



# THE INSPECTOR

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## A WORD FROM OUR PRESIDENT

By: Don Mathes:

Supporter vs. Participant

It has been six months since the Fall meeting and the Board members have been very busy preparing for the Spring meeting. If you have ever been involved in setting up a meeting for more than a few people, you know how time consuming it can be. I want to thank each and every member of the Board for their hard work and the personal time they have taken to help assure the safe and efficient operation of all boilers and pressure vessels through training seminars.

Beginning with this issue we will provide advertising space for a nominal fee in our Inspector newsletter. To help offset the cost of publication and mailing The Inspector to approximately 300 past and present members. We usually see thirty-to-fifty paid attendees at our bi-annual meetings, and while we are a non-profit organization, we have many expenses to cover, including mailing, meetings, lunches for meetings, speakers and the list goes on ad infinitum.

## WBIA 2003 SPRING SEMINAR

Now comes your part. All we ask is that you support the WBIA by paying your dues on time and that you attend the meetings the Board works so hard to put together. We would also appreciate your input regarding topics of discussion at our meetings. We encourage you and the company you are involved with sign up for the boiler and pressure vessel operation and use Seminar we have established. Tell others about it, too!

If you have not been to a meeting in recent years we want to say that you have been missed and would like to see you at the upcoming meeting. Your friends, who WILL be there, would also like to see you again.

Don Mathes  
President, WBIA

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## The Chief's Words

By: Mike Verhagen, Chief Boiler Inspector



Spring is around the corner and another year is before us. Since Governor Jim Doyle has appointed a new Department of Commerce Secretary, Cory Nettles and is looking to balance a state budget, the boiler safety section seems to be steaming ahead. All district inspector positions are filled, overdue inspections are declining and report processing in Madison is becoming more efficient. I want to thank and extend my appreciation for your help and efforts to make these things possible. Our inservice inspections make Wisconsin a safe place to work and play. Although I will miss the Spring 2003 meeting, I wish everyone good health and safe travels while assuring public safety in Wisconsin.

### DEPARTMENT NEWS

Boiler Safety has recently hired Steve Cobian as a District Inspector in the State of Wisconsin. Since previously employed with the insurance industry, After Steve received Department training and codes briefing, he eagerly accepted responsibilities in his Madison area district. Steve was assigned District 3 responsibilities with his name, address and phone readily available on the Commerce website. Please welcome Steve to his new position with Boiler Safety.

Another familiar person has returned to Boiler Safety. Please welcome Barb Lasek, Supervisor of Inspection Support Section, Safety & Buildings Division, Field Operations. Barb has been with the State over 22 years with 12 of those years working with the Boiler/Elevator Programs. Barb is a great asset to our team and will provide benefits to all of us with her past experience and knowledge of our program. Again, please welcome Barb back to familiar surroundings.

Rick Merkle is the Field Operations's Supervisor for Boiler Safety with his office in Madison. The address is: S & B Division, PO Box 2538, 201 W Washington Ave., Madison WI 53701-2538 and telephone: 608-266-3037. Joe Hertel, Program Manager @ 608-266-5649.

The Department was happy to report a clean "Incident report" to the National Board this past year. There were "0", ...no boiler or pressure vessel injuries or fatalities reported in Wisconsin for the year 2002. It's a fantastic record but keep in mind, it is your day to day inspections that keep equipment safe. Take the time to complete accurate inspection reports. If violations are written, the report should indicate present conditions, the specific code section of the violation and the corrective action the owner must take. Your thorough inspections and reporting of violations will hopefully keep Wisconsin's incident report at "0" for the year 2003.

### OFFICE MOVE PLANNED:

The office at 401 Pilot Court, Suite C will be moving to a new location. The move is planned to begin in the middle of February and hopefully be completed by the middle of March 2003. The Waukesha office plans to connect telephone and computer systems on March 12, 2003 for employees at the new location. The Department will provide formal notice at a later date. The new address will be

Safety and Buildings Division

141 NW Barstow St.

Waukesha, WI. 53186-3789

### DEPARTMENTAL CORRESPONDENCE DEPARTMENTAL CORRESPONDENCE

Mail general correspondence to the Madison office:

Department of Commerce  
Safety and Buildings Div/Inspection Support

PO Box 7302

Madison WI 53707-7302

Madison Program Assistant Contacts:

**Tiffeny Thompson@ 608-266-3068**

**Janice Schulz@ 608-261-7733**

Supervisor, Barb Lasek@ 608-266-7548

Inspector districts have been changed. Website for new District Inspector Map:

<http://www.commerce.state.wi.us/SB/SB-BoilerInspectorsMap.html>

**Thank You to All!**

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## WBIA Helps You Meet Your Training Needs

The Wisconsin Boiler Inspector's Association is offering training classes/seminars.

If you are interested in setting up boiler & pressure vessel training during the year let the WBIA know and we will tailor training to meet your needs. Certificates issued for all training hours. Contact Matt Keenan, Secretary @ 715-648-5506.

### Boiler fire quickly contained

February 6, 2003

A fire that began in a malfunctioning boiler Tuesday evening at Victoria Avenue and Gonzales Road caused \$7,000 worth of damage at West Montalvo Oil.

The boiler and its contents at 4100 Gonzales Road were worth \$20,000, but the fire was quickly contained and the loss was not a major one, fire officials said.

There were no injuries. A witness reported a large fire at 6:11 p.m., and firefighters from the county and Oxnard departments had the blaze contained by 6:48.

## Retirees

Anyone knowing of inspectors retiring please inform us so we can get their names in this Newsletter.

### Test Your Knowledge

#### Question:

An oil tank is 2' in diameter and 6' high. If there are 6.25 gallons of oil to the cubic foot, how much will the tank hold?

Answers on page 6:

Sunday, January 26, 2003

## July accident in Rocky Mount killed 1 man Employee error may have caused boiler explosion

Safety inspectors reached their conclusion after a six-month probe into events at Ronile, a yarn-dyeing factory, but a company official disagrees.

By MIKE ALLEN  
THE ROANOKE TIMES

State safety inspectors have concluded that employee error most likely caused the boiler explosion that killed a man at a Rocky Mount yarn-dyeing factory last July. But company officials at Ronile question that finding, saying the inspectors' theory does not explain what ignited the blast.

"The individuals involved did not do something unsafe that caused this," said Phillip Essig, Ronile's chief executive officer. "I don't think that they should feel that there's any blame on them."

Inspectors with the Virginia Department of Labor and Industry reached their conclusion after a six-month probe into the July 24 explosion at Ronile. John Lloyd Gregory Jr., 48, of Collinsville, died July 26 at the University of Virginia Medical Center burn unit as a result of first-, second- and third-degree burns over 80 percent of his body. Gregory was a contractor with Martinsville firm Prillaman & Pace.

The inspectors found that Ronile did not commit any safety violations related to the explosion and recommended no citations against the company, according to documents obtained by The Roanoke Times through the Freedom of Information Act. Everyone working to repair the boiler was qualified to do so, the documents say.

Ronile employee Jeff Jones was burned on his head and arms in the blast but survived. According to labor department documents, as Ronile employees tried to fix the malfunctioning boiler that day, they inadvertently created a hazard that led to the explosion.

Investigators say they think the accident occurred because employees working on the boiler bypassed an electrical circuit during a test. But Essig noted that had been safely performed before by engineers who installed the boiler in 2001.

"I personally do not believe that it's accurate to say the test caused the explosion," Essig said. "There's some other intervening event here that no one's been able to identify."

(Con't on Page 8)

## Proper Hydrostatic temp.

Water temperature is critical when hydrotesting. The latest edition of ASME Section VIII, Division 1, which is our rule book for new pressure vessel fabrication, RECOMMENDS that the metal temperature during hydrostatic or pneumatic pressure testing be maintained at least 30 degrees F. above the minimum design metal temperature, but need not exceed 120 degrees F., to minimize the risk of brittle fracture. The National Board of Boiler and Pressure Vessel Inspection Code, which is our rule book for repairing boilers and pressure vessels, REQUIRES that the metal temperature for the pressure test shall be in accordance with the original code of construction but not less than 60 degrees F. unless...toughness characteristic information...indicating acceptability of lower test temperatures is made available. And again the max. metal temperature allowed is 120 degrees F. Please read the information that was sent with these pictures and then pass these on to anyone who ever gets involved with repair work and pressure testing. Those of us involved with repairs and testing under our R

stamp program need to understand the risks associated with our work.



# TEN YEARS OF INCIDENT REPORTS UNDERSCORE HUMAN ERROR AS PRIMARY CAUSE OF ACCIDENTS

Reprinted with Permission by the National Board of Boiler and Pressure Vessel Inspectors, partial excerpt from the National Board Bulletin, Summer 2002

When the National Board standardized its reporting process for gathering incident statistics in 1991, it was with the objective of creating a accurate and consistent database that would, over time, yield a bona fide method of identifying and correcting the causes of boiler and pressure vessel accidents.

## OVERVIEW

Tragically, a total of 127 persons have lost their lives as the result of boiler and pressure vessel accidents during the past ten years. On average, that is just less than 13 fatalities per year. ...When it comes to number of accidents, there is little positive news. Each year during the 1992 to 2001 reporting period saw at least 2,000 accidents, with a total of 23,338 accidents. That averaged 2,334 accidents per year. The highest number of accidents (2,686) occurred in 2000, while the lowest number (2,011) took place in 1998.

## HUMAN ERROR

Of the 23,338 accidents recorded over the past ten years, 83 percent were a direct result of human oversight or lack of knowledge (i.e., LOW-WATER CONDITION, IMPROPER INSTALLATION, IMPROPER REPAIR, or OPERATOR ERROR OR POOR MAINTENANCE). Human oversight and lack of knowledge were also responsible for 69 percent of the injuries and 60 percent of recorded deaths.

As anyone who has followed these Incident Reports knows, LOW-WATER CONDITION and OPERATOR ERROR OR POOR MAINTENANCE have stood atop the list of boiler accident causes for all ten years (includes power boilers, steam-heating boilers and water-heating boilers)."

Mr. Donald E. Tanner, Executive Director of the National Board of Boiler and Pressure Vessel Inspectors, explained why these statistics are so alarming. "While being able to identify and isolate a problem may not necessarily give us complete comfort, it does provide certainty -- the knowledge of what needs to be corrected....simply put: what we do not know can hurt us. Our lack of understanding or knowledge of the perils of boiler and pressure vessel safety puts everyone at risk. Just ask the 84 people who were reported as sustaining boiler and pressure vessel-related injuries last year... And we must do more to inform the general public -- to insist that everyone who works on and around boilers have the essential knowledge to protect themselves as well as those around them.

Over the past two years, the number of people who have attended boiler and pressure vessel training courses in North America has reached record proportions.... Recently, however, economic events have prompted many companies to reduce their training participation. For our industry and its future, that suggests a less than optimistic picture....Numbers reveal only what was. It is up to you to determine what will be...." Check the National Board website for more information: [www.nationalboard.org](http://www.nationalboard.org).

## BOILERS AND PRESSURE VESSELS

### Index to Wisconsin Administrative Code

Accidents, reporting,	Comm 41.38
Inspections,	Comm 41.15 to 41.24
Fee schedule,	Comm 2.11
<b>Installations:</b>	
Before March 1988,	Comm 41.27 to 41.39
From March, 1988,	Comm 41.40 to 41.49
Nuclear power plants,	Comm 41.53 to 41.57
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Petroleum refineries, ,	Comm 41.80
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Repairs and alterations,	Comm 41.60 to 41.64
Scope, definitions and	Comm 41.01 to 41.10
administration,	
Secondhand vessels,	Comm 41.70 to 41.76
Standards, incorporated ,	Comm 41.10
by reference	
Wood-burning boilers,	Comm 41.49

## Future Seminars

The Officers and Board of Directors are looking for ideas for seminars. Please contact an officer or board member and voice your suggestions on future training seminars.

The WBIA wants to ensure that good quality educational seminars are presented.

## Thought of the Day

Everyone has a photographic memory, some just don't have film.

# INSPECTION OF FIRED COIL WATER HEATERS (HWS)

## General Description

These heaters are used for the rapid heating of potable water or hot water service.

This type of heater has very little volume so it may be used in conjunction with a larger hot water storage vessel, or used in a circulating hot water supply system.

The basic design utilizes a non-ferrous coil through which the water being heated is passed. The burner assembly is on the bottom and in most instances is fueled with natural gas. The coil and burner assembly are completely covered with an insulated jacket that serves to conserve heat and to channel the gases of combustion to the stack.

The common working pressures are 125 psig. and 150 psig. Very few are higher or lower. The normal operating temperature will be at or below 180 F. The single exception is water being used for sterilization purposes, in which case it must be set above 185 F.

## What Affects

### Erosion

1. The size of the coil and the velocity of flow through the coil combine to create wear or thinning of the coils.
2. If a delta temperature condition is created in the coil that allows for pockets or bubbles of steam to mix and flow with the water, grooving or cavitations will take place.

### Corrosion

This type of system uses 100 percent raw water make-up which contains free oxygen. This, coupled with a recycle loop, creates opportunities for extensive corrosion.

### Vibration

1. Operation of the burner creates a certain amount of vibration.
2. If any steam is created in hot spots or from a lack of flow, the water hammer effect will cause extensive vibration and mechanical stresses.

## Scale

The large make-up volume in this type of system introduces significant amounts of scale forming particles which come in contact with hot surfaces and precipitate out of the water, adhering to the hot surfaces.

## How to Inspect

### External

1. Inspect the outer casing and underneath the heater for evidence of leakage. If leakage is found, it is necessary to determine its cause and extent.
2. Look for corrosion, cracks, or other metal defects.
3. Check the support legs for cracks, missing or loose bolts, and other metal defects.

### Internal

1. Check the line or header near the inlet for grooving, erosion and corrosion.
2. Inspect the coil inlet for scale accumulation or any obstructions. Check the coil ends for evidence of leakage and cracking.
4. If tubes, piping, and headers are of dissimilar metal, check for cathodic corrosion attack.

### Openings

1. Check all openings for evidence of leakage.
2. Verify that all lines to all controls and gages are free and clear.
3. Examine all attachment welds for cracks and weaknesses.

(Con't on page 7)

## Answer:

$$V = D^2 \times .7854 \times H.$$

$$V = 2 \times 2 \times .7854 \times 6$$

$$V = 18.84 \text{ cubic/ft}$$

$$18.84 \times 6.25 = 117.7 \text{ gallons}$$

# **CPSC, Cavagna North America Inc., FIRED COIL WATER HEATERS (Con't from page 6)** **Announce Recall of Safety Relief Valves for Large Propane Tanks**

September, 2002

Media Contact of the Consumer Products Safety Commission

WASHINGTON, D.C.- In cooperation with the U.S. Consumer Product Safety Commission (CPSC), Cavagna North America Inc., of Branchburg, N.J., is recalling about 6,100 safety relief valves manufactured by Omeca, of Brescia, Italy. These valves, imported by Cavagna, are designed to relieve excess pressure in large propane tanks, typically the 500- to 1,000-gallon size. The recalled valves can have sharp internal edges that can cut into gasket seals in the valves, causing a propane gas leak. This poses a risk of fire or burn injuries.

Cavagna has received 18 reports of leaking valves. No fires or injuries have been reported.

The valves, model 66-1031, are approximately 7-inches long. Writing on the valve reads "OMECA 66-1031." Only valves that contain year and batch codes of "99.02," "99.16," "99.27," or "99.28" are included in the recall. The valves from these batch codes were installed on tanks that were refurbished or manufactured after May 1999.

The valves were sold to propane processors and distributors nationwide from May 1999 through May 2002 for between \$10 and \$15.

LP distributors, LP tank owners and propane gas users with recalled valves should immediately contact Cavagna to schedule an appointment to have the safety relief valve replaced at no charge. For more information, contact Cavagna toll-free at (866) 422-8246 between 9 a.m. and 4:30 p.m. ET Monday through Friday.

The U.S. Consumer Product Safety Commission protects the public from unreasonable risks of injury or death from 15,000 types of consumer products under the agency's jurisdiction. To report a dangerous product or a product-related injury, call CPSC's hotline at (800) 638-2772 or CPSC's teletypewriter at (800) 638-8270, or visit CPSC's web site at [www.cpsc.gov/talk.html](http://www.cpsc.gov/talk.html). Consumers can obtain this release and recall information at CPSC's web site at [www.cpsc.gov](http://www.cpsc.gov).

## **Controls**

1. Check that the heater is fitted with a relief valve set at or below MAWP of the heater. The capacity of the relief valve must equal or exceed the output capacity of the heater. Inspection details for relief valve inspection may be found in the general section of this book.
2. See if temperature controls on the heater include one operating temperature regulator and one high limit control. Both are advisable.
3. Inspect the flow switch, if installed, to determine its reliability and general condition. Since continuing flow is required when the burner unit is operating, many of these heaters are fitted with flow switches that will shut the burner off when the flow is interrupted.
4. Inspect the heater's thermometer to determine its general condition. Check its calibration by testing the water at the heater outlet with a calibrated thermometer.

## **WBIA Officers & Board Members**

### **Officers:**

Don Mathes, President	<a href="mailto:donald_mathes@hsb.com">donald_mathes@hsb.com</a>
Bud Herhuth, Vice President	<a href="mailto:bherhuth@yahoo.com">bherhuth@yahoo.com</a>
Matt Keenan, Secretary	<a href="mailto:matthew_keenan@rsausa.com">matthew_keenan@rsausa.com</a>
Jim Holter, Treasurer	<a href="mailto:james_holter@hsb.com">james_holter@hsb.com</a>

### **Board Members:**

Craig Running	<a href="mailto:beckerboiler@madtown.net">beckerboiler@madtown.net</a>
Paul Wilcox	<a href="mailto:pwilco@ci.mil.wi.us">pwilco@ci.mil.wi.us</a>
Don Smith	<a href="mailto:smithgcwi@aol.com">smithgcwi@aol.com</a>
Ray Glaser	<a href="mailto:raymond_glaser@hsb.com">raymond_glaser@hsb.com</a>
Darrell Stumpf	<a href="mailto:dkmnstum@execpc.com">dkmnstum@execpc.com</a>
Ken Becker	<a href="mailto:kenneth_becker@hsb.com">kenneth_becker@hsb.com</a>

## **Looking for a Few Good Men Or Women!**

If you would be interested in a position as a W.B.I.A. Board Member or Officer we would like to take with you. Please contact an Active Board Member or Officer by E-Mail today!

E-Mail addresses are listed above!

(Con't for Page 3)

## Employee error (con't)

According to documents, on July 24, Ronile called Prillaman & Pace to ask for Gregory's assistance in restarting a boiler that would not ignite. Gregory arrived at 12:15 p.m. He told Ronile employees that an air valve in the boiler could be malfunctioning. Under Gregory's supervision, an employee used a jumper wire to apply power to the circuit containing the air valve.

But applying power to that circuit also opened the valves that let fuel flow into the boiler - something that Gregory and the Ronile employees were probably unaware of. Investigators say they think fuel flowed into the hot combustion chamber.

Unaware of the danger, Gregory and several of the Ronile workers stood behind the boiler, looking over technical drawings. About five minutes after the test, the fuel inside the boiler exploded.

All of the Ronile employees but Jones escaped unharmed.

As Gregory ran for an exit, he was covered with 480-degree lubricating oil that sprayed from the damaged boiler. He made it outside the factory, but not before he had been critically burned.

Thousands of gallons of the superheated oil poured into the factory, igniting fuel that was also leaking and erupting into a blaze in the boiler room. It took Franklin County firefighters more than an hour to put out the fire, while environmental cleanup crews scrambled to block a flood of chemicals from pouring into the nearby Pigg River. The destruction of equipment, damage to the building and temporary loss of manufacturing capacity will ultimately cost the company more than \$1 million, Essig said.

It's standard for an electrician to test a circuit by isolating it, Essig said. Once the test began, a 20-second interval should have passed before the fuel valves opened. While it's unclear whether Gregory knew about the 20-second interval, all the witnesses present said the air valve test didn't last that long, Essig said.

A South Carolina engineering firm has conducted tests on the boiler's parts and computer system to see if anything malfunctioned, but so far the tests have been inconclusive, Essig said.

Gregory, a 30-year employee at Prillaman & Pace, had a reputation for boiler expertise that earned him regular calls from dozens of companies in Virginia and North Carolina, said his father, retired Martinsville Fire Chief John Gregory.

"He was a mechanical genius, even when he was a little fellow," the elder Gregory said. His son's interest in Erector Sets and the workings of machines led to a part-time job at Prillaman & Pace while he attended Martinsville High School. The contracting firm hired him full time as soon as he graduated.

The family has not decided whether to take legal action.

Gregory's family is still struggling to cope with the loss. "We've not reached closure on this thing, not by any means," the elder Gregory said. The family needs to know exactly what happened the day of the accident, he said. "That probably would help."

Ronile employs about 350 at its Rocky Mount factory, which has accumulated an impressive safety record in its 15 years of operation. The company had reached a benchmark of 500,000 man-hours without a reported accident when the explosion occurred.

## Boiler, Pressure Vessel Accidents Increase

Accidents in 2000 involving boilers and unfired pressure vessels totaled 2,686, a 24% increase from 1999, according to information from the National Board of Boiler and Pressure Vessel Inspectors. Statistics include power boilers, steam-heating boilers, water-heating boilers, and unfired pressure vessels.

Despite the rise in accidents, the number of deaths from the accidents dropped by 33% from the year before. In 2000, seven deaths were reported due to burner failure, and another six deaths reported remain unknown or under investigation. One death in 2000 was caused by faulty design or fabrication.

Operator error or poor maintenance were cited as the chief cause of accidents that occurred in 2000, the third year that has been the leading cause. A total of 1,180 accidents were caused by operator error or poor maintenance. The board lists causes in nine categories: safety valve, low-water condition, limit controls, improper installation, improper repair, faulty design or fabrication, operator error or poor maintenance, burner failure, and unknown or under investigation.

