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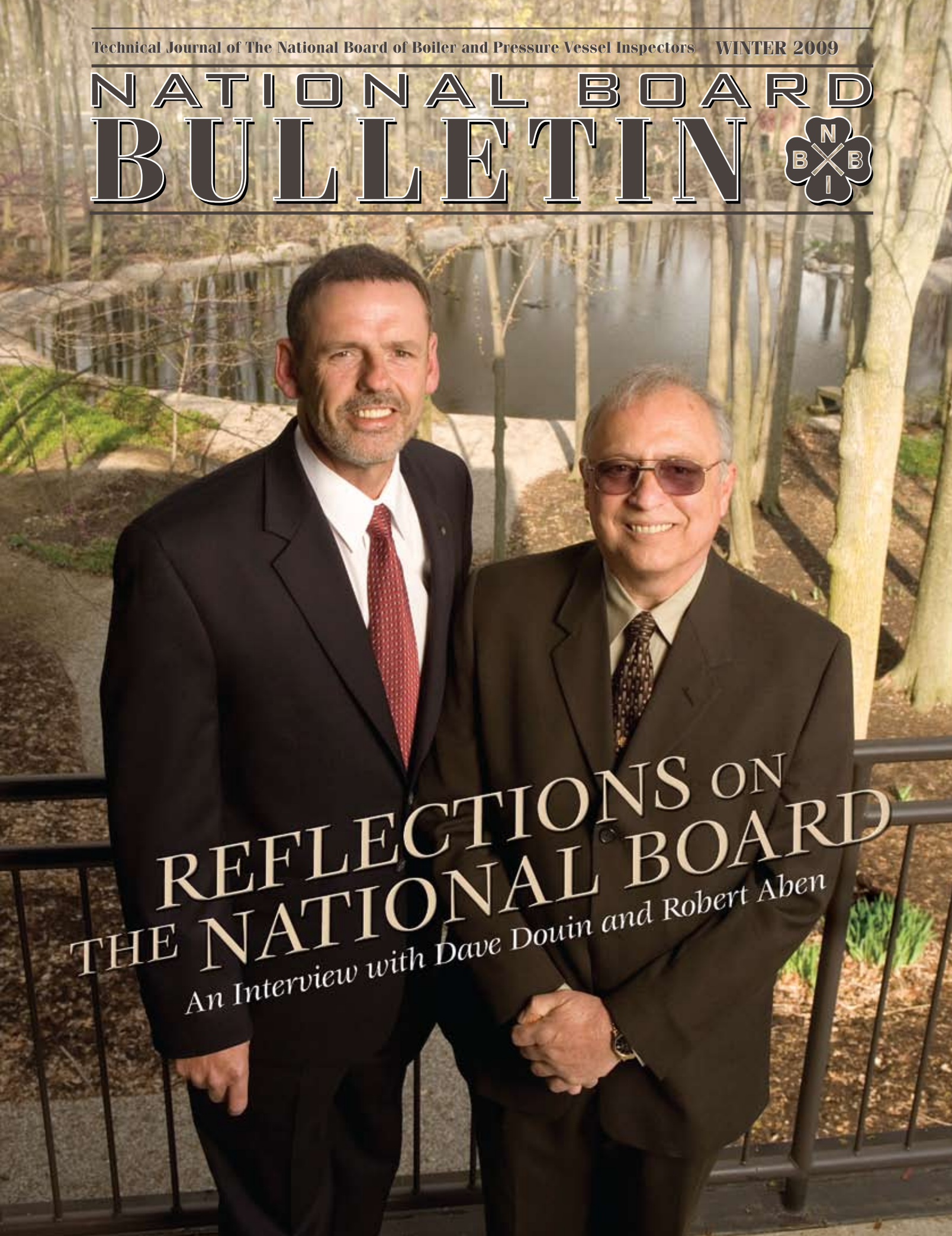
NATIONAL BOARD BULLETIN



REFLECTIONS ON THE NATIONAL BOARD

An Interview with Dave Douin and Robert Aben

BULLETIN

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

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David Douin and Robert Aben discuss the National Board.

Read more on Page 18.

BULLETIN cover photograph by Greg Sailor

Cover Story

Features

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A LAW IS A LAW. PERIOD.

BY DAVID A. DOUIN, EXECUTIVE DIRECTOR

Money versus safety is a theme chronicled many times in the *BULLETIN*

Given today's economic climate, it doesn't appear this debate will end anytime soon.

These are difficult times. I learn of jurisdictions implementing rollbacks just about every week. If it doesn't involve cutting work hours, it may be reductions in pay or staff, or limiting benefits. And every level of government is affected, even police and firemen.

Through all the media clutter, a very important point has gone unaddressed: while safety services may be pared back, mandates cannot. The government has an obligation to honor commitments that are part of – no, the subject of – jurisdictional law. And those mandates apply in bad times as well as good.

Simply put: a law is a law, and a law must be enforced.

Jurisdiction departments contemplating abolishing pressure equipment programs altogether are reminded such an action is the purview of the general assembly. That is, general assemblies *pass* legislation. State and provincial agencies *administer* legislation.

It's not easy to casually dismiss the rule of law. And while the public might applaud efforts to reduce government spending, few understand the unintended consequences.

One of those consequences is making cuts in resources permanent. If, for example, reduced staffing results in no additional or visible compromise in safety, what is to prevent state agencies from freezing staff size (and funding) at current levels when the budgetary process is relaxed?

There is yet another very important point to be made regarding pressure equipment legislation.

These laws were passed for a reason. At various times over the past 100-plus years, *all* jurisdictions determined it was in the public's best interest to regulate pressure equipment safety. Many of these laws were borne out of horrific accidents. And that is what some bureaucrats tend to forget.

Yes, it's about cash. Cold. Hard. And today, more elusive than ever.

There is another ironic and troubling twist to reducing jurisdiction pressure equipment resources: most of these operations are self-sufficient and require no additional revenue. In many instances, the monies generated through inspections and fees are more than enough to cover program costs. Excess dollars are deposited into the jurisdiction's general fund. Yet these safety programs continue to be targeted for austerity purposes!

Limitations on manpower and budgets will have an adverse effect on the operations of most members and their staffs. Yet it remains their obligation to abide jurisdiction laws.

More important: that obligation extends to member supervisors, department heads, commissioners – everyone up to and including governors. And don't forget legislators.

As you may recall, a National Board random survey commissioned several years ago revealed 90 percent of the public felt *it was the responsibility of the general assembly and governor to protect their safety and well-being*.

With all indicators pointing to a protracted economic downturn, we pray there will be no increase in the number of incidents. And while logic may suggest inspectors rearrange their priorities, there remain perils to be studiously avoided.

First, inspectors should not abandon their commitment to training. Secondly, they must remain vigilant in keeping sub-standard equipment out of their jurisdictions. Lastly, inspectors must remain accessible to answer technical questions from their jurisdictional constituencies (the cogs of industry will not grind to a halt).

Over the years, I have been proud to meet inspectors from all over North America. They know what it means to honor professional obligations. But they are also realists.

Bureaucratic posturing isn't going away.

Economic downturns aren't going away.

Furloughs aren't going away.

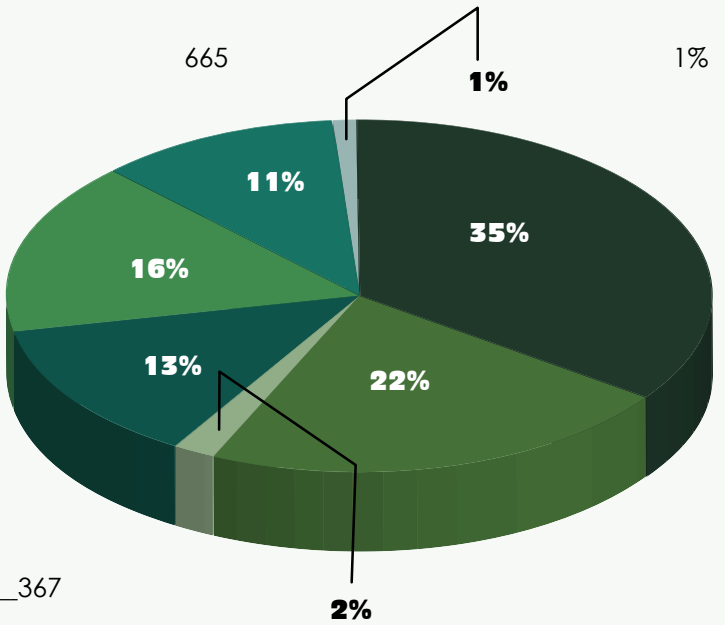
And fortunately for the public, neither are boiler and pressure vessel laws . . . .

2008 Report of Violation Findings

The National Board Annual Violation Tracking Report identifies the number and type of boiler and pressure vessel inspection violations among participating member jurisdictions. The chart below details violation activity for the year 2008.

Annual Report 2008

Category	Number of Violations	Percent of Total Violations
Boiler Controls	27,202	35%
Boiler Piping and Other Systems	17,510	22%
Boiler Manufacturing Data Report/Nameplate	1,829	2%
Boiler Components	10,028	13%
Pressure-Relieving Devices for Boilers	12,239	16%
Pressure Vessels	8,600	11%
Repairs and Alterations	665	1%



Summary for 2008

Number of jurisdictional reports: 367

Total number of inspections: 802,854

Total number of violations: 78,073

Percent violations: 10%

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

Economy Notwithstanding: It's Good to be an Inspector

BY PAUL BRENNAN, DIRECTOR OF PUBLIC AFFAIRS

PERSPECTIVE

The current economy has prompted speculation within our industry as to the future of pressure equipment inspection.

While some are concerned, others assume a more practical outlook.

Not to worry, they opine. The future of safety inspection resides in the development of new technology. These individuals point to new software on the market expressly designed to assist and make inspectors more productive. Further, they reason computerized inspection is only a matter of time.

Computers? Replacing inspectors?

To those endorsing the thesis computers can cure everything that ails us, this assumption – on the surface – sounds entirely plausible. After all, it's not that boilers are complicated. Teakettle simplicity allows even the most mechanically challenged among us to understand the dynamics of steam creation.

And the reality is: computers are changing our industry in ways few would have imagined several short years ago.

Today, many staff inspectors are equipped with laptops on which they can electronically file inspection reports from state cars. Not only does this approach preempt the necessity for inspectors to periodically complete and file their reports with a physical presence in their office, it allows them to accelerate report submission and maximize their productivity on the road. In one National Board jurisdiction, this process has been credited with a three-fold increase in productivity.

Through its Electronic Data Transfer (EDT) program, the National Board has pioneered the filing and retrieval of electronic data reports. In addition to eliminating space requirements for document storage, EDT allows manufacturers and inspectors to instantly access data reports any time day or night from any place in the world – and more economically than ever before!

While there have been numerous computer applications designed in recent years to improve boiler operation and efficiency, little has surfaced to help inspectors do a better job of inspecting. Recordkeeping, yes. Inspecting, no.

There is good reason the inspection process has not yielded to – and will never completely yield to – computerization. Until computers possess human-like sensing qualities, inspectors need not worry about their own obsolescence.

"Among the inspector's most important tools are his eyes and ears," one veteran inspector recently shared with me. "How can a computer spot a questionable repair or modification? Can a computer analyze sounds coming from a piece of equipment that an inspector knows is troubling?"

For years, computers have been monitoring boiler operations, thereby increasing efficiency and even in some cases extending equipment life. "But even though electronic monitors can keep track of pressure, temperatures, etc.," the inspector explains, "there are a variety of problems that take a trained eye to identify."

While technology has been somewhat successful incorporating more human-type characteristics in computers, there remains a sixth sense that eludes even the most elite electronic monitoring devices: intuition.

There is just no replacing years upon years of experience when it comes to inspection. That is a feeling unanimous among commissioned inspectors.

On the insurance side, a retired industry official chuckles at the mention of replacing inspectors with computers.

"It's been talked about for years," he explains with a shake of the head. "But I don't know anyone who has ever taken it seriously. Granted, technology has come a long way. But the only approach to monitoring a boiler for potential operational or safety problems is to build in an extraordinary number of sensors that can be electronically analyzed.

"Young people today," he continues, "may have more interest in creating equipment capable of self-monitoring. Problem is: it would be cost-prohibitive. For many buyers, new boilers are already considered too expensive."

If the cost to construct a new generation of sophisticated boilers were not enough to discourage those with a technical inclination, what about the incalculable time and resources that would be needed to retrofit millions upon millions of boilers and pressure vessels already in operation? (Assuming this equipment could be retrofitted.)

"Hypothetically, even if you eventually did become completely reliant on computerized inspection," the insurance industry retiree surmises, "owners and users would still require calibration of equipment consistent with national or jurisdictional codes and standards."

And that, he keenly observes, will have to be overseen by a third party who most probably would be – you guessed it – an inspector!

Speaking of codes and standards: it stands to reason any new fundamental approach permitting electronic oversight would necessitate a change – nay, a radical change – in jurisdictional laws. Knowing how deliberately the legislative process moves, it could be decades before a new standardized inspection process would be agreed to and incorporated into a state or province's regulations.

While I am a firm believer in technology and the power of invention and ingenuity, computers are not the answer. Nor are they key to delaying the inevitable departure from our industry of experience and knowledge that comes with being a baby boomer.

But here is some good news for individuals considering becoming boiler/pressure vessel inspectors: there is probably no career path offering better job security!

Compare recent electronic advancements in the pressure equipment industry to the undistinguished evolution of the inspector's hammer and flashlight, and it becomes clear an inspector's most important tool is that which holds forth in his head. And it evolves every day.

While technology involving information transfer will continue to advance, there is mounting evidence suggesting the time-tested, human method of performing inspections will pretty much remain the way it has for nearly 90 years.

With apologies to the late Walt Kelly and his beloved Pogo, we have met the future and it is now!

And Finally...

Bob Woodward passed away January 16 of last year.

I only recently learned of his death. And it saddened me.

His name may not be recognizable to many. But you knew him, or at least knew *of* him.

There wasn't much written about his passing. Just a modest five-inch obituary published in a statewide newspaper.

I had the pleasure of working with Bob in the two-year period leading up to passage of the South Carolina Boiler Law. He was a longtime fixture in the Palmetto State, known for his efforts promoting pressure equipment legislation.

Yes, *that* Bob Woodward.

With the resolve of a town crier, he cautioned the powerful and perplexed about boiler safety.

Yes, he was retired and yes, he had some time on his hands. But how many of us would pursue such an avocation given similar circumstances?

Bob and I had numerous discussions about the political climate in South Carolina. Several weeks prior to passage of the Boiler Inspection Act, we communicated almost daily – primarily by phone.

He had a computer. But unlike his more proficient days as a mechanical engineer, Bob wasn't in command of the new technology. The Internet passed him by some years ago.

Email confounded him. He was more of a paper-and-pencil type guy.

While years had taken a physical toll on him, Bob's mind remained as sharp as a freshly honed carving knife.

Some took interest in his cause. Many did not. Boilers, you see, don't sell newspapers. Nor do they enhance one's lifestyle. And hence the thrust of his message was oftentimes met with polite indulgence.

On any given day, Bob would truck tirelessly to a TV station in the unforgiving South Carolina heat. Or to a newspaper.

Bob Woodward

Anywhere he could sustain an audience.

He gave speeches. To big groups. To small groups. Always keeping his well-rehearsed message on point.

There was much to know about Bob Woodward. More than what was shared in his funeral notice.

Yes, he was graduated from the University of South Carolina. For many years, he served as a Deacon and taught Sunday school at Columbia's Forest Lake Presbyterian Church. Bob was married to his bride Joan for 53 wonderful years. He was survived by her, two grown sons, two grown daughters, and four grandchildren.

And then there were personal things.

Whenever I visited Columbia, Bob would graciously offer to chauffeur me about. Although we both shared a love of cigars, climbing into Bob's small hatchback always took a period of adjusting to the stale cigar smoke.

Hard of hearing in one ear, Bob had a peculiar way of cocking his head to bring his good ear within range of conversation. He had a grandfatherly way of communicating: calm, measured, steady.

One would be hard-pressed to spot Bob in a crowded room. Like a modern day Clark Kent, a reserved, unassuming demeanor belied his personal battle for "truth and justice."

In Bob's presence, South Carolina legislators revealed an urbane respect for the man from Greenville, South Carolina.

When the Boiler Safety Act passed, we engaged in quiet celebration. There were no high fives. No champagne.

Yes, we agreed a law had been finally passed. No, it was not as comprehensive as we wanted. But it was a start – a start 30 years in the making.

And there was one other thing we agreed upon: more would have to die in South Carolina before the Boiler Safety Act would assume the traction of neighboring jurisdictions. That was our little secret. And it wasn't, until now, for publication.

Mr. Woodward always touted the National Board's proactive efforts to pursue pressure equipment legislation when other entities lost interest. Perhaps he was just happy to have another organization share his cause.

There have been a number of people in my career I have been proud to work with.

Bob Woodward was such an individual.

South Carolina residents don't know it yet, but they will miss Bob Woodward. His void will become apparent right after the jurisdiction's next fatal boiler explosion. At said time, the media will descend, probing and prodding for answers. Their research will lead to Bob's name and what he attempted to do for his fellow citizens.

Bob Edward Woodward died a year and a half ago. He was 76.

Each of us in the pressure equipment industry should mourn, albeit belatedly. For it is not every day we witness a decent and stubbornly committed man at work.

Another extraordinary professional has departed God's waiting room. ✪

Common Misconceptions When Applying Code Rules, Part II

Patrick M. Nightengale, Senior Staff Engineer, Training Specialist

This subject was first addressed in an article appearing in the fall 2008 *BULLETIN*. Because of positive response from readers, we are continuing the subject. In this article, we will address more areas where misunderstandings continue to be identified.

ASME B31.1 Blowoff Versus Blowdown Piping

When discussing boiler external piping in an ASME Section I application, what is the difference between blowoff and blowdown piping? Ask most boiler operators, manufacturers, repair firms personnel, or inspectors, and the response may very well be the same. Either they can't tell you or they think these terms are used interchangeably. A review of ASME B31.1, paragraph 122.1.4, identifies very specific differences. By definition, blowoff systems are operated intermittently, such as a bottom blowoff from a watertube boiler water or "mud" drum. Blowdown systems are operated continuously, such as a surface blowdown from a watertube boiler steam drum.

Understanding these differences in terminology becomes important to establish the correct value of design pressure. Understanding these requirements may also apply during a rerating or alteration as defined in the *National Board Inspection Code* (NBIC).

ASME B31.1, paragraph 122.1.4 (A), requires the design pressure of blowoff piping to exceed the maximum allowable working pressure of the boiler by either 25 percent or 225 psi (1550 kPa), whichever is less, but shall not be less than 100 psig [690kPa (gage)]. ASME B31.1, paragraph 122.1.4 (B), requires the design pressure of blowdown piping be not less than the lowest set pressure of any safety valve on the boiler drum.

Blowoff systems with intermittent operation experience greater stress due to thermal shock loadings when the blowoff valves are opened, allowing very hot pressurized water from the boiler to flow through relatively cool downstream piping. For this reason, ASME code requires blowoff piping to have a more robust design when compared to the design of the boiler.

Blowdown systems, due to their continuous operation, result in uniform pressures and temperatures within the piping without the thermal shock loading experienced by blowoff systems. Therefore, it is appropriate to relate design pressure of blowdown piping to the lowest set pressure of any safety valve on the boiler drum.

Feedwater Piping

On a related topic, problems may occur when establishing the correct design pressure for power boiler feedwater piping. ASME B31.1, paragraph 122.1.3 (A.1), addresses the design of feedwater piping to include piping between the boiler up to and including the required stop valve and check valve. The minimum value of design pressure shall exceed maximum allowable working pressure of the boiler by either 25 percent or 225 psi (1550 kPa), whichever is less, with a minimum pressure [per paragraph (A.3)] of 100 psig [700 kPa (gage)], and shall never be less than the pressure required to feed the boiler. (Note: Alternative rules are mandated for forced flow steam generators with no fixed steam or waterline).

This requirement recognizes that feedwater can only be introduced into the boiler if its pressure is higher than boiler pressure; therefore, the piping must be designed for the higher pressure load.

ASME Section VIII, Division 1, Alignment Tolerances and Weld Reinforcement Limitations

When welded fabrication, repairs, or alterations are performed to the requirements of either the ASME code or NBIC, it is rare to see the required code books in the work area. Yet, the very people performing the work of inspecting to code requirements are required to know code parameters. If they don't know what the limits are, how can a meaningful determination be made regarding the acceptance of the activity?

Paragraph UW-33 and Table UW-33 of Section VIII, Division 1, establishes limits on the maximum alignment offset of sections at edges "to be butt welded." The alignment must be within the stated limits prior to actually depositing weld metal.

Fig. 1

Table UW-33

Customary Units

Section Thickness, in.	Joint Categories A	Joint Categories B, C, & D
Up to ½, incl.	¼*t*	¼*t*
Over ½ to ¾, incl.	⅛ in.	¼*t*
Over ¾ to 1½, incl.	⅛ in.	3⁄16 in.
Over 1½ to 2, incl.	⅛ in.	⅛*t*
Over 2	Lesser of ⅛*t* or ⅜ in.	Lesser of ⅛*t* or ¾ in.

SI Units

Section Thickness, mm	Joint Categories A	Joint Categories B, C, & D
Up to 13, incl.	¼*t*	¼*t*
Over 13 to 19, incl.	3 mm	¼*t*
Over 19 to 38, incl.	3 mm	5 mm
Over 38 to 51, incl.	3 mm	⅛*t*
Over 51	Lesser of 1⁄16*t* or 10mm	Lesser of ⅛*t* or 19 mm

Table UW-33 (see **Fig. 1)** imposes limits based on the thickness of the thinner of the two parts being joined. Tighter alignment limits are applied to Category A joints than to B, C, and D joints. Do the welders or QC personnel know the differences between Category A, B, C, and D as defined in paragraph UW-3?

When preparing to deposit tack welds for a longitudinal butt welded joint in a Section VIII, Division 1 shell course, ask the welder if the alignment is acceptable. Ask the QC inspector. Wait for their responses, then ask what criteria are used for alignment limits and see what they say. Ask to see the tools and methods used to determine the actual mismatch. You may be surprised. Often the requirements fail to get out of the code book and into the workplace, where they need to be understood by those performing the work or verifying its acceptance. Without accurate information, the work always seems to get done, maybe based on past practice or what they have learned from more experienced employees. (Or they may use the "it looks good to me" approach.) The overriding concern is this: Will vessel manufacturers meet their obligation to comply with the code?

Fig. 2

Table UW-35(d)

Customary Units

Material Nominal Thickness, in.	Maximum Reinforcement, in. Category B & C Butt Welds	Other Welds
Less than 3/32	3/32	1/32
3/32 to 3/16, incl.	1/8	1/16
Over 3/16 to 1/2, incl.	5/32	3/32
Over 1/2 to 1, incl.	3/16	3/32
Over 1 to 2, incl.	1/4	1/8
Over 2 to 3, incl.	1/4	5/32
Over 3 to 4, incl.	1/4	7/32
Over 4 to 5, incl.	1/4	1/4
Over 5	5/16	5/16

SI Units

Material Nominal Thickness, mm.	Maximum Reinforcement, mm. Category B & C Butt Welds	Other Welds
Less than 2.4	2.4	0.8
2.4 to 4.8, incl.	3.2	1.6
Over 4.8 to 13, incl.	4.0	2.4
Over 13 to 25, incl.	4.8	2.4
Over 25 to 51, incl.	5	3.2
Over 51 to 76, incl.	6	4
Over 76 to 102, incl.	6	6
Over 102 to 127, incl.	6	6
Over 127	8	8

Similarly, paragraph UW-35(d) of Section VIII, Division 1, establishes maximum limits on weld reinforcement (see **Fig. 2)**. As with alignment tolerances, ASME code sets more restrictive limits on Category A and D butt weld reinforcement than with Category B and C butt welds. As before, ask welders or QC inspectors if the reinforcement is acceptable and see what they say. Do they know the code limitations? How is reinforcement being measured?

Here's an example. A vessel shell is made up of two courses of rolled and welded plate. The material thickness at all welded joints is 1 inch (25 mm). **Figure 3** identifies maximum alignment offset and maximum permitted reinforcement.

As illustrated, these tolerances are very restrictive. It's important these requirements are understood and used in the workplace. Drawing notes, travelers, fabrication instructions, welding procedure attachments or postings in the work area are but a few methods that may be effective. It doesn't matter how the information is made available as long as the methods selected are effective and in accordance with the fabrication control requirements established in the quality control system.

Fig. 3

Based on 1 inch (25 mm) thickness	Category A Longitudinal Joints	Category B Circumferential Joints
Maximum Alignment Offset (UW-33)	1/8 inch (3 mm)	3/16 inch (5 mm)
Maximum Weld Reinforcement (UW-35)	3/32 inch (2.4 mm)	3/16 inch (4.8 mm)

ASME Section VIII, Division 1 Pressure Testing

All ASME code sections have requirements for pressure testing upon completion of construction. Sections I and IV are clear, but Section VIII, Division 1, requires a little more understanding to determine the correct value of minimum test pressure.

Rules for hydrostatic testing appear in paragraph UG-99(b). Rules for pneumatic testing appear in UG-100(b). Under either form of pressure testing, the code takes into consideration the relationship between the stress that exists in the vessel material at test temperature (typically ambient) and the corresponding stress at the designated design temperature. The stresses applicable to the materials used in the construction of the vessel can be found in ASME Code Section II, Part D. This relationship of stress at test temperature compared to the stress at design temperature is expressed as a ratio and must be calculated for all the materials used to construct the vessel. Once all the stress ratios have been determined, the lowest ratio must be applied when determining the minimum test pressure.

Figure 4 illustrates the way in which the required minimum test pressure is calculated for a hydrostatic test. If this approach is not properly implemented, the result could be a pressure test performed at a test pressure below that required by the code.

Fig. 4

Assumptions

1) Hydrostatic testing is to be performed.
2) MAWP = 375 PSI at a design temperature of 800°F.
3) Materials used in the vessel are as follows:

Calculate per UG-99(b)

1.3 x MAWP x lowest ratio of Stest ÷ Sdesign = Minimum Test Pressure

1.3 x 375 psi x 1.22 = 594.75 = 595 psi, Minimum Test Pressure

Part Name	Material Specification	Stress at Test Temperature, psi	Stress at Design Temperature, psi	Stress Ratio
Shell and Heads	SA-515, Gr. 65	18,600	11,400	1.63
Nozzles	SA-53 B, ERW	14, 600	9,200	1.59
Welded tubes	SA-268 Tp. 430	14,600	12,000	1.22*
Flange	SA-616, Gr. 70	20,000	12,000	1.67

***Lowest ratio = 1.22**

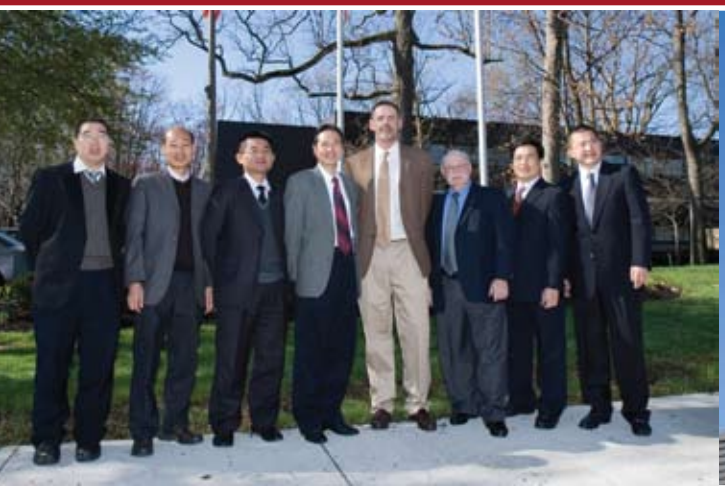
Conclusion

The codes with which we work are regarded as highly technical standards. The requirements contained therein are not always immediately recognized or understood. The best way to begin to learn about code requirements is to carefully read the parts of the code that apply to the item proposed to be constructed. If you are not confident in your understanding of the code, inquiries to your company's management, to authorized inspection agencies, to the jurisdictional authority, interpretation requests to the National Board or ASME as applicable, or a short training course may provide the support you need.

Editorial note: Metric values referenced in this article were derived from the ASME Codes and Standards and verified to be accurate at time of publication.

Chinese Delegation

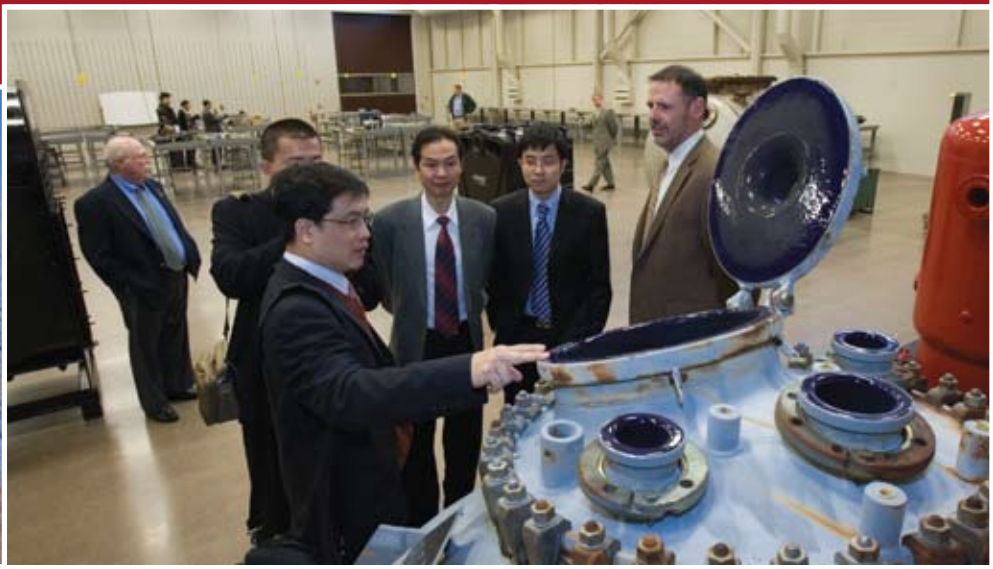
A TOUR WITH EXECUTIVE DIRECTOR



Top Left. National Board executives and Chinese delegation. From left to right: Wu Jiquan, Zhuang Xiaoxiong, Lin Shuozhong, Zeng Zifeng, Dave Douin, Dick Allison, Xie Changhuan, Sun Qi.

Visits National Board

DAVID DOUIN



A six-member Chinese delegation visited the National Board on Thursday, April 16. The delegation, which toured the headquarters, training, and lab, comprised five employees from the Shenzhen Institute of Special Equipment Inspection and Test (SISE) and one from the Bureau of Quality and Technology Supervision of Shenzhen. SISE inspects and tests high-risk equipment such as boilers and pressure vessels.

National Board Executive Director David Douin says the National Board "welcomed the opportunity to participate in a frank exchange of ideas" and that "talks were most productive in setting the tone for what promises to be a continuing and mutually beneficial association."

A delegation from the National Board plans to visit SISE this summer.

Bring on the entertainment!

2009 GENERAL MEETING HIGHLIGHTS

As in previous years, this year's National Board General Meeting proved to be not only highly informative but entertaining.

Monday morning, the Famous San Diego Chicken kicked off the Opening Session, whose speaker was Beach Boys' co-founder and front man Mike Love. The General Session featured prominent industry speakers such as Barry Bobo, vice president of Hartford Steam Boiler Global Nuclear Services, and David Lang, chair of the ASME Post-Construction Committee.

Following the Opening Session, guests were treated to an afternoon of shopping and sightseeing in the Cedros Avenue Design District. Tuesday they participated in a sailboat regatta in San Diego Bay. Wednesday morning they visited the USS *Midway* Museum and, in the afternoon, Marine Corps Air Station Miramar, site of the 1986 movie *Top Gun*. The day concluded with the Wednesday Evening Banquet, featuring legendary artists B. J. Thomas and Billy Joe Royal.

Ken K.T. Lau receives 2009 National Board Safety Medal.

National Board presents ASME Codes and Standards with a commemorative clock acknowledging 125-Year anniversary.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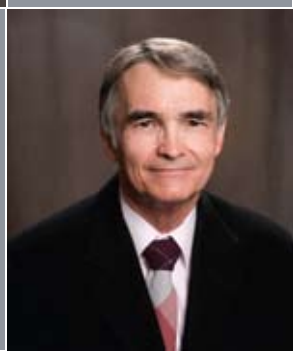


Impregnated Graphite Pressure Vessels

BY FRANCIS BROWN, SENIOR STAFF ENGINEER

FEATURE

The 2009 Addendum of Section VIII, Division 1 of the *ASME Boiler and Pressure Vessel Code* will contain a new part: *Part UIG – Requirements for Pressure Vessels Constructed of Impregnated Graphite*. Part UIG defines the requirements for manufacturing code-stamped vessels from impregnated graphite. Impregnated graphite is the only nonmetallic material in Section VIII.

A typical impregnated graphite pressure vessel is a heat exchanger consisting of impregnated graphite tubes and tubesheets in a steel shell with steel flanges and bolts (see **Fig. 1**). Impregnated graphite pressure vessels are limited to a maximum internal/external design pressure of 350 psi over a temperature range of -100ºF to 400ºF.

Impregnated graphite is a mixture of fine-grain graphite and a thermosetting resin such as epoxy. Graphite has high thermal conductivity (at room temperature it is comparable to aluminum or brass), excellent resistance to corrosion, is porous, and must be impregnated with a thermosetting resin for use as pressure vessel material. Impregnated graphite is not subject to the galvanic, aerobic, pitting, and intergranular types of corrosion common to metallic materials, and therefore is used extensively in aggressive environments.

The fabrication of an impregnated graphite pressure vessel begins with a block of graphite that may or may not be machined to the final dimensions of the finished part. The graphite is placed in an autoclave, and the air pumped out (see **Fig. 2**). After a sufficient length of time for the air to diffuse out of the pores in the graphite, an appropriate thermosetting resin is pumped into the autoclave and pressure applied to force the resin into the pores in the graphite (see **Figs. 3** and **4**). The resin is then cured, and, if required, the impregnated graphite machined to final dimensions.

Fig. 1

Tube and Shell Heat Exchanger, Courtesy of SGL Carbon Technic LLC.

Unlike metallic materials used for the fabrication of pressure vessels, there are no standardized material specifications for impregnated graphite.

Each manufacturer is required to write a certified material specification and to qualify the specification and the impregnated graphite material by testing before producing code-stamped vessels.

Periodically Part UIG requires the manufacturer to recertify the impregnated graphite material specification.

Impregnated graphite parts are joined together by cementing. The graphite cement typically consists of the resin, powdered graphite, and a catalyst. Like all material-joining methods, including fusion welding, appropriate joint design is essential for an effective bond. Part UIG requires the manufacturer to prepare and qualify by test a cementing-procedure specification that contains all essential and nonessential variables. Part UIG requires that only technicians qualified by testing perform the cementing.

The inspection of impregnated graphite parts and completed vessels is limited by the properties of the material to visual examination. The manufacturer's written visual examination procedure shall comply with the requirements of Section V, Article 9, and the visual examination procedure shall be demonstrated to the satisfaction of the authorized inspector (AI). The manufacturer shall appoint a qualified inspector(s) for visual examination of all parts and completed vessels manufactured of impregnated graphite.

The AI has additional duties associated with impregnated graphite vessels as compared to metallic vessels. The AI must verify the manufacturer has a certified specification for the impregnated graphite material as qualified by testing. This material specification must be periodically recertified. The AI must also verify the impregnated graphite used for code-stamped vessels complies with the appropriate certified material specification. Finally the AI must verify the manufacturer is producing impregnated graphite to the certified material specification.

Each manufacturer is required to write a certified material specification and to qualify the specification and the impregnated graphite material by testing before producing code-stamped vessels.

When joining two metallic components by welding, the AI verifies the weld procedure specification, the supporting performance qualification records, and the welder's qualifications for making the weld. When joining two impregnated graphite components by cementing, the AI must verify the manufacturer has a written specification for the cement, the qualification testing for the cement, the adequacy of the joint design, and the qualifications of the cementing technician making the cemented joint.

Impregnated graphite, with its high thermal conductivity and corrosion resistance, is used extensively in heat exchangers. The impregnated graphite is manufactured by the vessel manufacturer to a certified material specification, then machined to final dimensions as required. The vessel components are joined by qualified technicians per a certified cementing specification using certified cement. The AI shall verify the vessel complies with all Part UIG and Section VIII, Division 1 requirements.

FIG. 2

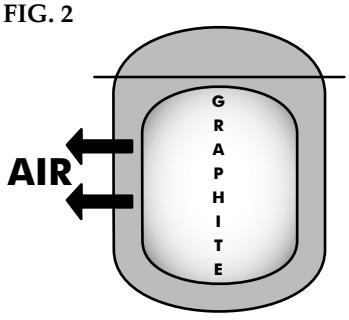


FIG. 3

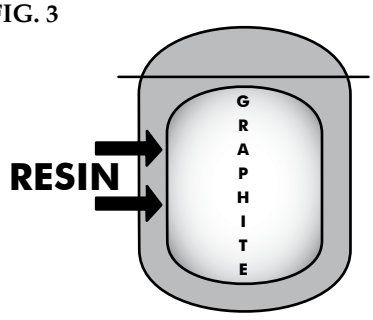
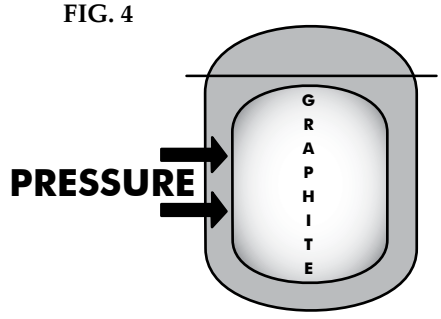


FIG. 4



Refle

ctions on the National Board

An Interview with David Douin and Robert Aben

If there is one thing separating new National Board Executive Director David Douin and recently elected Chairman of the Board Robert Aben, it would be an obvious 8-inch disparity in height.

But make no mistake: these are two gentlemen of outstanding professional stature. Together, they share over 65 years of experience and a number of observations intended to elevate the National Board to new plateaus.

Born in Trenton in Southern Michigan, Mr. Aben was first exposed to boilers during his 14 years with the US Coast Guard. Leaving the Coast Guard in 1980, he joined Hartford Steam Boiler, where he spent nine years as an inspector at Enrico Fermi 2 nuclear plant. Mr. Aben joined the state of Michigan in 1989 and is presently chief boiler inspector. He possesses both "I" and "N" endorsements.

Mr. Douin was born in Decatur, located in Central Illinois. Starting his career as a boilermaker in 1974, the 6'4" National Board executive director joined the state of Illinois in 1982, where he worked for 26 ½ years, 18 of which as superintendant of boiler and pressure vessel safety. He possesses "A" and "B" endorsements.

Both men joined the National Board as chief inspectors of their respective jurisdiction pressure equipment departments in 1990.

Mr. Douin was elected to the National Board Board of Trustees in 1997 and served 11 years, the past eight as chairman. Mr. Aben was elected chairman in October 2008 to fulfill the remaining term of Mr. Douin, who resigned the chairmanship in September.

National Board members elected the Illinois native executive director in November 2008. He officially assumed the position in January of this year.

With a new chairman and executive director in place, the *BULLETIN* asked Messrs. Aben and Douin to provide their perceptions of the National Board and comment on its future direction.

Herewith the answers to a series of questions:

BULLETIN: *MR. DOUIN, YOU'VE BEEN IN THE JOB FOR ABOUT FOUR MONTHS. HAS YOUR PERCEPTION OF THE EXECUTIVE DIRECTOR'S RESPONSIBILITIES CHANGED SINCE YOU WERE CHAIRMAN?*

MR. DOUIN: Yes and no. As chairman, I had a pretty good grasp of the position while working closely with Don [Tanner]. But being chief inspector at that time and having other jurisdictional responsibilities sort of filtered my appreciation for what the executive director does on a day-to-day basis. Naturally, overseeing a pressure equipment safety program in just one jurisdiction is considerably different than being involved with over 60 programs throughout North America. What is fascinating about the executive director's position is how one is able to witness the many similarities in programs, as well as dissimilarities. I look upon the National Board as the glue keeping each jurisdiction together and working to maximize their intended function. In this regard,

"Since 2005, we have turned over 26 chief inspectors or 43 percent of our membership. And that is a mountain with both an upside and a downside."

it is the executive director who must provide the oversight to keep the codes and standards system whole.

If there has been one somewhat surprising aspect of the position, it has probably been the business end. The National Board is involved in many transactions during the course of a day. A lot of these are with companies all over the world. Not only is the executive director responsible for overseeing what transpires daily, he must be able to anticipate what occurs down the road. The sheer volume of National Board business can be daunting. But this is where having an exceptional staff is invaluable. They have been great in getting me through the transition.

BULLETIN: *MR ABEN, YOU HAVE BEEN CHAIRMAN FOR APPROXIMATELY EIGHT MONTHS. HAS THERE BEEN ANY CHANGE IN YOUR PERCEPTION OF THE NATIONAL BOARD ORGANIZATION?*

MR. ABEN: As Dave said, I think the more responsibility you assume within the organization, the more you witness things in a different context. I believe my change in perception has been more individual in nature. Since assuming the chairmanship I have been in regular contact with many of my chief inspector colleagues – the kind of collective interaction that is rare working at a jurisdictional level. While I have always had an exceptionally positive impression of these men and women, you can't even begin to understand what they experience each and every work day. Most have had to keep their positions through multiple changes in administrations. Others have to regularly deal with budgetary constraints. A number are short-staffed. And then there is always the bureaucracy that goes along with being a civil servant. It's amazing the amount of work our chief inspectors complete with all the distractions! Yet our members persevere. I think those unfamiliar with the National Board sometimes underestimate a chief inspector's determination. Some keep a lower profile than others, but all possess that sense of cause, that certain ability to do a job and do a job right.

"While the National Board is sound financially, we have always believed it was our duty as a not-for-profit to be fiscally responsible."

BULLETIN: *ARE YOU AT ALL CONCERNED ABOUT THE FUTURE OF PRESSURE EQUIPMENT SAFETY PROGRAMS?*

MR. ABEN: Tightening of resources, I think, always generates concern. Comparing the effect on, say, a nondescript government agency and the inspection discipline: there is a profound difference. Public safety is everyone's business, and I think it's something we must continually remind ourselves and the people we work for. What the National Board has continually done for the members is provide important documentation illustrating the dangers of a scaled-down safety program. Sometimes this has positive impact. Other times it falls upon deaf ears, particularly with those only seeking political expediency. Whatever the situation, members must continually justify their operations and, when possible, reinforce the message of safety. This is an ongoing, unending process. A number of our members get new supervisors every couple of years. These management personnel must be schooled on the effectiveness of a fully funded, fully staffed program and the fallout of compromising an inspection process that works with efficiency and positive results. Our members must understand they are not alone in the struggle to retain revenue and manpower resources. National Board will do everything it possibly can to assist proactive communication efforts.

BULLETIN: *IN YOUR OPINION, MR. DOUIN, WHAT ARE THE MOST PRESSING ISSUES NOW FACING THE NATIONAL BOARD?*

MR. DOUIN: There are several. But one of the foremost is preparing a new generation of inspectors. Our training programs are attracting a significant number of students having college backgrounds. Unfortunately, emphasis at the college level is more textbook-oriented. While these young people have a good foundation of knowledge, some would be hard-pressed to identify a boiler in a boiler room. The challenge for the National Board is to provide

hands-on experience that will allow students to reconcile what they learned in school with what they work on. This is one of the reasons we constructed our new Inspection Training Center: to let our students experience firsthand the realities of the inspection process. While it has been gratifying seeing an increase in the number of people attending National Board courses, the pressure equipment industry still needs more inspectors. A major obstacle standing in the way of more individuals pursuing an inspector career path has been salaries. Over the past couple of years, however, the National Board has worked with several jurisdictions to raise inspector compensation, an effort that has been very well-received. Ironically, right after we were able to secure some wage relief, the economy soured and now several jurisdictions have to reprioritize their resources.

Another pressing issue involves the very essence of the National Board organization: uniformity. All one needs to do to appreciate the National Board's dedication to uniformity is to observe our preamble: "One Code. One Authorized Inspector. One Stamp." One of the things I hope to accomplish is convincing more jurisdictions to work in harmony. Our organization has a rich history of achieving only the highest standards and the only way to maintain those standards is through uniformity. That is a message I will continue to drive home with our membership.

BULLETIN: *MR. ABEN, WHAT WOULD YOU CONSIDER TO BE THE PRIORITIES OF THE NATIONAL BOARD?*

MR. ABEN: One of the most important, I believe, is strengthening National Board's international connection. Every year, we instruct hundreds of foreign professionals who come to Columbus, Ohio for training. Additionally, we welcome a number of representatives from foreign companies who use our lab for testing pressure relief devices. While the world has in essence come to us, it is perhaps time we make our product more available overseas. This month, we will travel to China to discuss several mutually beneficial projects. There remains considerable interest globally in the *National Board Inspection Code*. And our online training program is registering students from numerous overseas nations.

And speaking of training: the pressure equipment industry will be seeing an aggressive new approach to the marketing of our instruction programs over the next several years. Not only will we be promoting our courses to those first-timers exposed to our program, we'll be also encouraging past students to take periodic refresher courses. It's often been said a safety professional is only as effective as his or her most recent training. We think that is particularly true in our industry. By expanding the number of online courses, we are hoping to make National Board training as cost-effective and convenient as possible for our students.

BULLETIN: *THERE HAVE BEEN A NUMBER OF CHANGES MADE AT RECENT GENERAL MEETINGS. ARE THERE ANY OTHER MODIFICATIONS PLANNED?*

MR. DOUIN: The General Meeting is a function that has allowed the National Board to return to its constituencies a small token of gratitude for what can only be described as great industry support. While we have always strived to make the meeting an outstanding event for both men and women, meeting costs have risen significantly. Not wanting to affect the meeting's quality, we have managed over the years to contain many of the price increases through a series of subtle changes. While the National Board is sound financially, we have always believed it was our duty as a not-for-profit to be fiscally responsible. Company austerity is pretty popular in today's economy. But it is nothing new to the National Board. We have been prudent in cutting our expenses. And that, I think, will permit the General Meeting to thrive for many, many more years.

One additional note: the National Board is working closely with ASME to return the

> *"Public safety is everyone's business, and I think it's something we must continually remind ourselves and the people we work for."*

General Meeting under one roof. If some logistical problems can be resolved, this could occur as soon as 2011.

BULLETIN: *THE NATIONAL BOARD HAS WITNESSED SIGNIFICANT MEMBERSHIP TURNOVER DURING THE PAST SEVERAL YEARS. HAS THIS BEEN GOOD OR BAD FOR THE ORGANIZATION?*

MR. ABEN: Since 2005, we have turned over 26 chief inspectors or 43 percent of our membership. And that is a mountain with both an upside and a downside. Many of the chiefs who left our membership retired. Others went on to new employers, some within the insurance industry. Any way you look at it, that's a lot of experience that walked out the door. On the other hand, we worked diligently to replace departed members. Some of these newer chief inspectors may not have the background or depth of their predecessors – yet – but they do bring fresh eyes and fresh perspective that in the longer term will be good for the pressure equipment industry. Our new members have demonstrated a lot of promise and commitment. For that we are very pleased.

BULLETIN: *SPEAKING OF CHANGE, DO YOU ANTICIPATE ANY SIGNIFICANT CHANGE WITHIN THE NATIONAL BOARD ORGANIZATION?*

MR. DOUIN: I think it is inappropriate for a new administrator to come into an organization and make immediate changes. Will there be changes? Of course. But any modifications will be the result of a studied approach and after extensive evaluation. From what I have seen during the very early portion of my tenure with the National Board, most changes will concern meeting the evolving needs of the industry. A good example is the NBIC. Here is an important document that is modified each year. And when a major modification is required – such as separating it into five parts – we'll make the leap. As Bob mentioned, we have already decided to become more involved on the international level and accelerate marketing of our training programs. I think the reason most administrators seek immediate change in their organization involves personnel. In this regard, the National Board is on solid ground. It is no secret National Board staff is an extremely talented and dedicated group. They have certainly made my transition pleasant and virtually seamless. The input of both members and staff will be key to whatever changes the future may bring.

MR. ABEN: I echo Dave's sentiments. But I also want to add whatever changes do occur will more than likely involve ways to do our jobs more effectively and efficiently. An organization does not exist for 90 years without seeking to better its operations. And with the advancement of new technologies, there are endless possibilities. For example: while travel costs continue to climb, Web conferencing is becoming more and more attractive and a viable alternative to face-to-face conferences. Over recent months, the National Board has made extensive use of electronic letter balloting to tally opinion on a variety of issues involving both members and committees. In the future, I think the industry will see a much more extensive use of the National Board Web site to communicate both within our industry and beyond.

BULLETIN: *WHAT IS THE MESSAGE THE NATIONAL BOARD WOULD LIKE TO COMMUNICATE BEYOND THE INDUSTRY?*

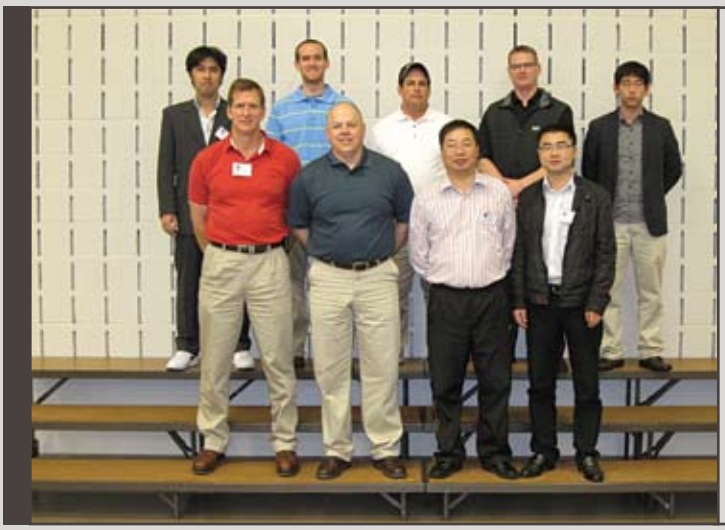
MR. DOUIN: This is a good time to become an inspector. While certain jurisdictions might be going through austerity measures, the National Board Web site is still advertising inspector openings. As the economy continues to recover, I think the demand will grow significantly. While becoming an inspector is not for everyone, it can be a very attractive position for young people who like to work with their hands and want to work independently within a stable work environment. Pressure equipment inspection could also prove interesting to those in mid-career, especially individuals between jobs with skills in welding, electrical, plumbing, fire safety, and building codes. But it requires considerable training and preparation. However, because it concerns safety and protecting the general public, being an inspector can be very gratifying.

BULLETIN: *THANK YOU, GENTLEMEN FOR SHARING YOUR TIME AND INSIGHT WITH BULLETIN READERS.*

TRAINING WRAP-UP

MARCH, 2009 "A" CLASS
NATIONAL BOARD TRAINING FOR
AUTHORIZED INSPECTION COURSE

MARCH, 2009 "N" CLASS
NATIONAL BOARD TRAINING FOR
BASIC NUCLEAR INSPECTION COURSE



APRIL, 2009 "A" CLASS
NATIONAL BOARD TRAINING FOR
AUTHORIZED INSPECTION COURSE

NATIONAL BOARD REPAIR ORGANIZATIONS WORLDWIDE
Where are They Located?

By Terry A. Parks, Manager of Field Services

Over the past 10 years there has been a significant increase worldwide in the number of repair organizations applying for and receiving the National Board "R" Certificate of Authorization. Currently there are approximately 3,900 National Board repair organizations throughout the world, with the largest concentration in North America. Although North America, in particular the United States, has the most stamp holders, the highest increase has been outside North America. In the U.S., 3,241 repair organizations hold the National Board "R" Certificate of Authorization.

The following table shows the number of organizations holding the "R" stamp in 1999, 2004, and 2009.

GROWTH

	1999	2004	2009	1999–2009 +/- (%)
U.S.	3,180	3,279	3,241	+61 (2%)
Mexico	18	27	60	+42 (233%)

In Canada, 110 repair organizations hold the "R" stamp. The following table shows the number of organizations holding the "R" stamp in 1999, 2004, and 2009.

GROWTH

	1999	2004	2009	1999–2009 +/- (%)
Canada	64	78	110	+46 (72%)

Outside North America, 476 repair organizations hold the "R" stamp. The following table shows the number of organizations holding the "R" stamp in 1999, 2004, and 2009.

GROWTH

	1999	2004	2009	1999–2009 +/- (%)
Outside North America	196	259	476	+280 (143%)

The past five years have seen a significant number of repair organizations in the Middle East and Asia receiving the National Board "R" stamp. During this time many countries in these areas have doubled or even tripled the number of stamp holders. In the Middle East, the United Arab Emirates had the largest increase: from 9 stamp holders in 1999 to 19 in 2004. Today they have 49 stamp holders, an increase of 225 percent since 1999. For Asia, India had the most significant increase: from 11 in 1999 to 14 in 2004. In 2009 it had 47, an increase of 306 percent since 1999.

The increase in the number of "R" Certificate of Authorization repair organizations outside North America is largely due to the fact the *National Board Inspection Code* has become more recognized internationally as a post-construction practice for the inspection, repair, and alteration of pressure-retaining items.

The following are lists of current National Board "R" Certificate of Authorization repair organizations worldwide by region.

USA

Alabama – 63
Alaska – 19
Arizona – 26
Arkansas – 32
California – 112
Colorado – 43
Connecticut – 20
Delaware – 13
Florida – 69
Georgia – 74
Hawaii – 13
Idaho – 21
Illinois – 124
Indiana – 74
Iowa – 49
Kansas – 42
Kentucky – 50
Louisiana – 145
Maine – 23
Maryland – 32
Massachusetts – 48
Michigan – 54
Minnesota – 62
Mississippi – 40
Missouri – 78
Montana – 17
Nebraska – 18
Nevada – 12
New Hampshire – 13
New Jersey – 72
New Mexico – 18
New York – 122
North Carolina – 81
North Dakota – 13
Ohio – 134
Oklahoma – 154
Oregon – 37
Pennsylvania – 214
Puerto Rico – 12
Rhode Island – 12
South Carolina – 46
South Dakota – 6
Tennessee – 63
Texas – 530
Utah – 41
Vermont – 4
Virgin Islands – 3
Virginia – 74
Washington – 78
West Virginia – 22
Wisconsin – 87
Wyoming – 32

Canada

Alberta – 23
British Columbia – 10
Manitoba – 2
New Brunswick – 2
Nova Scotia – 5
Ontario – 42
Quebec – 20
Saskatchewan – 6

Mexico

Mexico – 60

Central America & Caribbean Islands

Aruba – 1
Costa Rica - 1
Trinidad and Tobago – 2

South America

Argentina – 12
Bolivia – 1
Brazil – 11
Columbia – 16
Ecuador – 4
Peru – 1
Venezuela - 17

Europe

Austria – 1
Belgium – 1
Denmark – 1
Finland – 1
France – 7
Germany – 20
Greece – 2
Italy – 31
Netherlands – 11
Poland – 1
Romania – 1
Spain – 5
Sweden – 4
United Kingdom – 11

Middle East & Africa

Egypt – 16
Israel – 1
Kazakhstan – 4
Kingdom of Bahrain – 5
Kuwait – 10
Nigeria – 1
Pakistan – 5
Saudi Arabia – 25
State of Qatar – 5
Sultanate of Oman – 12
Tunisia – 1
Turkey – 5
UAE – 49

Asia

India – 47
Korea – 14
Malaysia – 18
Peoples Republic of China – 15
Philippines – 2
Republic of China (Taiwan) – 9
Singapore – 27
Thailand – 20
Vietnam – 6

Australia

Australia – 1

Indonesia

Indonesia – 13

Japan

Japan – 2

Randy Austin

Chief Boiler Inspector, State of Arizona

Ever met a person whose storied life might make for an interesting book?

Arizona Chief Boiler Inspector Randy Austin is such an individual. After all, how many can boast of becoming an entrepreneur at 15, once being AWOL, spending two raucous days (and nights) in a place called Crook, and being chief of two jurisdictions at one time?

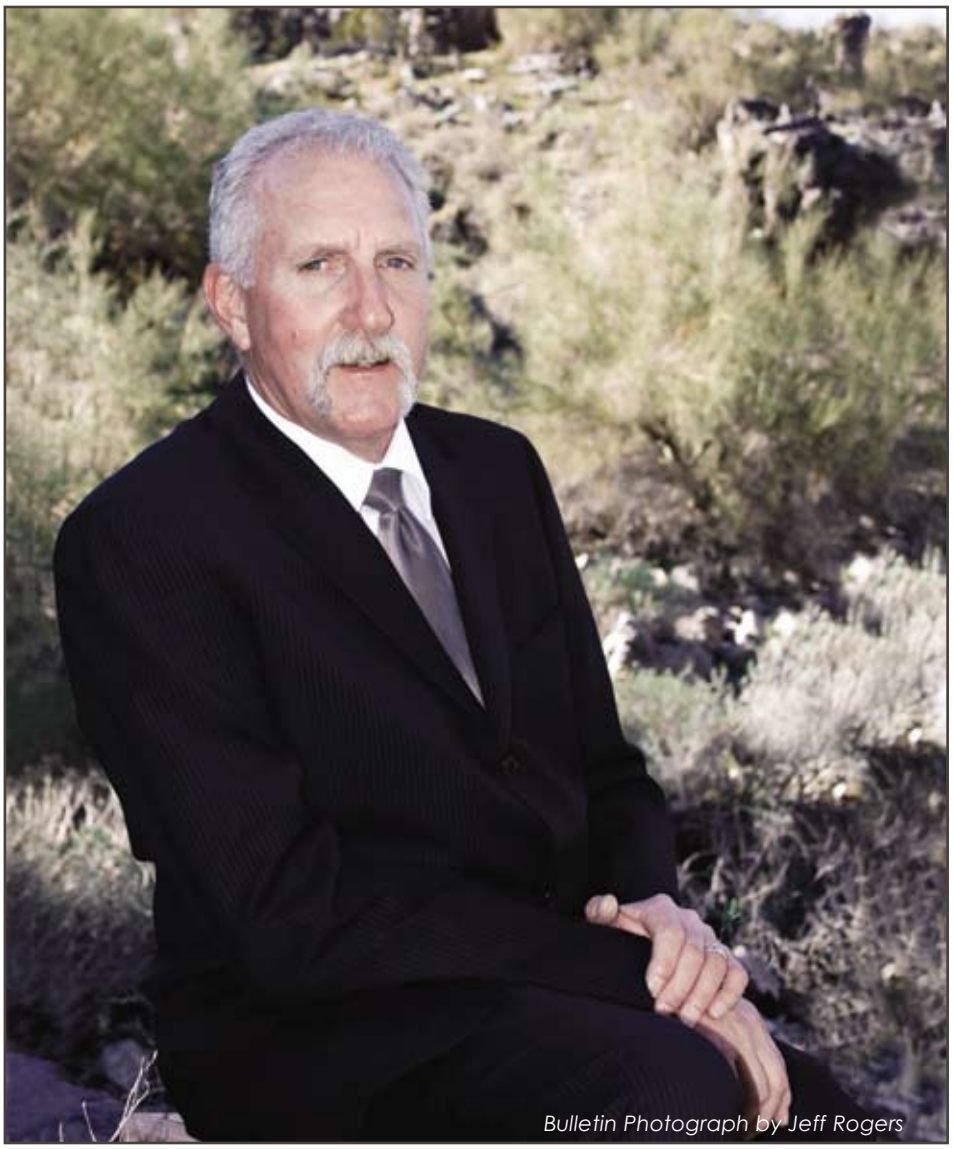
And that's just the beginning.

Arizona is a long way from Wisconsin and the state official's hometown of Monroe, just north of the Illinois state line.

From an early age, Randy Austin had priorities. And a sense of direction. He once showed up at his mother's office after trekking nearly 11 blocks in a blustery snowstorm. While not an unusual occurrence, it was for a four-year-old who orchestrated a clean getaway from home and the family babysitter.

Randy may have known where he was headed back then. But no one could have envisioned how the future National Board member, his parents and two siblings, would end up among the mountains of Colorado.

"My dad was taking the family to see the World's Fair in Seattle. I was in the first grade," he explains while tugging a closely cropped, gray fu manchu. "We got as far as Denver when the car broke down. While waiting four days to get parts, my dad fell in love with Colorado." Upon returning to Beloit, Wisconsin (where Randy spent his youth), his father put the Austin home up for sale and moved the family to Littleton, just south of Denver.



Bulletin Photograph by Jeff Rogers

The Wisconsin native admits to a fairly uneventful childhood growing up in the Centennial State. Upon turning 15, however, he focused attention on what a lot of teenagers focus on about a year before driving: making money.

Starting a lawn-cutting service, Randy landed a couple of large corporate clients before making enough money to purchase his own lawnmower. But he didn't stop at mowing equipment. In high school the future state official owned both a 175 Honda motorcycle and an Opal Cadet.

Randy supplemented his income from the lawn business by taking various part-time jobs, including stints as a cheese grater and dishwasher at a taco shop, bus boy at a local steak house, and a sacker and stacker at a local grocery store. "For

about a year, I worked all night and went to school during the day," he relates.

Having graduated from high school in 1974, Randy's interest in cars prompted him to take a serious look at automotive repair. Later that year, he entered the Navy with an eye toward becoming a diesel mechanic.

The Navy quickly disabused promises made to provide Randy specific mechanic skills. Following basic training, he was told to report to Boiler Technician "A" School. Considering going AWOL ("for about ten minutes"), Randy was convinced by basic training cohorts working on boilers was a good career move.

The Wisconsin native jumped in his 1970 "302" Mustang and headed to the Great Lakes Naval Training Center for his date to attend "A" School. During a snow storm on Highway 76 near the Nebraska state line, Randy and the Mustang were rear-ended by a semi-tractor trailer hauling 80 tons of chicken feed.

"My car was knocked half the distance of a football field," the National Board member recalls with a wince. "The damage was so extensive I had to climb out the back window."

Now without transportation, Randy hitched a ride with a truck driver who dropped him off in Crook, Colorado. "I ended up in a place called the Inferno Tavern," he explains with a shake of the head. "It was the only place open for miles, so I slept in an upstairs room for two days." When he wasn't sleeping, Randy found himself drinking beer, playing snooker, and listening to "I Fought the Law and the Law Won" on the juke box "over and over and over and over and over . . ."

Hitching a ride to Denver, Randy discovered he was now two days late getting to the Training Center and consequently – and officially – two days AWOL.

Resolving his absence, the Arizona inspector attended boiler school and made a profound discovery: "I really liked boiler work!"

During the next three-and-a-half years, Randy made three tours of the western hemisphere covering 32 different ports. Between the second and third tour, he found himself in Long Beach, California, where he was introduced to an acquaintance's girlfriend.

Within several months, Randy and the girlfriend – Frankie – were making wedding plans. A modest ceremony in 1977 was presided over by a woman minister who Randy described as "totally drunk."

The state official's first job coming out of the Navy in 1980 was that of boiler inspector for the state of Colorado. "They sent me out as a trainee to cover the Grand Junction district," he smiles. "I didn't even have my commission."

Upon moving to Grand Junction, Randy and Frankie immediately discovered the area's price of living to be more than they were accustomed to. "I took a second job building camper shells during evenings and weekends. Frankie took a job milking cows.

"For 22 years," he continued, "I oversaw everything west of the Continental Divide: 34,000 square miles or just about one third of the state."

The Arizona official earned his National Board Commission in 1988 "even though there was no state law at the time requiring it." He describes the 1990s as "an exciting time in my career. I learned a lot from then-Colorado chief Joe Troppman."

This formative part of his career established certain disciplines Randy abides today. "There was a time you wore a coat and tie on a review," he notes. "I still do that today just as a show of respect to the companies I visit."

Randy became Colorado Chief Boiler Inspector in spring 2002. But it was only last year, shortly before the chief's position in Arizona opened, that he and Frankie began seriously thinking about retirement. And Arizona was on the top of their list.

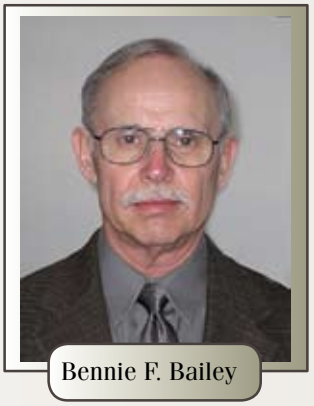
"When I learned of the opening, we decided to accelerate our plans," Randy grins. He applied for and got the job even though he had two and a half months before he could officially retire from Colorado. "My remaining vacation days in Colorado allowed me to begin the Arizona position while officially serving as chief inspector in both jurisdictions."

Randy and Frankie say Arizona is their last stop before retirement. Living in the Grand Canyon State, Randy says, is ideal for pursuing his interests in motorcycling, hunting, and fishing. And he has recently taken up golf after a 30-year hiatus.

As for writing a book, Randy reports no such plans.

"Besides," he winks, "I'm holding out for a movie deal …" ✪

Bennie F. Bailey Joins National Board


Bennie F. Bailey

Bennie F. Bailey has been elected to the National Board representing Illinois. He is superintendent, Division of Boiler and Pressure Vessel Safety, for the state.

Mr. Bailey joined the division in March 1990, serving as assistant superintendent through 2008. On January 1 he assumed the role of superintendent, formerly held by National Board Executive Director David Douin.

Mr. Bailey was graduated from Southern Illinois University with a bachelor of science. He holds National Board Commission No. 11123 with "A" and "B" endorsements. He resides in Athens, Illinois.

Edward S. Kawa Jr. Joins National Board


Edward S. Kawa Jr.

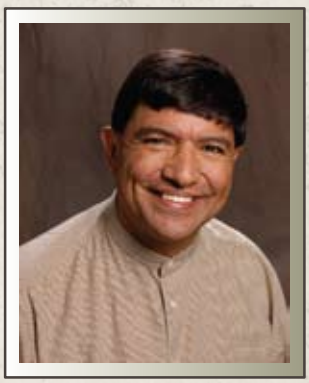
Edward S. Kawa Jr. has been elected to the National Board representing Massachusetts. He is chief of inspections for the state.

From 1985 to 2005, Mr. Kawa worked for the Merrimac Paper Co., where he held the positions of watch engineer (1985–1995), chief steam engineer (1995–2002), and corporate energy engineer (2002–2005). In 2005 he joined the state of Massachusetts as district engineering inspector. In 2006 he became manager of engineering inspectors; this year he became chief of inspections.

Mr. Kawa earned a certificate in steam engineering from the Peterson School of Steam Engineering in Massachusetts.

Residing in Danville, New Hampshire, he holds National Board Commission No. 13195. He and his wife Susan have two children, Amanda and Edward.

National Board Mourns Edward Zarate



It is with deep sadness the National Board announces the April 16 passing of former National Board member Edward Zarate. Mr. Zarate represented the state of Arizona from February 2005 to June 2006. He was 56.

Mr. Zarate was born in Visalia, California, in 1952. After graduating from high school, he served seven years in the US Navy as machinist mate aboard the USS *James Monroe*.

He was graduated with a bachelor's degree from St. Mary's College of California. Before joining the state of Arizona in 2004, he was senior boiler and machinery consultant for ARISE Inc. and One Beacon Insurance and quality control engineer for the Los Angeles Department of Water and Power. He also held various positions with HSB Group, Inc., for more than 20 years.

Mr. Zarate is survived by three children, Michael, Christopher, and Laura; their mother Elida; and granddaughter Milee Zarate-Bayani.

Board of Trustees Elections

National Board members elected Joel T. Amato first vice chairman, Donald Jenkins second vice chairman, and Gary Scribner member at large at the General Meeting in La Jolla, California.

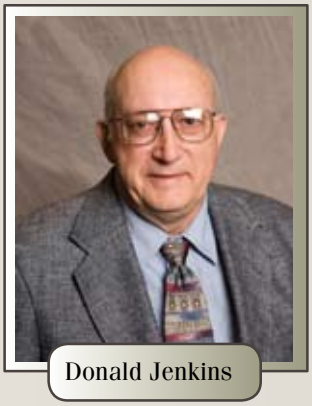
Mr. Amato, chief boiler inspector for the state of Minnesota, fills the vacancy on the board left by Mark Mooney. His term will expire May 2010.

Mr. Amato has served as chief inspector since 1999, the same year he was elected to the National Board. Before joining the state, he worked for Stroh's Brewery as power plant operator. He also served as boiler inspector with Kemper Inspection and Hartford Steam Boiler Company. A US Navy veteran, he was elected to the board of trustees in 2006 as member at large. He holds National Board Commission No. 11907 with "A" and "B" endorsements.

Joel T. Amato

Replacing Mr. Amato as second vice chairman is Kansas Chief Inspector Donald Jenkins, whose term will expire May 2011.

Before joining the state, Mr. Jenkins worked as a paper mill machine operator before becoming a boiler operator for the Bureau of Indian Affairs. Born in Aitkin, Minnesota, the US Navy veteran became chief boiler inspector for the Indian Affairs organization in 1982. In 1996, after a 29-year career with the bureau, Mr. Jenkins joined the state of Kansas as chief boiler inspector. He previously served on the National Board Board of Trustees from 2004 to 2008. He holds National Board Commission No. 11837.



Donald Jenkins

Replacing Mr. Jenkins as member at large is Gary Scribner, deputy chief for the Missouri Department of Fire Safety. He will serve a three-year term.

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

He served in the US Navy from 1975 to 1997, earning several commendation and achievement medals. During that time, he worked as boiler technician, recruiter, division officer, director of navy processing, boilers officer and repair officer, among other duties. He holds National Board Commission No. 12750.

Gary Scribner

Call for 2010 Safety Medal Nominees

The National Board of Boiler and Pressure Vessel Inspectors is seeking nominations for the 2010 Safety Medal Award. This award, the highest honor bestowed by the National Board, will be presented at the 79TH General Meeting in San Antonio. 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.

2009 National Board Safety Metal Recipient Ken K.T. Lau

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, 2009, 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 79TH General Meeting

The National Board of Boiler and Pressure Vessel Inspectors has announced a call for presentations to be delivered at the 79TH General Meeting, May 3-7, 2010, at the Hyatt Regency San Antonio, in San Antonio, Texas.

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 November 1, 2009. Abstracts may also be emailed to *pbrennan@nationalboard.org* by November 1.

Speakers chosen to deliver General Session presentations will be notified by November 30, 2009. 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 General Meeting 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, 2010.

Clarice Miles

Order Department Associate

Bulletin Photograph by Greg Sailor

Most likely everyone at some point has heard a story from a professed fisherman or fisherwoman about the one that got away. He or she stands there telling the tale, hands spread a couple of feet apart to show just how huge the fish was.

If Clarice Miles, order department associate at the National Board, was to tell her tale, she'd have to spread her arms wide – and that would only be a poor approximation. The one that got away from her – or rather, the one that had to be cut away because it was just too big – was an Atlantic Goliath grouper, which can grow to eight feet and weigh 800 pounds. Clarice hooked it in February while vacationing with her boyfriend in Florida, deep-sea fishing on a charter named *Lady Stewart*.

"I'd caught a snapper," she says, "and the grouper ate it and got hooked. I was using a 50-pound test line, which wasn't strong enough to pull it in, so the first mate had to cut the line. He said the fish probably weighed 300-350 pounds."

And how did her boyfriend do? "Oh, he caught a few small fish," she says and smiles.

Clarice, whose father was in the military, was born at Fort Benning in Columbus, Georgia. Shortly after her birth her family moved to Kentucky. When she was 13 they moved here to Columbus. She was graduated from Westerville North High School and attended Mt. Vernon Nazarene University for three years before starting work at Builders Square, a home improvement retailer.

In 1995 National Board employee Donna Radcliff, who'd worked with Clarice at Builders Square, told her about an opening at the Board. Clarice applied and was soon hired at the organization she calls "one giant family." As order department associate, she's responsible for, among other things, order processing, file maintenance, and invoice orders. On the phone much of the time, she says she "enjoys talking with customers from all over the world."

Besides fishing, she enjoys camping with friends as well as crocheting and cross stitching, though she readily admits that, when it comes to crafts, she can drag a project out. "I've been working on the same afghan for five years," she says regretfully. She also enjoys doing crossword puzzles and reading everything from the crime novels of J. D. Robb (the pseudonym of romance novelist Nora Roberts) to the plays of Shakespeare (her favorite is *Hamlet)*. But she especially enjoys spending time with woman's best friend.

Her dog, Tyra, is a Black Lab-German Shepherd mix about eight or nine years old. At 106 pounds she's in good health, but hasn't always been. In fact, in reference to her former condition, Clarice calls her "the poster child for spaying and neutering."

About five years ago Tyra, so skinny her ribs were sticking out, showed up in the front yard of former National Board employee Mark Copley. He took her in and cared for her but, because he already owned two big dogs, couldn't keep her. So he circulated her photo at work to see if anyone wanted her.

Clarice snagged her, and Tyra, no longer obliged to live a dog's life but a pampered one, has been in good hands ever since. ❂

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

Have Course, Will Travel

BY KIMBERLY MILLER, MANAGER OF TRAINING

Bahrain. California. China. Florida. Illinois. Minnesota. New York. Ontario. Pennsylvania. South Africa. Texas. Trinidad and Tobago.

What does such a diverse group of locations around the globe all have in common? The answer: National Board Training. Over the last few years the National Board's Training Department has sent instructors to each of these locations – several on more than one occasion – to conduct some form of training. Everything from two-day repair seminars to up to six weeks of commission and endorsement training has been taught at these varied destinations.

National Board Staff Engineer Jim Keenan with graduates of the Authorized Nuclear Inspection course, held in April in Shanghai, China.

Although there are times when the National Board hosts a seminar outside of its training facilities in Columbus, Ohio, the majority of this travel has been done under contract with a variety of companies. We have trained personnel from refineries to insurance agencies, utilities to federal agencies, all at their request.

Not everyone in the boiler and pressure vessel industry realizes the National Board can provide on-the-road training. National Board courses are portable, meaning we have the ability to teach the established menu of courses and seminars anywhere, such as a company's headquarters, training venue, or other facility. Attendance for such training has been as few as six students but as many as 40, depending upon the exact training requirements.

The National Board Training Department can also customize a course to an organization's needs. For example, a company may want to provide its employees with training on how to properly complete a Manufacturer's Data Report. Perhaps the company is interested in a detailed overview of preparing ASME Code Section VIII data reports with special emphasis on the U-1 and U-1A forms. In addition, there is an interest in the common mistakes made when completing such reports and how to avoid making those in the future. This information would then be provided to the National Board instructor that is most knowledgeable on each topic and training material would be developed and customized to fit the requests of the organization.

Those interested in National Board Training providing on-site instruction for their organization should contact me at kmiller@nationalboard.org or via telephone at 614.431.3205.

ENDORSEMENT COURSES

(A) Authorized Inspector Course —
TUITION: $2,500
September 14-25
October 19-30

(NS) Nuclear Supervisor Course —
TUITION: $1,250
November 30 - December 4

CONTINUING EDUCATIONAL OPPORTUNITIES

(RO) Boiler and Pressure Vessel Repair Seminar —

Two-Day Course
TUITION: $400
October 5-6 Hilton Hobby Hotel – (Houston, TX)

Three-Day Course
TUITION: $600
August 18-20

(VR) Pressure Relief Valve Repair Seminar —
TUITION: $1,250
November 30 - December 4

(WPS) Welding Procedure Workshop —
TUITION: $670
October 7-9 Hilton Hobby Hotel – (Houston, TX)

REGISTRATION FORM

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

☐ Mr. ☐ Ms. ☐ Mrs.

Name* _____

Title _____

Company _____

Address* _____

City* _____

State/Zip* _____

Telephone* _____

Fax _____

Email* _____

NB Commission No. _____

PAYMENT INFORMATION (CHECK ONE):

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

Cardholder _____
Card # _____
Expiration Date _____
Signature* _____

***Required**

HOTEL RESERVATIONS

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

All seminars and courses are held on the National Board campus 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, 614.888.8320, or visit the National Board Web site at nationalboard.org.

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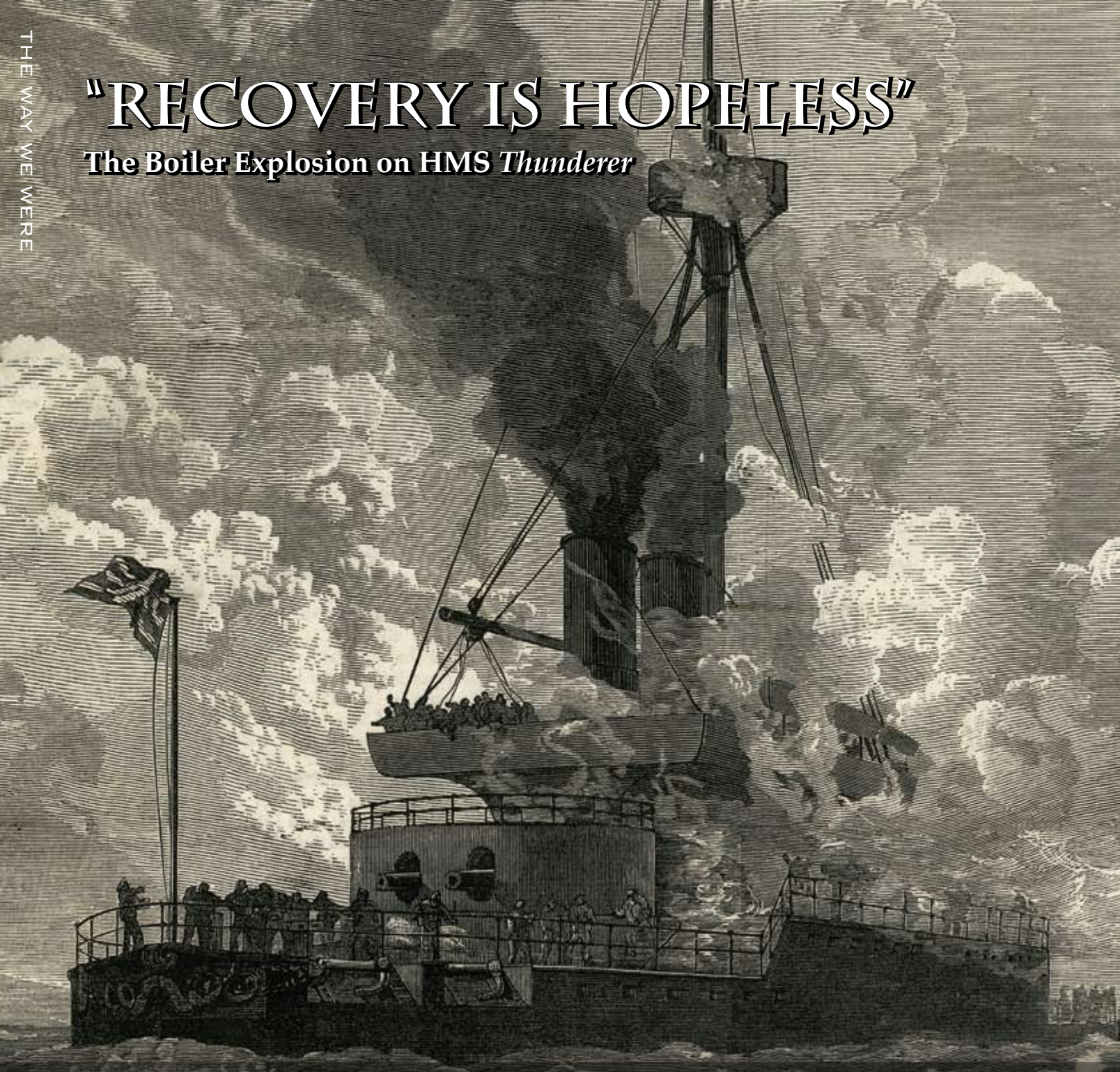
"RECOVERY IS HOPELESS"

The Boiler Explosion on HMS *Thunderer*



Around noon on July 14, 1876, 300 men boarded the HMS *Thunderer* for its first full-powered test run from Portsmouth Harbour in southern England to Stokes Bay, a little distance to the west. The ship had been launched a few years earlier by the British Royal Navy as a sister ship to the *Devastation*. Both ships were the first class of mastless turret warships. The *Thunderer* was equipped with eight low-pressure rectangular boilers. They were arranged in two stokeholds and capable of 30 lbs. psi.

Shortly after the ship weighed anchor at 12:45, a loud explosion was heard. The front of the forward starboard boiler burst, releasing scalding hot steam through the uptakes and gratings. When the steam subsided, 15 men, including the commanding officer, who was in the engine room, were found dead and 70 injured. The London *Times* reported "some of the wounded are so seriously scalded and mutilated that their recovery is hopeless, and several deaths are certain to occur during the next twenty-four hours." The Times would be right: 30 men later succumbed to their wounds, raising the total number of dead to 45.

An inquest found that several factors caused the explosion. First, the pressure gage, which had previously malfunctioned, had been turned off at the time of the disaster. Second, the stop valves had not been closed. Finally, the safety valves were not properly working.

The accident was the worst boiler explosion in Royal Navy history and helped effect the introduction of spring-loaded safety valves with alarm whistles.