

# BULLETIN

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The first motorcycle was powered by steam?  
Find out on page 18.

*BULLETIN cover photograph by John Gilroy.*

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# The NBIC Comes of Age

BY DONALD E. TANNER, EXECUTIVE DIRECTOR

It's hard to believe the *National Board Inspection Code* will be 65 years old in just three short years. And it is even more difficult to believe the very first code printed in 1945 is the fore-runner of what will be distributed in just three short months.

Interestingly, the first code "book" was more of a pamphlet. Measuring 5-1/2 inches wide and 8-1/4 inches long, its 24 pages were humbly enjoined by two metal staples.

That "Preliminary Printing," as it was called back then, did not as much address the mechanics of pressure equipment as it did establish the framework for what would become one of the world's most significant inspection documents.

Quoting from that original code:

*"This guide will be called the NATIONAL BOARD INSPECTION CODE and a copy will be placed in the hands of every member and of the 2000 National Board commissioned inspectors. It will serve as a textbook for the beginner and as an important influence toward uniformity for the more experienced."*

The first code was broken into six chapters: Introductory; Laws, Rules, and Regulations; Rules for Inspection of Existing Boilers; Rules for Inspection of New Boilers; Rules for Boiler Repairing; and Reference Data.

Fast forward 62 years and witness the introduction of the 2007 *National Board Inspection Code*. While dramatically more elaborate in content, it will comprise three parts: installation, inspection, and repairs/alteration. For the first time in the code's extensive history, these parts will now be segregated into individual binders.

This multi-document NBIC is evolutionary for a number of reasons, the foremost of which maximizes accessibility by NBIC

users. Those purchasing the NBIC now have the option of buying one part, two parts, or the entire three-part edition. In addition to the hard copy binders, each part will be individually offered in a CD-ROM format.

There is yet another option for NBIC purchasers, particularly those desiring more technically sophisticated information retrieval. Beginning with the 2007 edition, the NBIC will be offered in a Web-based format. As such, the NBIC will be instantly available to anyone with an Internet connection. As with the 2004 edition, NBIC hard copy/CD-ROM subscribers will continue to annually receive *only one addendum* at year's end. The Web-based NBIC, however, will include the most recent changes as approved by the NBIC Committee and released for publication.

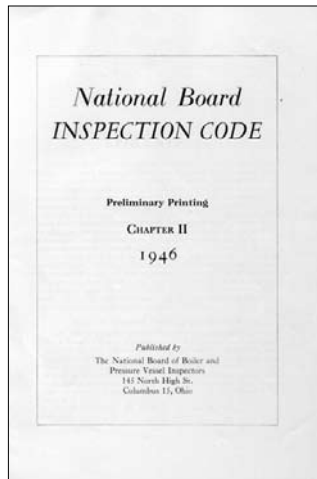
Some of you may notice a certain irony comparing the 2007 *National Board Inspection Code* with its predecessors. As this American National Standard has significantly expanded in content over the past 62 years, its physical dimensions — thanks to technology — have actually shrunk. Now with a Web-based format, the new NBIC will be conveniently accessible to anyone,

including those with a simple, handheld Internet-access device.

Yes, the NBIC's footprint has been extensively reduced. But its growth and influence within the pressure equipment industry has been nothing less than remarkable.

While the original NBIC Committee may never have envisioned their publication in the formats of today, I am sure they would be very proud of how that first modest pamphlet evolved.

Both in size *and* stature. ❖





# A Sign for the Times

BY PAUL BRENNAN, DIRECTOR OF PUBLIC AFFAIRS

It was a typical December day in Johnstown, Ohio.

However, for this small bedroom community of 3,500 located just 30 miles northeast of Columbus, the events of December 1 would be anything but typical.

The tree-lined streets of Johnstown displayed residue of the season's faded flora. Evenings yielded a sobering, precursory chill. And so it was on this invigorating December morning that Johnstown's young children gathered to attend Oregon Elementary School for an anticipated pre-Christmas curriculum.

But around noontime, Principal Linda Broebeck noticed an unpleasant smell in the school building. About the same time, a custodian from nearby Adams Middle School spotted smoke coming from the elementary school's basement.

Principal Broebeck followed procedure and evacuated the children before calling Aleron, a controls and mechanical company, which just happened to be performing repair work at the school location. Aleron dispatched on-site contractor Butch Harvey to Oregon Elementary's boiler room, where he made a disturbing discovery.

"I found a lot of smoke and a boiler that was running without water," he explained. Firefighters would later estimate boiler temperatures well in excess of 1,200 degrees when Mr. Harvey prepared to enter the boiler room.

"He actually crawled on his hands and knees down by the boiler at the risk of his own life to turn off three main valves," emphasized Maintenance Supervisor Mike Myers.

"I didn't think about the danger I was in at the time," Mr. Harvey recalled. "Not just anybody could go in and shut it down correctly. . . . There's a certain sequence in which things must be turned off."

The first, he pointed out, are the water valves. "When water hits the boiler, it could be like a low-pressure bomb and take out a good part of the school and any people there."

For defusing what was a potentially volatile situation, a humble Butch Harvey now enjoys heroic status — particularly among the students, parents, and teachers of Oregon Elementary School.

According to Mr. Harvey, the affected boiler was brand new, having been brought on line last October 13. "The condensation station, where the steam turns back into water and . . . fed back into the boiler by pumps was wired improperly so the boiler couldn't get any water," he pointed out. "And the water shut-off [low water fuel cut-off] was wired improperly so the boiler wouldn't shut itself off."

"Firefighters would later estimate boiler temperatures well in excess of 1,200 degrees . . ."

By his own admission, Mr. Harvey has quite a bit of experience with pressure equipment that totals, according to supervisor Myers, "many, many years of boiler installation and maintenance . . ."

When the veteran mechanical contractor observed "not just anybody could go in and shut it [the school boiler] down correctly," he put his finger on one of the most profound problems facing pressure equipment owners/operators today: lack of technical understanding.

It was indeed fortuitous the school had someone on premise who knew what to do. For many in similar situations, panic displaces common sense, and the use of water to cool down hot equipment becomes a logical choice.

But what if on that brisk December day in Johnstown, Ohio, the school had no one nearby with Mr. Harvey's experience? How would anyone — teacher, custodian, deliveryman, passerby — know what to do when face-to-face with a cherry-red piece of pressurized equipment that is (in all probability) about to do something very, very unpleasant.

In such tense situations, it's too late to dig out the maintenance manual. Time permitting, a call to the fire department or the installation contractor could preclude any ill-advised introduction of water. But if the luxury of time is not on one's side, how can the danger of an overheated boiler effectively be communicated to a layman?

The answer: signage.

Having been in my share of boiler rooms over the years, I have yet to see any posted instructions regarding what to do in a pressure equipment emergency.

First aid? There's a ton of material on what to do for injuries. Because that information has been available for years, most workers have seen it enough times to know precisely what to do.

It is now perhaps time for pressure equipment professionals to assume a similar path.

Unlike first aid messages splashed across industrial work areas, the pressure equipment notice should be short and to the

point — something such as:

**EXPLOSION WARNING**  
**Do Not Introduce Water**  
*Into or Onto*  
**An Overheated Boiler**

The addition of a telephone number or numbers to call for emergency assistance should also be posted close to the affected equipment.

You are now probably asking yourself, if this is such a grand idea, why doesn't the National Board mandate warning notices in and around the boiler room?

As many of you know, the National Board's responsibility physically ends with the pressure unit itself. It is not within National Board's authority to advise what warnings be prominently displayed unless said information is required to be physically part of the pressure equipment unit.

But what about jurisdictions?

Before anyone misinterprets where I am going with all this, please understand: I do not advocate any more regulations than those presently administered. However, the posting

of danger warnings in boiler rooms would be a positive step in helping curtail confusion that ensues when a lay person is confronted with a potentially deadly set of circumstances.

Some pressure equipment professionals may giggle at the idea. Of course *they* know proper procedure. But a significant number of individuals who work around and are responsible for pressure equipment know only to call a repairman when a

“How would anyone . . . know what to do when face-to-face with a cherry-red piece of pressurized equipment . . .”

problem occurs. (Would *you* know what to do if suddenly confronted face-to-face alone with, say, a black bear mistakenly disenfranchised from the local zoo?)

Just like an emergency evacuation plan or first aid education, employees must be continuously reminded of what to do if presented a dangerous scenario.

This is why boiler owners may want to thoughtfully consider a voluntary signage program. This past fall saw scores of boiler incidents, many of which occurred when school was not in session. But it is only a matter of time before luck runs its course.

Let's hypothesize for a moment.

If it were decided to post warning signage, what should be the location?

At Oregon Elementary, Butch Harvey crawled on the floor because of smoke filling the boiler room. A notice close to the boiler would have been of little consequence in that situation. Common sense tells us having a sign posted on the boiler room door and perhaps in a close location just outside the boiler room would caution everyone from soaking an overheated boiler with water.

And a sign close to the boiler? It would also be needed if for no other reason than to indoctrinate — day-after-day — those who frequent the boiler room whether as a professional responsibility or in a part-time caretaker capacity.

There are substantial numbers of individuals unfamiliar with correct safety procedures. Among these: school custodians, small business owners, church volunteers, after-hours cleaning personnel . . . just about anyone believing a boiler is as simple and harmless as a coffee maker.

“Experience  
and good  
communication  
save lives.”

But even experience has its limitations. Some who have worked for years around boilers either have forgotten or never became aware of the incompatibility of water and a hot, empty boiler.

The solution to educating the masses about this potentially lethal combination is elementary. So, too, the effort. (How complicated can it be to scribble a simple message on walls with close proximity to boilers or on doors leading into boiler rooms?)

And here's the best part: it's inexpensive, even if warning notices are posted at multiple locations. Is there a more effective and efficient way of communicating the dangers of an overheated boiler to those without a clue?

Perhaps what happened on that frosty December day at Oregon Elementary School was not nearly as important as what did not: that an unsuspecting good samaritan attempted to resolve a potentially lethal problem without knowledge of impending consequences.

Experience and good communication save lives. Some day, warning signs will be posted in *all* boiler rooms.

But what price will we pay before being so compelled? ❖

*The BULLETIN extends its appreciation to MOUNT VERNON NEWS (Ohio) and staff writer Pamela Schehl for reporting the Oregon Elementary School story in its 12.15.06 edition.*

# 2007 Registrations

National Board *Certificate of Authorization to Register* guarantees the third-party inspection process, providing for uniform acceptance of pressure-retaining equipment by member jurisdictions. This important safety process is documented via submission of data reports by the manufacturer to the National Board. These data reports are the only reports carrying the National Board registration number. Once registered, each report is maintained in a permanent file by manufacturer name and National Board number.

The list below identifies boiler, pressure vessel, and nuclear vessel registrations by size for the past five fiscal years. The National Board fiscal year is from July 1 to June 30.

The total number of registrations on file with the National Board at the end of the 2007 reporting period was 41,581,021. ❖

SIZE	FY 2007	FY 2006	FY 2005	FY 2004	FY 2003
<b>BOILERS</b>					
<i>square feet of heating surface</i>					
≤ 55 (A)	139,435	106,285	111,360	109,064	98,312
> 55 and ≤ 200 (B)	30,235	28,999	31,331	30,642	32,927
> 200 and ≤ 2000 (C)	10,050	9,225	9,325	9,322	9,797
> 2000 and ≤ 5000 (D)	891	641	651	629	846
> 5000 (E)	916	738	733	912	2,105
<b>TOTAL</b>	<b>181,527</b>	<b>145,888</b>	<b>153,400</b>	<b>150,569</b>	<b>143,987</b>
<b>PRESSURE VESSELS</b>					
<i>in square feet</i>					
≤ 10 (A)	856,421	825,423	741,220	718,214	745,601
> 10 and ≤ 36 (B)	356,659	363,092	399,534	449,968	370,780
> 36 and ≤ 60 (C)	57,587	58,987	58,447	64,790	50,263
> 60 and ≤ 100 (D)	13,123	11,729	10,160	9,794	9,628
> 100 (E)	16,490	13,160	10,626	10,426	12,975
<b>TOTAL</b>	<b>1,300,280</b>	<b>1,272,391</b>	<b>1,219,987</b>	<b>1,253,192</b>	<b>1,189,247</b>
<b>NUCLEAR VESSELS</b>					
<i>in square feet</i>					
≤ 10 (A)	712	519	553	702	1,725
> 10 and ≤ 36 (B)	182	71	5	90	137
> 36 and ≤ 60 (C)	63	9	1	1	33
> 60 and ≤ 100 (D)	13	23	5	132	14
> 100 (E)	34	24	15	15	17
<b>TOTAL</b>	<b>1,004</b>	<b>646</b>	<b>579</b>	<b>940</b>	<b>1,926</b>
<b>ATTACHMENTS*</b>	<b>89,815</b>	<b>76,707</b>	<b>70,736</b>	<b>77,715</b>	<b>100,136</b>
<b>GRAND TOTAL</b>	<b>1,572,626</b>	<b>1,495,632</b>	<b>1,444,702</b>	<b>1,482,416</b>	<b>1,435,296</b>

\*An attachment is any type of additional information to be submitted with the primary data report.

For more information on the Authorization to Register Program, access the National Board Web site at [nationalboard.org](http://nationalboard.org)



# Pressure and Temperature Monitoring of Boilers

BY HENRY T. MCEWEN, SENIOR STAFF ENGINEER

To properly inspect, operate, or monitor a boiler, an inspector needs responsive, accurate, and reliable indicators of the boiler's condition. Knowing the correct pressure and temperature of an operating boiler at all times is the first step in evaluating the status of the boiler's functions.

This especially holds true for the inspector who conducts the periodic operating (external) inspection as required by the jurisdiction. Most jurisdictions require an inspection to be conducted under normal operating pressures and temperatures. Depending on the construction type of the boiler, the inspection is conducted at specific times, ranging from annually to biennially. The information obtained has a direct impact on the issuance of the operating permit, which is released by the responsible inspector *only* upon completion of a satisfactory physical inspection.

To safely and properly conduct the inspection, one must know the boiler's operating parameters. With the use of properly installed and accurate boiler gages (along with pressure and temperature controls), it is possible to determine if the boiler is operating within its design limits. Questions pertaining to the current operating pressure, maximum allowable working pressure, and normal and acceptable operating temperature must be answered.

To answer such questions the inspector or operator must become familiar with these limits. Once known, the next step is to visually examine the indicators and compare them with the current operating condition. Any unusual observations should be addressed during the inspection and, if needed, corrective actions taken. Common problems include incorrectly installed gages or indicators, improper gages or indicators, clouded glasses, broken gages, and missing pointers. National Board violation tracking records even reflect that these appurtenances are sometimes found missing from the boiler proper.

ASME codes specify guidelines for the choice of gages to be used for installation on code-constructed objects:

Section I of the ASME Code (PG-60.6.1) states that each boiler shall be equipped with a pressure gage located so that it is easily read and that it shall at all times indicate the boiler pressure. This suggests that not only the location of the pressure gage is important but also the condition. PG-60.6.1 clearly gives other mandates about how to ensure that the pressure gage can indicate accurate and current operating pressures. It even goes as far as describing the dial range of the gage. The Code states the dial shall be graduated to approximately 2 times the set pressure of the safety valve, but in no case less than 1-1/2 times the safety valve. (In the case of two valves on a boiler, the lowest set safety valve should be used.) Pressure gage connections for steam boilers are pointed out in NBIC Appendix I-2722.

If possible, it is always good practice to compare the pressure indicated on the boiler's pressure gage with another source. Another gage on the boiler or downstream of the boiler is a good second observation. Common findings during operational inspections include broken gages, improperly mounted gages, nonfunctional gages, and gages for the wrong service.

Section IV: HG-602 (Steam Gages) and HG-611 (Pressure or Altitude Gages) are two references for the requirements of low-pressure steam and hot-water boilers. HG-612 (Thermometers) provides another reference for observing the operating temperature of a hot-water boiler.

For years, the *National Board Inspection Code* has addressed the issue of pressure and temperature device requirements.



Three deficient pressure gages. The one in the center is broken. The other two indicate pressure, though there is no pressure source.

Appendix I (I-2720) establishes pressure gage requirements. Appendix I (I-2730) is specific to temperature monitoring. The ASME Code and NBIC specify the area of pressure and temperature monitoring is critical and essential for safe boiler operation and inspections.

We have discussed the issue of pressure and temperature monitoring from a code and safety standpoint, but it should also be noted this can very well be a tool in monitoring the performance of a boiler. Conducting periodic gage readings from both the temperature and pressure sides can provide a time-lapse look at the boiler's activity. During an inspection it is not unheard of for an inspector to ask for a boiler operating log, which provides a look into the boiler's daily activity and allows for a more detailed and operational-sensitive inspection.

This information can also help in the event of an unexpected boiler outage. Charts, graphs, and other indicators are also useful in determining the boiler's operation. These can be especially helpful when a full-time operator is not available to conduct routine meaningful readings.

A recent survey conducted by the Department of Energy stated almost 80 percent of the boilers used today are 30-years-old or older. Granted, these are primarily the large, high capacity boilers, but also included are the smaller boilers used in hospitals, churches, and schools, where the vast majority of boilers are located.

One of the most recent results of the National Board's Violation Tracking Program revealed that in the first quarter of this year, 33 percent of the total violations were related to boiler controls, which are often indicated by pressure/temperature gage readings. This is the highest percentage of any category now being tracked. Though no one area of concern can be isolated because of different conditions noted on many reports, the percentage indicates inspectors are paying attention to pressure and temperature gages and their operating conditions and recording this data on inspection reports.

With regard to vessel operation and inspection, the use of accurate and properly installed indicators, whether pressure or temperature, takes the guesswork out of the equation. As an inspector responsible for a detailed inspection or as an operator responsible for safe operation, one must know at all times the status of the boiler, especially the operating pressure and temperature. ❖

In 1990 the National Board Testing Laboratory (NBTL), requiring additional space and upgraded systems for testing pressure relief devices, initiated a project to move from its facility at the Picway Generating Station (12 miles south of Columbus) to a facility in Worthington, a suburb of Columbus. The new facility would house the test laboratory as well as offices for the staff of the Pressure Relief Department, previously located at National Board headquarters.

The facility, completed in 1991, was state of the art; sixteen years later, it remains so. It also remains — no matter the state of the economy — continually busy.

“We’re immune to the economy,” says Joe Ball, who has worked for the National Board for 27 years and is director of the Pressure Relief Department. “Whether a manufacturer sells one pressure relief device or a hundred, they have to test them if they want to remain certified, so there’s never a lag.”



Joe Ball, director of the Pressure Relief Department

# National Board Testing Laboratory

## Continues to Set the Standard



BULLETIN photography by Greg Sailor



Shown above, two 900 psi steam generators in boiler room behind testing area. High-pressure air compressors (right).

The NBTL is operated by the Pressure Relief Department and conducts tests according to the ASME Performance Test Code PTC-25. The department's role, supported by the testing done in the NBTL, is:

- to grant certifications to use the National Board "NB" mark, "VR" repair stamp, and ASME Code Stamp Symbols "V," "HV," "UV," and "UD";
- to test new pressure relief concepts and designs;
- to serve as the comparative standard for all pressure relief testing labs accepted by the National Board and ASME (as of April 2007, there were nine such labs, including one in Hamburg, Germany);
- and, at the request of members, to conduct tests on pressure relief devices involved in boiler and pressure vessel accidents.

The "NB" mark signifies that the relieving capacity or flow resistance and performance of a pressure relief device meet the applicable construction code under National Board supervision. With regard to granting certification to use the "NB" mark and ASME Code Stamp Symbols, the



NBTL conducts two kinds of tests: one for initial certification, the other for production certification. The first establishes rating value used to determine the certified capacity of the pressure relief device. The second demonstrates that methods of construction, assembly, and testing by the manufacturer yield a device meeting code operational requirements and that the device meets or surpasses the flow rating for which it was originally certified.

The "VR" repair stamp signifies a company has established and demonstrated an adequate quality system for repairing pressure relief valves. The NBTL tests sample valves repaired by the applicant to verify they meet the ASME code requirements for performance and relieving capacity that would apply to the valve if it were new.

The actual testing area is approximately 3,600 square feet. Steam is produced by two 900 psi steam generators installed when the facility was built in 1991. Capable of producing almost 20,000 pounds of dry saturated steam per hour, they are located in a 1,400-square-foot boiler room behind the testing area. The room also contains three high-pressure air compressors and other support equipment.

The lab features three test systems using steam, air, and water. Each has a pressure vessel to which a pressure relief device can be attached for testing, and each can handle devices set up to 500 psi. A computer-based acquisition system captures data for fluid flow computation and analysis. Depending on the system and device, tests can take from 15 minutes to an hour.

Since moving into the Worthington facility in 1991, the NTBL has performed almost 24,000 tests, an average of 1,480 per year. Ball says the number increased significantly in 1998 after the 1998 addenda to ASME Code Section VIII was issued. Among other things, the addenda



Brandon Ashbrook, right, tests an air pressure relief valve. Shown below, the air pressure test line.





Above, Brandon Ashbrook (left) and Tim Brown hook up a steam pressure relief valve for testing.

Top photograph, Steve Irvin (left) and Tim Brown monitor a steam test.

required the certification of rupture discs and outlined methods of testing. "The addenda basically added a whole industry," Ball says. "We conducted our first test of a rupture disk in January 1998. By the end of the year, we'd done over 2,000 tests."

But don't think he and his staff ever get overwhelmed by the work or tired of it. "The variety of different types of pressure relief devices we see," Ball says, "along with the test participants coming from all over the world, keeps our work varied and interesting."

With a 16-year-old facility, he and his staff constantly monitor the condition of piping, pressure vessels, and valves to ensure continued safe operation. When necessary, they upgrade equipment. In 1996, air compressor capability was increased with a new 3,000 psi compressor; two more were installed in 2005. Air-drying capability was also improved in 2005. In 2001 a smaller high-pressure air test system for pressures up to 2,000 psig was added.

Ball says an expansion in testing is possible in the next few years. "There's been resurgence in the nuclear industry both in the U.S. and overseas. That will probably affect us. So will changes to ASME Section VIII as new types of devices are considered. Also, as the new ASME Code Section XII for transport vessels is adopted, I expect to see new work for testing pressure relief valves used in that industry."

In other words, in the upcoming years, expect to see the lab continue to set the standard for testing pressure relief devices. ❖

Pictured clockwise: a water pressure relief valve, the water pressure test line, and Joe Ball (left) and Henry McEwen conducting a water test.

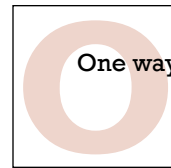


# Cast Aluminum Heating Boilers

by Terry Parks, Manager of Field Services



**High-efficiency, condensing gas water boiler. Courtesy of Burnham.**



One way to satisfy demands for higher efficiency and a cleaner environment is through cast aluminum heating boilers.

The transfer of heat with cast aluminum is approximately three times faster than with cast iron. Because of reduced fuel consumption, lower flue temperature and fuel emission are produced, and operating costs lowered.

The efficiency of a boiler is given as the Annual Fuel Utilization Efficiency (AFUE), a measurement of overall performance. AFUE is the seasonal or annual efficiency with regard to the cyclic on/off operation and associated energy losses of the heating unit as it responds to changes in the load. This in turn is affected by changes in weather and occupant controls. AFUE is measured by the amount of heat delivered to a conditioned space divided by the amount of fuel energy consumed.

AFUE shows how much energy is being converted into heat and is indicated by a percentage. For example, an AFUE of 92 means that 92 percent of the fuel is being used while 8 percent escapes as exhaust with combustion gases. Currently the US Department of Energy

(DOE) allows a minimum AFUE of 75 for gas steam boilers offered for sale in the United States; for other boilers, the DOE allows a minimum of 80.

In October 2006 the DOE proposed new efficiency standards for residential furnaces and boilers offered for sale in the United States. The standard would set the minimum AFUE to 84 for gas-fired boilers and 83 for oil-fired boilers. If enacted the standard will become effective January 1, 2015. According to the DOE the standard represents the maximum improvement in energy efficiency that is technologically justified. Its analysis indicated the proposed standards would save an estimated 0.41 quadrillion British thermal units (Btu), or quads, of cumulative energy over a 24-year period (2015-2038). According to the DOE, homes in the United States collectively consume about six quads annually for space heating.

Most cast aluminum heating boilers in the marketplace are high-efficiency, condensing, gas-fired water boilers with an AFUE in the mid to high 90s. A condensing boiler can have an AFUE rating much higher than a non-condensing unit, typically by more than 10 percent.

Condensing boilers condense water vapor produced in the combustion process and use heat from this condensation. The advantage over non-condensing boilers is reduced fuel costs. This is achieved because condensing boilers have more effective heat exchangers. These allow more heat to be removed from flue products, thus helping to prevent one's heat investment from being expelled outside and lost to the atmosphere. By

recovering and using heat otherwise lost up the flue, the best high-efficiency, cast aluminum boilers can operate with an AFUE in excess of 90. Recovering heat from the flue reduces the temperature of flue gases to a point where water vapor produced during combustion is condensed out. A side effect is that this condensed-out water, which is known as condensate and is acidic, has to be piped away to a drain. A heat exchanger resistant to the corrosive effects of the condensate is a necessity. All condensing boilers will produce a plume from the flue terminal that appears as steam. This is caused by water droplets held in suspension in the flue gases condensing in the colder outside atmosphere.

In the 2007 edition of the *ASME Boiler and Pressure Vessel Code (BPVC) Section IV, Heating Boilers*, a new Part HA, *Requirements for Boilers Constructed of Cast Aluminum* was added. It was created to incorporate several BPVC cases in order to outline the requirements for boilers constructed of cast aluminum sections. Part HA mirrors the majority of Part HC, *Requirements for Boilers Constructed of Cast Iron*, with some minor differences.

One significant difference is found in Paragraph HA-201 in Article 2, *Material Requirements*, which allows for repairs to seepage about chaplets — metal supports used to space and hold the core in position within a sand mold — and minor leakage defects by plugging, impregnation, or welding.

Plugging will be allowed only if the surrounding metal is sound and with use of an aluminum, brass, or stainless steel tapered thread pipe plug. The maximum size pipe

plug will be limited to NPS-1 (DN 25) and at least four full standard pipe threads must be in the casting metal.

Impregnation will also be allowed to correct seepage as long as the extent and frequency of impregnation is specified and approved in the Manufacturer's written quality control system. Impregnation is accomplished by forcing a liquid into a porous solid to change or improve its properties. Cast aluminum castings that have minor seepage are usually impregnated with silicone. Once impregnated, welding is prohibited on the castings. A hydrostatic test of each casting will be required after impregnation by the Manufacturer and must be performed in accordance with ASME, Section IV, Part HA, *Hydrostatic Test Requirements*.

Welded repairs on castings to fix seepage will need to be approved by and addressed in the Manufacturer's and Shop Assembler's written quality control systems. Welders and welding procedures must meet the requirements of ASME Section IX, *Welding and Brazing Qualifications*.

The chart below lists impregnation and welding requirements that should be addressed in the Manufacturer's and Shop Assembler's written quality control systems.

The data forms that will be used for boilers manufactured to Part HA are the *Manufacturer's Master Data Report for Boilers Constructed of Cast Aluminum*, Form H-5A; the *Manufacturer's Material Certificate of Conformance for Cast Aluminum Boilers*, Form HA-1; and the *Manufacturer's*

**Control System Requirements**

Manufacturer's Written Quality Control System	Shop Assembler's Written Quality Control System
<ul style="list-style-type: none"> <li>• Extent and frequency of impregnation</li> <li>• Method of marking impregnated castings</li> <li>• Control of impregnation</li> <li>• Welded repairs</li> <li>• Extent and frequency of welded repairs</li> <li>• Methods of inspecting welded repairs</li> </ul>	<ul style="list-style-type: none"> <li>• Method of marking impregnated castings (when shop assembler separate from manufacturer)</li> <li>• Welded repairs</li> <li>• Extent and frequency of welded repairs</li> <li>• Methods of inspecting welded repairs</li> </ul>



**Condensing, gas-fired water boiler with 95 percent AFUE rating. Courtesy of Burnham.**

*Material Certificate of Conformance for Hydrostatic Testing of Cast Aluminum Boiler Sections, Form HA-2. These forms mirror the forms for Part HC, Requirements for Boilers Constructed of Cast Iron, and will be included in Non-mandatory Appendix L, Guide to Manufacturer's Data Forms of Section IV, Heating Boilers.*

The use of cast aluminum for heating boiler applications has been available for many years. Today, as regulations, industry, and the general public demand lower operating costs and greater energy-efficient equipment, sectional cast aluminum boilers could be a viable option. Not only are there benefits in reduced fuel usage, there are other advantages. Cast aluminum boilers are light and typically smaller than other boilers, allowing for installation where space is limited. Some residential and small commercial units are designed to be mounted on a wall. Another advantage is the low flue gas temperature, allowing materials such as PVC or CPVC to be used for the flue and flue terminals. The disadvantages are the initial cost can be higher and the corrosive effect of the acidic condensate and flue vapor must be considered during installation.

As more cast aluminum boilers are manufactured, purchased, and installed, jurisdictional authorities will be required to look at their statutes and rules to ensure the unique requirements for cast aluminum boilers are considered. In-service boiler inspectors will also be required to become familiar with their operational and inspection requirements. ❖



# Born to be Wild

## Sylvester Roper

Inventor of the First Motorcycle

*BULLETIN* Photography  
by John Gilroy

Photograph above and opposite  
courtesy of The Smithsonian Institute.

Above: Sylvester Roper on  
a steam carriage he built  
sometime before 1870.

### The First Motorcycle

“A bicycle fleshed with power.”

That is how writer James Dickey, best known for his 1970 novel, *Deliverance* (the basis for the movie of the same name), describes a motorcycle in his poem “Cherrylog Road.”

The description is apt, especially to the first motorcycle ever built. Indeed that motorcycle — steam-driven and built by American inventor Sylvester Roper in 1869 — looks like a bicycle “fleshed with power.”

But a bicycle it wasn't, for it was in no way propelled by pedals, says Robert Boudeman, steam enthusiast, amateur historian, and owner of Roper's other steam motorcycle, which Roper built in 1894 and died on in 1896. "A true motorcycle doesn't have pedals on it. If you look at all the people who have claimed to invent the motorcycle, you'll find all their so-called motorcycles have pedals. Roper's motorcycles weren't bicycles with motors assisting them. They had no external help except the motor itself."

Roper built his 1869 steam motorcycle, which is permanently displayed in the Smithsonian, almost 20 years before German inventors Gottlieb Daimler and Wilhelm Maybach built the first gas-powered version, the *Einspur*. Theirs is often cited as the first, but Boudeman disagrees. "Something people get confused about is they equate the motorcycle with the internal-combustion engine. People think they arrived at the same time. But when Roper built his 1869 steam motorcycle, the gas-powered engine hadn't been invented. So if you accept the premise that a true motorcycle doesn't have pedals and is only driven by the motor, I think we can say he really did invent the motorcycle."

Pete Gagan, president of The Antique Motorcycle Club of America and owner of a replica of Roper's 1894 steam motorcycle, agrees. In an article on Roper titled "The First American Motorcyclist," he writes: "A great many books on the subject of motorcycles credit Gottlieb Daimler with the invention of the



Robert Boudeman

motorcycle, but they are mistaken, as it all began much earlier" with the appearance of Roper's 1869 steam motorcycle.

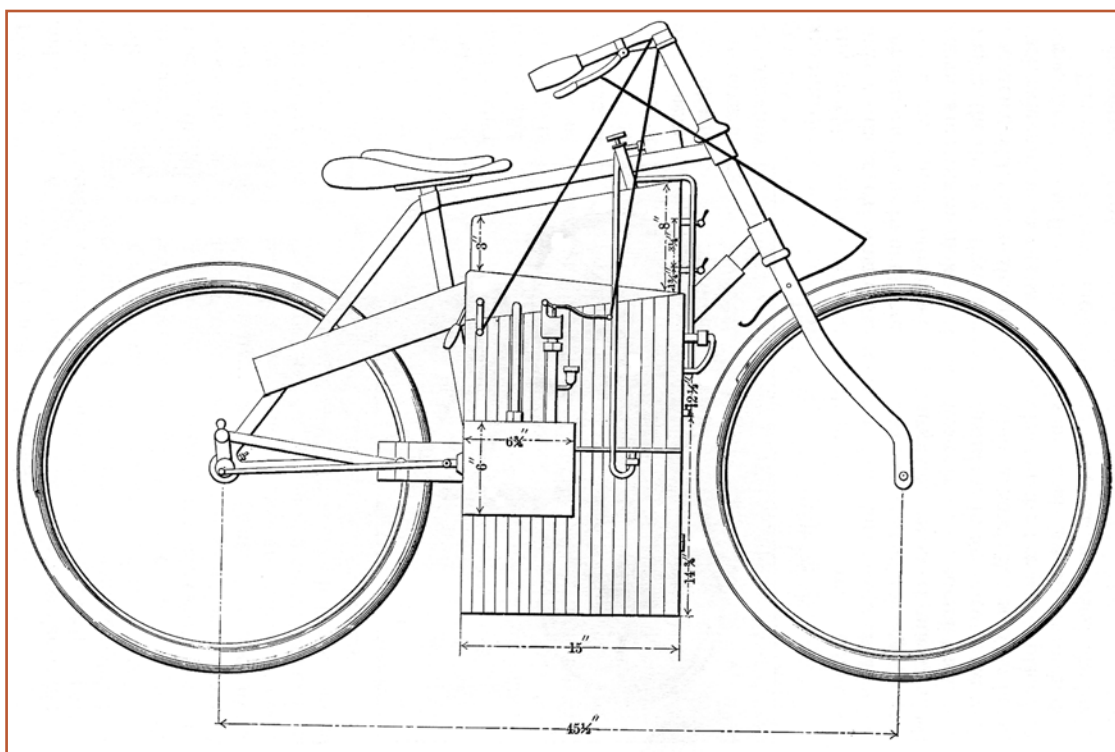
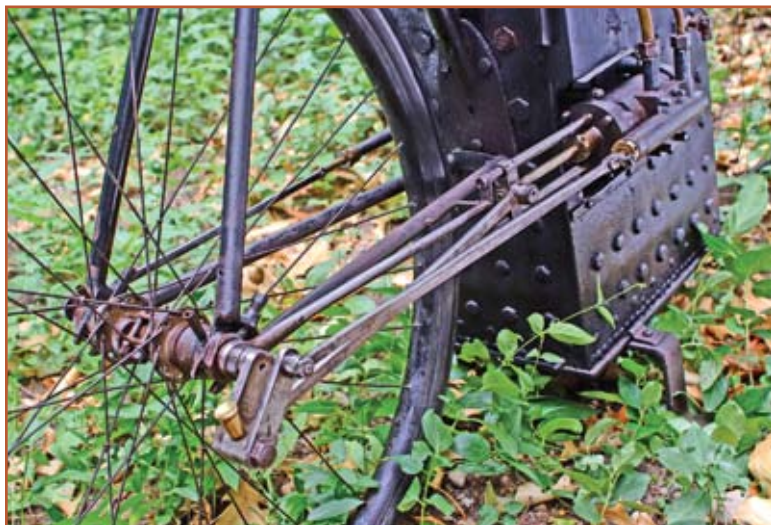
### "The Nestor of steam road vehicle inventors"

Sylvester Hayward Roper was born in Francestown, New Hampshire, on November 24, 1823. According to an article written by his granddaughter, Bessie R. Conant, in 1907, Roper as a boy "displayed a

remarkable degree of precocity in mechanics." At age 12 he built a small stationary steam engine — without ever having seen one. After leaving home he worked as a machinist in various cities before moving in 1854 to Roxbury, Massachusetts, where he lived for the rest of his life. He had about 20 patents, and, according to Conant, his inventions



Roper's 1869 steam motorcycle.



included “the handstitch [sic] sewing machine” and “breech-loading guns of various patterns.” He also made a lot of money from manufacturing Stirling engines, external-combustion engines invented by Robert Stirling in 1816.

But it is probably for his work on steam vehicles that Roper is best remembered. “Before Roper,” Boudeman says, “the kinds of steam vehicles made in this country and throughout the world were either railroad locomotives or traction engines, which were basically railroad locomotives that ran on the road. Roper made lightweight steam vehicles for personal transportation only. He called them ‘self-propellers.’”

From about 1860 to his death in 1896, Roper built 10 steam vehicles, including several steam carriages, a fire engine, and two motorcycles. His desire, however, to bring “self-propellers” to the masses in an era of horses did not go unchallenged. In its inaugural issue published in 1895, *The Horseless Age*, the world’s first automotive magazine, said Roper was for years

*reviled and abused, threatened with personal violence and even arrested for guiding his self-propelling vehicles through the streets of Roxbury and Boston. In every case where he was brought before the bar the authorities*



Photographs of the 1894 steam motorcycle, left to right: Single-cylinder steam engine; Door to firebox; and Pressure gage and water tank.

Illustration of the 1894 steam motorcycle, which appeared in 1899 in *American Machinist*.

*found that he had disobeyed no law, and they had no right to arrest him. But the case was no sooner disposed than some other blundering Dogberry [policeman] would assume that any man who was singular enough to ride in a horseless vehicle must be a law breaker, and again the determined inventor would be brought before a magistrate.*

Yet Roper, whose “hopes were centered upon steam” (as *American Machinist* magazine wrote of him in 1899), persevered. Shortly before his death, he finally began to receive public recognition, attested by his appearance in that first issue of *The Horseless Age*, which dubbed him “the Nestor of steam road vehicle inventors.”

## The 1869 Steam Velocipede

According to *Merriam-Webster's Collegiate Dictionary*, the word “motorcycle,” a combination of “motor” and “bicycle,” was not coined until 1896. So the steam motorcycle Roper built in 1869, as well as the one he built in 1894, was called a “steam velocipede” or “steam bicycle.”

For the frame of the 1869 motorcycle, Roper used the hickory frame of a “boneshaker,” an early type of bicycle notorious for bumpy rides. With wooden spokes and rims and iron-band tires, the wheels were 34 inches in diameter. From the front wheel, on which were footrests, rose a wrought-iron fork. At the top was a straight handlebar with wooden grips. Beneath the handlebar sat a steam gage. To slow the motorcycle down, a rider rotated the handlebar backward, activating a brake on the rim of the front wheel.

Between the wheels hung a spring-mounted firetube boiler, smokestack angling from the top. To steady the boiler, two stay rods

extended from its bottom to the rear axle. In the lower half was a charcoal-fed firebox.

At the front left of the boiler was a vertical hand-operated water pump; near it were three water-level cocks. At the back left, at the bottom, was a drain valve. Water was stored in a tank near the saddle (or seat). Tubing from the bottom of the tank supplied water to a hand pump and feedwater pump.

On each side of the frame, beside the smokestack, were oscillating steam cylinders with a bore of 2-1/4 inches. Piston rods drove 2-1/2-inch cranks on the rear wheel. The left cylinder crank operated the feedwater pump. The throttle, at the top front of the boiler and connected by tubing to the cylinders, was activated by rotating the handlebar forward.

While the motorcycle was at rest, a draft was provided by a tiny steam pipe leading from the safety valve (located at the top rear of the boiler) to the smokestack base; while it was moving, a draft was provided by exhaust steam carried by tubing into the base.

Roper had high hopes for his motorcycle and other steam vehicles. To try to promote them, he often took them to fairs and circuses in New England and raced them against horses. According to Boudeman, “Roper really anticipated the concept in stock car racing of ‘Win on Sunday, sell on Monday.’ In other words, if you could win races with your vehicle, you could create demand for it and sell it. The big venue at that time to show products was the county fair.”

But Roper, facing what *American Machinist* called “the bitterness of the storm that awaits the pioneer who interferes with the established rules of the road,” found no demand for his motorcycle. So he built no other — that is, until about 25 years later.



## “It would climb any hill and outrun any horse”

In 1894 Roper again turned his attention to the steam motorcycle. With funding from the Pope Manufacturing Company, builder of Columbia bicycles, he designed a motorcycle to be used as a pacesetter for bicycle races. Using a Columbia High Frame racing bicycle with pneumatic tires, he removed the cranks, chain, hanger, and rear wheel bearing and attached a boiler and steam engine.

Encased in asbestos and mahogany, the rectangular firetube boiler was 8 inches deep, 20-3/4 inches high, and 15-1/2 inches long. For the 84 firetubes, Roper, who in 1866 invented the cartridge repeater shotgun, used 12-gauge shotgun barrels. Feedwater, in a tank just below the rider and regulated by a hand pump near the handlebar, passed through a coil heater in the smokestack before entering the boiler. When the motorcycle was at rest, the smokestack could be turned upward to increase draft. The steam engine, on the right side, was a single-cylinder 1-3/4 inches in diameter with 4-inch stroke. A pin outside the crank drove an inside emission piston valve, or balanced valve. Two cords extending from the handlebar controlled the damper and throttle valve.

The motorcycle weighed 150 pounds, could reach 40 mph, and was tested to 450 psi. While scooting across level roads, it maintained about 160 psi; while climbing hills, about 225 psi. The grate held enough coal for a seven-mile trip. In fact Roper was often seen riding from Roxbury to the Boston Yacht Club and back again, a round-trip of seven miles. “The exhaust from [the] stack,” *American Machinist* wrote, “was entirely invisible so far as steam was concerned; a slight noise was perceptible, but not to any disagreeable extent.”

Because of its age and value, Boudeman says he does not fire up the 1894 original; Gagan, however, says he runs his 1894 replica at 150 psi (it has been hydrostatically tested to 500 psi) and has reached 40 mph at half throttle. “The handling of the motorcycle,” he says, “started to show its shortcomings at that speed. And sitting with a coal fire below and a boiler between your legs encourages caution!”



Top photo: The steam motorcycle's nameplate.  
Bottom photo: Robert Boudeman with the 1894 original.  
Opposite: The second steam motorcycle built by Roper in 1894.

Roper considered his 1894 motorcycle — which he boasted “would climb any hill and outrun any horse” — his finest “self-propellar” yet. He did not know it would be his last.

## The First Motorcycle Fatality

On the morning of June 1, 1896, 72-year-old Sylvester Roper rode his motorcycle to the Charles River Park Track in Cambridge, Massachusetts, to test it as a pacesetter. He arrived about eleven. Several bicyclists training on the cement track — one-third of a mile long with sharp curves — agreed to try to keep up with him.

From the starting line Roper zipped off, and the bicyclists followed. *The Boston Globe*, reporting on the incident the next day, wrote:

*The trained racing men could not keep up with him and he made the mile in two minutes, one and two-fifths seconds. After crossing the line, Mr. Roper was apparently so elated that he proposed making even better time and continued to scorch around the track. The machine was cutting out a lively pace on the back stretch when the men seated near the training quarters noticed that the bicycle was unsteady. The forward wheel wobbled badly, and then the cycle was suddenly deflected from its course and plunged off the track into the sand, throwing the rider and overturning. All rushed to the assistance of the inventor who lay motionless beneath the wheel, but as soon as they touched him, they perceived that life was extinct. The only wound was a slight cut over the left temple. Dr. Wolcott, who was called, gave his opinion that Mr. Roper died before the machine left the track.*

According to Roper’s granddaughter, part of the *Globe’s* report was incorrect. She wrote:

*Men who were there told my father [Roper’s son, Charles] that the machine slowed down and wobbled on the track so that they rushed to the side of Mr. Roper and caught him so*

*that he did not fall. There was no injury anywhere on him. He held the throttle open by a loop of string over his left thumb and as death paralyzed his muscles, his thumb relaxed and automatically shut off the power:*

Though what exactly happened on the back stretch of the track was not clear, it became apparent Roper died of a heart attack induced by arteriosclerosis and, as *American Machinist* speculated, “the excitement attendant upon the remarkable speed developed at the exhibition.”

And remarkable it was for the late nineteenth century, that speed, which Gagan says some bystanders estimated at 60 mph on the last lap. More than likely no one had ever reached such speed in a “self-propeller.” In fact, two years later, when the first recognized land speed record was set, the vehicle, an electric automobile, averaged 39 mph. Perhaps Roper, in Dickey’s words “drunk on the wind in [his]



From a newspaper clipping: Charles Roper, as he pushes the 1894 steam motorcycle from the track shortly after his father's death.

mouth” and “wringing the handlebar for speed,” was indeed overcome with excitement on that last lap.

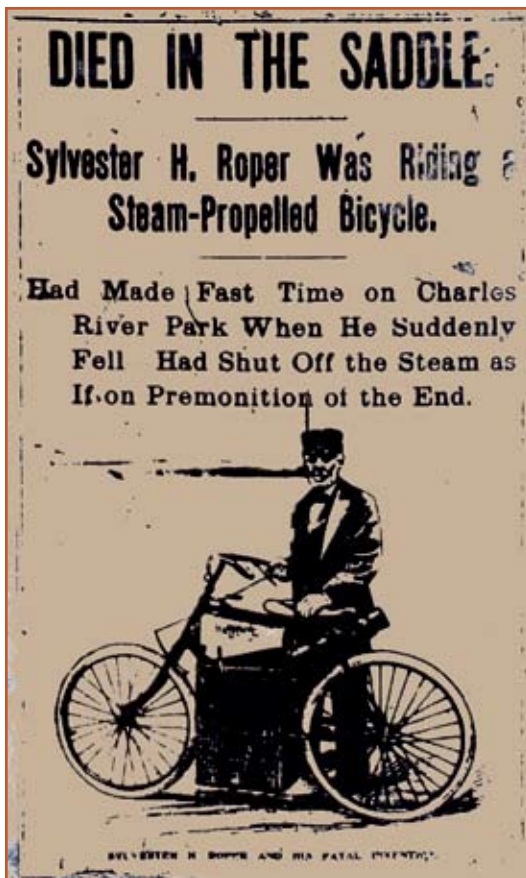
If so, then his death, though not due to a crash per se, was partly due to the intoxicating speed of a motorcycle. Thus, Roper — inventor of the motorcycle — carries another distinction, albeit dubious: the first victim of a motorcycle accident. “I have no doubt,” Gagan says, “that Sylvester was the first motorcycle fatality.”

## Roper's Legacy

After Roper's death the Pope Manufacturing Company abandoned its plans to use his motorcycle as a pace-setter. However, his contribution to the history of motorcycles was not forgotten. In 2002 he was inducted into the Motorcycle Hall of Fame, and his 1894 steam motorcycle displayed for a short time in the Hall of Fame museum.

“Seeing Roper inducted into the Motorcycle Hall of Fame,” Boudeman says, “showed me that historians and enthusiasts from around the world recognized his vision and creative genius. It was a pleasure to loan the motorcycle to the museum. Nothing is good until you share it.”

Mark Mederski, the museum's executive director, says although in the history of motorcycles the internal-combustion engine eventually won out over the steam engine, Roper's steam motorcycles had two advantages over early internal-combustion motorcycles. “His designs lacked pedals, which is somewhat remarkable because many early internal-combustion motorcycles had to use pedals to start the engine and launch the machine. That he didn't use a clutch per se is also an advantage because in early designs, clutches were complicated and unreliable.”



The announcement of Sylvester Roper's death as printed in the *The Boston Daily Globe* on Tuesday, June 2, 1896.

Mederski admits most enthusiasts are more familiar with Daimler's 1885 *Einspur* than with Roper's 1869 and 1894 designs. Which is something he tries to remedy. “When I speak to enthusiasts, I do my best to make them aware of Roper's work. He's the person who successfully used steam to propel a bicycle. He got us moving without pedals.”

And into the horseless age. ❖



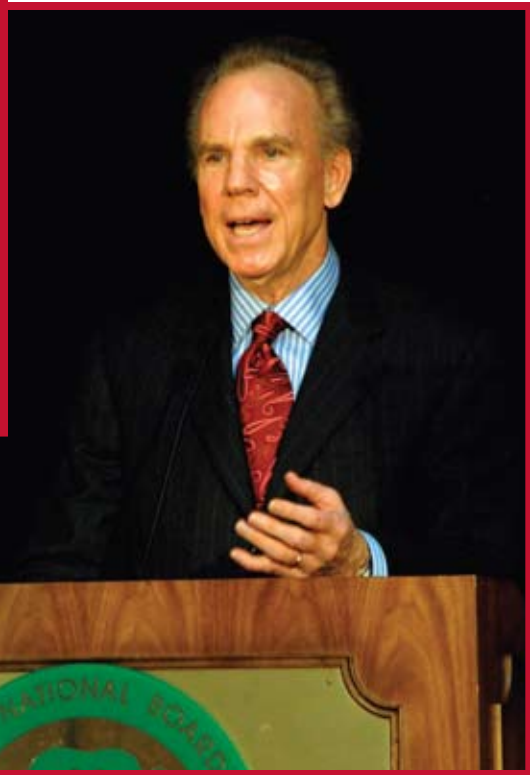
### Editor's Note:

The Motorcycle Hall of Fame Museum is located in the Columbus suburb of Pickerington, Ohio. For more information on the museum, visit their Web site at [www.motorcyclemuseum.org](http://www.motorcyclemuseum.org).



**MAKING THEIR POINT(S).** Ron and Judi Howard choose their table for the Wednesday banquet as National Board staff members John Hoh (seated right), Bob Ferrell (seated left), and Mark Clemens look on.

**THE KICK IS UP, AND IT'S . . .**  
 South Dakota member Howard Pfaff punting a football at Texas Stadium while others eagerly await their chance during a National Board members gathering.



**Roger Staubach**, featured speaker.

**THAT'S ONE SMALL STEP FOR . . .**  
*American Idol* Season 4 semifinalist Celena Rae as she poses with National Board Board Chairman David Douin in the Dallas Cowboys' locker room.



**LIMBER LADIES.**  
 The Kilgore Rangerettes launch the Opening Session with a high-kick dance routine.

**THE EYES OF TEXAS ARE UPON YOU.**

Two former Texas chief boiler inspectors, George Bynog (left) and Terry Parks (center), welcome new Texas Chief Boiler Inspector Anthony P. Jones.



**William Kuntz**, Executive Director, Texas Department of Licensing and Regulation.



**William Tate**, Mayor, City of Grapevine.



**James Hefner**, Coordinator, Surviving World Steam Project.



**Jim Crites**, Executive Vice President of Operations, Dallas/Fort Worth International Airport.



**Ted Alexovich**, Manager of AP 1000 Projects Quality, Westinghouse Electric Company.



**Patrick Hoffman**, Corporate Vice President for Safety, Six Flags Over Texas.



**G. William Spohn III**, Vice Chairman, National Certified Pipe Welding Bureau.



**Earl Harlow, P.E.**, Mechanical Integrity Engineer, GE Plastics Mt. Vernon, Inc.



**Tom Wayne**, Director, Grapevine Vintage Railroad.

Executive Director Donald Tanner (center)  
with 2007 Safety Medal winners  
Dr. D'Orville Doty (left) and Ernest Steen.



**DIAMONDS ARE INDEED A GIRL'S BEST FRIEND.**

Gerri Tanner (front left), Marilou Kerr (back left), Gloria Allison (front right), and Cindy Flosek ogle the jewelry at Neiman Marcus department store on Tuesday afternoon.



**SOMBER SITE.**

Tuesday outing participants gather in Dealey Plaza, where President John F. Kennedy was assassinated on November 22, 1963.



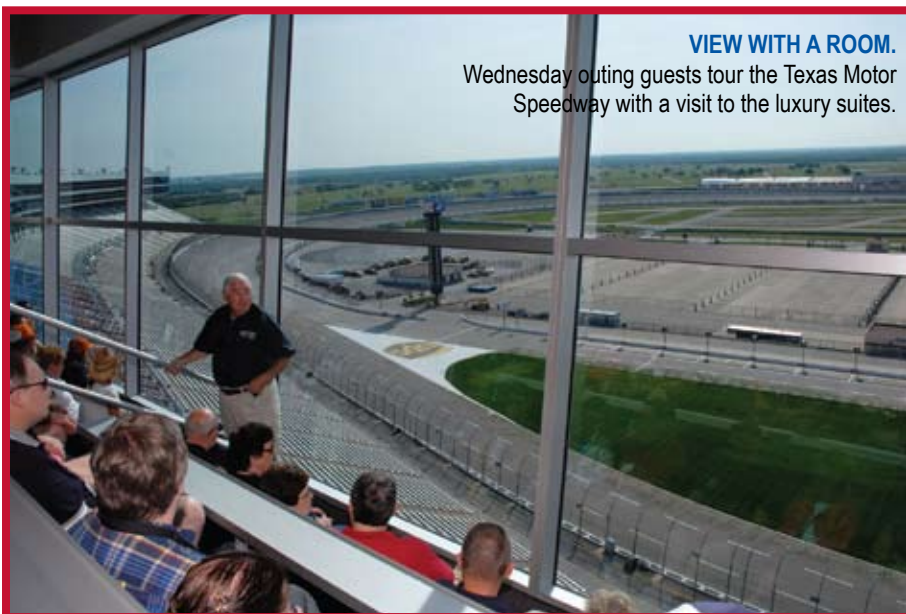
**(BARBEQUE) PIT STOP.**

Wednesday outing participants at Texas Motor Speedway refuel at the buffet table.



**VIEW WITH A ROOM.**

Wednesday outing guests tour the Texas Motor Speedway with a visit to the luxury suites.



**GENTLEMAN, START YOUR ENGINE!**

National Board Executive Director Donald Tanner revs up for the inaugural Segway 500.



**ACTION AFTERNOON.**  
NASCAR stock cars carrying Wednesday outing participants fly down the track at Texas Motor Speedway.



**MOTOR MOTIF.**  
Wednesday outing participants were on the right track as they proceeded to a garage lunch at Texas Motor Speedway.

**STRIKING A HIGH NOTE . . .**  
For Wednesday evening banquet attendees is fan-favorite Johnny Lee.



**PICKIN' PICTURES.**  
Wednesday evening banquet guests select photos taken during General Meeting activities of the previous few days.



# Martin R. Toth

## Chief Boiler Inspector, State of Tennessee

The first thing one notices about Martin Toth is his boyish good looks.

Engage him in conversation and it fast becomes apparent the youthful appearance belies a mature, internal intensity: a characteristic not often associated with the youngest of six children, nor one who happens to be the youngest member of the National Board.

"It's called passion," the Tennessee chief boiler inspector smiles. It is a word he knows well.

"I have always been motivated," Martin explains with a sense of purpose. "And I am one of those blessed individuals who actually look forward to coming to work each and every day."

And so it is for Martin Toth and the way he approaches life. Whereas most would define their passions as lifelong, Marty, as he's called by friends, prefers his to have a sort of expiration date. "They come as quickly as they go," he freely admits. And it's been that way since childhood.

The son of a migrant chef from Hungary and a country girl from Tennessee, Marty was born in Detroit but spent a good portion of his youth bouncing between Michigan and Tennessee. As the youngest Toth child, he learned at an early age a great deal about "getting along." He also learned about divorce.

"My parents split up when I was a baby," the National Board member calmly reveals. "Because my father had custody and had to work evenings during the week, my siblings and I pretty much grew up in an orphanage."

It was during the early 1970s when Marty's mother returned and packed up the kids and moved back to her hometown of Erin,



BULLETIN photograph by Tim Campbell

Tennessee. A few years later, she backtracked to Detroit (where Marty's dad resided), stayed several additional years, and finally returned to Erin.

While many of Marty's formative years were spent growing up in Michigan, he was graduated from Houston County High School in Erin. During his high school years, Marty developed his very first passion: sports. "I played just about everything — football, basketball . . . even a little hockey," he chuckles. His love of athletics notwithstanding, Marty's first real passion was baseball (which he still plays today in a local adult league).

The Tennessee official admits to another passion growing up: writing poetry. Although by his own admission not attracted to the point of launching a writing career, Marty over the years has had several of his poems published.

The future National Board member was only 13 years old when tragedy struck the Toth family. "I lost my oldest brother in an automobile accident," he laments. The result of that dreadful occurrence was a profound sense of loss that remains with the state inspector to this very day.

While poetry was an early passion, it was fleeting. Following high school graduation in 1986, the Detroit native returned to his hometown and made a decision to join the Navy. With a desire to

“build things and work with my hands,” Marty pursued an engineering discipline following enlistment. “I really wanted to soak up as much knowledge as I could to prepare myself for life after the Navy,” he explains.

And absorb he did. Marty approached his responsibility as machinist mate on the USS *Coronado* with all the determination — and yes, passion — he could muster. “Working with boilers and turbines really interested me,” he recalls, “and it really became another passion. I set out to qualify on everything I was eligible for — from Oil King to Water King, to volunteering for every watch standing position in the boiler and engine room.”

Life on board ship wasn’t bad for a kid just out of high school. “Heading to Hawaii, I got a chance to play some baseball for the admiral at various ports of call,” the short stop/centerfielder offers with a grin. “I also did ten months on Bahrain in the Persian Gulf.”

Marty emphatically explains he owes everything he is today professionally to the Navy. And so it was following his discharge in 1990 that the Detroit native set his sights on a position with the Tennessee Valley Authority (TVA) apprenticeship program. Armed with new skills, experience, and a grounded level of confidence, he was quickly dispatched by the utility company with a curt “you’re overqualified!”

Determined and far from disillusioned, the future Tennessee official visited the state employment security office. While there, Marty learned about inspecting boilers, work he found instantly appealing. “Outside of the military, I didn’t even know such a profession existed,” he recalls.

Taking a job initially as a bartender, the 22-year-old began sending résumés in 1991 to a variety of organizations, including the state of Tennessee. Shortly thereafter, he went to work at a manufacturing company performing welding and maintenance, and operating low pressure boilers.

In 1993, one month after his 25<sup>th</sup> birthday, Marty received a letter from Tennessee announcing its intentions to hire boiler inspectors. Revealing a strong interest — nay, passion — in becoming a boiler inspector, he lobbied for the job by inundating state officials with phone calls. His persistence paid off when the

state finally agreed to give the future National Board member “a shot.”

Marty’s first assignment as deputy boiler inspector involved conducting field inspections, as well as performing ASME and National Board reviews in the Jackson area. Commissioned early 1994, he transferred to Nashville in 1998 under the watchful supervision of then state chief boiler inspector and current National Board Executive Director Donald Tanner. When Mr. Tanner retired as chief inspector in 2001 and left to take the Columbus, Ohio, position, Marty was chosen his successor. Joining the National Board later that year, the 32-year-old Michigan native assumed the dubious distinction of being the organization’s youngest chief. Today, Marty oversees a staff of 19 and is responsible for more than 65,000 boilers and pressure vessels in the state.

Over the past two years, Marty’s life has been reconfigured by a series of personal and professional milestones that have contributed to a newfound appreciation of all that surrounds him.

In 2004, during a Sunday downpour, he dodged raindrops leaving his church and suddenly found himself sharing a dry overhang with an attractive yet unfamiliar young lady. Spending the rest of that day together, Kristen and Marty Toth married in 2005 and are today proud parents of one-year-old Madaline Grace. Maddie (as she is called) and Daddy (as Marty is called) share the same August 23 birth date.

Two years ago, Marty ran for — and was elected as — an at-large member of the National Board Board of Trustees. Now at the age of 39, he has only recently relinquished the role of youngest National Board member.

Not one to let passion get in the way of priorities, Marty has adapted well to the new job of husband and father, as evidenced by his uncompromising devotion to Kristen and Maddie. Though the passion for his job is high on the list, Marty admits it runs a distant third to Mommy and Maddie. “It only took 36 years for me to know true passion,” he observes with a laugh, “but unlike my other passions, this one doesn’t come with an expiration date!”

Poetic. Persevering. Passionate. Good inspector qualities all. ❖

## Aben and Price Elected to Board of Trustees

**T**he National Board elected member Robert J. Aben Jr. first vice chairman of the Board of Trustees at its meeting in Grapevine, Texas. He will serve a three-year term.

Mr. Aben is chief boiler inspector for Michigan Consumer and Industry Services, Bureau of Construction Codes and Fire Safety, Boiler Division. He was elected to National Board membership in 1990.

Before joining the state of Michigan, Mr. Aben spent 14 years serving in the Coast Guard, including stints in Alaska (search and rescue); Traverse City, Michigan (vehicle maintenance); Cheboygan, Michigan (ice cutter); and Chesapeake, Virginia (buoy tender). After leaving the Coast Guard, he accepted a boiler inspector position with Hartford Steam Boiler, where he was employed for nine years. In 1989 he became assistant chief inspector, nuclear specialist for the state of Michigan before rising to chief inspector the following year.

Mr. Aben holds National Board Commission No. 9586 with "I," "N," and "NS" endorsements.

Daniel C. Price, chief boiler inspector for the province of Yukon, has been elected as a Board of Trustees member at large.

Mr. Price has been employed as chief inspector with the Yukon Territory, Public Safety Branch, since 1989. He was elected to National Board membership in 1994 as the Yukon's first National Board member.

Before moving to the Yukon Territory, Mr. Price was employed for 10 years with the Northwest Territories, first as boiler inspector and subsequently as chief inspector.

Mr. Price holds National Board Commission No. 11607. ❖



Robert J. Aben Jr.



Daniel C. Price

# Tom Monroe and Frantisek Musuta Join National Board

**T**om Monroe has rejoined the National Board representing Oklahoma. He is chief boiler inspector for the Department of Labor.

Mr. Monroe was employed with the Oklahoma Department of Labor from 1971 to 1999, spending several years as director of safety standards and chief boiler inspector. From 1999 to early 2007 he served as a contracted authorized inspector for One Beacon America before returning to the state of Oklahoma.

The returning National Board member was graduated from Northeastern State College in Tahlequah, Oklahoma, with a bachelor of science degree in business. Additional studies included boiler construction and inspection.

Mr. Monroe actively served in the US Army from 1956 to 1958 and in the US Army Reserve from 1959 to 1964.

Residing in Tecumseh, he holds National Board Commission No. 9654 with endorsements "A" and "B." He and his wife Judy have two children, Tommy and Lou Ann.

Frantisek Musuta has been elected to the National Board representing Ontario. He is technical supervisor for the Technical Standards and Safety Authority.

Mr. Musuta began working for the province of Ontario in 2003 as boiler and pressure vessel inspector. Before joining the province, he was a pressure equipment safety inspector in the Slovak Republic from 1991 to 1996. He served as an independent consultant for boilers and pressure vessels from 1997 through 2002 before moving to Canada.

Mr. Musuta graduated from The Slovak University of Technology in Bratislava in the Slovak Republic with an engineering degree in thermal/nuclear equipment power generation. He also served in the Czech Republic military from 1989 to 1990.

Mr. Musuta holds National Board Commission No. 12756. He resides in Ajax, Ontario, with his wife Irma and their two children, Ivana and Filip. ❖



Tom Monroe



Frantisek Musuta

## Keith Rudolph, Mario Ramirez Become National Board Members

**K** Keith Rudolph has been elected to the National Board representing Hawaii. He is supervising boiler inspector for the state.

Mr. Rudolph began working for the state of Hawaii in 1993 as a boiler inspector. Before joining the state, he worked from 1976 to 1978 as restoration technician for Goldenrod Showboat in St. Louis, Missouri. Mr. Rudolph was previously employed as an electrician by Baptist College in Charleston, South Carolina, where he worked for two years before starting the Keith Rudolph Company in 1981. In 1989 he began as all-trades technician for Fluor Daniel Services and continued in that capacity until leaving for the state of Hawaii in 1993.

Mr. Rudolph was graduated from Ranken Technical Institute of St. Louis, Missouri, with a degree in HVAC. He and wife Robin reside in Aiea, Hawaii.

Mario Demetrio Ramirez has been elected to the National Board representing Florida. He is chief boiler inspector for the Fire Marshal Division.

Mr. Ramirez began working for the state of Florida in February of this year. Before joining the state, he worked for Denver Pipe Fitters and Plumbers Union in Colorado and Alaska from 1984 to 1996. He subsequently worked for the state of Alaska as deputy boiler and pressure vessel inspector from 1999 to 2005 while also teaching at the University of Alaska as adjunct professor. From 2005 to 2007, he was employed by Travelers Insurance in Risk Control as a boiler and pressure vessel inspector while again teaching as adjunct professor at Des Moines Area Community College.

The Florida official served in the US Army Reserve from 1980 to 1988.

Mr. Ramirez resides in Tallahassee, Florida, with his wife Kathy and has two children, Michael and Stephanie. He holds National Board Commission No. 12218. ❖



Keith Rudolph



Mario Ramirez

# National Board Welcomes Kenneth Watson and Anthony Jones

**K**enneth Watson has been elected to the National Board representing Mississippi. He is chief inspector/director for the Department of Health.

Mr. Watson started with the state of Mississippi in 2005 as deputy inspector before becoming chief inspector earlier this year. He began working for Entergy Corporation in 1978 as plant, boiler, and water treatment operator until 1980. He then went to work for the Arkansas Department of Labor as deputy inspector and then as acting chief inspector until 2005. From 1999 through 2003, he also worked as instructor of boiler operation/boiler repairs at Pulaski Technical College in Arkansas.

Mr. Watson served in the US Navy from 1973 to 1977.

Residing in Puckett, Mississippi, Mr. Watson holds National Board Commission No. 9360 with endorsements "A" and "B."

Anthony Jones has been elected to the National Board representing Texas. He is chief boiler inspector for the Department of Licensing and Regulation.

Mr. Jones joined the state of Texas in 2005 as boiler inspector before becoming inspection specialist in 2006. He previously worked as control room operator from 1999 to 2000 for Trigen-Biopower, Inc., in Greenville, Mississippi. From 2000 to 2001, Mr. Jones worked as stationary engineer at Tinker Air Force Base in Oklahoma City before returning to Trigen-Biopower, Inc., in St. Mary's, Georgia as shift supervisor. He then left for Clarksdale Public Utilities in Clarksdale, Mississippi, to work as shift supervisor until 2002. In October 2002, he was employed at Holman Boiler Works, Inc., in Houston, Texas, as boiler controls technician before joining the state.

Mr. Jones served in the US Navy from 1992 to 1999 and earned a Navy Achievement Medal.

Residing in Austin, Texas, he holds National Board Commission No. 13127. ❖



**Kenneth Watson**



**Anthony Jones**

# Castle, Cate, and Wheel Elected as Honorary Members

Three former chief inspectors were recognized as National Board Honorary Members at the 76<sup>th</sup> General Meeting. Honorary membership is bestowed for dedicated service to both the industry and to the National Board. A candidate must have served either as a member of the National Board for six years or the Advisory Committee for six years or meet other criteria showing a demonstrated contribution to the objectives of the National Board.

**Charles J. Castle** is former chief boiler inspector for the province of Nova Scotia and was elected to National Board membership in 1995.

Mr. Castle joined the province in 1974, having previously served as a boilermaker for 10 years with the Department of National Defense. He was trained as a boilermaker apprentice at the HMC Dockyard in Halifax, Nova Scotia.

Before his work at the Department of National Defense, Mr. Castle served as an officer cadet with the Royal Canadian Air Force. Mr. Castle holds National Board Commission No. 8241 with "A" and "B" endorsements. He currently resides in Sackville, Nova Scotia, with his wife Mary.

Former National Board Member **Robert R. Cate** had served with the Louisiana State Fire Marshal's Office as chief boiler inspector since 1993.

Before joining the state of Louisiana, Mr. Cate started his career with the Omaha Public Power District as a steamfitter from 1971 to 1978. From there he went to Continental Insurance as loss control representative from 1978 to 1981. Mr. Cate continued as a loss control representative from 1981 to 1986 for Home Insurance before working for Kemper Insurance from 1986 to 1992.

Mr. Cate served for eight years in the US Navy. He holds National Board Commission No. 8946 with "A" and "B" endorsements. He and his wife Judith have seven grown children.

**Malcolm J. Wheel** is a former National Board member from the state of Vermont.

Mr. Wheel had served as the assistant fire marshal/chief boiler inspector for the state since 1984. He began his employment with Vermont in 1966 as a boiler inspector. Previously, he worked as boiler inspector for Continental Insurance Company.

The first National Board member from the state of Vermont, Mr. Wheel served on the Board of Trustees as member at large from 1993 to 1994.

Mr. Wheel served in the US Navy for two years as well as in the US Coast Guard for three years. While in the Coast Guard, he attended engineering school. Mr. Wheel holds National Board Commission No. 5351 with an "A" endorsement. He lives in Vermont with wife Jane. The Wheels have three grown children and six grandchildren. ❖



Charles J. Castle



Robert R. Cate



Malcolm J. Wheel

# Doty and Steen Receive Safety Medals

**F**ormer Advisory Committee Members Dr. D'Orville Doty and Mr. Ernest Steen were awarded 2007 National Board Safety Medals.

The National Board's most prestigious award, the Safety Medal is awarded each year to an individual based on his or her extensive experience and commitment to safety in the boiler and pressure vessel industry. This year marks the first time the Safety Medal has been awarded to two individuals.

Dr. Doty has accumulated more years on the National Board Advisory Committee than any committee member. He additionally served on the *National Board Inspection Code* Committee and the Committee on Internationalization.

Dr. Doty received bachelor's, master's, and doctoral degrees in metallurgy from Rensselaer Polytechnic Institute, where he was also a research fellow.

For more than 35 years, Dr. Doty worked for United States Steel Corporation, beginning as a welding metallurgist. Upon retirement, he was a senior metallurgical and product consultant. After his retirement, he formed Doty and Associates, Inc. Having also served as chairman of the Pressure Vessel Research Council, he is a registered Professional Engineer in the Commonwealth of Pennsylvania.

In 1998, Dr. Doty was elected as an honorary member of the National Board.

Dr. Doty has also been a respected and long-standing member of both ASME and the American Welding Society.

Ernest Steen also served on the National Board Advisory Committee. His service to the National Board includes membership on the *National Board Inspection Code* Committee in addition to his work as a member of the National Board Examination Committee and the Committee on "R" Accreditation. Mr. Steen also participated in the critical processes of developing and grading National Board commission examinations.

Now a resident of Connecticut, Mr. Steen grew up in Brooklyn, New York, and was graduated from Polytechnic Institute of Brooklyn with bachelor's and master's degrees in mechanical engineering. He also was graduated from Western New England College with a master of business administration.

During Mr. Steen's early career he worked as a mechanical engineer for the Nuclear Development Corporation of America. He later joined the Foster Wheeler Equipment Division as a staff engineer. He was also senior NSSS engineer for the CE Nuclear Power System before becoming a consulting engineer for US PPL (Combustion Engineering), a position he holds today.

A long-time ASME member, he has served on several code committees as well as on the ASME executive board. ❖



D'Orville Doty



Ernest Steen

## In Memoriam: John Lemire and Joseph Cvar

The National Board was saddened to learn of the April 29 death of former California Principal Safety Engineer John Lemire and May 13 death of former Delaware member Joseph G. Cvar.

Mr. Lemire, 63, became a National Board member in 1993 and retired from the state of California in December 2002.

Born on Staten Island in New York, Mr. Lemire and his family moved to California's Mojave Desert when the future state official was three years of age. The son of a Navy supply corps officer, he spent much of his youth growing up in Scotland and Japan. Following high school, Mr. Lemire became a marine engineer while attending the California Maritime Academy. His tour of duty included service on board ships carrying ammunition and supplies to Vietnam.

Mr. Lemire joined Continental Insurance Company in 1970 as field representative to perform boiler, machinery, and fire inspections. In 1974, he assumed the position of industrial safety engineer with California's Occupational Safety and Health Administration (since disbanded). Mr. Lemire became California's pressure vessel unit senior engineer in 1987. He was promoted to principal safety engineer in 1992.

During his tenure with the state, Mr. Lemire oversaw the adoption of NFPA 58. He was also instrumental in revamping safety orders involving boilers, fired pressure vessels, and compressed and liquefied gas.

Mr. Lemire is survived by Lois, his wife of 36 years, and children Julie and Kevin.

Mr. Cvar became a National Board member in 1983 and was elected to the Board of Trustees as first vice chairman in 1989.

In 1994, Mr. Cvar was elected an Honorary Member, recognized for his work in the state of Delaware as well as for the National Board.

Mr. Cvar was preceded in death by Catherine Lyons Cvar and Barbara Cook Cvar. He is survived by his sister-in-law, Eileen Valente of Philadelphia, Pennsylvania; his niece Margaret Yezzi and husband Tom; grandnephew and niece, Scott and Kristen from Landsdale, Pennsylvania; step-daughter, Patience Cook Eiker and husband Mark of South Holland, Illinois. ❖



John Lemire



Joseph G. Cvar

## National Board Mourns Passing of Former Member David Kenison

The National Board recently learned of the passing on November 27, 2006, of former Alaska member David Kenison. Mr. Kenison, 61, became a National Board member in May 1997 and retired as lead boiler and pressure vessel inspector for Alaska on July 1, 1998.

Born on December 27, 1944, in Forest Grove, Oregon, Mr. Kenison attended Benson Tech High School in Portland. He later enlisted in the US Navy, serving as an engine room supervisor aboard two nuclear-powered submarines over a seven-year tour of duty. He attended Mt. Hood Community College in Gresham, Oregon.

For 15 years Mr. Kenison worked as an inspector for the state of Oregon and three insurance companies before joining the Alaska Labor Standards and Safety Division. Professionally, he was a member of the Alaska Boiler and Pressure Vessel Inspectors Association. He also served as president of the Oregon Boiler and Pressure Vessel Inspectors Association and president of the Lower Columbia Chapter of the National Safety Management Society. He was a member of the National Safety Council and the American Society of Safety Engineers.

He is survived by his wife MaryAnn and three children, David, Donna, and De'nette, all of Wasilla, Alaska. ❖



David Kenison

## Leland Cooper Remembered

The National Board regrets to announce the May 29 passing of field staff employee Leland Cooper. He was 59.

Mr. Cooper began working as a field staff member in January 2003. From 1993 to 2002 he served as a consultant. Certified as a National Board/ASME team leader, Mr. Cooper's responsibilities included conducting reviews of manufacturers with National Board and/or ASME stamps, participating in ASME nuclear surveys, and conducting pressure relief valve manufacturer reviews.

Mr. Cooper joined the US Navy in 1968 and was honorably discharged in 1972. He began his career as an inspector in 1973 with the Hartford Steam Boiler Inspection and Insurance Company. In 1974 Mr. Cooper received his National Board Commission. He held endorsements "A," "B," "I," "N," and "NS."

"Leland Cooper was an important, respected member of the pressure equipment industry," commented National Board Executive Director Donald Tanner. "His 34 years of professional service reveal a record of remarkable dedication to both excellence and the principles of safety. Leland's sudden passing has left the National Board with a significant void that will be difficult to fill."

Having resided in Chouteau, Oklahoma, Mr. Cooper is survived by son Leland K. Cooper. ❖

# Call for 2008 Safety Medal Nominees

The National Board of Boiler and Pressure Vessel Inspectors is seeking nominations for the 2008 Safety Medal Award. This award, the highest honor bestowed by the National Board, will be presented at the 77<sup>th</sup> General Meeting in Vancouver, BC, Canada.

To be considered for the Safety Medal Award, letters of recommendation must be submitted by three individuals who are acquainted with the candidate and can attest to his or her safety contributions within the boiler and pressure vessel industry. At least two of the letters must be from National Board members.

Each letter of recommendation should include:

- The name, title, employer, and business address of the candidate.
- A listing of specific candidate contributions or achievements relative to the award.
- A brief biography of the candidate that includes positions held, National Board involvement, and participation in industry activities, including any honors and awards known to the individual making the nomination. (Note: In order to be considered, the candidate must have served on a National Board committee or a nationally recognized standards committee, have participated in National Board activities for not less than 15 years, and been recognized as a contributor to professional organizations related to the boiler and pressure vessel industry.)
- The name, title, employer, and business address of the individual submitting the nomination.

Letters of recommendation must be received by December 31, 2007, and be addressed to the Executive Director, The National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, Ohio 43229. ❖

## Call for Presentations Announced for 77<sup>th</sup> General Meeting

The National Board of Boiler and Pressure Vessel Inspectors has announced a call for presentations to be delivered at the 77<sup>th</sup> General Meeting, April 21-25, 2008, at the Sheraton Vancouver Wall Centre in Vancouver, British Columbia.

The General Meeting is conducted each year to address important issues relative to the safe operation, maintenance, construction, repair, and inspection of boilers and pressure vessels.

To be considered, presentations should address one or more aspects of the aforementioned subject areas and should be limited to 30 minutes. Additional subject areas may include safety valves as well as other unit components, testing, codes and standards, risks and reliability, and training. Presentations of a commercial or promotional nature will not be accepted.

Those interested in submitting presentations for consideration should send an abstract of no longer than 200 words in English (do not include supplementary materials) to: Paul Brennan, Director of Public Affairs, The National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, Ohio 43229. Submissions must be postmarked by October 1, 2007. Abstracts may also be emailed to [pbrennan@nationalboard.org](mailto:pbrennan@nationalboard.org) by October 1.

Speakers chosen to deliver General Session presentations will be notified by October 31, 2007. Each will receive one complimentary National Board registration packet, which includes one ticket to the Wednesday Banquet, as well as entry to the General Session, all guest activities, and receptions. It is requested that speakers assume their own travel and hotel expenses.

All speakers will be required to submit a paper for publication. Submission due date is January 31, 2008. ❖

BULLETIN photograph by Greg Sailor

# Sue Haas

## Accounting Associate

In Samuel Taylor Coleridge's poem "The Rime of the Ancient Mariner," the title character bemoans, "Water, water, everywhere . . . nor any drop to drink."

Well, "Water, water, everywhere" would suit National Board employee Sue Haas just fine. "I really like the water," she says. "Almost every year our family goes to a beach for vacation. Our favorite beach is Gulf Shores, Alabama, but we've also enjoyed Panama City Beach, Florida, and North Carolina beaches. We also go to Lakeside, Ohio, on Lake Erie, one weekend each summer. My parents rent a cottage there, and we've been going every summer since I was eight. We go to shops, play shuffleboard, sit by the lake, and read. It's quiet and peaceful."

Sue is one of only two part-time employees at the National Board. "It's by choice. When my children were little, I didn't want to be away from them all day. Now they're older, but I still work part-time because it gives me a chance to be home after school with my son and be involved with his activities. I also do other things in the afternoon — clean the house, walk with a friend, stay active in church. It's been a real blessing."

Born in Dayton, Ohio, Sue met her future husband Bob while she was in high school. In 1978, a week after she was graduated from Bowling Green State University in Bowling Green, Ohio, they married. In 1987 they moved from Bowling Green to Columbus. Bob works for the Ohio Department of Job and Family Services, helping local governments design programs that aid people in finding work. They have two children: Leah, 24, and Adam, 17. Leah and her husband Dan live in Cleveland, where she is a social worker. Adam is a senior in high school; he plays the flute and saxophone and wants to major in music in college.

As you might expect from someone whose duties at the Board include processing expense reports and credit card bills, Sue manages the household finances. She quickly says, however, that Bob could manage them just as well. "I just have the time to do it," she says with a smile. And the result? As you might expect: "Every month the checkbook balances to the penny."



Before coming to the Board, Sue worked as a secretary and then as an accountant for B.G. Salvi's Restaurants and as a medical history underwriter for Equifax. In April 1990 she answered a newspaper ad for an accounting associate at the Board and was soon hired. She has been here ever since. "I like my job. There's a lot of variety in my work, and our department really works well together."

She has no plans to switch to full-time — she's too busy. To begin with, she and Bob are members of Heritage Christian Church in Westerville, Ohio, where she is active in the women's and prayer ministries and helps edit newsletters and flyers. On occasion she and Bob also like to play pinochle and euchre with friends. Two or three times a week she likes to rollerblade and, in the evenings, settle in with a good book. She particularly likes to read Christian fiction, and her favorite authors include Janette Oke, Beverly Lewis, Dee Henderson, and Karen Kingsbury.

"I've always liked to read," she says. "As a little girl, I would come home from the library carrying stacks of books. I still do."

❖

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



# Welding Procedure Workshop

BY RICHARD MCGUIRE, MANAGER OF TRAINING

The National Board's Welding Procedure Workshop helps broaden students' knowledge about writing and qualifying welding procedures, performing welding, and inspecting welds and welders. For example, since students are often surprised to find that construction codes have welding requirements, they learn ASME Construction Codes and ASME Section IX requirements. This provides a systematic foundation to help avoid test failures, lost time, and unnecessary welder qualification. The workshop is ideal for anyone involved in welding, as well as for authorized inspectors, quality managers, and consultants, and qualifies for Commissioned Inspector recertification. Because we customize it to a student's needs, every student will benefit no matter his or her level of welding experience.

The workshop addresses questions such as:

- Where does one find information about how to properly qualify a welding procedure?
- What information is required to be in an ASME welding procedure?
- How does one know if a welder is qualified to apply a procedure?
- What if the weld requires postweld heat treatment?
- Is there a requirement to specify a voltage range?
- When must a procedure meet impact testing requirements?

One benefit of the workshop is students learn how to work in areas other than their areas of expertise. For example, someone

who focuses on simple repeat qualification tests with carbon steel might be asked to do a qualification test with another material. Or someone experienced in shielded metal arc welding might be asked to qualify a welding procedure using another process. Such variables may be difficult to navigate until explained clearly during the workshop. Another benefit is anyone can bring his or her actual procedures to share and be critiqued by the instructor and other students. This allows students to take what they learned in class and apply it immediately to their jobs.

The instructor, Barry Newmark, is an independent consultant engaged in material processing and forensic engineering. With more than 35 years' experience in engineering, construction, and quality assurance, he is a member of the ASME Section IX Subcommittee and chairman of the Subgroup on General Requirements. Mr. Newmark has been teaching at the National Board for many years, and students enjoy his no-nonsense style.

Students will leave the Welding Procedure Workshop not only with new knowledge, which is immediately applicable, but also with the information necessary to more easily search for the answers to future questions. We offer the three-day course four times a year. No quizzes or tests are administered, and each student receives a course book. Please visit our Web site for currently scheduled course dates. ❖

**Editor's Note:** Available course dates can be found on the National Board Web site, located under the TRAINING menu button, COURSES AND SEMINARS > TRAINING SCHEDULE.

## ENDORSEMENT COURSES

(B) **Authorized Inspector Supervisor Course** — TUITION: \$1,250  
February 11–15, 2008

(NS) **Nuclear Supervisor Course** — TUITION: \$1,250  
November 26–30

## CONTINUING EDUCATIONAL OPPORTUNITIES

(ISI) **Inservice Inspector Seminar** — TUITION: varies  
February 11–15, 2008 (Louisiana)

(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  
February 18–29, 2008

(R) **Boiler and Pressure Vessel Repair Seminar** — TUITION: \$400  
January 23–24, 2008 (Houston)

(VR) **Repair of Pressure Relief Valves Seminar** — TUITION: \$1,250  
December 10–14                      January 28–February 1, 2008 (Houston)

## 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, and is also available on the National Board Web site.

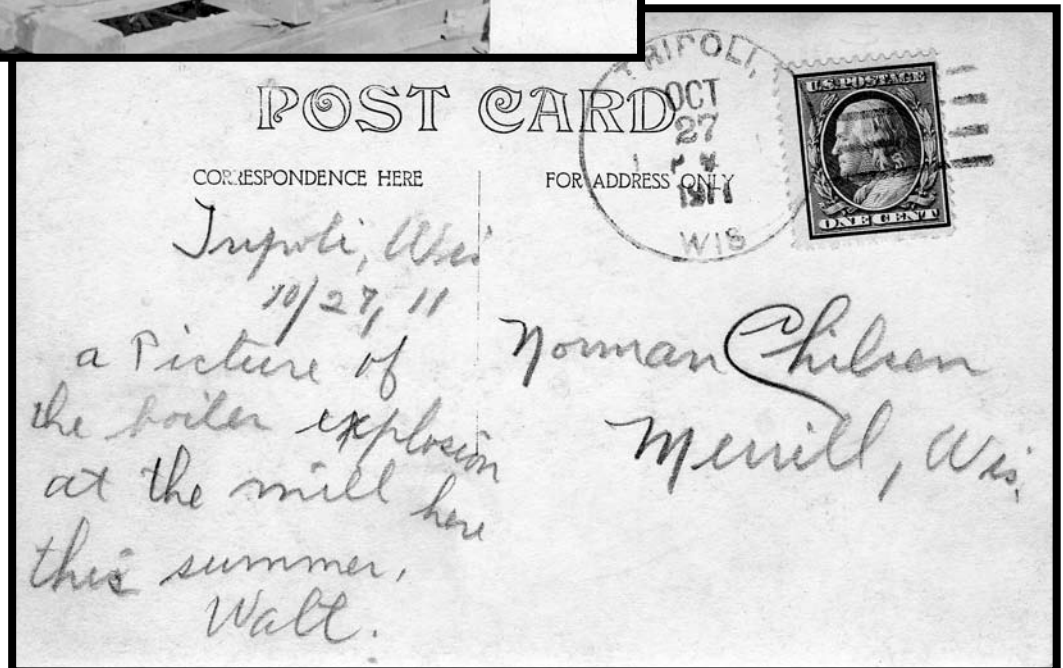
All seminars and courses are held at the National Board Training and Conference Center in Columbus, Ohio, (unless otherwise noted) and are subject to cancellation.

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 [www.nbc-nb.com](http://www.nbc-nb.com).



## Disorder and Excitement on Every Hand Tripoli, Wisconsin

**T**he back of the card reads, "10/27/11 A picture of the boiler explosion at the mill here this summer. Walt." The front shows a picture of several men walking around amid destruction: felled wood, scrap metal, barren trees. Overexposed, this postcard cannot project the enormity of the damage created by the explosion of a thresher engine on a farm northwest of Springfield, Wisconsin.



It was Tuesday evening, and two stacks of grain had already been threshed. The engineer on duty, Arnold Ryan, was busy pulling the separator between two other stacks when the boiler blew into the air and over the house, injuring six members of the threshing crew. Pieces of the boiler were found 660 feet away.

The local paper reported the "boiler was straightened out so that it resembled a huge piece of battered sheetiron, and one could scarcely imagine that it once served the purpose of a steam boiler." A farmhand unloading wheat nearby heard the "deafening" explosion and hurried to the scene to find "disorder and excitement on every hand."

"The greatest miracle," the paper continued, "was that every member of the crew was not killed instantly." Local doctors

arrived quickly to treat the wounded and make the victims as comfortable as possible.

The threshing machine had been inspected the previous July and was said to be in fair condition. The only recommendation at that time was a new fusible plug, which Ebert Meyer, one of the owners, bought and placed in the boiler the previous Sunday.

The boiler had a maximum capacity of 130 pounds, and according to the crew, it was running at only 125 pounds at the time of the explosion. The engine and the separator were lined up east and west, and the explosion appeared to have happened on the south side of the machine, throwing pieces to the north. The state inspector promised a thorough investigation, placing blame where it "fully belongs." ❖