# 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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INSIDE:
*Highlights of the 72nd General Meeting in Honolulu: Bill Russell and Peggy Fleming pose in front of Diamond Head in Honolulu. For more, turn to page 22.*

COVER PHOTOGRAPHY COURTESY OF STANLEY MUSEUM

## Cover Story



## Features



## Departments

# *Be Careful of What You Wish For . . .*

BY DONALD E. TANNER, EXECUTIVE DIRECTOR

It's a question I often dreaded answering. And yes, there were times I wished it would simply go away.

But over the past year, I've noticed that fewer and fewer people are asking me: "*When was the last time you read or even heard about a boiler or pressure vessel accident?*"

While that could be construed as higher public awareness of the safety issues that relate to our industry, it also reveals a rather dark and disturbing truth: recent accidents that have found their way into the media have made a sobering impression on a public that commonly thought such incidents were unique to an industrial environment.

Recent headlines suggest that going out to a good old-fashioned county fair, a seemingly innocuous activity, is best enjoyed with caution, preferably at a distance far removed from machines of a particular vintage. Earlier this year, many were disturbed to learn that on, of all places — a cruise ship — the dangers associated with boilers are very real and should be of genuine concern to even leisure travelers.

In just these two high profile accidents (at the Medina, Ohio, county fair and aboard the cruise ship *Norway*) thirteen people lost their lives and many others were severely injured. Following both incidents, the National Board was inundated with media inquiries seeking to more fully understand *how* and *why* these terrible events could have occurred.

What made the media so interested in these accidents?

Both occurred in areas that were considered safe for the general public. Since these tragic events, there have been others. A custodian was killed and a coworker badly injured this past summer in a boiler-related explosion — still under investigation as of this writing — at a school in Ocean City, New Jersey. (When it comes to public places, schools have always been vulnerable — especially at this time of the year when boiler systems are restarted for the fall.)

According to annual incident reports going back ten years, an estimated 95 percent of recorded injuries and deaths have taken place in an industrial setting.

But what the public — and the media — have come to recently understand is that boiler and pressure vessel accidents can and do take place *any* time, *any* place.

And that is what has been lacking up until now in the ongoing debate regarding boiler and pressure vessel safety: the necessity for all of us to be especially cautious *even in a public place*.

World events suggest that these are very dangerous times. The public has reacted by becoming more sensitized to the dangers around them.

While no passengers were physically impacted by the *Norway* explosion, this incident serves as an unsettling reminder of how close we all could come to being affected by tragedy.

Does a higher accident profile help or hurt our cause?

While answering the question — "*When was the last time you read or even heard about a boiler or pressure vessel accident?*" — seemed almost a relentless duty, it did give me occasion to emphasize the diligence and effectiveness of our members; that is, attributing the absence of newsworthy incidents as being a positive result of their efforts.

Granted, a wider public understanding and appreciation of boiler and pressure vessel safety makes communicating our message of safety somewhat easier. However, I frankly prefer the days of having to respond to the "last time" question.

Especially if it means fewer deaths and injuries. ❖

# 2003 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.

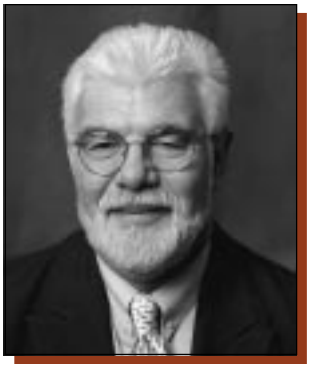
The list below identifies boiler, pressure vessel, and nuclear vessel registrations by size for the past five fiscal years. The National Board fiscal year is from July 1 to June 30.

The total number of registrations on file with the National Board at the end of the 2003 reporting period was 35,585,645. ❖

| | Size | FY 2003 | FY 2002 | FY 2001 | FY 2000 | FY 1999 |
|---|---|---|---|---|---|---|
| **BOILERS** | | | | | | |
| *square feet of heating surface* | | | | | | |
| ≤ 55 | (A) | 98,312 | 78,695 | 87,681 | 72,700 | 80,257 |
| > 55 and ≤ 200 | (B) | 32,927 | 25,445 | 24,670 | 23,614 | 25,456 |
| > 200 and ≤ 2000 | (C) | 9,797 | 9,130 | 8,959 | 9,344 | 12,201 |
| > 2000 and ≤ 5000 | (D) | 846 | 689 | 765 | 976 | 1,599 |
| > 5000 | (E) | 2,105 | 1,184 | 1,057 | 1,605 | 3,170 |
| **TOTAL** | | **143,987** | **115,143** | **123,132** | **108,239** | **122,683** |
| **PRESSURE VESSELS** | | | | | | |
| *in square feet* | | | | | | |
| ≤ 10 | (A) | 745,601 | 671,433 | 816,778 | 694,085 | 678,481 |
| > 10 and ≤ 36 | (B) | 370,780 | 340,818 | 297,047 | 350,576 | 286,129 |
| > 36 and ≤ 60 | (C) | 50,263 | 60,992 | 41,149 | 46,861 | 37,749 |
| > 60 and ≤ 100 | (D) | 9,628 | 10,343 | 10,503 | 10,081 | 10,983 |
| > 100 | (E) | 12,975 | 11,585 | 12,121 | 12,470 | 13,930 |
| **TOTAL** | | **1,189,247** | **1,095,171** | **1,177,598** | **1,114,073** | **1,027,272** |
| **NUCLEAR VESSELS** | | | | | | |
| *in square feet* | | | | | | |
| ≤ 10 | (A) | 1,725 | 565 | 1,053 | 515 | 354 |
| > 10 and ≤ 36 | (B) | 137 | 424 | 669 | 362 | 275 |
| > 36 and ≤ 60 | (C) | 33 | 45 | 89 | 12 | 33 |
| > 60 and ≤ 100 | (D) | 14 | 15 | 19 | 13 | 9 |
| > 100 | (E) | 17 | 17 | 19 | 19 | 26 |
| **TOTAL** | | **1,926** | **1,066** | **1,849** | **921** | **697** |
| **ATTACHMENTS*** | | 100,136 | 79,272 | 82,745 | 73,495 | 78,018 |
| **GRAND TOTAL** | | **1,435,296** | **1,290,652** | **1,385,324** | **1,296,728** | **1,228,670** |

*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 Programs on the National Board Web site at nationalboard.org.*



# Fit-Up and Dimensional Inspections

BY CHUCK WALTERS, ASSISTANT DIRECTOR OF INSPECTIONS

The topic of fit-up and dimensional inspections is important due to the number of deficiencies reported on ASME and National Board Qualification Review Reports for ASME and NBIC symbol stamps. These reports indicate that fit-up and dimensional inspections are not always being conducted or documented during fabrication or repair operations.

ASME Code Sections I, IV, and VIII, Div. 1, 2, and 3, include responsibilities and duties of manufacturers and Authorized Inspectors (AIs) with regard to certain examinations and inspections. These duties include performance of fit-up and dimensional examinations as required by PG-90 of Section I; HG-515 of Section IV; UG-90 and UG-96 of Section VIII, Div. 1; AG-300 and AG-303 of Section VIII, Div. 2; and KG-300 of Section VIII, Div. 3. Because of these code requirements, examinations need to be identified on the drawing(s), the traveler, checklist, or process sheets to ensure that instructions are transmitted from engineering to production during the construction or repair phase. Furthermore, the AI is responsible for verifying that these examinations are performed in accordance with the specific code section and the organization's quality system.

There are usually a couple reasons why descriptions of fit-up and dimensional examinations are sometimes lacking. First, engineers and designers may overlook the geometric dimensioning and tolerance requirements of welded joints that satisfy code and customer requirements. Second, production systems may not provide sufficient guidance to construction personnel to adequately fabricate the unit to satisfy all applicable code requirements.

Instructions should be identified on the applicable drawings and that information transferred to the production traveler, checklist, or process sheet. In many cases the drawings are mute to this subject, and are left to production personnel to determine whether fit-up and dimensional examinations are necessary. This condition is not satisfied because the AI rarely designates these two categories as hold points for examination.

To correct this problem, the AI should analyze the company's program to ensure that there is sufficient information on drawings or other documents and that resultant examinations are documented on a traveler, checklist, or process sheet.

A suggested way to accomplish this task is for the AI to meet with the appropriate personnel to determine how adherence to code requirements is being formulated and distributed from engineering to production. Once this is established, all concerned personnel should be involved in developing a vehicle that will adequately address the manufacturer's or repair organization's examination requirements. Also, the quality control inspector should become more involved in the examination process by establishing inspection points that recognize these requirements. This can also be accomplished by developing a thorough monitoring program by the AI.

This is not an easy task and will differ from organization to organization. However, the code is clear and fit-up and dimensional examinations are required. Not only are there concerns for code compliance, but also concerns for customer requirements.

Once the manufacturer or repair organization has developed requirements for performing the inspections, quality control inspection and production personnel can be trained to implement the requirements. Without this information, the pressure-retaining item may not fully satisfy the applicable code requirements. ❖

# Inspector Notices

### Importance of Registration and Documentation

Registration of a boiler and/or pressure vessel consists of three parts. The first part of the registration process is inspection of the boiler/pressure vessel by a National Board commissioned inspector. The second part is affixing the National Board mark and number to the boiler/pressure vessel. The third is submitting the Manufacturer's Data Report (MDR) to the National Board to document the completion of the first two items. The registration process is complete only when the MDR is in the National Board file.

In some cases, MDRs are not being submitted in a timely manner to complete the registration of the boiler/pressure vessel. A timely manner is considered to be not more than 60 days from the time the authorized inspector signs the MDR. The 60-day time limit should be specified in the manufacturer's quality control manual.

Not only does the delay in submitting an MDR prevent completion of the registration process, but the MDR is then not available to the jurisdiction, the owner, or the repair company when needed. To issue a certificate of operation to the owner, many jurisdictions require National Board registration and the information on the MDR.

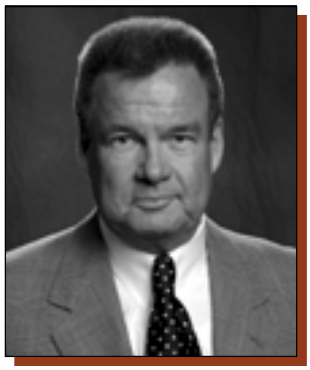
Having the MDR on file with the National Board is important when the owner or repair company requests a copy of the MDR if the boiler/pressure vessel needs a repair or alteration. The National Board receives 30 to 40 requests a day for MDRs.

Since an authorized inspector signs the MDR as being registered by listing his or her National Board Commission Number, the inspectors are encouraged to monitor this requirement. Periodically a quick check of the manufacturer's registration logbook will show if data reports have been submitted within the allotted 60 days. The inspector should also be sure to review and sign the MDR within a few days of the completion of boiler/pressure vessel construction. ❖

### Procedure for "Metrication"

With the 2004 edition of the *ASME Boiler and Pressure Vessel Code*, units of measurement will be listed in both US Customary and SI (metric) values. ASME has issued a "Procedure for Metrication" for inclusion of metrics in the code books. This procedure requires a statement be added in the Foreword of each code book section to indicate that either US Customary Units or SI Units may be used. Use will require consistent application during all phases of construction; a certificate holder will not be allowed to mix units on a code item.

Inspectors should be aware of these changes, as manufacturers will apply them to code items. Inspectors should also monitor potential issues with jurisdictions as these changes are applied. It is important to note that conversions may not be direct when moving from US Customary to SI units, and that jurisdictional laws may be impacted as a result. The certificate holder is responsible for verifying that the application of metric units adhering to the guidelines does not pose a conflict with jurisdictional requirements. ❖



# Jurisdictional Budget Cuts: Not Simply an Issue of Money

BY PAUL BRENNAN, DIRECTOR OF PUBLIC AFFAIRS

There is a good chance you are paying more in taxes these days. A number of jurisdictions have chosen to increase revenue sources to make up for deficits brought about by current economic conditions.

While many in government would have us believe that these additional monies are preserving essential public safety services, logic suggests that our well-being is incrementally compromised each time a jurisdiction is faced with a significant economic downturn — and that may come as a surprise to many taxpayers.

Fortunately for the elected officials who must balance their respective budgets, the public is oblivious to the systematic erosion of the safety process. However, this dynamic has had a particularly negative impact on the boiler and pressure vessel operations of our membership.

In many jurisdictions, budgets have been reduced. Some significantly. Some modestly. The irony is that most of our member departments actually generate *more* revenue than what is required to sustain their operations with excess monies deposited into their jurisdictions' general funds.

Yet some jurisdictions have mandated certain across-the-board cuts in *all* departments. It is apparently more preferable to generate the perception that steps are being taken to cut spending than to actually examine what effect such cuts would have on revenue flow, or more important, public safety.

And that is the real issue.

Cutbacks in public safety staff and expenses are more profound than what might be normally experienced in other government operations. In a boiler safety department, for example, a reduction in inspection personnel translates to fewer inspections (the law notwithstanding), which in turn means longer intervals between inspections, which consequently results in lengthier identification of a potential problem. Hopefully the problem can be located and corrected before someone is needlessly injured, or even killed.

Another frequent victim of the budget axe is training. While this may seem rather inconsequential (and may very well be in other government operations), training is of critical importance to a boiler and pressure vessel inspector. The *National Board Inspection Code* is a living document and one of several codes and standards that is modified on an ongoing basis. For an inspector not to be up on recent changes, as well as the latest technological developments, is to compromise his or her effectiveness as a highly trained inspection official and may very well put the general public in severe jeopardy. Even though the National Board provides training to members and their staffs at no cost, it must be noted that jurisdictional participation has been showing a modest decline in recent years (likely the result of budget and staff reductions).

In most instances, training requires travel — another budgetary line item that is among the first to be scrutinized and scaled back through austerity measures. While this seldom threatens the local day-to-day routine required for those performing inspections, restrictions placed on travel often limit many inspectors from obtaining necessary training at locations outside their respective jurisdictions. Complimentary training provided by the National Board is of little consequence if those eligible cannot travel to participate. (Although the National Board is in the process of launching a Web-based training program, it should be noted that not all courses lend themselves to electronic instruction. There are a number of National Board courses that still require hands-on involvement.)

Perhaps the most difficult cost to identify when analyzing the effects of budget reductions are the additional monies consumers must spend in the form of increased insurance rates. This is not an increase in personal insurance rates per se, but rather additional costs that are passed along to the consumer — you and me — by the companies that do pay higher rates resulting from increased risk. Simply put: Less oversight (brought about by fewer inspections) means more risk. More risk equals higher insurance rates.

Understandably, insurance companies do not like to talk about their premiums. But rest assured, rates have and continue to go up and budget cutting at the jurisdictional level is among the prime culprits.

While it could be assumed that these effects of budget reduction are negligible, they take on a new and significant value when collectively viewed over a period of years. To date, they have already taken a toll. Just ask any National Board member. But what will happen if these scenarios are played out over and over again in future years?

It is worth examining, particularly when it involves *your* safety and *your* money.

So the next time you read in your local newspaper that tax collections are getting *larger*, remember that the government's role in protecting you and your loved ones is getting *smaller*.

And you may want to rethink the old maxim: "You get what you pay for."

It no longer applies. ❖

**BRIEFLY NOTED:** The only jurisdiction in North America without a boiler law now has two proposed bills in committee. Having completed the first of a two-year legislative session, the South Carolina House and Senate have seen the introduction of two identical pieces of legislation calling for the registration of all boilers with the state Department of Labor, Licensing and Regulation.

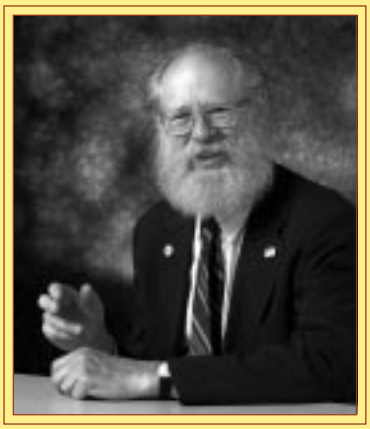
Both pieces of legislation, Senate Bill 133 and House Bill 4396, are watered-down versions of previous bills that have been regularly introduced and summarily rejected by the General Assembly since 1976. Under the proposed legislation, inspections would become the responsibility of insurance companies, and boilers located in "a public assembly area" would be required to carry proof of insurance of at least $500,000. There are no provisions for National Board registration or a qualified chief inspector to oversee a statewide program.

Unless the bills are voted out of their respective committees and passed by the 105th Session's June 6, 2004, adjournment, each will die in committee (as has generally been the history of proposed South Carolina boiler legislation).

The National Board rejects both bills for failing to acknowledge and address the tremendous risk factors inherent in all boilers, and for lacking the critical regulatory safeguards to proactively protect each and every South Carolina citizen and his or her property. ❖

# *Along for the Ride . . .*

# Steam Car Technology:



An Interview with Dave Nergaard
Vice President, Steam Automobile Club of America

Were it not for an invention in 1912, there is a good chance that the car in your garage would have a steam engine under the hood, albeit with technological refinement. A quicker mode of transportation than a horse and carriage, steam cars became an attractive and attainable form of transportation in the United States by the end of the 1890s. Steam was a natural choice; it had been used for years as a power source in trains, factories, and with electricity generation. It has been estimated that all told there were 55,000 steam cars in use. They were quiet, clean, powerful, and a marvel to drive. But not very convenient to start, particularly in the winter.

Internal combustion vehicles shared the road, but could not match the interest and comfort level drivers had in steam cars. Steam cars produced by the Stanley Motor Carriage Company, its two offspring the Locomobile and the Mobile, and White virtually dominated transportation for nearly 10 years. That is, until Cadillac cars came equipped with the electric starter in 1912. With a literal flip of the switch, internal combustion vehicles offered drivers the convenience they had been looking for. No longer having to wait for the steam to generate, drivers could now hop in and take off. Combine that with the introduction of antifreeze solutions for water jackets in internal combustion vehicles, and well . . . the rest, as they say, is history.

There is still a hearty group of steam car loyalists throughout the world. Steam car owners all over the country meet in groups several times a year to admire, boast, debate the merits of modern-day steam cars, and almost invariably race their cars against the clock. The Steam Automobile Club of America (SACA) boasts 550 members. It is estimated that more than 1,000 steam cars are still in existence today, some enjoyed recreationally.

When it comes to the evolution of steam automobile technology, one of the more knowledgeable SACA members happens to be its vice president, Dave Nergaard of Littleton, Massachusetts. Possessing two steam cars — a 1922 Stanley model 735M (M for modified) and a 1907 White model "H" — and more than a thousand volumes of information published on steam cars throughout the years, Mr. Nergaard is a charismatic retired engineer who can be found most days tinkering with his 1922 Stanley. Educated at Cornell University, he can tell you just about anything you want to know about steam cars. The *BULLETIN* recently sat down with Mr. Nergaard to glean a bit more information about these pioneers of automobile history.

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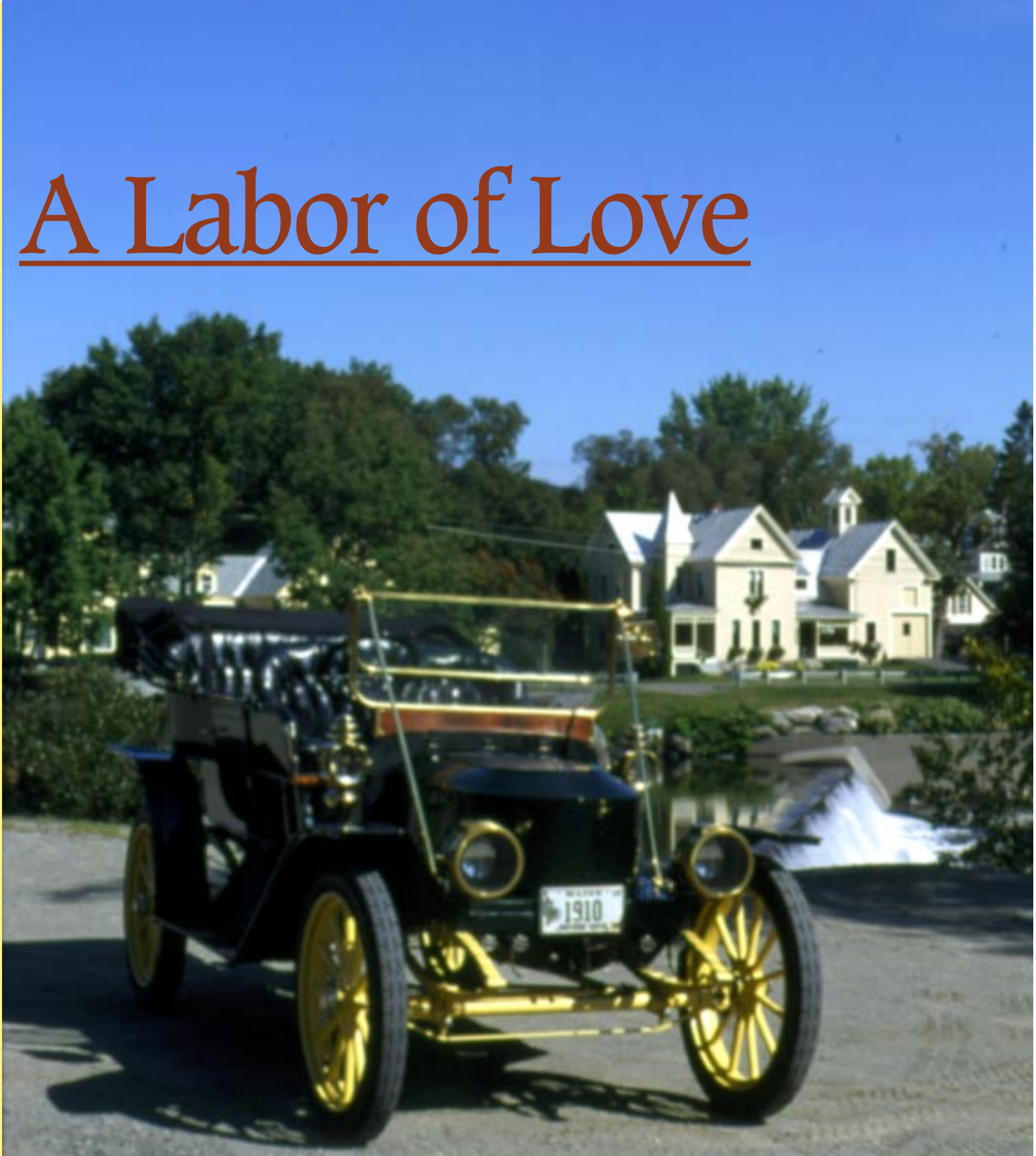
*BULLETIN*: How and when did steam car technology come about?

Mr. Nergaard: Toward the end of the nineteenth century, literally hundreds of people were trying to build horseless carriages for their own use. Many explored steam as the tried-and-true mobile power source. Small boilers and engines were widely available for steamboats or small shop power plants. Every major town had a foundry, so

# A Labor of Love




getting a new design built was no problem. There were at least half a dozen people in the Boston area alone working in this way, including the Stanley brothers.

What probably started public interest in the cars were several publicity stunts: the 1895 race sponsored by the *Times-Herald* in Chicago, and Boston's first automobile show in November 1898, sponsored by a Massachusetts mechanics organization. The remarkable performance of the Stanley on the latter occasion was widely reported. It won no prizes, as it was not an official entry, but had been invited to give a demonstration. Magazine articles of the day, in addition to praising the performance of the steamers at the show, particularly mentioned the absence

PHOTOGRAPH COURTESY OF STANLEY MUSEUM

■ *A standard Style No. 2 Locomobile circa 1900, this two-passenger steam car was equipped with a rubber bucket, side lamps, gong, cyclometer, and a full set of tools for $750.*

of noise and smell, of which the competing gasoline-driven cars were notably guilty.

The Stanley brothers quickly received hundreds of offers to buy the car. So they decided to make a hundred cars — the first quantity production of automobiles in the world! Before production was really underway, an offer was made to buy the whole business, including the building and patents, which had not yet been applied for. So the first Stanley-designed cars sold to the public were built by a firm jointly owned by John Brisben Walker, publisher of *Cosmopolitan*, and Amzi Lorenzo Barber, a paving machine manufacturer. These two people soon had a parting of ways. Two companies resulted, Locomobile and Mobile, and together made nearly 10,000 of these simple runabouts in four years.

When a Locomobile, driven by F.O. Stanley, became the first car to climb Mount Washington, New Hampshire, in August 1899, it made headlines around the world. Of course, as soon as the popularity of these cars was noticed, everybody tried for a bit of the action. More than a hundred companies tried making steamers in the first decade of the twentieth century.

*BULLETIN*: What does steam car technology involve?

Mr. Nergaard: Like a steam power plant, a steam car can be divided into four major sections: the burner, the steam generator, the engine, and the auxiliaries. The burner releases the fuel's energy in the form of heat. The steam generator conveys that heat to the working fluid for the engine. The engine converts some of the heat in the fluid to mechanical energy, which propels the car. And the auxiliaries handle all the details needed to run the car, like pumping the working fluid and fuel into the generator and burner, respectively, and controlling various functions in the car.

*BULLETIN*: Did steam technology improve along with steam car design?

Mr. Nergaard: Yes, but not nearly as rapidly as it should have.

The petroleum industry provided the most important improvements needed for early cars. Mineral oil-based lubricants, like superheated cylinder oil, and volatile fuels, like gasoline, both by-products of the kerosene industry, made small, efficient steam plants, as well as gasoline engines, possible.

The development of the gasoline vaporizing burner produced a compact, powerful, easily controlled, and clean source of heat. This, in turn, allowed the building of very compact, efficient boilers. Coupled with a small version of an engine, one obtained a power plant quite suited to the needs of a small motor carriage. The early Locomobile only weighed 500 pounds, with full tanks, water, and fuel for about 30 miles.

■ *The "Standard Gasoline Burner" (left) was used with the majority of Locomobiles, while the "Reverse Burner Complete" had an asbestos-lined casing, pilot light, generator, and regulator.*

■ *This "Standard Boiler" – touted in the early 1900s as a best-seller in The Steam Carriage Boiler Company catalog – was made of a seamless steel shell with the crownsheet or head riveted in. It occupied the least amount of space possible and was easily fitted to any burner on the market.*

Very quickly, improvements were added by various makers. "Flash" boilers were introduced, which were quick firing and, in French terms, "inexplosible." They were, however, difficult to control, and only a few makers used them successfully. Feedwater heaters, recovering heat from exhaust steam, were added. Some cars were fitted with compound engines, adding about 25 percent in efficiency, but losing in smoothness and flexibility.

Beginning after the first war, development of various atomizing burners began, with the goal of producing a "turn the switch and go" steamer. While the somewhat fussy job of starting a vaporizing burner was avoided, these burners required a larger "fire pot" and were strictly on or off, making control of "flash" boilers much more difficult. Descendents of these burners are now routinely used in sizes from hot water heaters to locomotive boilers.

Steam pressures, which had been less than 200 psi in 1900, rose to 600 psi in 1906. Superheating was used, with average temperatures of 650°F (Stanley) to 750°F (White).

With the introduction of superheat, mechanical cylinder oil pumps were fitted instead of the earlier displacement lubricators. At the same time, enclosed crankcases with splash lubrication of the engine and gears became normal. With earlier cars, you were supposed to oil all the engine parts by hand whenever you refilled the water tank, every 30 to 50 miles.

While some attempts to produce more efficient engines were made, sadly none of them reached the market. The "E" series Doble, arguably the best steam car ever offered to the public, used a carbureted gun burner-fired monotube "flash" boiler supplying steam at 750 psi and 750°F to a two-stage, four-cylinder-balanced compound engine, directly coupled to, and mounted on, the rear axle. This engine, although beautifully made and very well balanced, was not notably more efficient than the two-cylinder compound engines used by White in 1906. The later versions of this car were fitted with exhaust steam turbines driving the condenser fan and the burner blower, a sort of steam supercharger, if you will. They were easily capable of 100+ mph speeds, but were not economical in operating costs! They were designed for the same market as Duesenberg, Hispano-Suiza, and Rolls-Royce.

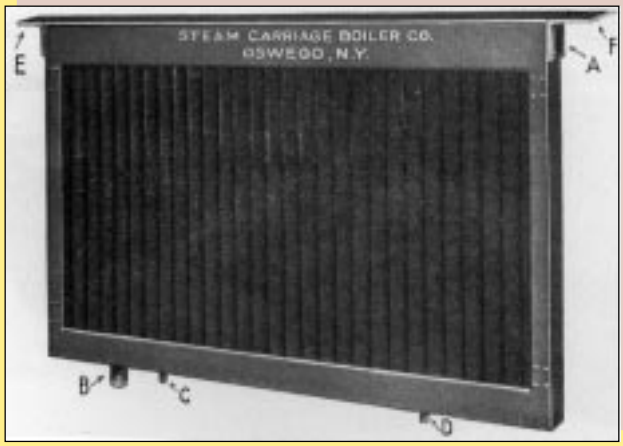
*BULLETIN*: Explain the process of generating steam for a drive.

Mr. Nergaard: Preparing a steamer to drive is unique for each car. What I am familiar with is my Stanley; it may be irrelevant for any other car, including other Stanleys. The first step, however, is universal: verify that the boiler contains water.

After checking that you have enough fuel, at the correct pressure, use a propane torch to heat the end of the pilot light vaporizer for about half a minute. Then, pointing the torch flame through the burner peephole, briefly open the pilot burner valve. It should ignite with a clear blue flame. After a few seconds, the pilot valve can be opened slightly and left to warm up the main vaporizer. At this point, I usually have breakfast.

After the pilot has burned long enough to heat the main vaporizer, make sure the peephole is closed, and briefly open the "firing up" valve, which feeds pilot fuel — gasoline — to the main burner. After this has been burning a few seconds, slightly crack open the main fuel valve, adding kerosene, or in my case, diesel oil, to the main burner flow. In less than a minute, the burner should

■ *Labeled "positively the best and cheapest condenser on the market," the construction of this early 1900s Oswego condenser made it impossible for the vertical tubes to become clogged.*




be hot enough to burn cleanly without the pilot fuel, so close the "firing up" valve and gradually open the main fuel valve to get full power.

Open the throttle and engine drip valves so steam will blow through the engine to warm it up. As the boiler pressure rises, reduce the throttle opening to prevent the car from moving off. Maintain fuel pressure, using the hand pump, if necessary. When you have at least 200 psi of steam, blow down the water level gages and low water automatic valve. Doing the latter should shut off the fire until the valve cools again.

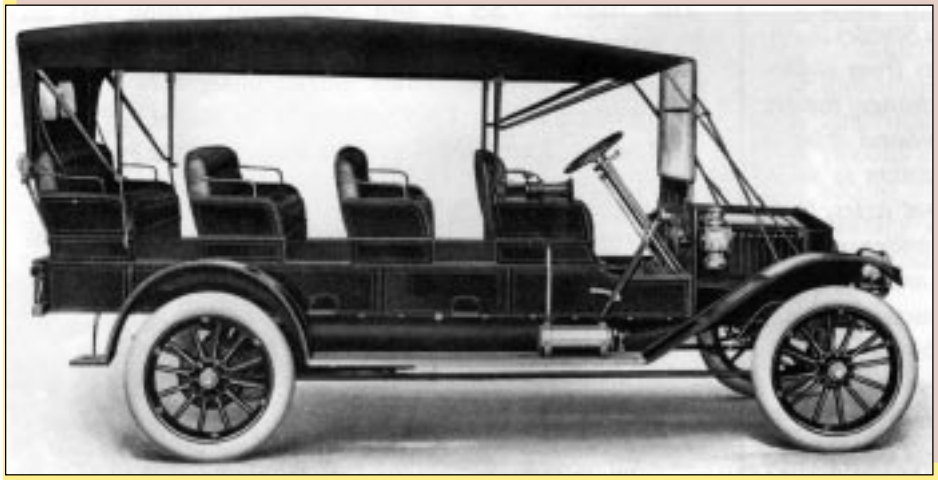
With the engine drip valve open to relieve the engine of any water, gently move the car back and forth until the engine is clear. Then top off the water tank and you are ready for the road!

*BULLETIN*: How many miles per gallon of water and gas do these vehicles typically get?

Mr. Nergaard: The classic Stanleys and Whites should get 10-12 miles per gallon of fuel. The noncondensing 20-horsepower Stanleys went about a mile per gallon of water.

The power used, the efficiency of the engine, the quality of the road and any hills thereon, whether the car is fitted with a condenser, and, if so, the weather, can all affect the mileage. On a cool day driving on level roads, I have gone 140 miles on one tank of fuel. Climbing Mount Washington, I had to refill after less than five.

*BULLETIN*: Is it true that with all of the necessary mechanical components and supply of water required to generate steam, the steam car was exceptionally large and heavy?



■ *The Stanley Mountain Wagon, aka Bus, was originally designed in 1908 by F.O. Stanley.*

Mr. Nergaard: No, they were often lighter than gas cars capable of the same speeds. A modern steamer probably would be heavier than a modern gas car, but not greatly so. The early Locomobiles were two-seaters, with a 60-inch wheelbase and a weight of about 450 pounds. Stanleys were made in various styles and sizes, up to 15 seats on a 140-inch wheelbase with a weight of about two tons like the famous 30-horsepower "Mountain Wagon." My own Stanley is somewhat



■ *The Locomobile winning the 5-mile race for steam carriages at Guttenberg, New Jersey, September 18, 1900.*

overweight at 4,400 pounds on a 130-inch wheel base, a 20-horsepower type 735 roadster, with two seats. Dobles were large and heavy, nearly 6,000 pounds, but with more than 100 horsepower, definitely not slow.

*BULLETIN*: What advantages did steam have over the internal combustion engine?

Mr. Nergaard: Steam cars had great engine flexibility, giving easy control of the vehicle without gear shifting. They were easily understood and repaired by the mechanics of the time. Starting them was without mechanical effort, a serious issue in the early days. Early internal combustion engines were not so easy to drive, and, until the introduction of electric starting in 1912, even harder to get ready.

Even the earliest steam cars had automatic control of the fire. In good working trim, they were much easier to drive than gasoline cars of the same very early era. (Early De Dions had three controls on the carburetor, all of which had to be set accurately if the engine was to run at all! One of the settings was for how much fuel was in the tank.) And automatic control of all required functions was available long before automatic spark advance was available for gas cars, for example. The Stanleys did not fit full "automatics" until rather late in the game, well after White and Lane had stopped production.

*BULLETIN*: What typically was the top cruising speed?

Mr. Nergaard: Even the earliest cars were faster than a horse! Classic Stanleys and Whites were quite capable of 40-60 mph on good roads. The later model condensing Stanleys were much heavier and larger than the classic models, and performance suffered accordingly: 35-40 mph is about the limit for an original car. The condition of the roads usually limited speed, even at the end of production (1925).

*BULLETIN*: Racing was popular during the steam car's evolution. How did these vehicles fare against the internal combustion competition?

Mr. Nergaard: Contests took many forms in the first decade of the twentieth century.

There were reliability tours, like the Glidden Tours. White steamers not only did quite well in these events, but were often used by the tour officials themselves.

Many of the dirt tracks intended for horse racing were the site of speed contests. Five-mile races with cars classed by purchase price were common. Steam cars usually did fairly

*This Stanley car maintenance schedule and guide (opposite →) give the following care instructions:*

*Every 15,000 miles:*
*(B) Pack spring cover with Red B Mineral Jelly.*

*Every 10,000 miles:*
*(A) Pack hub with grease.*

*Every 1,000 miles:*
*(C) Mobil Oil C;*
*(D) Atlantic Ref. Co.'s 20th Century Oil;*
*(E) A few drops of light machine oil; and*
*(F) Examine oil level 1-1/4" under filler cap, add Mobil Oil C.*

*Every 500 miles:*
*(G) Mobil Oil C.*

well in these races, as they could finish with just one tank of water. Any really long race required water stops, and that usually precluded keeping a winning pace.

Hill climbing competitions were very popular, as this was a test the average driver could relate to well. Dead Horse Hill, in Worcester, Massachusetts, and Eagle Rock Hill in Glen Ridge, New Jersey, were two well-used sites. The biggest, literally, was the "Climb to the Clouds" up Mount Washington, a contest that is held annually to this day. In 1904, a Stanley costing $750 came in second, beaten only by an imported Mercedes costing $16,000. Steamers did so well in these contests that organizers of several of them saw fit to forbid their entering the contests!

For out and out speed, the races on the sand at Ormond Beach, Florida, from 1904 to 1908 were without equal. At this venue, a Stanley became the first vehicle to go two miles in a minute and set a land-speed record of 127.66 mph in 1906, which was not surpassed for more than four years.

The following year, the Stanleys were back with an even faster car, but failed to set any records because of the poor condition of the beach. In fact, the driver, Fred Marriott, lost control at an estimated speed of 145 mph, and wrecked the car. This incident ended racing efforts on the part of the Stanleys; they refused to risk a driver's life for such "trivial benefit." This site was used for land-speed record trials into the 1930s.

Purses were often awarded in early competitions, as well as silver cups and other memorabilia.

*BULLETIN*: How many steam cars do you estimate were manufactured, all told?

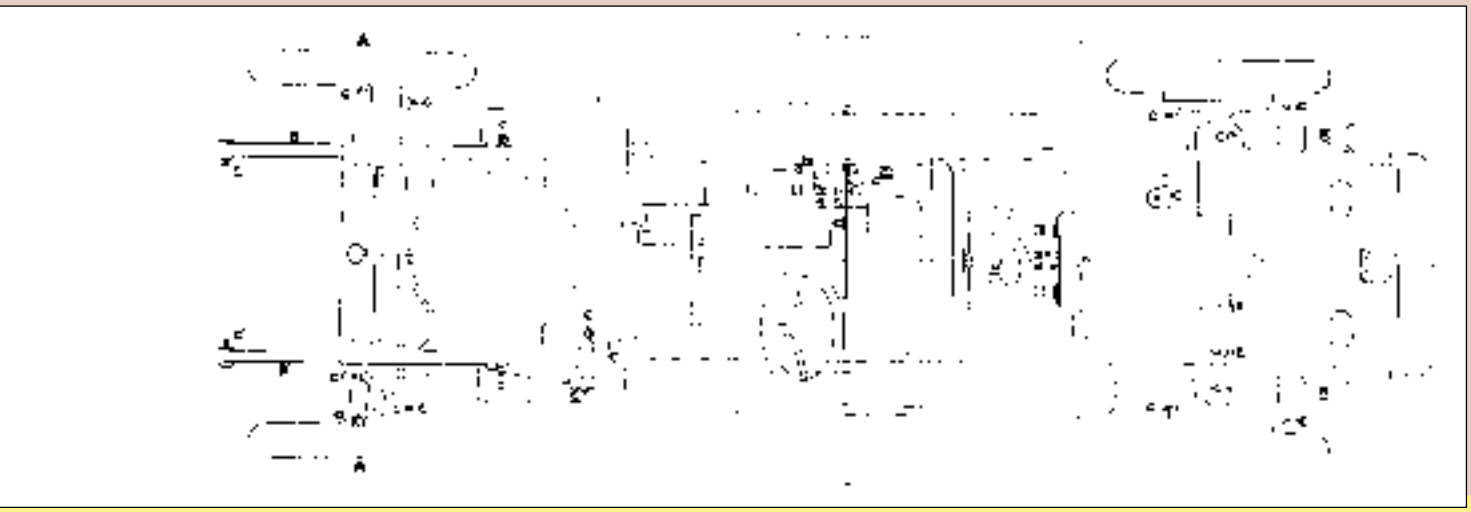
Mr. Nergaard: From data published in the *Horseless Carriage Gazette*, I estimate 55,000 cars were manufactured between 1899 and 1925. The years of maximum production were 1900-1904.

*BULLETIN*: Given the many positives of steam car technology, why were these vehicles never a commercial success?

Mr. Nergaard: They were a success! In 1905 steamers outnumbered gas cars and electric cars combined. Until Ford introduced the production line, White was the world's largest automobile manufacturer.

If steam technology had advanced even half as rapidly as gasoline engine technology, I think they would have remained viable at least until the depression of 1929-1933, which eliminated most of the gas car manufacturers of the time. However, none of the steam car makers took that route, except the brothers Doble, who, if anything, went too far. They attempted a technology well beyond the limits of reliability and affordability.

Also, hand assembly remained the method of manufacture in all the steam car works. This was especially the case with the Stanley. The Stanley brothers were independently wealthy and didn't really care if the factory showed a profit; they enjoyed making and driving steamers! So they made no attempt to push production beyond 700 cars annually. They recognized that the performance of their later cars was no longer competitive, and had begun experiments to improve things. However, their successors in running the factory canceled the program and made no changes in the 1908 vintage machinery still used to push the much heavier 1920 chassis and body styles. The decline in sales was inevitable.



*BULLETIN*: Are many still running? How active are collectors/owners of steam cars?

Mr. Nergaard: There are more than 600 cars listed in the last Sprague Steam Car Register (1985). Noting the highest serial numbers of cars still in existence, I got 38,500 cars of 21 makes, which is evidence of how many were made. I don't know how many of these are operable. There are 30 members in the Northeast Chapter of Steam Automobile Club of America. We have had a dozen running cars come to some of our meets. Some of us are quite active. My Stanley is registered as a "daily user," not an antique! Others I know, however, have bought cars and never driven them.

*BULLETIN*: What would be the value of these vintage machines?

Mr. Nergaard: One can buy a condensing Stanley for $25,000 to $35,000. Older cars are dearer. Dobles are like yachts: "If you have to ask, you can't afford it!"

*BULLETIN*: How much maintenance time and expense are involved with an active steam car?

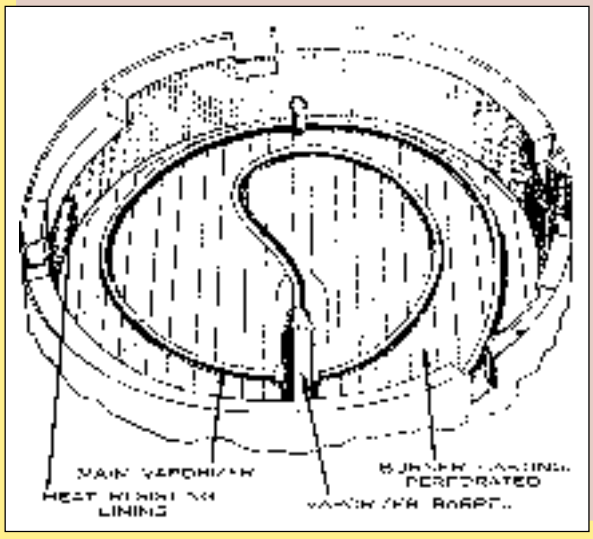
Mr. Nergaard: Steam cars today fall in two categories: antique and experimental. For both, maintenance is a major issue in time and expense.

Any antique has outlasted its maker's wildest dreams of longevity. So just keeping up with the effects of age requires a lot of effort. Add to that the longer trips at higher speeds that are normal today and you will understand why time spent under the car far exceeds time spent driving it.

The owner of an experimental steam car has the same issue for a different reason. It is inherent that one gets some things wrong in building the machine and has to go back to the drawing board.

The steam generator must be kept clean, and should be stored empty when not in use. The usual way to empty it is to blow it down at the end of the day, which is also the way to clean it. Automotive burners are so clean that cleaning the fire side of the generator is seldom an issue.

Depending on what kind of burner is used, one may spend a fair amount of time keeping it clean, primarily because modern fuels are not as clean as those of 1910! For me, this usually requires some ten minutes a day when touring with the Stanley. If I get a bad batch of fuel, it becomes



■ *The 4-foot wire cable located inside the burner's vaporizer should be removed and cleaned often to avoid any stoppage. Stoppage would be indicated by a lack of force in the burner.*

ten minutes out of each hour. It is more of a problem for vaporizing burners, unlike the more recent carburetting or pressure atomizing types. These require about as much servicing as a home heating burner, which they largely resemble. In fact, the first commercially successful oil burners for home heating were designed as steam car burners.

Steam engines usually need much less care than gasoline engines of the same vintage. One seldom needs to change oil more often than annually, but old oil seals being what they are, you often have to add some. Cylinder lubrication is oil sprayed into the steam, which consumes a gallon of oil every couple thousand miles. On really long tours, you have to carry oil with you; you can't get superheated cylinder oil at a turnpike gas station. The same applies equally for the crankcase oil: the additives in modern internal combustion engines or transmission oils can damage a steam engine.

There is one essential task that is both tedious and difficult, but it is done only once per season. Since anti-freeze solutions should not be used in boilers, the entire water system of a steam car must be carefully drained before the first heavy frost. The only alternative is to keep the car warm at all times. Usually one must disconnect various bits of plumbing and take apart certain valves to be sure they are empty. It is about an hour-long process, during which a certain amount of the car's water gets deposited on its owner.

*BULLETIN*: Profile the steam car owner at the turn of the century, and of today.

Mr. Nergaard: This is speculation! I think the steam car buyer of 1900 wanted a low-maintenance vehicle, the machinery of which he could understand. Remember, when he thought of maintenance effort, he was comparing keeping a car with keeping a horse. A major selling point in those days was "you only feed it while you use it!" Both electric and gasoline cars involved devices, which to the average man at that time were both mysterious and unreliable. Even reliable spark plugs were nearly 20 years in the future.

As for the "modern" steam car owner, it helps to be crazy! Some of us want to preserve a fading technology that may be useful some day. Some of us feel the technology could make a really low pollution, high performance car. They have a feel, sound, and, yes, smell unlike any other vehicle. I've met retired locomotive engineers who were attracted to my car by the memory of hot cylinder oil.

*BULLETIN*: Given the advances in technology, is it reasonable to assume steam cars would be commercially viable today?

Mr. Nergaard: I believe a modern steam car could compete, in terms of fuel consumption in normal driving, with a gasoline car of equal performance. I don't think one could compete in efficiency with diesels. However, the manufacturing costs would be astronomical in the small quantities likely unless the government got serious about internal combustion engine pollution. If internal combustion engine pollution becomes the issue it should be, steam may be the only viable road vehicle power source.

Modern assembly robots are so good that many steam car parts could be made totally automatically, even Stanley boilers. However, serious changes would have to be made in the way cars were plumbed, not only to simplify assembly but to ensure easy and effective draining when needed. Steamers might be viable in a niche market, like limited edition sports cars or taxis for a very low pollution market.

*BULLETIN*: Thank you, Mr. Nergaard, for sharing your expertise with *BULLETIN* readers. ❖

# Steam Car Boiler Explosions

*By Dave Nergaard*
*Vice President, Steam Automobile Club of America*

Collecting data in a part-time, amateur manner on steam technology as it applies to automobiles for more than 40 years, I have found more than 55,000 steam cars were made and sold in the United States, most of them before 1905. I have also found remarkably few references to automotive boiler failures, and only ten mentions of explosions with any detail. It is surprising that there were so few accidents!

Of the ten explosions, three occurred at a time when the very design of boilers was largely an experiment. Two more were not in cars, and one of these was a deliberate test to failure. That leaves five accidents to cars in private hands, in the heyday of steam cars, 1899-1908. Of these, three were caused by the dangerous feeding of a large amount of cold water to a low water reserve. Two involved boilers that may have been unsafe; proper inspection would have revealed the danger while the boilers were still cold. No explosions have occurred since 1910. The ten I am referencing are detailed below.

1 In 1834, a Scott Russell coach broke a wheel trying to negotiate a pile of rocks deliberately placed to block the road. The wheel failure caused the boiler to assume loads previously carried by the coach chassis and axles, which it was unable to do. The resulting explosion killed several people and ended the commercial viability of those coaches. However, the out-of-court settlement of the suit brought by Scott Russell against the turnpike company essentially absolved that boiler from fault.

2 At about the same time, a Walter Hancock coach exploded when the engine man tied down the safety valve and ran the declutched engine so the fan would force the fire! I don't think I have to say much about this failure, and neither did the coroner's court at the time.

3 A Goldsworthy Gurney coach had a boiler failure in June 1831, while on exhibit in Glasgow, injuring two children. It was reported that the coach was being operated without Mr. Gurney's attendance or his permission.

These three incidents happened more than a decade before Bourdon invented the first practical pressure gage. The only clue early engineers had to the pressure being used was the "feel" of the safety valve!

4 A blacksmith obtained a boiler rejected and scrapped by the Stanley Company and attempted to use it without the usual wire wrapping used to strengthen Stanley boilers. According to the story, he destroyed the boiler, his shop, and himself. Thereafter, the Stanley factory drove a spike through the side of any rejected boiler shell.

5 A member of the Stanley family tested the lightweight racing-type boilers that the Stanleys proposed to make the production boiler. A pit was dug behind the factory building, and a boiler with burner was

lowered into the pit and tested to destruction. The boiler exploded at a pressure between 1,800 and 2,000 pounds per square inch. Although no production car used a steam pressure higher than 600 psi, neither were they fitted with any of the racing-type boilers.

6 An August 1903 magazine article described the failure of an Ofeldt "Salamandrine" boiler near Cincinnati. The car in question was a Mobile, which was normally fitted with a Stanley boiler. It is perfectly clear what happened: the boiler had been run totally dry, then, while it was very hot, a large quantity of water was pumped into it by a steam-powered feed pump. The driver was not killed because he had dismounted in order to turn off the burner, which could not be done from the seat.

7 A Stanley reportedly exploded May 13, 1906, in Omaha, Nebraska. The upper tubesheet went straight up and the lower tubesheet went down against the ground. The people in the car received minor injuries from insulation blown into their faces. It is believed the boiler had a copper shell and that the circumstances of the accident involved a hot dry boiler into which water was pumped. Early Stanleys did use copper shells, but steel shells were standard from about 1906.

8 The explosion of the boiler in an 1899 Locomobile in Columbia, South Carolina, December 11, 1906, is the only documented case I have found of the wire wrapping used on Stanley boilers failing while in service. The story claims the boiler was choked by corrosion from constant use of river water, and had made ominous sounds just before the failure.

9 A boiler explosion in a 1903 "Geneva" car August 10, 1908, near Painesville, Ohio, killed two people. The boiler had a copper shell about 1/16 of an inch thick and was not the boiler normally fitted to the car, which was a semi-flash boiler with a steel-shelled firetube section above a watertube section. There is no mention of a wire wrapping, which would be absolutely essential on a copper shell boiler at normal automotive steam pressures. The accident happened near the bottom of a long downhill grade, and it is assumed that the fire had not shut off when it should have and the safety valve had stuck.

10 In a 1912 Stanley Mountain Wagon, a four-inch section of the weld between the upper tubesheet and the shell failed and released the steam with sufficient violence that the hood (bonnet) flipped up and smashed the windshield. Nobody, either in the car or near it, was injured. I do not consider this incident an "explosion," as the boiler shell remained essentially intact.

There have been steam car explosions in recent years, but all involved fuel tanks, not boilers. There have been boiler failures also, but these have not been explosions. A great many Stanley drivers have "scorched" their boilers by running them dry, including this writer. But so long as only the normal engine-driven or hand-operated feed pumps are used, this situation is expensive, not dangerous. ❖

# Madiha Kotb Assumes Leadership of ASME Conformity Assessment Board

Province of Québec Chief Boiler Inspector and National Board Member Madiha Kotb, P.E., has begun a three-year term as ASME vice president for conformity assessment. She was elected to the position for a term extending from June 2003 to June 2006.

The Board on Conformity Assessment, under the direction of the Council on Codes and Standards, supervises ASME's accreditation, registration, and certification activities as well as developing activity criteria. As vice president, Ms. Kotb serves as chair of the board and a voting member of the Council on Codes and Standards.

"The next three years will see Ms. Kotb play an instrumental role in the important codes and standards process," commented Donald Tanner, National Board executive director. "We extend to her our best wishes for what we believe will be a productive term and continue to offer our support for the important work performed by the Board on Conformity Assessment."

A native of Cairo, Egypt, the former Miss El Mehelmy was graduated from Concordia University in Montréal with a bachelor's and master's degree in mechanical engineering. She joined the Québec Pressure Equipment Division in 1981 as technical support engineer, and became a member of the National Board representing the Québec jurisdiction in 1989. She is the only woman to have served on the Board of Trustees (1991-1993).

Currently a member of the ASME Subcommittee on Nuclear Accreditation and the Boiler & Pressure Vessel Code Conference Committee, Ms. Kotb has been a member of the Board on Conformity Assessment since 1994 and most recently served as the board's vice chair.

According to Ms. Kotb, the major issues that she will seek to address during her tenure include: a careful examination of emerging trends and evaluation of the need and value of select conformity assessment programs, promotion of wider recognition of conformity assessment programs internationally, and building cooperation within the society to further integrate ASME strategies.

Another issue on Ms. Kotb's agenda involves reconciling the differences that presently exist between the public and private sectors. "It is a tremendous challenge that will undoubtedly require extraordinary patience and resourcefulness," she noted.

"One of my main objectives for the next three years will be to open up our communications so that all industry professionals will be better informed and consequently more able to contribute to the conformity assessment process," she added.

"Ms. Kotb's election to this prestigious position is made possible through the outstanding cooperation and encouragement of her jurisdiction," explained Mr. Tanner. "We commend the Province of Québec for its excellent support of Ms. Kotb's National Board and ASME involvement."

In a related professional honor, this summer Ms. Kotb was presented the Canadian Standards Association Award of Merit in recognition of her "advocacy, expertise and dedication towards the development of safety regulations, codes and standards . . . over the last 20 years." ❖

# Out-of-Print ASME Code Editions Now Available

The National Board is launching a library service designed to assist organizations that use out-of-print editions and addenda of the ASME Code. By agreement with ASME International, copies of out-of-print editions of the *ASME Boiler and Pressure Vessel Code* are now available from the National Board library.

"Copies of out-of-print ASME Code editions and addenda, or specific sections, can be hard to obtain. This can make it difficult to determine the rules used in the construction of the equipment being repaired or altered," states Bob Schueler, senior staff engineer.

The charge for the first copied page is $27. Each page thereafter will be an additional $1.50. Pricing is based on staff research time.

To order an out-of-print copy of an ASME Code edition or addendum:

1) Phone, fax, or email the National Board technical staff with the request. The phone number is 614.888.8320, and the fax number is 614.847.1828. A list of technical staff and their email addresses can be obtained on the Web site at *nationalboard.org*, under "Staff."

2) A staff member will review the edition and addenda requested for the applicable pages. Once the material is found, he or she will contact the individual to confirm content and number of pages to be copied.

3) The material will then be sent by email, fax, or postal mail.

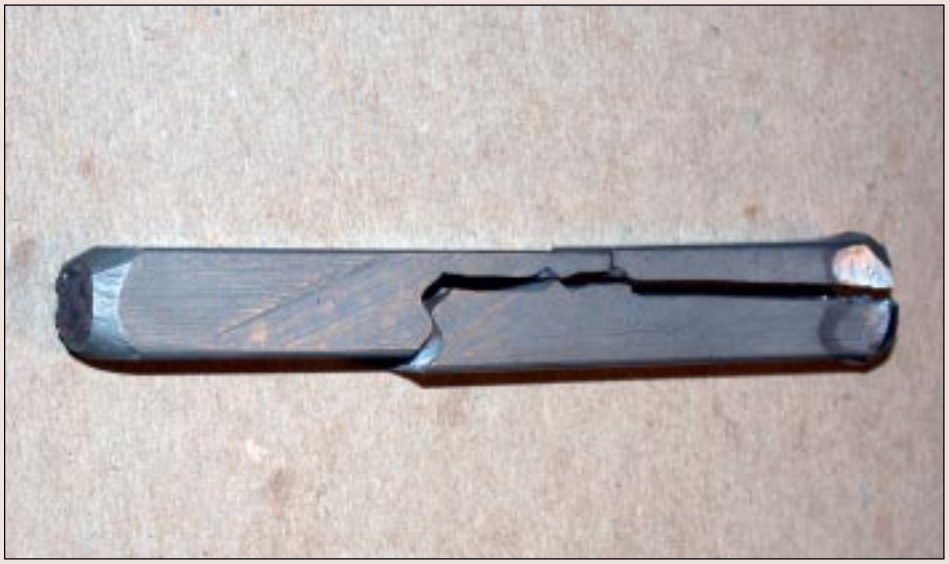
Mr. Schueler goes on to say, "Having a means of acquiring the applicable rules to which inservice equipment was constructed should simplify the task of repair and ensure that the correct material, tests, and requirements are employed as part of the process. This service should be of value to manufacturers of new equipment that have to research products that have been built over time or are fabricating similar items, and to organizations performing repairs and alterations to equipment built to earlier editions and addenda of the ASME Code." ❖

# Stamp Maintenance

By John Hoh, Assistant Director of Inspections

Approximately 3,000 boiler and pressure vessel manufacturers around the world have received the National Board "NB" symbol stamp for use on those items registered with the National Board. While the mandatory effective date for the stamp was January 1, 2003, many manufacturers began using the stamp as soon as they received it. This provided well over one year of feedback from manufacturers. Of the total number of stamps in use, three reported problems concerned the same issue, maintenance of the stamp.

Any struck tool such as the "NB" stamp can exhibit deformation or "mushrooming" at the point where it is struck by the hammer. While this is normal, the user of the tool should inspect the struck end for small cracks, especially around the perimeter of the "mushroom." These cracks develop as the steel deforms. If not removed, the cracks can cause the stamp to split down its length (as shown in these photographs). The cracks are easily removed by light grinding or by using a hand file. This simple maintenance will greatly extend the life of the stamp. ❖



# Highlights from the 72nd General Meeting

Photography by Dean Williams


Banquet Banter Picking up their tickets for the Wednesday banquet, these guests were anxious to begin their week of fun in the sun.

Basketball legend Bill Russell

Olympic Gold Medal figure skater Peggy Fleming

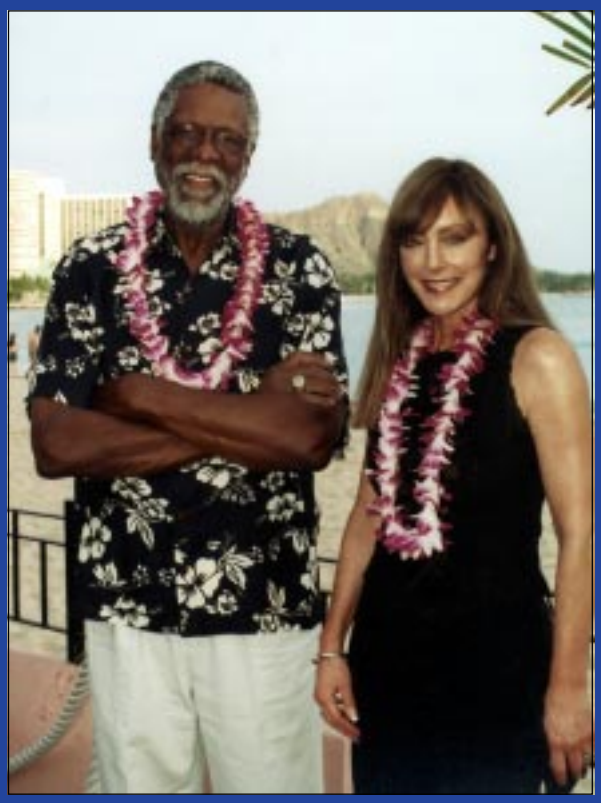
Rear Admiral Jeffrey A. Brooks, COMREL Director, U.S. Navy Pacific Fleet

Vicky Cayetano, CEO of United Laundry Services and former First Lady of Hawaii

Tree Hugger Not exactly what you would expect to see high up in a palm tree, this young man gave visitors to the Polynesian Cultural Center a living lesson on the ancient Polynesian culture.

Synchronized Salutation Hawaiian chanter Kahale Richardson-Naki joined forces with the Royal Kings Guard as part of a welcoming program that kicked off the 72nd General Meeting.

Polynesian Pyrotechnics It may look dangerous, but this fire dancer knew what he was doing while entertaining the crowd at the Wednesday banquet.



Gold Medal Guests
Bill Russell and Peggy Fleming pose in front of Diamond Head in Honolulu.

# Honolulu, Hawaii

View With a Room With the stunning Pacific sunset as a backdrop, these musicians and beautiful dancers entertained hotel guests during a National Board reception.

John Hoh Meets Don Ho
National Board Assistant Director of Inspections John Hoh and legendary Hawaiian singer Don Ho visited at the Board of Trustees dinner at Don Ho's Island Grill.

The Douin Crew National Board Chairman and Illinois Chief Inspector David Douin and son Michael, wife Beth, and daughter Lisa enjoyed lunch on the USS *Missouri* as part of a tour of the battleship.

SAFETY
ONE GOAL
ONE CHANCE

Hawaii's Lieutenant Governor James Aiona Jr.

Hawaiian Hello Jennifer Shishido, administrator of Hawaii's Division of Occupational Safety and Health, was met by a lei greeter at the Wednesday banquet.

Advisory Committee Member Dr. Maan Jawad of the Nooter Corporation

Snow in Hawaii Morris Snow, that is! The past National Board chairman and retired inspector from Tennessee was welcomed to Hawaii by a lei greeter.

National Board Executive Director Donald Tanner

Manager/Chief Inspector for Hawaii Yash Nagpaul

Ensemble Effervescence Modeling their colorful haute couture at a cocktail reception at Hilton Hawaiian Village were (from left): North Dakota's Chief Inspector Bob Reetz, Colorado's Chief Inspector Randy Austin and his wife Frankie Austin, Nova Scotia's Chief Inspector Charles Castle, and Mississippi's Chief Inspector Henry McEwen.

All Smiles The Hawaiian Polynesian Dancers, along with Danny Couch, treated the crowd to a delightful show at Hilton Hawaiian Village's Lagoon Green.

# Honolulu, Hawaii

No Refrigeration Required
Figure skating icon Peggy Fleming enjoyed a number with a native dancer, proving that she has rhythm on *and* off the ice.

Having a Grand Time
Mimi Hanson, grandmother of Minnesota's Chief Inspector Joel Amato, followed the lead of a hula dancer during a National Board cocktail reception.

Star Gazing
Danny Couch and the Paradise Sisters, along with the Hawaiian Polynesian Dancers, performed under the stars.

# 2003 Safety Medal Awarded to George Bynog

George Bynog, former chief boiler inspector with the State of Texas Department of Licensing and Regulation, has been awarded the 2003 National Board Safety Medal, in honor of his notable contributions to the boiler and pressure vessel industry.

Mr. Bynog retired from the Department of Licensing and Regulation this year, after 14 years as a National Board member. He holds National Board Commission No. 9683.

The National Board's highest commendation, the Safety Medal is awarded based on a nominee's extensive experience in the boiler and pressure vessel industry, as well as a demonstrated commitment to safety. ❖

George Bynog

# Safety Medal Nominations Sought for 2004

The National Board of Boiler and Pressure Vessel Inspectors is seeking nominations for its 2004 Safety Medal Award. This award, the highest honor bestowed by the National Board, will be presented at the 73rd General Meeting in Nashville, Tennessee.

For someone to be considered for the Safety Medal Award, it is required that letters of recommendation be submitted by three individuals who are acquainted with the candidate and can attest to his or her contributions to safety within the boiler and pressure vessel industry.

Each letter of recommendation should include:

- The name, title, employer, and business address of the candidate.
- A listing of specific contributions or achievements enjoyed by the candidate with relevance to the award.
- A brief biography of the candidate including positions held, National Board activities, and participation in other industry activities, including any honors and awards known to the individual making the nomination.
- The name, title, employer, and business address of the individual submitting the nomination.

Letters of recommendation must be received by December 31, 2003, and should be addressed to the Executive Director, The National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, Ohio 43229. ❖

# New York Chief Inspector Ronald K. White Retires

Former National Board Member Ronald K. White has retired from both the State of New York and his National Board duties, effective May 21.

Mr. White began working for the State of New York in 1964 as a boiler inspector. Other positions he has held at the state level include senior boiler inspector, boiler inspector supervisor, and chief boiler inspector — a post he held for more than 17 years.

Mr. White holds National Board Commission No. 7264. He and his wife Sofia plan to relocate from Athens, New York, to Kingman, Arizona. ❖

Ronald K. White

# Sam E. Lyons of Arkansas Retires

Former National Board Member Sam E. Lyons retired July 1 as chief boiler inspector for the State of Arkansas.

Mr. Lyons began his career in boiler inspection in 1975 with the Hartford Steam Boiler Inspection and Insurance Company. He joined the Arkansas Department of Labor, Boiler Division, in 1992, becoming chief inspector in 1994. He was elected to the National Board in 1998.

A retiree of the Navy, Mr. Lyons has 22 years of military service.

Mr. Lyons holds National Board Commission No. 11790. ❖

Sam E. Lyons

# Industry Mourns Passing of Henry Mauk, Former Executive Committee Chairman

The National Board regrets to announce that former Executive Committee Chairman Henry S. Mauk died June 27, in Wilmington, Delaware. He was 85 years old.

Henry S. Mauk

Mr. Mauk served as Director of Public Safety for the Delaware Division of Boiler Safety, becoming Delaware's National Board member in 1948. He was a member of the Executive Committee (now the Board of Trustees) from 1971 to 1981, serving as chairman from 1977 to 1979. Mr. Mauk retired from the State of Delaware in 1983 and was awarded Honorary Membership that same year. He helped found the Delaware Society of Professional Engineers in 1950. In addition, he was a charter member of the Delaware ASME section.

"Henry Mauk will be sorely missed. His contributions to the boiler and pressure vessel industry as well as to the engineering profession were many," remembers National Board Executive Director Donald E. Tanner. "The National Board extends condolences to his family and many friends."

Mr. Mauk is survived by wife Catherine, children Marie Stewart, Catherine Logue, Michael Mauk, Claire Mauk, David Mauk, and Joseph Mauk, as well as 14 grandchildren and four great-grandchildren.

❖

# John J. Duffy Remembered by National Board

The National Board is saddened to report the June 29 death of John J. Duffy, former National Board member and field representative. He was 83 years old.

John J. Duffy

Mr. Duffy was chief inspector of Wisconsin for almost 11 years, from 1975 to 1986. From 1981 to 1986 he was a member of the National Board's Board of Trustees. In 1986, Mr. Duffy joined the National Board field staff. After retirement he worked as a consultant for several insurance companies.

Mr. Duffy served for 20 years as an engineer for the Merchant Marine Service, and during World War II was active in the European, Asian, and North Atlantic theaters.

"John Duffy played a vital role with the National Board. We extend our heartfelt sympathy to his family," notes National Board Executive Director Donald E. Tanner. "Mr. Duffy's impact on the boiler and pressure vessel industry will be felt for years."

Mr. Duffy is survived by his wife Ruth, daughter Nancy Meyer, two sons William Duffy and James Duffy, and eight grandchildren. ❖

# Charles J. Castle

## Chief Inspector, Province of Nova Scotia

If public service had a face, it would undoubtedly resemble Nova Scotia Chief Inspector Charles "Chuck" Castle.

"After 39 years as a civil servant," the National Board member offers with a smile, "I'm exceptionally proud of having dedicated my career to helping and protecting others."

Admittedly, Charles says public service is not a profession most people aspire to. "It all depends on what a person wants to get out of a career," he emphasizes.

Growing up in Carroll's Corner, located about 35 miles north of Halifax, the Nova Scotia official recalls no early childhood epiphany that would have led him down the path of becoming a chief inspector. But he vividly remembers enjoying a number of adolescent diversions that went along with growing up in a small river village where the living was slow and easy.

"I spent most of my free time skating and swimming," the provincial official explains. "Our school was actually one of those one-room rural schoolhouses that were pretty typical back then," he recalls.

Becoming a teenager gave Charles a new perspective on life and some ideas on what professional direction he might want to pursue. At the tender age of 17, he left Carroll's Corner to become a pilot in the Royal Canadian Air Force.

"I took a battery of tests during the first two weeks only to be told that they wanted me to become a navigator," Charles reflects. It was not what he wanted to hear. "I figured that if I couldn't fly, there was no reason to stay."

And so, after six months, he obtained an honorable discharge. But not before spotting a Royal Canadian Navy advertisement announcing an apprenticeship program that would allow him to pursue another professional interest: mechanics.

"I always had an interest in mechanics," Charles admits while stroking his graying, neatly combed beard. "In school, I scored particularly high in the subject on my aptitude tests." Now focused on becoming a machinist, the 18-year-old enrolled in the Royal Canadian Navy civilian apprenticeship program.

After subjecting himself to tests administered by the Navy to determine his placement, Charles was interviewed by a trades board that examined his rationale for wanting to become a machinist. "They laid out for me the duties of the job in a way that was not quite what I expected," he notes with a look of concern. But what did appeal to him at the time was a description of another job that would "allow me to perform a larger variety of mechanical tasks." That position: boilermaker.

"There weren't a lot of boilers around where I grew up," Charles explains, "but I was familiar with steam as a kid having watched steam locomotives come and go." His fascination with the raw power of steam coupled with knowing a childhood friend whose dad was a boiler inspector made a lasting and positive impression.

Having to make his decision during the board interview, Charles agreed to enter an apprenticeship program that was "extremely rigorous." But as he got more into the program, the future Nova Scotia official found that boilermaking "really appealed to me."

Also appealing to Charles during the years he worked the naval dockyard was a young lady to whom he was introduced by friends in 1966. He married his wife of 36 years, Mary, in 1967.

Leaving the dockyard as a journeyman boilermaker in 1974, and now 28, Charles was about to embark on his life beyond the Royal Canadian Navy. Noting an advertisement in the local newspaper for a provincial boiler and pressure vessel inspector, the future Nova Scotia official felt confident in his abilities to satisfy the job requirements.

That summer, Charles was interviewed for the position by then Nova Scotia Chief Inspector Wayne Lewis. "Wayne had actually gone through the same apprenticeship I had," he proudly explains. Chosen to fill the inspector vacancy, the new provincial employee set his sights on obtaining his National Board Commission. Passing the commission examination in 1976, Charles added to his already considerable boiler experience by serving as a Nova Scotia boiler and pressure vessel inspector for 22 years.

"Most of those years were under Bob Yeo who became chief inspector when Wayne Lewis left the province shortly after I started," the National Board member recollects.

"Back in those early days, we only had two or three shops (as opposed to seven today) that manufactured boilers and pressure vessels," he explains. But that still meant travel. Lots of travel.

Yet Charles has no regrets. "During the more than ten years I spent at the dockyard, there was very little opportunity to get out of my work area. When I joined the province, I truly enjoyed going to different places and meeting interesting people. I think it's a benefit of the job that some inspectors don't fully appreciate."

In 1995, Charles was promoted to Nova Scotia chief inspector upon Bob Yeo's retirement. Now in the position for eight years, he heads a staff of twelve responsible for 15,000 pressure vessels and 1,200 boiler inspections. "It's a good group of professionals who perform an outstanding service for the people of Nova Scotia," he proudly notes.

Not having to travel as much now as when he worked as an inspector, Charles has more time to pursue two of his most ardent passions: wine making and golf.

"Making wine can be a very therapeutic process," Charles notes with a serious glance. "It teaches you that patience is a virtue that can result in a lot of good things."

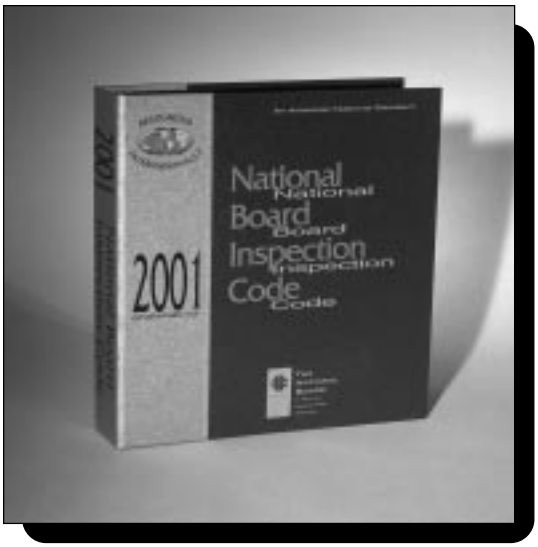
And speaking of patience, there is perhaps no one more patient when it comes to indulging his love of golf. "There are a number of fine courses in the Halifax area," the Nova Scotia official is quick to point out. To take full advantage of his playing time, Charles purposely schedules his vacation in September when most of the golf courses have bid adieu to the summertime crowds.

Charles says he'll be playing even more golf when he retires in a few years. And spending more time with wife Mary, and grown daughters Catherine and Victoria, is a priority.

As for whether Charles thinks he has gotten what he wanted out of his career, he nods and emphasizes that his life as an inspector has yielded "tremendous personal growth and professional satisfaction . . . more than I could have ever dreamed of while growing up in Carroll's Corner." But there are limits.

"After 39 years," he sighs, "I'm finally looking forward to my place in the sun."

Preferably, with an early tee time. ❖




# The NBIC and Routine Repairs

By Chuck Withers, Senior Staff Engineer

What distinguishes a *routine repair* from a *repair* is that the requirement for in-process involvement of the inspector and stamping may be waived for a routine repair. The *National Board Inspection Code* (NBIC) provides specific requirements to those who perform routine repairs on pressure-retaining items. Not all jurisdictions recognize the practice of routine repairs as identified in Part RC of the NBIC. Jurisdictions that do not accept routine repairs generally require all repairs to be performed without waiving the inspector involvement or stamping.

Inspector authorization is a Part RC general requirement that pertains to repairs and alterations, including routine repairs. Authorization is required prior to initiation of any work by the "R" certificate holder. There are a number of ways that inspector authorization may be granted; how this can be accomplished is not defined in the NBIC, but is a joint responsibility of the inspector and the "R" certificate holder.

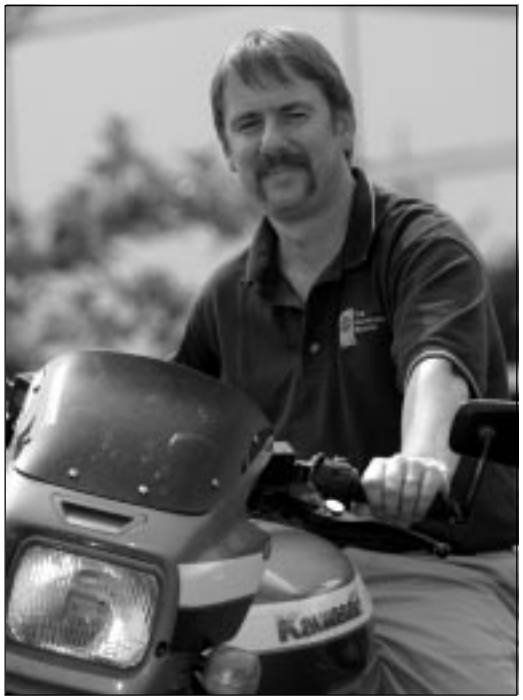
When jurisdictions allow routine repairs in accordance with the NBIC, these requirements are applicable:

- The process of identifying, controlling, and implementing routine repairs must be identified in the "R" certificate holder's quality system manual.
- The "R" certificate holder must notify the inspector of all work to be performed prior to start of work.
- In-process involvement of the inspector and stamping may be waived subject to the acceptance of the jurisdiction.
- The inspector has the final authority to determine if in-process inspections are needed or if stamping is required.
- The jurisdiction may impose specific requirements when dealing with or accepting routine repairs.
- The inspector should be aware of jurisdictional requirements, capabilities of each repair organization, and use of specific methods of repair in order to make a final evaluation to waive in-process inspections and/or stamping as allowed.
- The "R" certificate holder may classify a repair as routine if it falls within the categories of routine repairs as listed in Part RC. The inspector may accept this determination or decide otherwise, in which case the routine repair becomes a repair.
- The inspector is required to monitor this program.
- All routine repairs are required to be verified by examination or testing as stated in Part RC. Examinations or testing methods should be verified and accepted by the inspector.
- All routine repairs must be documented on Form R-1 as identified in Part RC and Appendix 5.
- All inspector activities relating to repairs/alterations must be logged and maintained in a bound diary.

Very few of the duties and responsibilities of the inspector are waived when performing routine repairs. The NBIC recognizes that "R" certificate holders and the inspector must assume joint responsibility when performing routine repairs, taking all necessary precautions to ensure safety. ❖

# Joe Ball, P.E.

## Technical Manager
## National Board Testing Lab



This is one code enforcer who doesn't mind a little danger every now and then.

Meet Joe Ball, technical manager of the National Board Pressure Relief Department, motorcycle enthusiast on the side.

It is hard to picture this teacher, engineer, and customer service professional in leathers on a Kawasaki 600, racing around a tarmac track, maneuvering curves, and passing other riders. His friendly face and happy eyes belie his competitive side.

"I have been on a motorcycle since I was 18, racing competitively for the last 13 years," he explains. At one time the motorcycle was his main form of transportation. "I can remember riding my bike up Interstate 71 to work, in my suit with my tie flapping over my shoulder and my briefcase strapped to the back of the bike," he reflects with a laugh.

Proudly, Joe shares that he has been in 125 sprint races and 17 endurance races over the years. Competing in the Expert Class, he won a championship at the regional level last year and went on to place third in his motorcycle class nationally. His goal is to reach the AMA Nationals.

"What I enjoy most about riding my motorcycle and competing in races is the immediate, in-the-moment aspect of it. Racing only allows you to be thinking of one thing. My work at the National Board tends to involve longer processes and detailed projects. Racing is instant gratification," he reveals.

Joe has been with the National Board since January 30, 1980. His first role was as lab technician, next was assistant director of the pressure relief department, which evolved into assistant manager of the pressure relief department, changing duties in name only. He has been technical manager for about 10 years now.

At home Joe enjoys life with Nancy, his wife of four years, his stepson, and their pets. While his commute is now by car, Joe still enjoys coming to work every day after 23 years.

Joe elaborates, "My job is different every day. I could find myself teaching, maintaining our boilers, writing codes and standards, designing instrumentation, or testing equipment. There is always something new coming up."

As technical manager, Joe is responsible for managing the pressure relief device capacity certification program and the technical aspects of the lab. He fields calls about safety concerns, and educates customers on pressure relief device applications, inspection, and various National Board programs.

Safety is the top priority of the staff at the testing laboratory, with more than 1,500 pressure-relief valves undergoing scrutiny every year. Joe works closely with many of the customers who come to the lab to witness the testing first-hand, helping them improve their products through training and explanation.

Along with his coworkers, Joe is constantly striving to eliminate risk and hazard. Except on weekends . . . ❖

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

# The Option Is Yours

BY RICHARD MCGUIRE, MANAGER OF TRAINING

The Pre-Commission Examination Course (PEC) is an intensive 10-day training session that prepares attendees to take the National Board Commission Examination. Course participants are exposed to inspector duties and responsibilities, code calculations, industry terminology, and testing, welding, and material requirements. Each class is scheduled such that the National Board Commission Examinations are held either the following week, or two weeks later.

The first five days of the training familiarize course participants with the ASME Code and the *National Board Inspection Code* (NBIC); the second five days challenge them with real-life situations to further enhance the learning experience. Both weeks are held at the Training and Conference Center in Columbus, Ohio. While not mandatory, the course is considered a terrific opportunity to prepare for the exam.

Accommodating those who prefer to work at their own pace or who are unable to attend both weeks of the course, the National Board has designed a new self-study course. Reading assignments based on the ASME Code and on the NBIC are given. Study modules and quizzes administered by the National Board are provided at the end of each reading assignment so the course participant can maintain the same level of preparedness as those participating on-site. If a 70 percent passing rate on these quizzes is achieved, the self-study pupil may then elect to attend the second week of the PEC.

This new schedule gives learners the opportunity to go at their own pace, reading and studying as time allows. Your time schedule and comfort level determine your momentum.

The PEC self-study option also is helpful for anyone who simply wants to learn more about material contained in the ASME Code and the NBIC. While reading assignments, study modules, and tests will be administered by the National Board, study is independent. This is a good option for a person who wants to update his or her knowledge of the ASME Construction Codes.

Tuition includes a copy of the NBIC. Not included in tuition are the costs associated with travel, lodging, and meal expenses. Students will need to provide their own copies of ASME Code Sections I, B31.1, IV, V, VIII, Div. 1, and IX. Successful completion of either 2-week PEC option can garner eight Continuing Education Units. Four CEUs can be earned through successful completion of the self-study-only choice.

Most importantly, whether someone is learning on his or her own or in the Training and Conference Center, he or she is gaining an insight and an understanding from the field's leading instructors. The National Board provides a learning environment like no other. Industry associates from all over the world gain an edge through these programs.

Register now! The option is yours. The seminar will be offered again November 10-21, 2003, at the Training and Conference Center. For more information about the Pre-Commission Examination Course, visit the National Board Web site at *nationalboard.org* and click on "Training and Conference Center," then "Seminar and Course Descriptions." ❖

## ENDORSEMENT COURSES

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

March 8–19, 2004

**(B)** **(O)** **Authorized Inspector Supervisor Course/Owner-User Inspector Supervisor Course** — TUITION: $1,250

February 2–6, 2004

**(I)** **Authorized Nuclear Inservice Inspector Course** — TUITION: $1,250

March 22–26, 2004

**(N)** **Authorized Nuclear Inspector Course** — TUITION: $1,250

March 29–April 2, 2004

**(NS)** **Nuclear Supervisor Course** — TUITION: $1,250

December 15–19, 2003

## CONTINUING EDUCATIONAL OPPORTUNITIES

**(1 Day)** **How to Complete a Data Report and *National Board Inspection Code* Highlights** — TUITION: $115

November 13, 2003 December 4, 2003

**ASME Section IX** — TUITION: $275

November 11, 2003 December 2, 2003

**ASME Section VIII** — TUITION: $275

November 10, 2003 December 3, 2003

**ASME Section I** — TUITION: $275

November 12, 2003 December 1, 2003

**Two one-day seminars or two participants earn 5-percent discount**

**(CWI)** **Certified Welding Inspector Seminar** —
TUITION: $1,150 (complete seminar with D1.1 Code)
$1,110 (complete seminar with API-1104 Code)
$375 Structural Welding (D1.1) Code Clinic ONLY
$335 API-1104 Clinic ONLY
$440 Welding Inspection Technology (WIT) ONLY
$335 Visual Inspection Workshop (VIW) ONLY

November 17–21, 2003 (CWI Exam November 22)
February 16–20, 2004 (CWI Exam February 21)

**(PEC)** **Pre-Commission Examination Course** — TUITION: $2,500

November 10–21, 2003 February 9–20, 2004

**(R)** **Boiler and Pressure Vessel Repair Seminar** — TUITION: $335

December 1–2, 2003 February 9–10, 2004
January 12–13, 2004 April 28–29, 2004

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

April 19–23, 2004

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

December 3–5, 2003 February 11–13, 2004
January 14–16, 2004 April 14–16, 2004

## 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 _____

### HOTEL RESERVATIONS

A list of hotels will be sent to you with your National Board registration confirmation.

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

For additional information regarding seminars and courses, contact the National Board Training Department at 1055 Crupper Avenue, Columbus, Ohio 43229-1183, 614.888.8320, ext. 300, or visit the National Board Web site at *nationalboard.org*.

# "The Most Horrible Tragedy . . ."

As the headline in the 4 o'clock afternoon City Edition of *The Berkshire Evening Eagle* reported December 29, 1910, this boiler explosion at the Morewood Lake Ice Plant in Pittsfield, Massachusetts, caused the "most horrible tragedy in the history of Pittsfield." Four days after Christmas in 1910, the lives of at least 15 men were lost when the boiler used to run the conveyor that carried blocks of ice to the ice houses ruptured, sending boiler parts reportedly more than 400 yards away.

What the newspaper reported on the 29th was thorough and seemingly conclusive, yet probably premature and speculative. It was thought that the steam gage, registering between 25 and 35 pounds steam pressure that morning, was not reading pressure accurately. Accounts stated that the steam gage was not working the night before and had even been taken off for adjustment. It was also known that the safety valve was installed and inspected a mere half hour before the explosion.

Chief of the boiler inspection department of the state district police J.H. McNeil was on hand the afternoon of the tragedy to investigate. Property loss was estimated at $5,000. ❖

Thanks to the Local History Department of The Berkshire Athenaeum for its contribution to this column.

*Have any information about these postcards? We would like to know more! Email getinfo@nationalboard.org.*