds me: we are only judged by our failures. But an overwhelming percentage of those failures had nothing to do with the inspection process. As we have discussed in this publication ad nauseam, most accidents

are the result of human error — committed by humans having no connection to inspecting boilers.

Nonetheless, the boiler industry is generally guilty by association to all things bad in the boiler room. Reality be damned.

The National Board recognized this a long time ago. Fearing a loss of something in the translation, it advanced an aggressive agenda of *preventing* accidents rather than *promoting* accident consequences.

Regrettably, the Rouge Plant incident will be forever classified a boiler explosion, at least by those not in the know. But fortunately there are those who accurately chronicle the real cause of the New London disaster. And for good reason.

Following this incident, the state of Texas enacted what is believed to be North America's first odorization law requiring natural gas to be mixed with distinctive malodorants to detect gas leaks by smell. Even the Rouge disaster caused Ford officials to redouble safety efforts in such a way that Ford plants are today considered to be among the safest in the automotive industry.

While good occasionally arises from the aftermath of an explosion, the end result for the pressure equipment industry is rarely positive. A *failure* is a *failure* notwithstanding what the public chooses to call it.

But *public perception* is seldom *proper perspective*. And that is why our industry must maintain a sober and rational appreciation for our successes (see Violations Tracking, page 13).

The next time you hear about a boiler accident, think verisimilitude. And then identify the cause. The *real* cause.

When one separates truth from the appearance of truth, there can only be one conclusion: our industry should feel pretty good about a job well done.

It should feel even better about a job done well. ❖

## UPDATE

*Synopsis* users should be advised of recent changes reported in three jurisdictions: Kansas, Washington, and Colorado. In KANSAS, these include changes to *Date of Law Passage, Insurance Inspection Requirements, Certificate of Inspection, State Fees,* and major changes to *Rules for Construction and Stamping,* and *Miscellaneous*. WASHINGTON reports adoption of the 2004 Edition CSD-1 standard. COLORADO modifications involve changes in boiler inspection frequency and can be found under *Inspections Required*. ❖

# Surviving the "R" Renewal Audit:

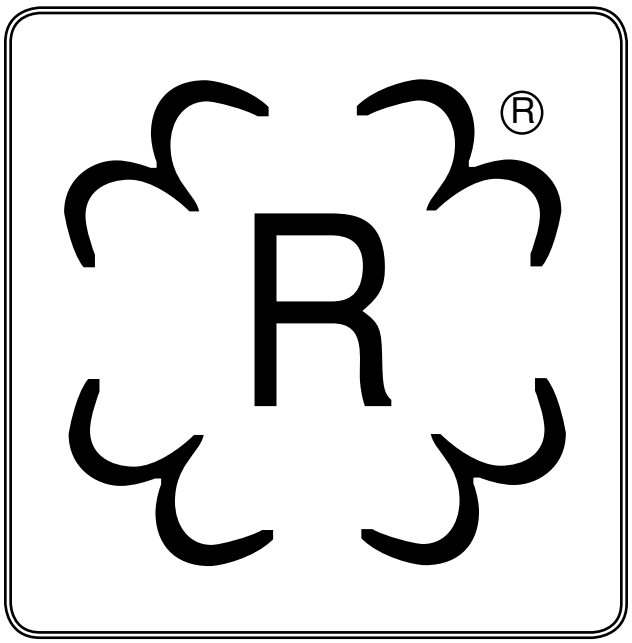
# A Certificate Hold

The mail is delivered to your office, and there on top is an official-looking letter. You slowly open it, wondering what it might be. It is notification your company's *Certificate of Authorization* to use the "R" symbol stamp is about to expire. Now comes all the things you have to do: scheduling, sending in a deposit, filling out an application, and deciding on a demonstration item. Talk about stress!

Relax, the National Board can help.

Several years ago we put together *The National Board Guide for ASME Code Sections I, IV, VIII, Divisions 1, 2, and 3, X, and XII, Class 1, 2, and 3, for Review, and the National Board "R" and "NR" Certificates of Authorization*, otherwise known as NB-57. It is a general guide National Board staff, consultants, qualified team leaders, and the boiler and pressure vessel industry use during reviews for accreditation to ASME Code and the applicable requirements for the National Board *Certificate of Authorization*. The contents apply to renewals of certificates as well as new applications. Developed to help create consistency during the joint review process, it is now available online at no charge to National Board Web site account holders.

As someone who spent almost 30 years in boiler and pressure vessel manufacturing and is now a qualified team leader, I have a unique perspective on the joint review process. Let me share a few ideas that should make it a little more tolerable.



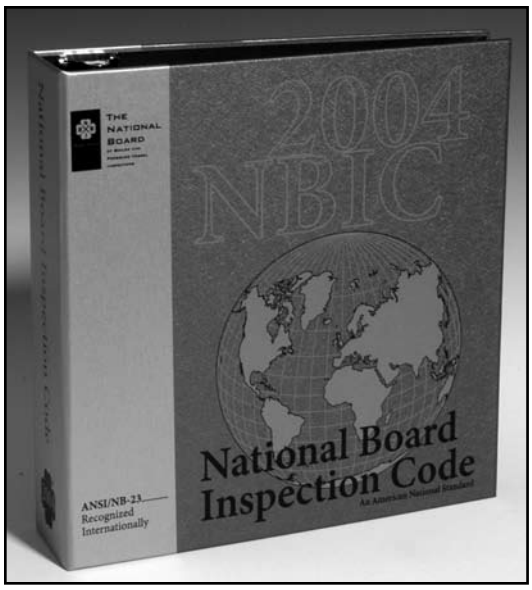

First of all, you should know how the joint review is conducted. The joint review has several mandatory points or elements that must be addressed by the team. But there are two events around which the whole review process revolves:

1) the quality manual review (or written description of the system you will use to repair/alter a code item) and

2) the implementation review.

# er's Guide

by Bill Smith, Senior Staff Engineer




The manual review is usually done off-site by the review team. Since the complexity of products and services offered by different organizations vary greatly, the quality manuals describing how organizations repair/alter a code item will vary greatly. Therefore, your manual should describe how your company operates. In other words, it should be unique.

Now that we have established the uniqueness of the quality manual, there are some features to be addressed. These are listed in Part RA of the *National Board Inspection Code* (NBIC) and include such topics as Material Control, Examination and Inspection, Welding Control, and Correction of Non-Conformities. Since this is your manual, you can be detailed or brief as necessary in explaining how each area is handled by your organization. This is your opportunity to "say what you do."

The second important joint review phase is the implementation portion. This is where you get the opportunity to "do what you say." The review team will determine by means of your demonstration item if you have complied with both your written quality manual and the code. This process takes all the areas addressed in the quality manual and puts them to work. Drawings, material requisitioning and purchasing, receiving inspection and correction of nonconformance, fabrication processes, and inspection — all are reviewed to make sure an item can be repaired/altered in a manner complying with the code and quality manual. This portion of the joint review tends to be the more "painful" portion, especially if you have not given adequate time to prepare.

Let me give you an example of how not "doing what you say" will lead to a deficiency finding by the review team. Let's imagine your manual states the Quality Control Manager will fill out a Material Requisition Form for all code material, listing all code requirements, and forward the requisition to the Purchasing Manager, who will take the information and transfer it exactly onto a Purchase Order. The Purchasing Manager then sends copies of the Purchase Order to the supplier of the material and the Receiving Inspector and maintains a copy in the purchasing department.

Now, a rush order comes in and the Designer calls the material supplier and gives him a verbal order for some code material. The material shows up at the delivery dock the next day. Great delivery — but the quality system was bypassed. The Quality Control Manager, Purchasing Manager, and Receiving Inspector were all left out of the loop. Verification of code requirements is now in question.

Remember, there are many ways to accomplish a task, just detail the method in your written description. In other words, "say what you do and do what you say."

Be prepared. Don't try to wing it. Make a checklist and follow it. Take the time to thoroughly go over all your paperwork for errors and omissions. Make sure your demonstration item has all the necessary markings and identifications and that all background documents, such as Welding Procedure Specifications, Procedure Qualification Reports, Welder Performance Qualifications, and Nondestructive Examination Procedures and Personnel Qualification, are current and applicable.

Your Authorized Inspection Agency (AIA) is a wealth of knowledge and a valuable resource. AIAs have been down this road many times. It is usually best to have your inspection agency perform a pre-joint review to make sure you have all the bases covered.

The joint review process is a stressful time. Your quality system is being audited. You have to put up with outsiders, probably strangers, who come into your organization, dig through your records, disrupt the normal flow of business, and ultimately formulate a recommendation to the accreditation department for your *Certificate of Authorization*.

The outcome of your joint review will always go more smoothly (and, not to mention, generate less stress) if you put in the time and effort to prepare well in advance of the event.

And always remember, the National Board is here to help! ❖

**Editor's Note:**

The 2007 NBIC is being restructured and will not contain a Part RA. The restructured NBIC is scheduled for December 2007 distribution.

# NEW PRESSURE RELIEF DEVICE DESIGNS

by Joseph F. Ball, P. E., Director, Pressure Relief Department

As pressure relief device manufacturers develop new technology, the *ASME Boiler and Pressure Vessel Code* adapts to recognize the new designs. Inspectors and users must become aware of requirements for these devices when they come across them in service. We will look at two different types of new non-reclosing pressure relief device designs that the ASME Code has recently addressed. Both are used for the same types of application where rupture disks are currently employed.

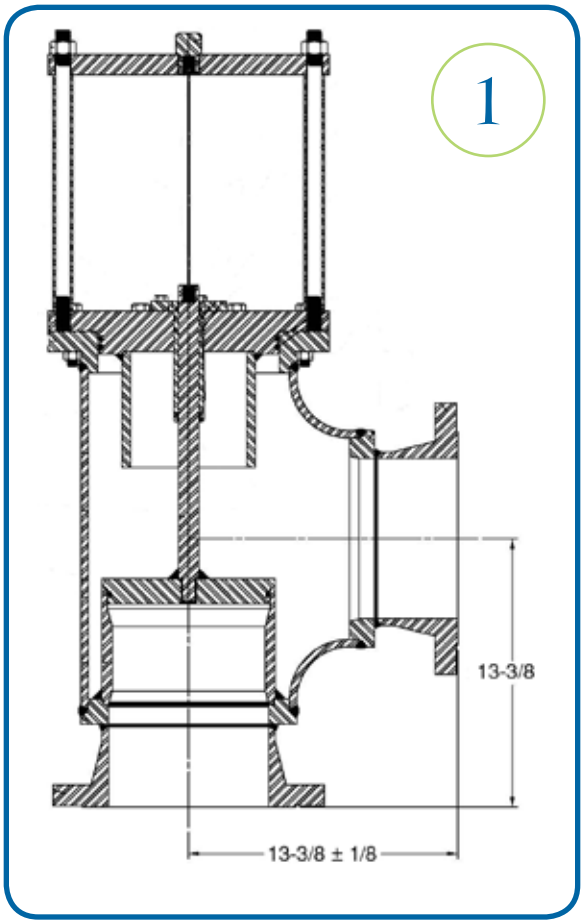
## BUCKLING PIN VALVES

A buckling pin pressure relief device is a valve held closed by a pin axially loaded by system pressure acting on the valve disk. The valves come in several different configurations and offer users some advantages in application to over-pressure protection.

The buckling pin valve uses the principle of Euler's Law for the buckling of a thin column. The law states the force at which a column will buckle is proportional to the diameter and length of the column and the modulus of elasticity for the column material. The force where the column (the pin in these devices) will buckle is set equal to the force on the disk of the valve at the required set pressure. Once a pin material is selected, the manufacturer varies the pin diameter and length to calibrate the device to open at the required set pressure.

While the principle is simple, the details of the device design are where manufacturers work hard to ensure proper performance. The exact method used for fixing the ends of the pin is particularly important; the seal methods that keep the device tight are also critical. These sometimes proprietary features that manufacturers have developed are the elements enabling relief devices to be accurate enough for use in the critical area of overpressure protection.

One version of a buckling pin valve is shown in figure 1. The device looks similar to a pressure relief valve that has a piston-type disk with an o-ring seal. Instead of being

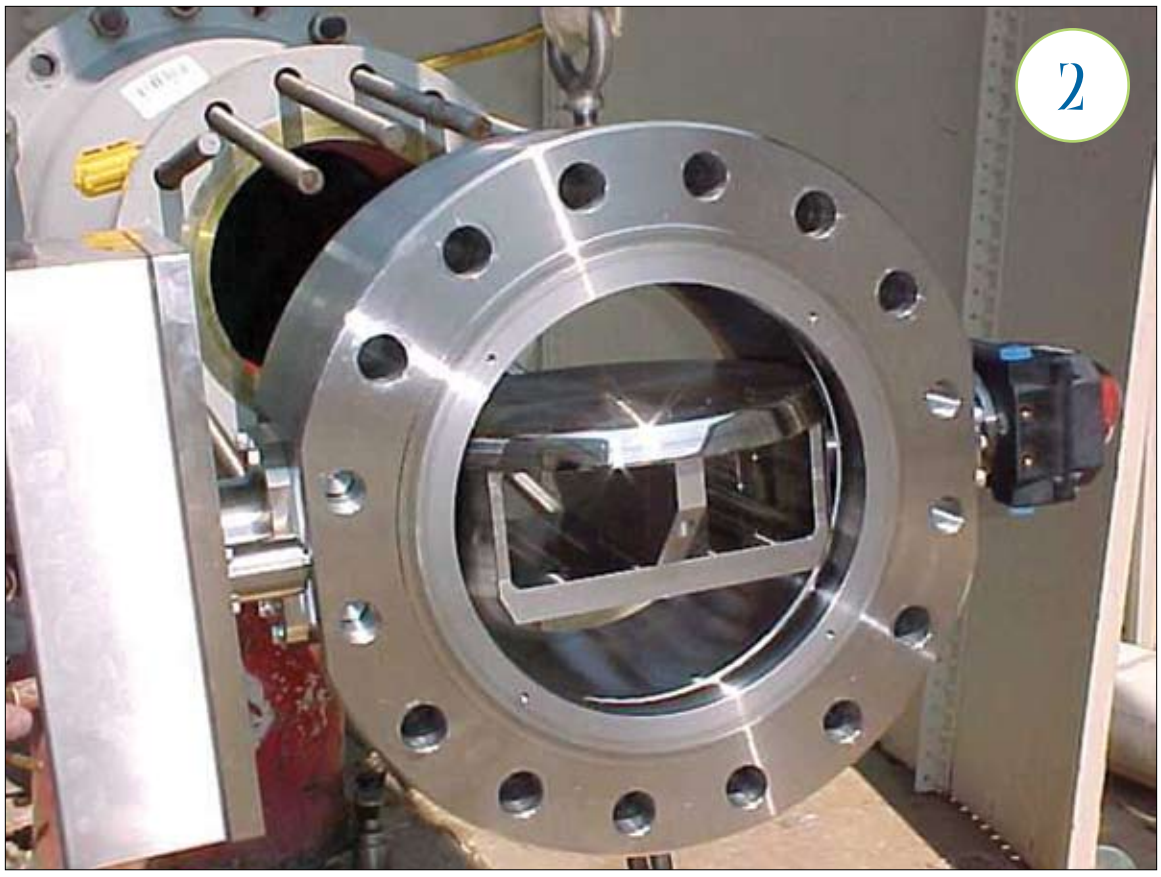



**Buckling Pin Valve,** Courtesy of Rupture Pin Technologies

held closed by a spring, the device is held closed by the buckling pin, which is on top of the stem of the valve. The system pressure is contained in the valve inlet and transmits a force through the disk and stem up to the pin. When the set pressure is reached, the pin buckles, the disk opens up, and the system pressure is released, averting the over-pressure condition. To reset the device, the top nut is removed, the disk manually reseated, and a new pin installed. In some versions, the spare pins are stored right at the valve.

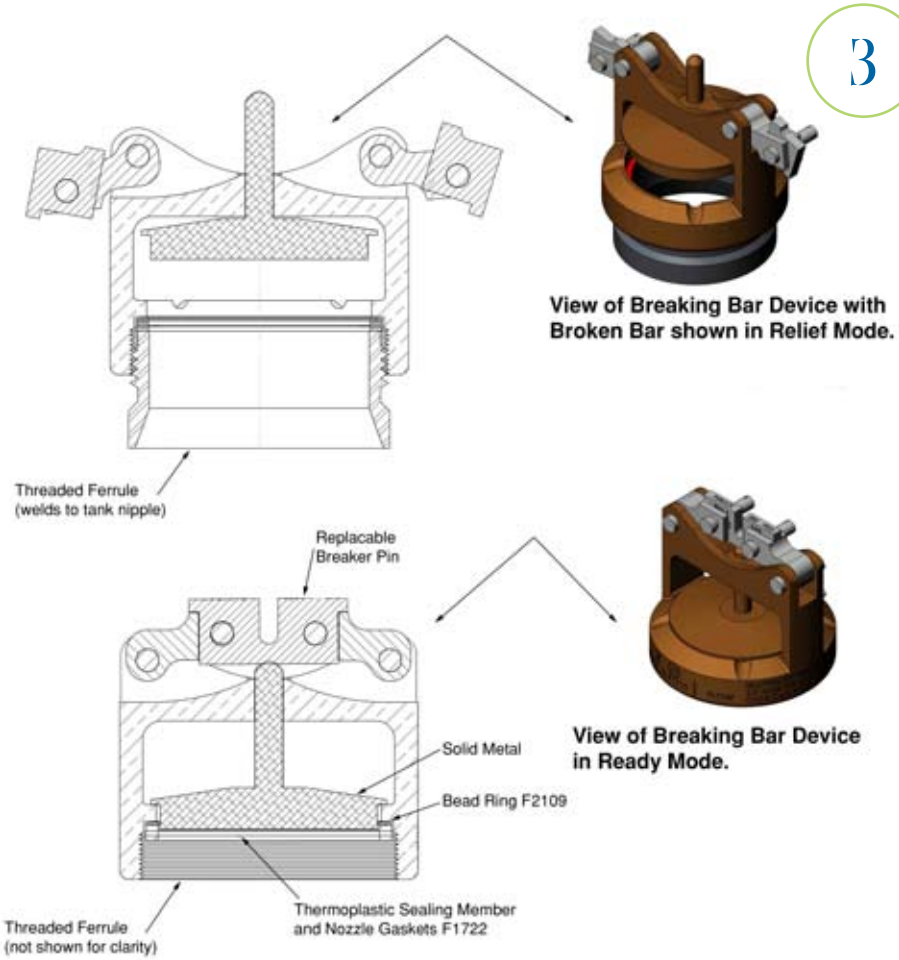
Another version is similar to a butterfly valve (see figure 2). The valve disk stem is located off-center, causing the pressure force to be applied unequally. This causes a torque on the stem, which is transmitted through a lever to the buckling pin, located in this case on the side of the valve. When the set pressure is reached, the pin buckles, the disk rotates to the open position, and the system pressure is released.

There are several advantages to these types of devices. The first is the pin is not exposed to the system fluid and is therefore not affected by corrosion or degradation of the pin material. The pin is also not directly affected by the fluid temperature. While these devices must be calibrated at the application temperature for the pin, in most cases this will not be as extreme as the system temperature itself.




**Buckling Pin Valve,** Courtesy of BS&B Premco

**BREAKING BAR VALVE,** Courtesy of Perlick Corp.




A second advantage is that to replace the pin, the process line does not have to be opened up, thus possibly releasing system fluids. Finally, these devices are not prone to fatigue failure, which can affect some designs of rupture disks.

These devices can be used in both gas and liquid service. Each can also be applied both as a sole pressure-relieving device and in combination with a pressure relief valve.

## BREAKING BAR VALVES

The breaking bar valve is somewhat similar to the buckling pin valve. The difference is the valve disk is held closed by a pin or bar that breaks in shear at a predetermined set pressure. For the device that is currently ASME Code and National Board accepted, the breaking pressure is calibrated by the dimensions of a notch that is machined into the bar, similar to a notch used for a Charpy impact test bar. (See figure 3.)

While the concept of the breaking bar valve is not new, the ASME Code has recently developed the language needed to use these devices as the sole means of over-pressure protection.

The breaking bar valve offers some of the same advantages as those for the buckling pin valve. The bar is not exposed to the system fluid, so corrosion issues are less likely, and the system fluid temperature has less effect on device operation. The device in figure 3 is designed for service on a vessel or pipeline with no discharge piping; however, a flange holding the device does not have to be opened to install another breaking bar.

## CODE PROVISIONS

Both the buckling pin valve and breaking bar valve are currently covered by ASME Code Cases. These are Code Case 2091-3, Buckling Pin Pressure Relief Devices, Section VIII, Division 1; and Code Case 2487, Breaking Pin Pressure Relief Devices, Section VIII, Division 1. The Code Cases are similar in that they require the device to have been independently tested at an ASME- and/or National

Board-accepted test laboratory for operation and capacity. The manufacturer must have an accepted quality program for manufacturing the devices, and each lot of pins or bars must have had sample parts tested to verify the device set pressure.

The devices can be marked with a capacity similar to a pressure relief valve, in which case the installation provisions of paragraph UG-135 of Section VIII of the ASME Code apply. These provisions, which require inlet and outlet piping to be at least the same size as the valve and sized to avoid excessive pressure drop, will ensure the nameplate capacity can be attained. The devices may instead be marked with a $K_R$ value similar to a rupture disk. This value is the resistance coefficient. It is used to determine the pressure drop of the device and combined with the $K_R$ values for the other elements of the relief piping system to determine system capacity. The devices will be marked with either a "UV" or a "UD" Code symbol stamp depending on whether the device was rated by capacity or $K_R$ value.

## KEY APPLICATION AND INSPECTION PROVISIONS

When these devices are encountered in the field, there are several key points that must be recognized in application:

1. The device that is ASME Code accepted is the combination of the activation element (pin or bar) and the valve itself. The manufacturing of replacement buckling pins or breaking bars must be done by the original manufacturer of the valve. Despite their simple appearance, the dimensions and materials of these elements are closely controlled during manufacturing, and the only accepted source for these pieces is the original supplier. The pin or bar is marked with a "Pin-to-Device Identifier," which gives traceability to the main valve. When replacement pieces are needed, this identifying number should be used for ordering new parts. This will ensure device function is maintained.

2. To ensure the valve is not tampered with, a seal will be applied by the manufacturer to keep the assembly together. The pin itself does not have to be sealed since it may need to be replaced while in service.

Besides these points the devices are inspected like other pressure relief devices. The device set pressure must be equal to or less than the pressure vessel Maximum Allowable Working Pressure (MAWP). The marked pin temperature will be the expected temperature of the pin (not the process) when the device is expected to actuate. For most of these devices, this will be ambient temperature. The devices should be inspected for damage, signs of leakage, proper installation, and pin identification. The pins will be marked with the manufacturer's name, set pressure and temperature, the pin-to-device identifier, and the appropriate ASME Code Symbol stamp.

Currently accepted manufacturers can be found on the National Board's Web site, listed under "Pressure Relief Device Certifications." Inclusion in this listing shows the manufacturer has had its design tested to demonstrate its function and capacity and that the quality system for manufacturing has been successfully reviewed.

Inspectors and pressure vessel users should be aware of the code provisions applicable to these valves when reviewing their applications in the protection of pressurized equipment. ❖

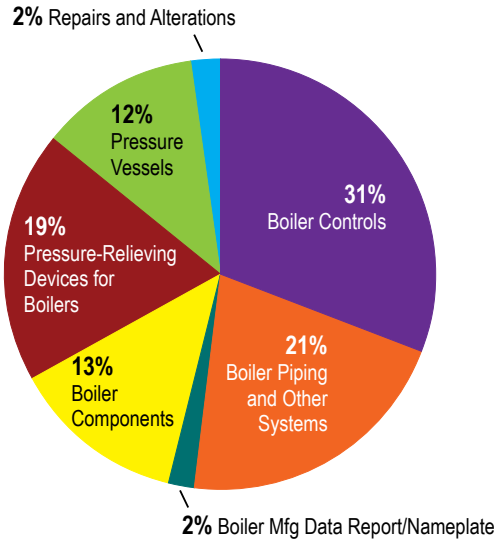
# 2006 Report of Violation Findings

The National Board Annual Violation Tracking Report identifies the number and type of boiler and pressure vessel inspection violations among participating member jurisdictions. The chart below details violation activity for the year 2006.

*The Violation Tracking Report indicates problem areas and trends related to boiler and pressure vessel operation, installation, maintenance, and repair. Additionally, it identifies problems prior to adverse conditions occurring. This report can also serve as an important source of documentation for jurisdictional officials, providing statistical data to support the continued funding of inspection programs.* ❖

## Annual Report 2006

| Category | Number of Violations | Percent of Total Violations |
|---|---|---|
| Boiler Controls | 18,685 | 31% |
| Boiler Piping and Other Systems | 13,004 | 21% |
| Boiler Manufacturing Data Report/Nameplate | 1,322 | 2% |
| Boiler Components | 7,956 | 13% |
| Pressure-Relieving Devices for Boilers | 11,607 | 19% |
| Pressure Vessels | 7,381 | 12% |
| Repairs and Alterations | 1,031 | 2% |




### Summary for 2006

Number of jurisdictional reports: 394

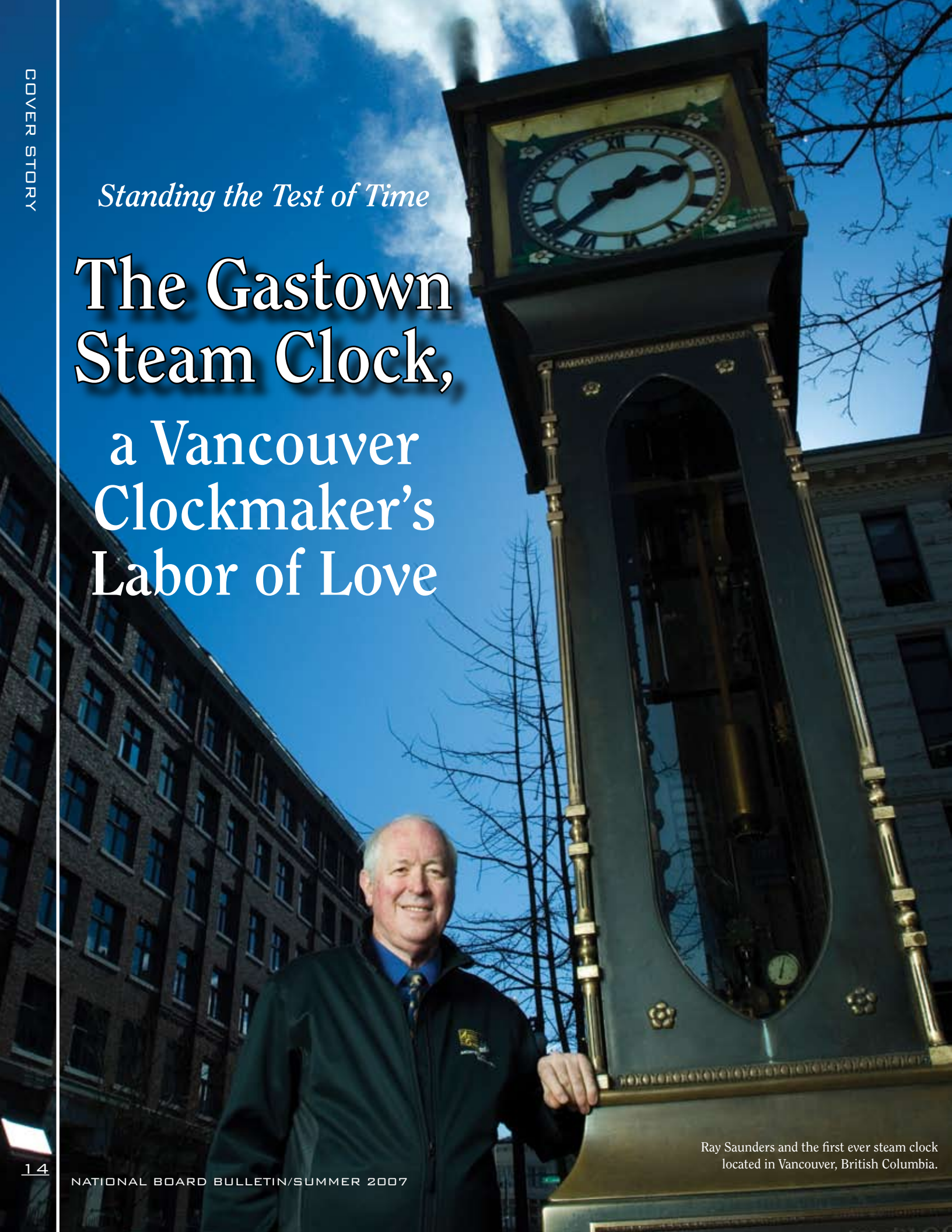
Total number of inspections: 758,708

Total number of violations: 60,986

Percent violations: 8%

*Standing the Test of Time*

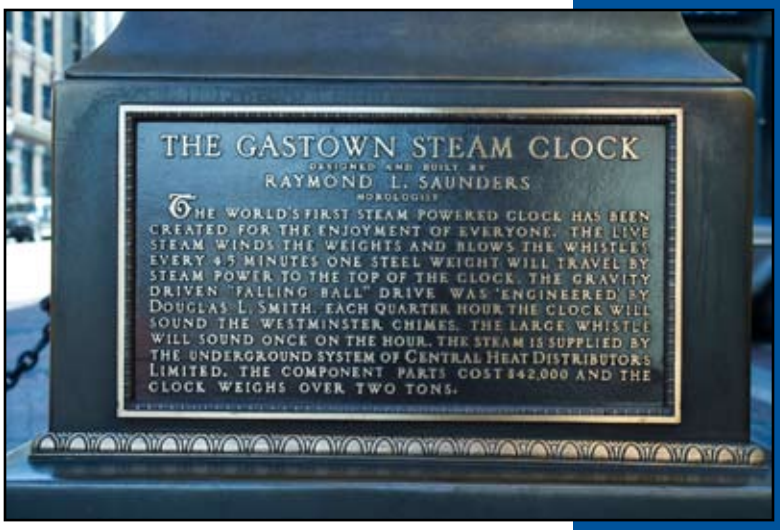
# The Gastown Steam Clock, a Vancouver Clockmaker's Labor of Love



Ray Saunders and the first ever steam clock located in Vancouver, British Columbia.

*BULLETIN* photography by Ed Araquel

"Steam and clocks don't mix."




Or so Ray Saunders kept hearing. Good thing he didn't listen.

Saunders, who is 67 and was born and lives in Vancouver, British Columbia, is owner and president of Landmark Clocks International (*www.landmarkclocks.com*). Since 1970 he has designed and built more than 150 public clocks and was the first person in the world — yes, the world — to do what many said couldn't be done — build a steam clock.

"'Steam and clocks don't mix,'" he says. "That's what I kept hearing from companies when I tried to get one to build a clock mechanism. But I turned all those negative comments into challenges to overcome."

"Vancouver's resident horologist" (as *The Province*, a local paper, once dubbed him) got interested in horology — the science of measuring time or the art of making timepieces — through his father, an electrical engineer. It was the late '50s, and Ray was attending Vancouver Technical Secondary School, taking courses in woodwork, metalwork, and drafting. His father gave him some alarm clocks to tinker with. He took them apart, but couldn't put them back together. Of course most teenagers, notorious for short attention spans, would have probably left the clocks permanently disassembled.

Not this teenager. "I read a couple of books on repairing clocks and learned how to get them going again. That sparked my appetite."

After school and on weekends, he worked at a watch and clock repair shop servicing timepieces for department stores. When he was graduated from high school, Ray apprenticed as a watch and clock technician for Woodward's department store. In 1970, after working for 10 years, he took a course on starting a business. Opening his own shop, Ray began sculpturing metal clocks. In 1975 Jon Ellis, who worked for the City of Vancouver Planning Department, approached Saunders with a proposal concerning Gastown, a historical district near downtown Vancouver.

At that time Gastown merchants and property owners on Water Street were spending a lot of money renovating the street. On a corner of Water and Cambie, Central Heat Distribution, Ltd. (CHD), which provided various buildings with steam heat, had installed along its lines an underground equipment room with air vent. In other parts of Vancouver, CHD had placed hollow planters with small trees over the vents to disguise them. Ellis, knowing the merchants and property owners would want something more picturesque for the money they were spending, talked with CHD about alternatives. They decided on a sculptured clock that would use the steam as a power source. In other words, a steam clock.

Easy enough, right? Hardly. Ellis, now retired, says, "I called every watch and clock maker from Vancouver to Toronto to see if one would make us a steam clock. All of them — not counting the ones who hung up on me — said I was insane: 'Steam and clocks don't mix.'"

Vancouver Central Heat Distribution Operations Superintendent David Falcon next to one of the many control panels serving the Gastown Steam Clock.

Fortunately one of Ellis's coworkers remembered reading an article in *The Vancouver Sun* about a local man who made sculptured clocks. Ellis enlisted the Vancouver Public Library to search back issues of *The Sun* and was given a name — Ray Saunders — and address. The latter, Ellis soon discovered, was no longer correct. After a week or so of playing sleuthhound, he tracked Saunders down.

"By the time I found Ray," Ellis says, "I was well aware a steam clock had never been built. Anywhere. Ray seemed like a keen young man with demonstrated artistic abilities who was clearly clueless he couldn't build one. He was perfect for the job."

Would Saunders do it? "I was too stupid to know it couldn't be done," he says, "so I said I'd be happy to."

Because England has some of the best clock-movement makers in the world, he began contacting companies there to see if one would build him a mechanism. They all turned him down.

Why? You guessed it: "Steam and clocks don't mix." More specifically, condensation from the steam engine can build on the mechanism, which has steel and brass parts, thus causing the steel to rust. Saunders says the companies told him, "Don't get involved in trying to build a steam clock, no one has ever done it. We don't recommend it, and we don't want our mechanisms used for steam clocks."

Since the Gastown Steam Clock Fund-Raising Committee had already started raising money from merchants, property owners, and private contributors, Saunders persisted and found a company in England willing to build a mechanism: Gillett & Johnston, Ltd. Formed in 1844 and located in the London borough of Croydon,

Gilletts specializes in the manufacture and worldwide installation of large public clocks. Managing Director Stephen Coombes says Gilletts decided to work with Saunders because "the fact that no other clockmaker had risen to the challenge made us determined to meet his requirements."

Gilletts built a small tower clock movement based on one of its 1875 designs. A pinwheel escapement drives a one-meter pendulum, and a set of gears drives the hands. Saunders says no steam comes in contact with the movement, only condensation from cool moist air circulating in the clock. To prevent rust, he lacquers all the parts of the movement save the gear teeth.

The clock took two years to build. According to Ellis, "Ray and I ran into every kind of difficulty the human mind can imagine. We overcame them by being stubborn and not a little stupid and by soldiering on one problem at a time."

The main problem was shortage of money. Originally estimated to cost $25,000, the clock was reestimated to cost $42,000 when Saunders found out the bronze case alone would cost $22,000.

In the end the clock cost $58,000. Saunders says, "It was hard to go around a second time and ask for money. It came in really slow. For two years there was a sign on the vent saying, 'Steam clock coming soon.'"

Finally, on September 24, 1977, on a corner of Water Street and Cambie, Vancouver Mayor Jack Volrich unveiled the Gastown Steam Clock™.

"It took two years to build it," Saunders says, "and there were quite a few hurdles to overcome, but that clock was a labor of love."

His and Ellis's persistence has definitely paid off. Since 1977 more than 800 million people have come to see it, and it's the most photographed tourist attraction in Vancouver. "It's very gratifying to see how popular it's become," Saunders says. "There are sometimes three busloads of tourists an hour. When the steam whistles go off, they clap their hands, take pictures, and get back on the bus. I'd be a multimillionaire if I got 10 cents for every picture taken."

Jon Ellis

The Gastown Steam Clock™ is 16 feet high. The case is made of 1/4-inch-thick cast bronze and weighs more than 2,300 pounds. The clock shows the time on four dials; each is 30 inches in diameter and surrounded by a 24-carat gold-plated frame. On top of the clock stand five steam whistles, one in each corner and a large one in the center. They sound from 9:00 a.m. to 9:00 p.m. Every 15 minutes they play "Westminster Chimes": 4 notes on the first quarter, 8 on the half hour, 12 on the third quarter, and 16 on the hour. Because cold whistles do not sound as melodious as hot ones, heaters with copper lines that bypass the solenoid valve constantly blow a little steam into the whistles.

Until recently the whistles were activated by a mechanical tune-playing machine; Saunders replaced that with a Program Logic Controller (PLC), a device he also used in another steam clock, the Indiana State Museum Steam Clock in Indianapolis. That clock, unveiled in May 2002 and provided steam from the museum, is 18 feet high, made of stainless steel with brass trim, and displays four 24-inch dials. Its eight brass whistles, one in each corner and four in the center, play a few notes of "Back Home Again in Indiana" every 15 minutes and a more complete version on the hour.

The Gastown Steam Clock™ is wound by a Stuart No. 4 single cylinder, double-acting vertical steam engine in the base. It stands 10 inches, and the flywheel is 4-7/8 inches in diameter. The cylinder bore is 1-1/2 inches, the piston stroke 1-1/4 inches. Because the engine has to run constantly, Saunders modified it to make it more durable: he changed the piston, piston rings, and slide valve to fluorescent plastic; put spring-loaded gaskets on the piston and slide valve rods; and added oil cups to the bearings, which he changes every five years.

Steam pressure, regulated in the underground equipment room, is 17 psi. When the clock was unveiled in 1977, the pressure was set at 75 psi, but the whistles blew too loudly. "There were complaints," Saunders says, "so we turned the pressure down to 17 psi and retuned the whistles. That's what they blow at now, and they sound great."

The clock movement is wound by the steam engine and driven by descending weights. The engine powers the lower sprocket of a vertical chain, to which are attached ring buckets. At the bottom of the chain, on a track — the starting point — one-pound steel balls are lifted one at a time every 4-1/2 minutes into the buckets. The buckets travel upward and unload the balls onto another track at the top. There they are loaded into buckets of another vertical chain, the clock drive chain. With every tick of the clock, the drive chain moves downward 1/16 of an inch. The chain is geared 5:1, that is, each one-pound ball pulls five pounds on the small sprocket of the clock movement.

ABOVE: Power plant where steam is generated to operate the Gastown Steam Clock. RIGHT: Interior clock movement, including steam engine, fly wheel, and verticle chain and ring buckets used to operate the steam clock.

In his workshop, Saunders carefully examines remnants of an old clock being restored.

Besides the steam clocks in Gastown and Indianapolis, Saunders has built clocks for the cities of Whistler and Port Coquitlam, both near Vancouver, and Otaru, in Japan. The Otaru clock is a replica of the Gastown clock (a replica also stands in Yokohama, Japan, but it is not a steam clock). The Otaru clock, built in 1994 for $125,000, is supplied steam from a Miura packaged boiler. Over the past 10 years Saunders, who assumes all maintenance for his clocks and has never had a steam-related accident, has twice flown to Otaru to fix solenoid valves plugged from mineral-heavy water. “They’ve since put a cleansing machine on the water supply, so they don’t have that problem anymore.”

Generally it takes him a year to build a steam clock. First he draws several designs on a computer and submits them to a client. After the client chooses one, Saunders compiles a detailed quotation of all specified components and drafts a contract including scheduled payments. The price depends on the size of the clock and the material of its case — aluminum, stainless steel, brass, or bronze, which is the most expensive but lasts hundreds of years. The basic price starts at about $185,000.

A fabricating plant near Vancouver, Avant-Garde Sign Graphics, Ltd., builds cases for him. He supervises the work, which includes cutting materials for the clocks using a water jet cutting machine, but is primarily involved in installation. For certain parts, such as steam whistles, he uses subcontractors. “I could make all the whistles myself, but it’s just more efficient to have a machine shop make them.”

For a clock with bronze case, he has a steel frame built and sent to a nearby foundry for bronze castings. When it comes back, he inserts all the components and tests the clock. Because there is no steam in the shop, he takes the whistles to CHD to tune them and test the PLC. When satisfied that all is working well, he takes the components out, packs them up, and sends the clock in three pieces — base cube, center section, and top cube — to the site for assembly. Usually it takes about a week to install the clock. “We have to set the clock up and test the whistles. We have to put silicone on all the joints to weatherproof the case. It takes four or five days, sometimes more.”

Saunders says he doesn’t know who will carry on his work when he quits building steam clocks. “The only apprentice I have is my son. He’s a watchmaker, but he doesn’t want to build them.”

Yet don’t expect the elder Saunders to quit building them any time soon. Right now he is working on a clock still in the concept stage. It will have a Stuart Twin Victoria No. 7 steam engine and nine whistles that will play “Waltzing Matilda.” (Give you an idea of where it’s headed?)

But no matter how many clocks he builds, one in particular will always stand out, the Gastown Steam Clock™. Sometimes he strolls down to that corner on Water and Cambie just to hear people talk about it. "I have fun seeing little kids enjoying it and asking their parents what steam is. Once, a little girl tugged at her mother's dress and said, 'Mommy, that clock is on fire!' Her mother said, 'No, honey, that's just steam.' I get a lot of satisfaction from things like that."

Satisfaction he never would have gotten had he listened to naysayers — those who kept telling him, "Steam and clocks don't mix." ❖


# Hyatt Regency La Jolla

# Designated 2009 General Meeting Site

## Las Vegas General Meeting Site Shifted to 2011

The National Board has announced the 2009 General Meeting will take place at the Hyatt Regency La Jolla, replacing the previously designated Grand Hyatt Las Vegas, which will now serve as the 2011 location.

According to National Board Executive Director Donald Tanner, the decision to move the Las Vegas General Meeting date was necessitated by construction delays at the city's newest Las Vegas strip hotel.

Revised dates of the 2009 General Meeting at La Jolla will be May 11–15. The 2011 Las Vegas General Meeting has been moved to May 9–13.

One of Southern California's premiere landmark venues, the Hyatt Regency La Jolla is situated

on the northern shore of San Diego's upscale "Golden Triangle" resort area. The Michael Graves-designed hotel is conveniently accessible to excellent local restaurants (many with breathtaking panoramic views of the Pacific Ocean), unique boutiques, and art galleries — all within 20 minutes of the San Diego International Airport. The Mobile 4-Star and AAA 4-Diamond-rated Hyatt Regency La Jolla consistently ranks as the Hyatt organization's leading venue for guest satisfaction.

The Grand Hyatt Las Vegas

Scheduled for early 2010 completion, the 2,998-room Grand Hyatt Las Vegas will feature 62 glistening, glass-enclosed stories of hotel and meeting space, a world-class casino, a beach club, and more than a dozen internationally famous restaurants and lounges. It will also include a 1,800-seat theatre, a 57,000-square-foot pool deck with multilevel pools and Jacuzzis, and an incomparable view of the Las Vegas strip, as well as the Bellagio Fountains next door.

Mr. Tanner emphasizes the National Board has secured outstanding hotel room rates for each of the 2009, 2010, and 2011 General Meetings.

The San Antonio Hyatt Regency

The National Board executive director explains the 2010 General Meeting will remain at the Hyatt Regency San Antonio on the Riverwalk May 3–7.

The San Antonio Hyatt Regency is uniquely situated at the heart of the Riverwalk among scores of nearby restaurants and boutique shops. Directly across from the Alamo, the Hyatt Regency's modern 16-story atrium complements lavish marble and steel appointments that provide a stylish contrast to the city's historic motif. A rooftop pool and nightly live jazz on the Riverwalk Landing make this 632-room venue a popular gathering spot for locals and hotel guests alike.

The Sheraton Vancouver Wall Centre

The General Meeting is conducted each year to address important issues relative to the safe operation, maintenance, and construction of boilers and pressure vessels. The 77th General Meeting in 2008 will take place in Canada April 21–25 at the Sheraton Vancouver Wall Centre. ❖

# Gary Scribner Joins National Board

Gary Scribner has been elected to the National Board representing Missouri. He is deputy chief for the Missouri Department of Fire Safety.


Gary Scribner

Mr. Scribner started working for the state of Missouri in 2003 as a boiler and pressure vessel inspector. He began his career as director of building services at Presbyterian Senior Care in 1997 before becoming maintenance supervisor at Smurfit Stone Container Corporation in Milwaukee, Wisconsin, in 1999. From 2001 to 2003, he worked as maintenance manager at Mead Container/ Smurfit Stoner in Fort Smith, Arkansas, before going to Missouri.

He served in the US Navy from 1975 to 1997, earning several commendation and achievement medals. During that time, he worked as boiler technician, recruiter, division officer, director of Navy processing, boilers officer, and repair officer, among other duties.

Mr. Scribner resides in Russellville, Missouri, with his wife Cathy. He has four daughters: Brandy, Stephanie, Shana, and Cindy.

He holds National Board Commission No. 12750. ❖

# Former Chiefs McEwen and Parks Named to National Board Staff

Henry T. McEwen and Terry Parks have joined the National Board staff as senior staff engineers. Mr. McEwen is responsible for violation tracking and reporting as well as working with the technical library. Mr. Parks is involved with NBIC committee activities, National Board and ASME team leader activities, and National Board members support.

Henry T. McEwen

Mr. McEwen served as chief boiler and pressure vessel inspector for the state of Mississippi for 25 years. As chief with the Department of Health, he managed seven employees and provided support to various state departments. During his tenure, he computerized inspection data reporting, restructured the invoicing system, and began annual training of inspectors.

Before joining the state of Mississippi, Mr. McEwen worked for the Public Service Commission as steam plant engineer from 1970 to 1978. He then served as boiler and machinery inspector for Hartford Steam Boiler Insurance Company before joining the Mississippi Department of Health in 1979. In addition, he was a member of the Arkansas National Guard from 1964 to 1970 as a hospital corpsman.

The former Mississippi official was graduated from LaSalle University with a bachelor of science in engineering and a master of science in engineering management.

Mr. McEwen holds National Board Commission No. 9121 with "A" and "B" endorsements. He has one daughter, Lisa.

Terry Parks

Mr. Parks served as chief boiler inspector with the Texas Department of Licensing and Regulation from 2002 until earlier this year. He began working for the department in 1996, first as deputy boiler inspector and then, in 2001, as inspection specialist.

As chief, Mr. Parks managed more than 25 employees and provided support to various state departments. During his tenure, he was able to update the Texas boiler rules with ASME and NBIC codes. He also brought the overdue boiler inspections to the lowest point — 1.8 percent — in Texas boiler history.

Before joining the state of Texas, he served in the US Navy for almost 22 years as senior chief machinist mate. After serving in the Navy, he worked at Clayton Industries as a lead technician.

The former Texas official was graduated from the University of Southern Illinois at Carbondale with a degree in vocational education and curriculum development.

Mr. Parks is a certified team leader and holds National Board Commission No. 12337 with endorsements "A," "B," and "N." He and his wife Lana have 10 children and 12 grandchildren. ❖

# Joel T. Amato

## Chief Boiler Inspector, State of Minnesota

BULLETIN *photograph by Brian Scott Holman*

It was a crisp March day in St. Paul when then Minnesota Chief Boiler Inspector Jim Larson and a representative from the state human resources department sat down to interview a young man for a boiler inspector's position.

As the interviewing process was winding down, the human resources representative matter-of-factly asked the potential inspector where he wanted to be in five years. Pointing at the chief inspector, the Navy veteran confidently replied: "I want *his* job!" Everyone chuckled.

It wasn't even a year following the 1999 interview that present state chief boiler inspector Joel Amato achieved his goal. "I have always been lucky in life," he asserts with a grin. Events of Mr. Amato's rather young heretofore existence appear to support his confidence-fueled optimism.

Joel and his older sister were born to schoolteacher parents in Grand Rapids, a farming community located among the iron ranges of northern Minnesota. Growing up on a 120-acre farm, the future state official spent a goodly portion of his youth chopping wood for the family's wood-burning furnace as well as making hay for the family's livestock. He also invested appreciable time studying his dad's innate talent of being able to fix anything and everything on the farm with duct tape and bailing twine.

Joel admits there were a number of drawbacks to being the offspring of a teacher. But not all were unpleasant. "When I was between the ages of 6 and 10, summer break was a time for our family to travel around the country," he explains. "By the time I was ready to enter high school, I had camped out in 48 states and most of the Canadian provinces!"

It was during these trips young Joel Amato developed an appreciation — nay, passion for fishing. His hook, line, and sinker preference: Walleyes.

Following high school in 1984, he and his best friend decided to join the Navy. Starting as a fireman on the USS *Ogden*, Joel was quickly appointed a boiler technician by the ship's chief engineer. His boiler career had begun.

In 1989 as a boiler technician second class, Joel finished his military obligation and was suddenly without a job, but not without optimism. "Up until that point in my life, I sort of lucked into things," he recalls. "I knew my Navy training would get me a decent job." And it did.

One day after his discharge, Joel was hired on the spot as a stationary engineer at a Long Beach, California medical center. Now making a decent wage and with military service behind him, the future chief boiler inspector decided on pursuing his other passion: flying.

"I spent a lot of money taking flight lessons back then," Joel recollects with a sigh. Such was his interest that he joined the Long Beach Civil Air Patrol.

Life was good in the early '90s, especially when Joel landed a job as a stationary engineer at Lever Brothers. But in 1992, the reality of his "lucky in life" philosophy hit a road bump in the form of a motorcycle accident.

"I broke my leg and was on disability for three months," he explains. While that meant a hiatus in flying, Joel found a novel way to indulge his aviation interests while at the same time capitalizing on his incapacity. "I started making and selling model radio-controlled airplanes," he admits almost in a whisper.

Returning to Lever Brothers, the Grand Rapids native suddenly found himself inundated with soap — bars and bars of Lever Brothers Dove-brand soap. "As employees, we'd get it cheap and give it away," he recollects. "When the plant shut down in February 1994, I brought home enough soap to fill my closets and occupy just about every crevice in my apartment!"

While the closing was disappointing for many, it ironically marked the beginning of another "lucky in life" chapter for the Minnesota state official. "The company provided us with a nice severance package," he emphasizes, "and after three years, I was ready to take some time off."

That summer, Joel interrupted his "time off" to accompany a friend and his wife to Europe. What started out to be a two-week vacation became a four-week sojourn when he and his friend rented a car and took off for the southern coast of France. "We stretched our budget by dining on wine, cheese, and bread every night," Joel explains with fond recollection. The trio continued on to Spain, Italy, Austria — a total of 12 countries in two weeks. Highlight of the adventure was a visit to the Leaning Tower of Pisa where, according to the affable Land of 10,000 Lakes native, "everything leans after a few glasses of wine."

It was in September of 1994 when Joel returned to Minnesota and a nearly depleted checking account. Consequently, he did what anybody would do in his circumstance: he went fishing. "It was the best nine months of my life," Joel recalls, referring to his European adventure and four-month hunting and fishing expedition. With his unemployment compensation now exhausted, the Navy veteran received an offer in January 1995 through the state job service to become a boiler operator at the now defunct Stroh's Brewery plant in St. Paul.

"It was a good job because it familiarized me with operation of coal-fired boilers," he explains with a sense of satisfaction. During graveyard shifts, Joel began studying for the National Board examination. "I came to know Chief Inspector Larson, who encouraged me to pass the exam," he continues. "When I passed in December of 1995, Jim wanted to hire me but couldn't because of a state hiring freeze."

After waiting six months for the hiring suspension to end, Joel accepted the position of boiler inspector/loss control specialist for Kemper Insurance Company, now Hartford Steam Boiler. In March of 1999, Minnesota hired him as a state boiler inspector. When Jim Larson left to enter the private sector in late 1999, Joel was appointed chief boiler inspector.

If the state's new inspector was "lucky in life," he was also lucky in love. While on the job in 2003, he met and began dating his future wife Suzanne. Married in 2004, the Amatos have two small children: Sara and Brianna.

If Joel Amato's good fortune seems almost a flight of imagination, welcome to life without a net. Last year, in his very first run for the National Board Board of Trustees, Joel was elected to a three-year term as member-at-large.

Good natured and quick with a humorous observation, the Minnesota official credits his 11 inspectors for one of the country's most successful inspection programs overseeing the state's 27,000 boilers (including 300 historial units), 52,000 pressure vessels, 135 boats, and 35,000 licensed engineers. "Our success is also due to the tremendous support and encouragement received from our new director, executive director, and deputy commissioner," he proudly adds.

"I have been a very lucky person," Joel says with a nod to the sky. "I have just about everything I could ever want: great wife, wonderful kids, super job, supportive bosses, a talented staff, my private pilot's license, a land of 10,000 lakes . . . and enough soap for the rest of my days!"

Life doesn't get any better than this. ❖

# Eight Years & Counting . . .

# EDT Program Growth

In November 1999, the National Board launched what is perhaps its most ambitious venture to date: Electronic Data Transfer, or EDT.

EDT is an Internet-based document management system that allows manufacturers to electronically create, register, and access their data reports online any time of day or night from any part of the world. This system, developed by the National Board, has become a convenient and dependable method for streamlining the registration process and dramatically reducing paperwork through electronic storage.

To date, EDT has recorded over 4.7 million data report registrations. "That," explains Manager of Data Reports Nikki Estep, "represents a staggering savings of millions of sheets of paper and the elimination of much valued storage space."

In 2006, the National Board electronically registered over 850,000 pieces of equipment — almost 3,500 registrations each business day.

## In the Beginning

When EDT was in the planning stage, the first objective was to create a user-friendly electronic version of the U-1A Pressure Vessel Form, explains Ms. Estep. "During development, we had the benefit of input from several large pressure vessel manufacturers. They were a valuable source of information for developing a system to accommodate the workflow and needs of users."

After the system went "live" in November 1999, the next two years were spent bringing new manufacturers onto the system and fine-tuning the process. In 2002, an in-house programmer was added to expand the number of forms available and thus expose EDT to a wider group of manufacturing locations, as well as continue to enhance the existing features of the system.

Lead Programmer Analyst Dolores Kefalos has worked on the EDT project since joining National Board five years ago.

"The process of incorporating additional forms into the system and the development relating to EDT is a continual work-in-progress," Ms. Kefalos points out. "Many of the recommendations for enhancements continue to come from manufacturers. Because the system is intended for use of manufacturers, it is important we are sensitive to making EDT as easy and as efficient as possible."

Ms. Kefalos explains the EDT system is more complex than a simple data entry system. "It is the warehouse of data for each manufacturer using the system. They also have a number of ways of accessing this information due to the search capabilities of the system. And because EDT is essentially the manufacturer's document management

# Continues

system, it is critical this data is accessible when needed. That's a huge responsibility."

## Eight Years Later

The National Board presently works with 115 manufacturing locations and 28 repair firms, according to Registration Processing Coordinator Donna Radcliff. "Currently, we have 14 data report forms available online to accommodate the registration process." These include: all U and H forms, as well as the R-1 and RP-1 forms. In development is the R-2 form.

New forms are added several times each year, Ms. Radcliff points out. "Unfortunately, bringing on new forms is more complex than most people realize. Each must undergo extensive workflow analysis and testing before it can be made available for online use."

Additionally, forms are modified based on different code changes. For example, earlier this year some forms were modified to accommodate metric requirements of the ASME Code.

With regard to the 36-million-plus data reports stored as microfilm and scanned images, National Board officials say it would be impractical to convert these formats for use in the EDT program.

## The Reviews are In

Designed by the National Board to expressly process data reports online, EDT is a unique, sophisticated system that has received remarkably positive reviews by the user manufacturers.

"They generally like it for different reasons," comments Ms. Estep. "Most are extremely happy with the cost savings and the ability to access their records in just seconds. But all seem to agree doing away with paper records and voluminous space to store these records is both economical and a cure of numerous headaches."

If there are any manufacturer frustrations, the National Board manager concedes, it involves companies that do not register 100 percent of their manufactured items. The EDT system is a document management system for only those items stamped with a National Board number. Of course those choosing to use EDT for all their data reports find the discounted rates for filing electronically and immediate record access to be of significant value.

While EDT may be complex in its technology, Ms. Radcliff emphasizes using the system is rather simple. "I can generally train each new manufacturer over the telephone in a matter of minutes," she adds.

But some manufacturers prefer to find out about EDT in person. Recently, one curious manufacturer visited National Board to obtain a better understanding of how EDT works. "The process of explaining it to him took just minutes," recalls Ms. Kefalos. "But he was so interested in the system, we talked for three hours!"

With EDT nearing its eight-year anniversary, the EDT development team looks back upon their accomplishments with a sense of pride. But Ms. Radcliff says there is one thing she would prefer to change.

"EDT might stand for Electronic Data Transfer," she observes. "But to me, it will always mean Easy, Dependable, and Timely!" ❖

EDT
electronic data transfer system

The National Board's Electronic Data Transfer System (EDT) is an interactive document management system that simplifies and expedites the process of registering data reports.

**The benefits of using EDT include the following:**

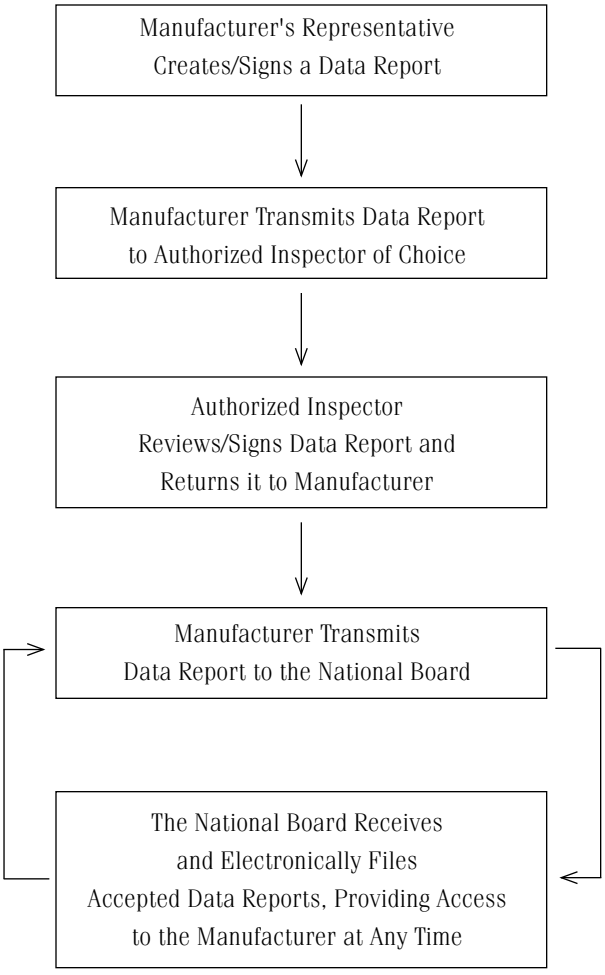
- Decrease in costs for paper and postage
- Discounted filing fees
- Increased productivity:
  1. Required information is automatically inserted each time a data report is created.
  2. Templates allow a manufacturer to create a series of templates for each product line.
  3. Electronic prompting for required information eliminates need for correcting reports because of omitted information.
- Access to data reports 24 hours a day, 7 days a week at no charge
- Access to the most up-to-date data report forms
- One-on-one assistance for each user during normal business hours

**No software is necessary.** All that is required to start the process is logging on to the National Board's EDT Web site.

**System Requirements:**

- Personal computer with Internet Explorer browser (Version 5.0, Service Pack 2 or higher)
- Pentium IV processor or higher
- Windows 98 or higher
- Monitor resolution of at least 800 x 600
- Adobe Acrobat 5.5 or higher

**The EDT Workflow:**



BULLETIN *photograph by Greg Sailor*

# Lois Ann Condo

## Administrative Assistant, Accreditation

Monday through Friday, at 5:00 a.m., when most people are still snug in bed, snoring, Lois Ann Condo is exercising at an athletic club in Westerville, Ohio. Twice a week she walks three miles on the track; three times a week she does water aerobics. "I've been taking the same class for 20 years with some of the same people," she says. "It's a lot of fun."

Most people probably wouldn't call exercising at 5:00 a.m. "fun." But perhaps this is what helps keep Lois, a 67-year-old grandmother, looking so youthful.

Lois has worked at the National Board since October 31, 1989. One of her jobs before coming to the Board was in payroll at the Timken Company, a manufacturer of tapered roller bearings. There, in the 1960s, she met her future husband, Joe, a machinist. "On payday, we'd go to the factory and hand out checks to workers at their machines. That's how I met him." Joe retired from Timken in 1999.

Lois and Joe have two children, Kathy, 37, and Joey, 36. Kathy and her husband live in McDonough, Georgia, and have one child, Joshua, 5. Joey and his wife live in Delaware, Ohio, and have four children: Morgan, 11; Clayton, 6; Gabrielle, 3; and Robert, born in March.

Besides her passion for exercising, Lois has a much more important one — spreading the word about autism, with which her grandson Clayton was diagnosed when he was two.

Autism is a neurobiological disorder affecting a person's ability to communicate and interact with others and his or her environment. Many autistic people can't speak or understand simple concepts and need intensive behavioral intervention to help them do so. A recent US study of autism, the cause of which is unknown, found that one in 150 American children has the disorder and called it an urgent public-health concern.

"I knew something was wrong with Clayton at 17 months," Lois says. "He wasn't talking, he didn't look in your eyes, and he stopped doing things."

Thanks to the patience of his family and aggressive therapy known as applied behavioral analysis (ABA), Clayton has made stellar progress. He attends mainstream kindergarten and reads at a second-grade level. "At first it was hard on all of us," Lois says, "but now there are more good days than bad ones. Because of ABA, I finally understand him and know how to deal with him." When she retires, she hopes to get more involved with autistic children and ABA.

And when will she retire? Probably not soon. "I'm in no big hurry. I'm afraid I'll be bored."

Besides, she needs to help fund another passion — buying products from The Longaberger Company in Newark, Ohio. This passion began in 1995, when she started collecting pottery because — she says jokingly — "Food tastes better on Longaberger plates." Soon her passion spread to baskets, curtains, tablecloths, etc. "Yes," she reluctantly admits, "I do buy a lot of stuff at Longaberger parties."

With a smile she adds, "But it's because it's all made in Ohio. I'm supporting the economy."

A good reason indeed. But that smile suggests it's not the only one. ❖

*"Do You Know . . .?" is a* BULLETIN *feature introducing readers to the dedicated men and women who comprise the National Board staff.*

# Applying Book Knowledge to Real-Life Situations

BY RICHARD MCGUIRE, MANAGER OF TRAINING

If knowledge is power, applied knowledge is unlimited power. In National Board training courses, students not only learn from specialized instructors, they position themselves to apply their knowledge to work situations. It is practical training they directly and immediately use.

For example, the Pre-Commission Examination Course is designed primarily to aid students in passing the National Board Commission Examination. We teach requirements in the ASME Code, then go one step further using real-life examples of how to apply the code. This approach exposes students to doing things that will benefit them on the job. In other words, the course is practical.

In the "A" endorsement course, we do much the same thing. Throughout the manufacturing phase of a pressure-retaining item, an AI is required to verify many items, such as design calculations, material identification and control, NDE, and welding qualifications. In class we begin by discussing code requirements and pointing out to inspectors their duties regarding manufacturer oversight. We then present students with a fabrication package for construction of a vessel. Using a series of workshops, we guide inspectors through the necessary steps to ensure code compliance. The workshops take students through the design package, as well as what must be verified and how to accomplish that verification. Material ordering and verification is discussed, and traveler development and procedure review and acceptance is thoroughly covered. This method provides situations as close to real life as can be accomplished in a classroom.

In our "B" and "NS" endorsement supervisor courses, we strive to use the same methods, mainly concentrating on supervisor duties and responsibilities by demonstrating how to perform audits, help subordinates, and ensure all code requirements are being met.

In the *Introduction to Boiler Inspection Course*, students are first taught code requirements. The ASME Code of Construction is covered along with codes applying to boiler controls. Students travel to a local hospital boiler room, where they must locate all systems making up a power plant. Students then make an inspection checklist to use when they return to inspect the boiler. They also write an inspection report and conduct a mock exit interview with the owner. During the interview, students explain what was found and specify any necessary repairs. In this class, there is as much *doing* as there is reading.

Our *Safety Valve Repair Seminar* uses a similar technique, except everything is accomplished in the classroom. After teaching code requirements, we demonstrate how to disassemble valves, what to look for during assembly, how to tell if parts need repairing, and how to make adjustments to valve settings. While not actually a hands-on seminar, it is a very effective method.

Most people grasp ideas when they can apply information in a controlled environment. The use of real-life situations is one way of fostering this. Learning what is in the book is only half the challenge. Applying knowledge is the other half. At the National Board we do our best to stress both halves.

Remember, all our courses can be conducted at your facilities. Classes tailored to your specific needs can also be developed. For information, contact me at 614.431.3214. ❖

## ENDORSEMENT COURSES

**(A)** **Authorized Inspector Course** — TUITION: $2,500

September 10–21 October 22–November 2

**(B)** **Authorized Inspector Supervisor Course** — TUITION: $1,250

August 6–10

## CONTINUING EDUCATIONAL OPPORTUNITIES

**(IBI)** **Introduction to Boiler Inspection Course** — TUITION: $2,500

July 23–August 3

**(PEC)** **Pre-Commission Examination Course** —
TUITION: $2,500 Full two-week course
$660 Self-Study (Week 1) portion
(self-study materials sent upon payment)
$1,190 Week 2 of course

August 20–31

**(R)** **Boiler and Pressure Vessel Repair Seminar** — TUITION: $400

October 15–16

**(VR)** **Repair of Pressure Relief Valves Seminar** — TUITION: $1,250

July 9–13 October 15–19 (Houston)

**(WPS)** **Welding Procedure Workshop** — TUITION: $670

October 17–19

## REGISTRATION FORM

Please circle the seminar/course(s) and date(s) you wish to attend. Please print.

☐ Mr. ☐ Ms. ☐ Mrs.

Name* _____

Title _____

Company _____

Address* _____

City* _____

State/Zip* _____

Telephone* _____

Fax _____

Email* _____

NB Commission No. _____

### PAYMENT INFORMATION (CHECK ONE):

☐ Check/Money Order Enclosed
☐ P.O. # _____
☐ Payment by Wire Transfer
☐ VISA ☐ MasterCard ☐ American Express

Cardholder _____
Card # _____
Expiration Date _____
Signature* _____

***Required**

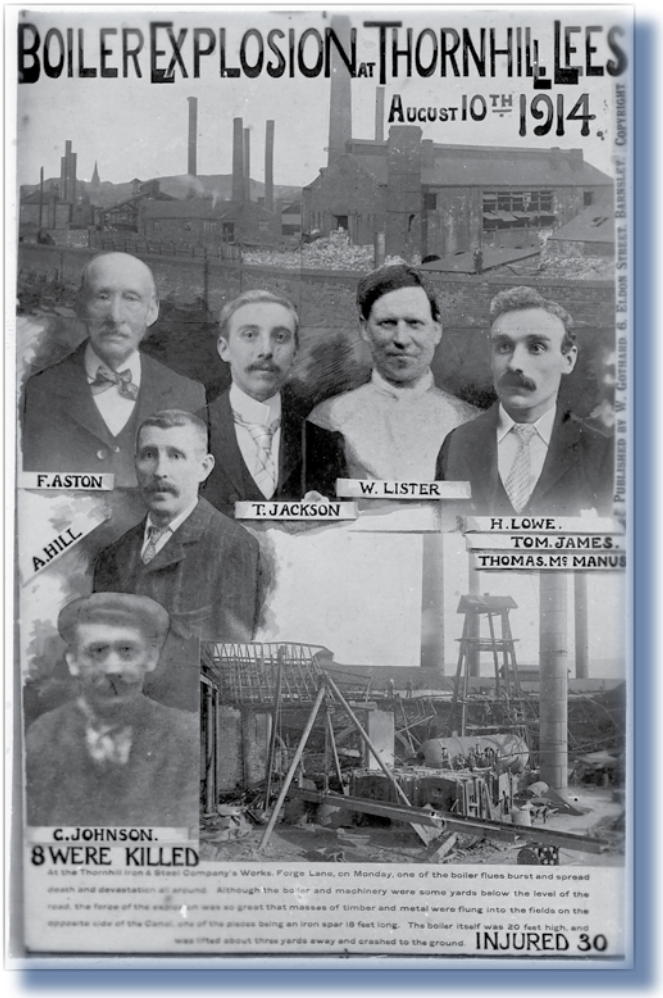
### HOTEL RESERVATIONS

A list of hotels will be sent with each National Board registration confirmation.

All seminars and courses are held at the National Board Training and Conference Center in Columbus, Ohio (unless otherwise noted) and are subject to cancellation.

For additional information regarding seminars and courses, contact the National Board Training Department at 1055 Crupper Avenue, Columbus, Ohio 43229-1183, 614.431.3216, or visit the National Board Web site at nationalboard.org.

## Running Short of Steam
# Thornhill Lees — August 10, 1914




The explosion shook the countryside surrounding the Thornhill Iron and Steel Company at Thornhill Lees, West Yorkshire, England. Eight people — six of whom were shown on a postcard commemorating the event — were killed and many injured. Observers who rushed to the scene found only destruction.

At the inquest, Frederick John Thornett Wheeler stated he had been manager at Thornhill for 22 years and director for 18 months. The company operated eight boilers, which were coupled together. The boiler that exploded was a Rastrick vertical boiler. Newly installed in 1897, it could withstand 80 to 100 pounds of working pressure. However, the company's maximum working pressure was 60 pounds, and the boiler blew off at 55. It was inspected every year and had been inspected the previous December and found "perfectly satisfactory."

A report given to the jury showed the boiler had been externally examined only a couple of weeks before the explosion, on July 27. At that time the boiler was working normally under everyday conditions, with no repairs necessary. The coroner pointed out to the jury the importance of these findings.

When further witnesses were examined, it came to light that before the explosion some workers had put a weight atop the safety valve to "save the steam, as we were running short." In addition, the stop valve had been screwed down, and the boiler somehow uncoupled from the others. When it began to generate too much pressure, the blocked safety valve could not release the steam. ❖

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