BLACK LIQUOR RECOVERY BOILER
ADVISORY COMMITTEE

MINUTES OF MEETING
Crowne Plaza Hotel/Atlanta Airport
Atlanta, Georgia
October 5, 6 & 7, 2009

OBJECTIVE

BLRBAC's objective is to promote improved safety of chemical recovery boilers and their auxiliaries through the interchange of technical knowledge, experience, and data on past and any future recovery boiler incidents. ***Bylaws - 2.1***

OFFICERS

Chairman:	Len Erickson Boise. Inc. P. O. Box 990050 Boise, ID 83799-0050	Tel: 208-384-7933 Fax: 208-384-7637 Cell: 208-841-4246 **lenerickson@boiseinc.com**
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Treasurer:	**Ron Hess** HSB I&I Company 110 Cedar Cove Court Buckhead, GA 30625-3300	Tel: 706-484-1723 Fax: 706-485-5267 **ronald_hess@hsb.com**

REGULAR MEMBERSHIP

Organizations operating, manufacturing, or insuring chemical recovery boilers are eligible.

ASSOCIATE MEMBERSHIP

Organizations having a direct interest or role in the safety of chemical recovery boilers are eligible.

CORRESPONDING MEMBERSHIP

A company residing outside of the United States which finds it impractical to attend meetings on a regular basis because of distance and expenses, but desires to be involved and informed of BLRBAC activities. ***Bylaws - 3.1***

BLRBAC INTERNET ADDRESS: ---- www.blrbac.org
IRS Employer ID/Tax ID (IRS E.I.N.T./T.I.N) ---- #13-366-5137

EXECUTIVE COMMITTEE

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BLRBAC MEETING SCHEDULE

Spring	**April**	**12, 13 & 14**	**--**	**2010**
Fall	**October**	**4, 5 & 6**	**--**	**2010**
Spring	**April**	**4, 5 & 6**	**--**	**2011**
Fall	**October**	**3, 4 & 5**	**--**	**2011**
Spring	**April**	**2, 3 & 4**	**--**	**2012**

"Bring Operator(s). Give them a chance to hear first hand!"

■ Past Chairman Lon Schroeder

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BLRBAC has established its own WEB Site which is: www.blrbac.org

At this WEB site you will find a copy of past Meeting Minutes and the next Meeting Notice. Therefore, each Representative and Associate Representative is asked to inform their people of this WEB site. This is where they can obtain the following BLRBAC documents:

BLRBAC MEETING NOTICE

COVER LETTER General Information

REGISTRATION FORM Print and mail to Said & Done with appropriate fees before the posted cut-off date.

CROWNE PLAZA HOTEL Blocked room dates, pricing, address, hotel phone numbers, alternate hotel information, etc.

SCHEDULE List of Subcommittee activities on Monday & Tuesday

AGENDA Reports given to Joint BLRBAC Meeting on Wednesday

OPERATING PROBLEMS QUESTIONNAIRE Mail/e-mail completed questionnaires to Barbara Holich. These will be given to the Vice Chairman and he will see that your concerns are brought up and discussed during the Operating Problems session at the next meeting.

Mrs. Barbara Holich
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Below is the current status of the BLRBAC publications. These are available at the **BLRBAC INTERNET ADDRESS**: **www.blrbac.org**

Recommended Practices by BLRBAC

Recommended Practices by BLRBAC

Materials & Welding Guidleines
(Dated: April 2009)

Safe Firing of Black Liquor in Black Liquor Recovery Boilers
(Dated: April 2009)

Safe Firing of Auxiliary Fuel in Black Liquor Recovery Boilers
(Dated: April 2009)

Emergency Shutdown Procedure
(Dated: October 2009)

Fire Protection in Direct Contact Evaporators and Associated Equipment
(Dated: April 2008)

Personnel Safety & Training
(Dated: October 2007)

Waste Stream Incineration
(Dated: October 2008)

Application of Rotork Actuators on Black Liquor Recovery Boilers
(Dated: October 2005)

Post ESP Water Level
(Dated: January 2005)

Checklist and Classification Guide for Instruments and Control Systems
(Dated: October 2004)

Post ESP Guidelines
(Dated: October 2002)

If you have any questions, contact:

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SAFE FIRING OF BLACK LIQUOR SUBCOMMITTEE

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‡**Scott Moyer** Georgia-Pacific P. O. Box 919 Palatka, FL 32178-0919 Tel: 386-312-1190 Fax: 386-325-6187 **scott.moyer@gapac.com**	‡**Doug Murch** MeadWestvaco 11013 West Broad Street Glen Allen, VA 23060-5937 Tel: 804-327-5245 Fax: 804-201-2192 **douglas.murch @meadwestvao.com**	‡**Sandi Sims** Alabama River Pulp. P. O. Box 100 Perdue Hill, AL 36470 Tel: 251-743-8552 Fax: N/A **sandis@ariver.com**

‡ = Attended the October 2009 Meeting
*= Denotes a new member

WASTE STREAMS SUBCOMMITTEE

John Rickard – Chairman
Jacobs Engineering
P. O. Box 5456
Greenville, SC 29606
Tel: 864-676-6393; Fax: 864-676-6005
john.rickard@jacobs.com

Henry Beder 14150 NE 32nd Place Bellevue, WA 98007 Tel: 425-861-6801 Fax: 425-516-8225 **maddmaxx321@comcast.net**	**Chris Cahoon** Domtar P. O. Box 747 Highway 149 North Plymouth, NC 27962 Tel: 252-793-8301 Fax: 252-793-8262 **chris.cahoon@n.domtar.com**	‡**Mark E. Cooper** FM Global Key Center 601 108th Avenue, NE, Ste.1400 Bellevue, WA 98004 Tel: 425-709-5084 Fax: 425-454-7847 **mark.cooper@fmglobal.com**
‡**Wendy Coyle** Weyerhaeuser Postal Bag 1020 Grande Prairie, Alberta Canada T8V 3A9 Tel: 780-539-8183 Fax: 780-539-8344 **wendy.coyle@weyerhaeuser.com**	**Arnie Iwanick** Harris Group, Inc. 1750 NW Naito Parkway Portland, OR 97209-2530 Tel: 503-345-4516 Fax: 503-228-0422 **arnie.iwanick@harrisgroup.com**	‡**Olie Kujanpaa** Andritz 10745 Westside Parkway Alpharetta, GA 30004 Tel: 770-640-2571 Fax: 770-640-2455 **olli.kujanpaa@andritz.com**
‡**John Lewis** Fluor Daniel Forest Products 100 Fluor Daniel Drive Greenville, SC 29607-2762 Tel: 864-517-1683 Fax: 864-517-1322 **john.lewis@fluor.com**	**Mathias Lindstrom** MeadWestvaco 1021 Main Campus Drive Raleigh, NC 27606 Tel: 919-334-3998 Fax: 919-334-3312 **mathias.lindstrom@mwv.com**	**Steven Osborne*** Babcock & Wilcox Power Generation Group 20 S. Van Buren Avenue Barberton, OH 44203 Tel: 330-860-1686 Fax: 330-860-9023 **slosborne@babcock.com**

‡ = Attended the October 2009 Meeting
*= Denotes a new member

WASTE STREAMS SUBCOMMITTEE (Cont.)

Winston "Jerry" Pate Georgia Pacific P. O. Box 709 Brewton, AL 36427 Tel: 251-867-8371 Fax: 251-867-1153 **winston.pate@gapac.com**	‡**Ann Plank** A.H. Lundberg Associates Inc. P. O. Box 597 Bellevue, WA 98009 Tel: 425-283-5070 Fax: 425-283-5081 **ann.schlegel @lundbergassociates.com**	‡**Paul Seefeld*** A.H. Lundberg Associates Inc. 6174 Kissengen Springs Ct. Jacksonville, FL 32258 Tel: 904-614-6492 Fax: N/A **paul.seefeld @lundbergassociates.com**
‡**H. Bentley Sherlock** Babcock & Wilcox 2302 Parklake Drive. N.E. Ste. 300 Atlanta, GA 30345 Tel: 770-621-3947 Fax: 770-621-3922 **hbsherlock@babcock.com**	‡**Michael D. Sides** GE GAP Services 1360 Olympia Park Circle Ocoee, FL 34761 Tel: 407-656-4275 Mobile: 407-462-4622 Fax: 888-964-7348 **michael.sides@xlgroup.com**	**Arie Verloop** Jansen Combustion and Boiler Technologies 12025 115th Avenue N.E., Suite 250 Kirkland, WA 98034-6935 Tel: 425-952-2825 Fax: 425-825-1131 **arie.verloop@ansenboiler.com**
Marla Weinberg International Paper Corporate Technology Center 6285 Tri-Ridge Blvd. Loveland, OH 45140 Tel: 513-248-6789 Fax: 901-214-0894 **marla.weinberg@ipaper.com**		

‡ = Attended the October 2009 Meeting

*= Denotes a new member

WATER TREATMENT SUBCOMMITTEE

‡**Tom Madersky**
Power Specialists Assoc. Inc.
531 Main Street
Somers, CT 06071
Tel: 860-763-3241; Fax: 860-763-3608
tom.madersky@psaengineering.com

‡**Craig Aderman** Sappi 1329 Waterville Road Skowhegan, ME Tel: 207-238-3000 Fax: N/A **craig.aderman@sappi.com**	**Kari Cahoon** Domtar Paper Company Highway 149 North Plymouth, NC 27962 Tel: 252-793-8059 Fax: 252-793-8262 **kari.cahoon@n.domtar.com**	‡**Clark Conley** Metso 2900 Courtyards Drive Norcorss, GA 30071 Tel: 770-263-7863 Fax: N/A **clark.conley@metso.com**
‡**Buck Dunton** ChemTreat 4301 Dominion Blvd. Glen Allen, VA 23060 Tel: 804-935-2000 Fax: N/A **buckd@chemtreat.com**	**Frank Gabrielli** Alstom Power 2000 Day Hill Road Windsor, CT 06095 Tel: 860-688-1911 Fax: N/A **frank.gabrielli @power.alstom.com**	‡**John Gray** Rayonier 4470 Savannah Highway Jesup, GA Tel: 912-427-5221 Fax: N/A **john.p.gray@rayonier.com**
‡**Ken Hansen** Babcock & Wilcox 20 South Van Buren Avenue Barberton, OH 44203 Tel: 330-860-1186 Fax: N/A **kehansen@babcock.com**	‡**Norris Johnston** Ashland, Inc. 37 Hough Road Lacey's Spring, AL 35754 New York, NY Tel: 256-650-0049 Mobile: 256-520-1011 **nnjohnston@ashland.com**	‡**Sam Lewis** Delta Training 4020 Oleander Drive Wilmington, NC Tel: 910-790-1988 Fax: N/A **slewis@deltatraining.com**

‡ = Attended the October 2009 Meeting
* = Denotes new subcommittee member

WATER TREATMENT SUBCOMMITTEE (Cont.)

‡**Mitch Morgan** Nalco 1601 W. Diehl Road Naperville, IL 60563-1198 Tel: 630-305-1000 Fax: N/A **jmorgan@nalco.com**	‡**Rick Morgan** FM Global Granite Parkway Plano, TX 75024 Tel: 972-731-1656 Fax: N/A **rick.morgan@fmglobal.com**	**Kurt Parks** SAPPI Fine Paper NA 2201 Avenue B Cloquet.MN 55720 Tel: 218-878-4378 Fax: 218-879-0648 **kurt.parks@sappi.com**
‡**Tom Przbylski** Boise Int'l. Falls, MN 56649-2327 Tel: 218-285-5011 Fax: N/A **tomprzybylski@boisepaper.com**	‡**Jim Robinson** GE (infra, water) 4636 Somerton Road Trevose, PA 19053 Tel: 215-355-3300 Fax: N/A **james.robinson@ge.com**	‡**Alarick Tavares** Georgia Pacific 133 Peachtree Street Atlanta, GA 30303 Tel: 404-652-4000 Fax: N/A **ajtavare@gapac.com**
‡**Alvaro Timotheo** Andritz 1115 N. Meadow Parkway Roswell, GA 30076-3857 Tel: 770-640-2500 Fax: N/A **alvaro.timotheo@andritz.com**		

‡ = Attended the October 2009 Meeting

* =Denotes new subcommittee member

Registered for the meeting were:

A.H. Lungberg Associates
Plank, Ann, Bellevue, WA

AbitibiBowater
Nixon, John, Catawba, SC

AirTek Construction
Bringman, Lewis, Linthicum, MD

Alabama River Pulp
Browning, John, Perdue Hill, AL
Sims, Sandi, Perdue Hill, AL

Alstom Power
Bush, Joe, Chattanooga, TN
LeBel, Mark, Windsor, CT
Rushing, Michael, Silver Creek, MS
Semyanko, Ivan, Windsor, CT

AMEC
Tiedeman, Justin, Tucker, GA

American Forest & Paper Association
Grant, Thomas, Yonkers, NY

American Plant Services
Flatt, Butch, Sylacauga, AL

Andritz
Collins, Peter, Roswell, GA
Frykmo, Christer, Roswell, GA
Kujanpaa, Olli, Roswell, GA
Phillips, John, Roswell, GA
Roc, Kevin, Roswell, GA
Soderlund, Harri, Rosswell, GA
Timotheo, Alvaro, Roswell, GA

Appleton Papers
Decker, Walter, Roaring Spring, PA
Schneeberger, John, Roaring Spring, PA

Ashland, Inc.
Hill, Andrew , Jacksonville, FL
Johnston, Norris, Lacey's Spring, AL
Matheson, Ken, Quisgamsis, NB
Meliauskas, Magno, Sao Paulo, Brazil
Ramaharach, Bachah, Trinidad

Austin Fire Equipment
Tourres, Jack, Prairieville, LA

Austrian Energy and Environment
Merriman, Nick, Graz, Austria

AV Nackawic Inc.
McCray, Cail, Nackawic, NB
Moorehouse, Aubrey, Nackawic, NB

AXA Corporate Solutions
Abel, Fred, Lyon, France

Babcock & Wilcox
Blazer, Phil, Charlotte, NC
Bodnovich, Michelle, Barberton, OH
Dickinson, Jim, Barberton, OH
Hansen, Kenneth, Barberton, OH
Hedges, Meville, Atlanta, GA
Hicks, Timothy, Barberton, OH
Hiner, Larry, Barberton, OH
Hovinga, Mark, Barberton, OH
Kornaker, Greg, Barberton, OH
Kulig, John, Barberton, OH
Lance, Gail, Barberton, OH
Sherlock, H. Bentley, Atlanta, GA

Boise, Inc.
Bazarow, Jeff, DeRidder, LA
Breaux, Bob, Jackson, AL
Erickson, Leonard, Boise, ID
Przybylski, Tom, International Falls, MN

Buckeye Technologies
Streit, David, Perry, FL

Registered for the meeting were:

Buckman Laboratories
Fairchild, William, Sylacauga, AL
McCool, Craig, Brandon, MS.

CB Anthony Ross
Adams, Wayne, Clinton, NC

Charles Higginbotham, PE, LLC
Higginbotham, Charles, St.Simons Island, GA

ChemTreat
Dunton, Buck, Richmond Hill, GA
Graham, Jim, Collierville, TN

Clearwater Paper
Bliss, Dave , McGehee, AR
Lawen, Bud, Lewiston, ID
Wren, David, Lewiston, ID

CORR System
Ruiz de Molina, Eladio, Birmingham, AL

Delta National Kraft
Spencer, Daryl, Pine Bluff, AR

Delta Training Partners
Lewis, Sam, Wilmington, NC

Diamond Power
McAllister, Phil, Lancaster, OH

Evergreen Packaging
Holland, Brook, Canton, NC

F. L. Smidth Airtech
Collier, Cale, Evans, GA
Petty, Jerry, Covington, LA

Fluor
Lewis, John, Greenville, SC

FM Global
Beaulieu, Andre, Montreal, Que. Canada
Cooper, Mark, Stockholm, Sweden
Crysel, Scott, Plano, TX
Fonseca, Nelson, Sao Paulo, Brazil
Hoffman, Daryl, Prosper, TX
Judge, Chris, Manchester, UK
Lang, Dave, Plano, TX
Matarrese, Rick, Alpharetta, GA
Meehan, Thomas, Brewer, ME
Moberg, Eric, Johnsburg, IL
Onstead, Jimmy, Plano, TX
Morgan, Rick, Plano, TX
Parrish, David, Norwood, MA
Polagye, Mike, Norwood, MA

Fossil Power Systems
Anerson, Christine, Dartmouth, NS
Donahue, Mark, Dartmouth, NS

FPInnovations
Singbeil, Douglas, Vancouver, BC

George H. Bodman, Inc.
Bayse, Michael, Kingwood, TX
Bodman, George, Kingwood, TX

Georgia-Pacific
Harrod, Chad, Brunswick, GA
Hill, Wes, Camas, WA
Holm, Ralf, Atlanta, GA
Johnston, Jennifer, Atlanta, GA
Lane, Terry, Brunswick, GA
Morency, Karl, Atlanta, GA
Nelson, Joe, Atlanta, GA
Tavares, Alarick, Atlanta, GA

Glatfelter Co.
Gentzler, William, Spring Grove, PA

Global Risk Consultants
Jackson, Christopher, Beaverton, OR
Smith, Andy, Atlanta, GA

Registered for the meeting were:

GommiTech
Gommi, Jules, Maple Valley, WA

Graphic Packaging International
Ash, Dan, Macon, GA
Barnes, Marcus, Macon, GA

Howe Sound Pulp & Paper
Casey, Shawn, Port Mellon, BC

Integrated Global Services
Polutnik, David, Midlothian, VA

International Paper
Clay, Dean, Loveland, OH
Coyle, Wendy, Springfield, OR
Cram, David, Franklin, VA
Dunn, Tony, Franklin, VA
Fuhrmann, Dave, Loveland, OH
Guarnieri, Fernando, Loveland, OH
MacIntire, Wayne, Loveland, OH
Sargent, Mark, Loveland, OH
Woyak, Mark, Augusta, GA

Jansen Comb. & Boiler Tech.
Dye, Ned, Kirkland, WA
Verloop, Arie, Kirkland, WA

Kapstone Paper
Hehn, Chris, Charleston, SC
Kowalczyk, David, Charleston, SC
Ramsey, Phil, Charleston, SC

K-Patents, Inc.
Hamalainen, Arto, Naperville, IL

LENRO Inc.
Olavessen, Len, Millington, TN

Lincoln Paper & Tissue
LaFlamme, Alan, Lincoln, ME
MacEachern, Patrick, Lincoln, ME

Liquid Solids Control
Sweeney, Michael, Upton, MA

Longview Fibre
Andrews, Mark, Longview, WA
Wilson, Cliff, Longview, WA

Matrix Risk Consultants
Garfield, Michael, Lowell, ME

MeadWestvaco
Andrews, John, Charleston, SC
Clemmons, Curtis, Covington, VA
Lindstrom, Mathias, Raleigh, NC
Murch, Douglas, Glen Allen, VA
Wheeler, Paul, Covington, VA

Metso Power
Blackard, Vernon, Charlotte, NC
Borduas, Pierre, Charlotte, NC
Conley, Clark, Charlotte, NC
Johnson, Dewey, Charlotte, NC
Langstine, Bob, Charlotte, NC
Morgan, Preston, Charlotte, NC
Morris, Richard, Raleigh, NC
Nichols, Jody, Charlotte, NC
Nika, Kent, Charlotte, NC
Ries, Nancy, Charlotte, NC
Skoog, Mikael, Charlotte, NC
Wasson, Eric, Charlotte, NC
Weikmann, John, Charlotte, NC

Nalco
Morgan, Mitch, Orange Park, FL
Novak, Scott, Naperville, IL

NewPage Corp.
Hollern, Michael, Luke, MD

Nova Resourcing Group
Fry, Rober, New Glasgow, NS

Registered for the meeting were:

Packaging Corp. of America
Guess, Kevin, Valdosta, GA
Stelling, John, Tomahawk, WI
Webb, Trey, Valdosta, GA

Power Specialists Assoc. Inc.
Haraga, Rudy, Somers, CT
Madersky, Tom, Somers, CT
Zawistowski, Bob, Somers, CT

Process Engineering, Inc.
Leber, Ben, Birmingham, AL

Process Equip/Barron Ind.
Nolen, Ken, Pelham, AL
Ray, Allen, Pelham, AL

Proterra-Power
Proterra, Joe, Gainesville, GA

Rayonier
Broeckling, Nat, Jesup, GA
Daniel, Richard, Jesup, GA
Gray, John, Jesup, GA
Kicklighter, Thomas, Jessup, GA
Phelps, Meridith, Jesup, GA
Stephens, Jack, Jesup, GA

RMR Mechanical
Roy, Bob, Cumming, GA

Rock-Tenn Company
Chambless, Tony, Demepolis, AL
Tarpley, Donn, Demopolis, AL

SAPPI
Aderman, Craig, Westbrook, ME
Dorko, Bob, Skowhegan, ME
Fredrickson, John, Cloquet, MN

Savcor Consulting
Duda, Yurij, Vancouver, BC

Simpson Tacoma Kraft Co.
Fay, Michael, Tacoma, WA

Smurfit Kappa Carton de Colombia
Cubillos, Jairo, Cali, Colombia
Franco, Daniel, Cali, Colombia

Smurfit-Stone Container
Dunn, Johnathan, Florence, SC
Johnson, James, Hopewell, VA
Lykins, Michael, Carol Stream, IL
Mills, Drexel, Missoula, MT
Smith, Dan, Hodge, LA

SOMPO Japan Risk Management
Funaguchi, Akira, Tokyo, Japan

Starr Technical Risks
Anderson, Peter, Dunbarton, NH

Thompson Industrial Services
Harry, Todd, Savannah, GA
Hobday, Jeff, Sumter, SC
Jackson, Dwayne, Sumter, SC

Verso Paper
Navojosky, Frank, Jay, ME

Weyerhaeuser
Hinman, James , Federal Way, WA
Knowlen, Bruce, Federal Way, WA
Partsch, Mike, Grande Prairie, AB
Roberts, Steve, Columbus, MS
Vandermeer, Bert, Granne Prairie, AB

XL GAPS
Goddard, Robert, Tupelo, MS
Franks, James, Somerville, TN
Rawls, Lynn, Perkinston, MS
Sides, Michael, Ocoee, FL

INTRODUCTION

BLRBAC Chairman, Len Erickson, called the meeting to order at 8:00 a.m. on Wednesday, October 7, 2009.

CHAIRMAN: Good morning. I'd like to call to order the fall 2009 business meeting of BLRBAC. I'd like to welcome everyone here. This meeting, as with all BLRBAC meetings, will be held in accordance with the BLRBAC Anti-Trust Guidelines. No discussions involving prices, pricing policies, or any restraint on competition are allowed.

I'd again like to welcome everyone and I appreciate the participation. With the economy the way it is, we have certainly held our own. We are right under 200 attendees at this time. After talking with our TAPPI counterparts, it was noted that they have taken a much bigger hit on participation at their meetings.

OLD BUSINESS

ACCEPTANCE OF THE SPRING 2008 MEETING MINUTES – Len Erickson

I assume everyone has reviewed the meeting minutes from the spring 2009 meeting. Do I have a motion to accept the Spring 2009 Meeting Minutes? Second? All in favor? Any opposed? The spring 2009 Meeting Minutes have been approved as written.

NEW BUSINESS

1. **NEW MEMBERS/REPRESENTTIVE CHANGES REPORT** – Mike Polagye

NEW REGULAR MEMBERSHIP

Renew Paper - St. Francisville, LA – operates a Kraft paper mill
Carl Terrell is the designated Representative.
Stephen Grandquest is the designated Alternate Representative.

NEW ASSOCIATE MEMBERSHIPS

Integrated Global Services - Midlothianh, VA - supplier of corrosion resistant thermal spray and weld overlay products
David Polutnik is the designated Associate Representative
No Alternate Associate Representative named.

Proterra-Power - Gainesville, GA - a power and recovery boiler consultant organization
David Proterra is the designated Associate Representative
No designated Alternate Associate Representative as this is a solely owned subsidiary.

NEW CORRESPONDING MEMBERSHIPS

Celulosa Arauco - a pulp and paper company with five mills in Chile and one mill in Argentina

1. **NEW MEMBERS/REPRESENTTIVE CHANGES REPORT** - Cont.

REGULAR REPRESENTATIVE CHANGES

AV Nackawic, Inc.
Frank Slater replaced Allan Danroth as the designated Representative
Cail McCray replaced Bob Mills as the designated Alternate Representative

Babcock & Wilcox
John Kulig replaces Jim Dickinson as designated Representative
Steve Osborne replaces John Kulig as designated Alternate Representative

Kapstone Kraft Paper
Ben White replaced Tim George as the designated Representative
Phil Ramsey replaced Ben White as the designated Alternate Representative

Simpson Tacoma Kraft
Mike Fay remains the designated Representative
Jim Hilton replaced Michael Blixt as the Alternate Representative

ASSOCIATE REPRESENTATIVE CHANGES

CORRESPONDING MEMBERSHIP CHANGES

Sompo Japan and Sompo Japan Risk Management
Kinichi Muramatsu replaced Kei Miyamoto as Corresponding Representative
Akira Funaguchi replaced Hisatoshi Terashima as Corresponding Alternate Representative

MEMBERSHIP COMPANY NAME CHANGES

CB Anthony Ross
previously d/b/a Clyde Bergemann EEC per e-mail received from Wayne Adams

*{**Secretary's Note**: The Company Membership List posted on the BLRBAC website is out of date, not reflecting all the mergers, acquisitions, and name changes that have occurred. Anyone who sees something that needs changing should bring it to the attention of the BLRBAC Secretary via fhholich@aol.com}*

2. **EXECUTIVE COMMITTEE REPORT –** Len Erickson

The Executive Committee met in closed session Tuesday afternoon. I guess we set a new record on Executive Committee length yesterday, but it was productive. In attendance were Mike Polagye as Secretary; Len Olavessen as Treasurer and standing in for Ron Hess; Jimmy Onstead as the Insurance Representative; Mark LeBel as the Boiler Representative; Dave Fuhrmann as the Owner's Representative; Scott Moyer as the Vice Chairman, and myself as Chairman.

2. **EXECUTIVE COMMITTEE REPORT –** (Cont.)

We had a wide range of discussions and I'll try not to take four hours on this. We met with TAPPI's Scott Springmier on Monday and with Craig McKinney on Tuesday. We discussed what synergies BLRBAC might have with TAPPI; how we can work together to improve attendance and help each other out; and then if there are things that BLRBAC can do to help out TAPPI without crossing the lines. We have done some of this in the past; however, we have not set up a formal relationship. The things we have discussed were helping TAPPI promote International Chemical Conference which is coming up in Williamsburg, WV, next year; cross-communication between both organizations, such as we are doing with cross-linking the websites with a BLRBAC link and a TAPPI link' and then even looking to see if we reference a number of TAPPI tips in our documents, either hot linking those or at least referencing them so people can find them over on t he TAPPI website. Also, we realize that to get to a lot of that information you have to be a TAPPI member.

We also discussed continuing the agreement we have with TAPPI as far as the Steam and Power Meeting piggy-backing on the back end of the spring BLRBAC meeting. Then we followed up and offered TAPPI, for instance at the Chemical Conference, some items that probably would be of value to the BLRBAC members at the ICRC, such as, (items that we are seeing at BLRBAC) stress assisted corrosion cracking, NCG incineration in recovery boilers, and operating enhancements. It was a good discussion. Hopefully we will continue to move forward and it will be beneficial to both organizations.

The spring Executive Committee meeting minutes were reviewed and accepted. For the last couple of meetings we have been discussing the merits of trademarking our logo. We had a number of discussions and obtained some information on what that would cost. The Executive Committee felt that was a fairly inexpensive insurance. It doesn't give us a tremendous amount of protection, but it gives us at least a front seat if there were someone who wanted to infringe or try to high-jack our logo or our name. So we voted to proceed with trade marking our logo.

The By-laws were reviewed with respect to Regular, Associate and Corresponding members. At this time there are no proposed changes in the classifications in the By-laws. Only Regular members may vote at the main meeting. You may want to read the By-laws. They are posted on the Web. It is pretty clear, although some questions were brought up on it to the Executive Committee.

As we reported in a couple of the past meetings, we've been looking at the operating procedures. There are 16 Operating Guidelines that have been voted on by the Executive Committee that we use as a matter of course. We had to dig back in the files to find some of these. They include anti-trust, conflict of interest, incident reporting, hospitality suite operation, records retention, use of BLRBAC resources, presenters' fees, technical presentation guidelines, treasurers' duties, open meeting guidelines, recommended practice update schedule, materials not available to the general public, fees for materials and storage, meeting registration fees and there are a couple of new ones that we are discussing. And there are probably a few more that some other people know about.

2. **EXECUTIVE COMMITTEE REPORT –** (Cont.)

One of the new ones is separate votes for complicated changes when you have multiple changes in a document that are unrelated. The other is picture and video taking during committee and subcommittee meetings. This we discourage and we will discuss this further during the next Executive Committee meeting in the spring. Over the next six months we plan on consolidating these and then reviewing to see if this needs to be a By-laws change or an operating procedure change. Right now the By-laws don't reference the operating procedures. So we have some work to do as far as streamlining a couple of those documents. Our goal is to get it done and be ready if there is any vote required during the spring 2010 meeting.

The spring meeting is scheduled for April 12th through the 14th. We looked at holding it the last week in March, but due to Passover that didn't work. The first week of April is Easter week. Therefore, we moved the meeting to start on April 12 to avoid conflict with both holidays.

October 2012 marks the 50th Anniversary of BLRBAC. It seems like it wasn't very long ago it was just the 40th Anniversary of BLRBAC. Some of us can't remember a lot about that event! I do remember I was here. We are looking for volunteers to help organize that event. We figure about a two year head start is about appropriate. Looking back at how some of our recommended practice changes go, we probably should have started working on this a year ago. Please see myself, Mike or one of the other Executive Committee members if you would like to participate in helping put this event together. I can already see Karl volunteering up front here! Dean too! We need someone to control the budget.

We have been approached by several companies on incidents being and not being reported. The Executive Committee continually reviews the reported incidents. We are talking about numbers. BLRBAC Recommended Practices are revised based on the incidents that are reported, Much of the North American Black Liquor Recovery Fleet are pretty similar in age, there are some new ones and there are some old ones. But across the spectrum of the companies there is probably a similar average age of the units. There is a perception that the incident reporting is skewed. Some companies report more completely than others. BLRBAC encourages all our member companies to report their incidents in a timely manner.

Reporting BLRB incidents will help with the changes to the Recommended Practices which in turn will promote safety in the North American recovery boilers. It is voluntary to report, but we just want to reiterate that we really encourage all the companies to report all the incidents. It helps us with the database and tells us what is going on. For instance, yesterday we heard about stress assisted corrosion cracking a fair amount. As the fleet ages, that is only going to get worse and worse. We will need to deal with it as an industry.

In the spring we reported that Craig Cooke is resigning as chair of the Publicity & News Release Subcommittee. Dave Parrish has agreed to be appointed to take that position. Therefore, effective as of the Spring 2010 meeting, Dave will become the Chairman of the Publicity & News Release Subcommittee.

Any questions from the Executive Committee on what we have covered? None, thank you.

3. **TREASURER'S REPORT** – Len Olavessen for Ron Hess

Good morning. Let me go over the attendance numbers first. We had 151 Advance registration and 52 At Door registrations. Of the attendees we had 25 paper companies, six insurance companies, four boiler companies, 21 Associate member companies, and five guests of member companies. We had eight people off-shore; three from Colombia; one from Japan; one from the United Kingdom; one from France; one from Sweden and one from Austria. Considering the economic times, those numbers are very consistent and very good.

Our account totals as of October 1, 2009 is::

Certificate of Deposit	$14,578.08
Checking Account	$44,538.30

We haven't paid for this meeting so those numbers will be affected by that. We went through the budget for next year and the Executive Committee has approved it. We are in good shape financially and we have a plan for moving forward. Are there any questions or comments?

SCOTT MOYER: I'd just like to comment that the only source of funds BLRBAC has is from the registration fees collected during the spring and fall meetings. The Executive Committee works very hard to control our costs so that we can keep the meeting registration fee at a very attractive and reasonable level for the amount of work that goes on here and the facilities that we use here. I want to thank you all for your cooperation in helping us control our costs. I particularly want to thank the people who forgot to register early, as that helps increase our revenue.

4. **SECRETARY'S REPORT** – Mike Polagye

I will keep my report brief this morning. I'm sure you are all aware of the importance of keeping your e-mail addresses up-to-date in the BLRBAC database. All mass communication from BLRBAC is by e-mail and as attendees at this meeting, you are all part of that database and will remain in it as long as your address is up-to-date; i.e., e-mails are not returned as undeliverable. Along with that I want to remind everyone that BLRBAC strives to maintain as open a revision process for our recommended practices and guidelines as we can. All changes are generated at the subcommittee level, many by employees of the operating companies. These changes are the result of those subcommittees' best efforts to improve recovery boiler safety. They are not generated for the purpose of making your life miserable or to give your auditors or insurance companies something new to "pick on" you for. Once a subcommittee is satisfied with its revision it's sent to the Executive Committee for review and comment and after any comments are resolved, it's posted on the BLRBAC website for review and comment by anyone. There is always an e-mail sent to you by BLRBAC that tells you when a proposed revision or new document has been posted for this public review period. If you don't want to be surprised by what gets published, it's your responsibility to go to the website and check it out. If you don't like what's being proposed, that's your best opportunity to speak up, either to your mill management or directly to the subcommittee. Make your voice heard so you don't find yourself grumbling later about what you're being asked to do.

4. **SECRETARY'S REPORT** – (Cont.)

SECRETARIAL SERVICES REPORT – Barbara Holich

It is required that each regular member company (boiler insurers, boiler operators and boiler manufacturers – voting members) keep me advised of names and e-mail addresses of their designated Representative and designated Alternate Representative. Preferably they will be someone who regularly attends BLRBAC. It is the member company's responsibility to keep me informed of any changes in representation by e-mailing me. **A "Representative Change Form" is posted on the BLRBAC website to make it easier for management to submit the changes in responsibility and/or any e-mail address changes.**

Anyone who wishes to be added or deleted from the BLRBAC e-mail list, please e-mail me (fhholich@aol.com) your intentions. Include your name, company and your e-mail address.

Someone is needed to take the initiative (in the best case scenario, this should be the designated Representative or Associate Representative) to keep me advised of any member company name changes, mergers, etc. so that the BLRBAC database can be properly maintained.

No changes are made to the database until written (letter, fax, or e-mail are acceptable) notification is received. I keep a file folder for each member company that includes correspondence naming the Representative and Alternate for each organization. These letters usually contain the e-mail addresses I must have in order to maintain the BLRBAC database.

Therefore, be sure that I have your current working e-mail address. BLRBAC notice of meetings and meeting minutes will only be sent via e-mail. If an e-mailed notice is returned to me as "undeliverable," that e-mail address will be deleted from the BLRBAC database after a second attempt has been made.

This second attempt is made in case someone's mailbox is full or there was a system problem at the time of the first mailing.

If you are a designated Representative or Alternate Representative for your organization and something happens wherein you will no longer be functioning in this capacity, such as, retirement, occupational change, downsizing, etc., please let me know (fhholich@aol.com) and supply me with the name and e-mail address of whomever will fill your vacated position within BLRBAC.

Per BLRBAC's policy, BLRBAC's Secretarial Services will verify receipt of meeting registrations and checks via e-mail when appropriate e-mail addresses are given on the registration form. Be advised that except for special consideration given to our non-U.S. attendees, faxed registration forms are of no use to me until the appropriate fees are paid. Therefore please,

DO NOT FAX REGISTRATION FORMS!

5. SUBCOMMITTEE REPORTS

5.1 **AUXILIARY FUEL REPORT –** Bruce Knowlen

The Safe Firing of Auxiliary Fuel Subcommittee met in open session in the Hepburn room on Monday, October 5th at 1:00 PM. There were a total of 20 people in attendance with six of ten members present. A large number of guests indicated that this was their first time to visit this subcommittee. A new member, Chad Harrod of Georgia Pacific, joined the subcommittee.

The BLRBAC antitrust statement was read and discussions were conducted under that policy.

This was the second meeting of the subcommittee in 2009 to allow a transition in the retiring of Dave Streit as Chairman and Bruce Knowlen taking over that role.

The posted agenda was reviewed.

Mr. Scott Moyer was recognized to address the group on the effort to create a Pre-Startup Checklist using input and a volunteer from each of the subcommittees. Although no one volunteered during the session, a commitment was made to Scott that our group would participate in this effort. After Scott left, the discussion continued on the checklist with the note that mills may have different checklists in use depending on the type of outage or interruption. Several indicated that they may be able to provide examples of checklists in use.

A review of the subjects discussed during the Spring meeting were covered, highlighting matters typically handled by the subcommittee. The group was asked if there were subjects or issues that were of need for discussion. No new items were brought forward.

Discussion occurred on the recent changes to the SFAF document relating to the interlock on dissolving tank level. It was noted that several did not totally agree but that it was easily accommodated in their system logic.

The question was placed to the group as to the schedule of future meetings, frequency, and preference - Spring or Fall. Those indicating preference favored: one meeting, in the Fall.

The meeting was concluded after a short time due to no new business.

The SFAF Subcommittee meetings are typically open and we welcome all to come, bring questions, and help us keep our recommendations effectively promoting safety.

5. SUBCOMMITTEE REPORTS

5.2 **BLACK LIQUOR REPORT** – Scott Moyer reporting for Mark Sargent

The Safe Firing of Black Liquor Subcommittee met in Open Meeting, October 5, 2009, at 8:30 AM in the Crawford Room with seven members and approximately 35 guests and in Open Meeting at 1:00 PM in the Crawford Room with six members and approximately 15 guests.

AGENDA:
Opened the meeting.

Reviewed BLRBAC Anti Trust statement

Reviewed and approved the Spring 2009 meeting minutes.

Our Subcommittee had discussion as to whether or not to keep the requirement to for a weak wash low flow alarm in Chapter 10 – Dissolving Tanks. This language/requirement was added after voting and approval at the main committee meeting at the Spring 2009 meeting. After the Spring meeting there was some thought that this requirement was too restrictive. However, after polling the visitors at both the morning and afternoon sessions, no-one reported to not have weak wash flow indication to their dissolving tanks. There was some discussion at the operating problems session regarding the need for this alarm and no action taken.

We discussed if there is the need for developing an emergency procedure for known or suspected live smelt in the dissolving tank (in conjunction with the personnel safety subcommittee). We have developed some language for Chapter 10 and there was quite a bit of discussion in both the morning and afternoon sessions. We will be further refining the language to provide guidance for owner/operators of recovery boilers in case of impending crystallization or live smelt in the dissolving tank. We may separate high density/crystallization from known or suspected live smelt in the dissolving tank and develop some separate generic guidelines in our document.

We reviewed Figure 4 – Black Liquor Tripping logic to determine if we need to clarify that the logic needs to specifically state “no auxiliary hearth burners” vs. the present logic statement, “No Auxiliary Burners in Service” that leads to the “Loss of All Flame” condition and results in an MFT. After discussion in both the morning and afternoon sessions we felt that the concern over pyrolysis gases is adequately addressed in Figure 5 and that nothing needs to be done to Figure 4.

We reviewed Figure 2 – Permissive Starting Logic Black Liquor Firing as it relates to previously submitted language requiring “establishing stable firing” as a black liquor header purge requirement. We originally intended to require that recovery boilers be; at operating pressure and delivering steam to the header, stable firing established and all SH loops cleared of condensate as a black liquor header purge permissive. There are some older units that cannot meet this requirement so our Subcommittee withdrew the language and we will make another attempt to address the issue.

5. **SUBCOMMITTEE REPORTS**

5.2 **BLACK LIQUOR REPORT** – (Cont.)

We have decided to enhance the logic in Figure 2, Table 2 and in Chapter 15 – Discussion and Background information will be presented at the Spring 2010 meeting.

We are having ongoing discussion in the SFBL subcommittee regarding Figure 5, Black Liquor tripping logic. We do not require monitoring for valve failure and subsequent divert if the black liquor header valve or divert valve are not in the proper position. There has been at least one occasion reported to our subcommittee when a solenoid failed on a 3-way black liquor header/divert valve and the valve failed to the divert position. Because the flowmeter on the firing header was before the header/divert valve the liquor flow did not drop below the 30% trip level and steam flow did not drop below 30%. There were no auxiliary fuel hearth burners in service. The operators were able to figure out what the problem was and were able to reset the header/divert valve and resume liquor firing without purging the black liquor header or experiencing either an MFT or BLT. We are reviewing our document and the instrumentation guidelines and will clarify our black liquor protective tripping logic explanation in chapter 15 – Discussion and Background information. We will also refer to the information in Chapter 15 in Table 5.

We fielded a question from a member company between meetings on why a gravity system does not require a parallel/back-up spout cooling pump and why an auto-start function is not required whereas the vacuum system requires both a parallel pump and an auto-start feature. We reviewed Chapter 9 dealing with spout cooling water systems and came to the conclusion that no changes are needed to the gravity system design as drawn in chapter 9.

While fielded a question from an insurance carrier between meetings regarding a request to look at our generic black liquor firing system for pressurized storage systems. The question raised dealt with the difference between our document and the Swedish committee Sodahuskommitten with regards to the number of block and bleed SSV's on the supply to and return from the black liquor header. We discussed both within the Subcommittee and with visitors and came to the consensus that our document is sufficient and we would not recommend additional block and bleed SSV's to our generic black liquor piping drawings for pressurized storage systems.

We fielded a question from the Personnel Safety Subcommittee regarding the requirement for sufficient instrument air as a permissive for boiler purge and for protective MFT tripping logic. We will defer to the Instrumentation Subcommittee to see if this is applicable. We find that there are no requirements in either BLRBAC or in NFPA 85-07 for instrument air logic other than a low pressure alarm.

We shared a dry spout failure with the Subcommittee and visitors.

For any comments or questions please contact Mark Sargent @ mark.sargent@ipaper.com or by phone at (513) 248-6086.

5. **SUBCOMMITTEE REPORTS -** (Cont.)

CHAIRMAN: The next report will be the Emergency Shut-down Procedures Report given by John Andrews. At the spring Executive Committee meeting we approved the posting of the revisions being proposed to the ESP document. You all should have reviewed it on the BLRBAC WEB site. At the end of John's presentation we will put that up for a membership vote. John will describe the changes during his subcommittee report.

5.3 **ESP SUBCOMMITTEE REPORT** – John Andrews
(See ***Appendix A*** – Incident List and ***Appendix B*** – ESP Report Slides)

The ESP Subcommittee met in closed session on Monday, October 5th with 13 members represented. David Slagel of Weyerhaeuser was selected by the committee to fill the seat that was opened by Chris Gore's resignation from the Subcommittee. The Subcommittee met in open session on Tuesday morning, October 6th with 13 members represented and about 160 guests.

During the open session, the Subcommittee reviewed 27 incident reports from North America and three international incidents. Of the 27 incidents, seven (7) of the leaks were classified as critical incidents and 19 were non-critical incidents. An Emergency Shutdown Procedure (ESP) was performed in 5 of the incidents including only one of the critical incidents representing 14% of the critical incidents that should have been ESP'd. One incident that was classified as critical was discovered during a hydro and should not have been ESP'd. One report was for an ESP with no leak found and one report was for a dry spout failure.

The basic definitions of Explosions, Critical Incidents and Non-Critical Incidents were re-established by the Executive Committee in September 1999. They are summarized as follows:

Explosions: Only if discernible damage has occurred. This does not include incidents where there is only evidence of puffs or blowback alone. With the new emphasis on damage, more attention will be given to the extent of damage and the amount of downtime for the damage repair (as opposed to total downtime that includes other activities).

Critical Incidents: All cases where water in any amount entered the recovery unit forward of isolating baffles (and therefore would be a similar criterion to the need to perform an ESP). This includes leaks of pressure parts of all sizes. Since small leaks often wash adjacent tubes to failure, this category is important to our learnings. This new definition will result in more entries for the Critical Incident list.

Non-Critical Incidents: Those cases that did not admit water to the boiler cavity defined above.

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.3 **ESP SUBCOMMITTEE REPORT** – (Cont.)

Some explosions reported before 1999 occurred with no discernable damage or injury, but were reported to be an explosion. Before 1999, the term Critical Exposure was used rather than Critical Incident. A Critical Exposure required the presence of smelt that could be contacted by the water. If there was a leak found and there was a clean furnace, it was considered a Non-critical Exposure. The 1999 change had the effect of increasing the cases classified as Critical Incidents from this standpoint.

Appendix A contains a summary of the incidents reviewed during the meeting.

Incident Locations

The general locations of the leaks for boilers in North America are shown in Figure 1, which displays a typical boiler, not representing any particular style or model. The yellow marks are the non-critical incidents with the yellow mark outside the boiler indicating the leak in the feedwater coil air heater and the red marks indicate the location of the critical incidents. The leaks locations are summarized as follows:

- 14 – Economizer
- 6 – Superheater
- 1 – Boiler Bank
- 4 – Wall Tubes
    - 3 – Upper Furnace
    - 1 – Lower Furnace
- 1 – ESP No Leak
- 1 – Dry Smelt Spout Failure

ESP History

Figure 2 shows the history of Critical Incidents with and without an ESP reported at each meeting with the most recent being shown on the left side. This meeting represents the lowest percentage of Critical Incidents that were ESP'd for some time.

Root Cause

The determination of the root cause is somewhat of a subjective determination by the Subcommittee based on information in the reports. The breakdown is listed below:

- 10 – Weld Failure
- 6 – Fatigue
- 4 - Thinning
- 2 – Overheat
- 2 - Stress Assisted Corrosion or Corrosion Fatigue
- 1 – Flow Accelerated Corrosion

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.3 **ESP SUBCOMMITTEE REPORT** – (Cont.)

How Discovered

Operator observations during boiler walkdowns continue to be the prevalent method of detecting leaks and accounted for identification of 19 of the leaks (70%). Four (4) of the leaks were identified by the control room and two (2) leaks were initially indicated by the leak detections system installed. Two of the leaks were discovered by a hydrostatic test during an outage.

Leak detection systems were installed on units in 17 of the incidents (63%), which is on par from past meetings. In two of the incidents, the leak detection systems were credited with providing the initial indication of the leak and both of those were Economizer leaks that have historically been difficult to detect with leak detection systems. Five additional leaks were confirmed by the leak detection system.

The Subcommittee has been looking at the time between the initial indication of the leak and the initiation of the ESP. The incidents reviewed showed that for those incidents that provided detailed information on timing, the time between initial indication of the leak and the initiation of the ESP ranged from about five minutes to 1.6 hours.

There were no incidents that reported a smelt water reaction at this meeting although there have been several close calls recently where there had been evidence of a smelt water reaction following an incident but without discernable damage to the boiler. Because there was no damage, the incidents were classified as Critical Incidents.

Incident Review

We are receiving most of the reports electronically and the Subcommittee has initiated a procedure to acknowledge the receipt of all Incident Reports that are received in order to make sure no reports are lost in “cyberspace”. Often the reports become large files when pictures and diagrams are attached so there have been some issues with getting through the e-mail system. Whenever you submit an Incident Report, you should receive a confirmation within a week. If not, please contact the ESP Secretary, Jules Gommi, to see what happened to the report. We are aware of at least two reports that had problems getting through to Jules e-mail. If you submitted a report for the Fall Meeting that is not reported here, please contact Jules to see what might have happened. The current file size limit for Jules to receive the reports is 10 megabytes. If you are preparing a report and it gets to be greater than 10 MB, please shorten the file or send it in two separate e-mails.

Figure 3 shows the critical incidents reported each year. The recent trend indicates that the critical incidents are decreasing from the recent years. Figure 4 shows the history of Recovery Boiler Explosions showing the string of years without an explosion was been broken with the Aux Fuel explosion at Vicksburg in 2008.

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.3 **ESP SUBCOMMITTEE REPORT** – (Cont.)

Figure 5 shows the five year rolling average of reported boiler explosions is now up to 0.2 after finally getting to zero. It will be several years to get back down to zero – assuming we don't have another boiler explosion during that time.

Figure 6 shows the history of dissolving tank explosions and there was one reported last meeting so it looks like dissolving tank explosions continue to be a problem.

Figure 7 is a plot of explosion history per 100-boiler operating years. This is a statistical summary of the experience across the industry. The smelt water explosion experience is continuing to trend down over time and is down to just above 0.5 explosions per 100 boiler operating years, but the total explosions, which includes all boiler explosions and dissolving tank explosions, continues to hold steady at just under 0.9 explosions per 100 boiler years because of the dissolving tank explosion reported during this meeting. The factor is calculated by a summation of all reported explosions since 1948 divided by a summation of the number of boilers reported in service each year during the same period. We all need to continue making the effort to keep this trending down. Efforts should be focused in developing better procedures to handle heavy smelt runs and plugged spouts.

Learnings

There were several items from the discussions of the incidents that may be of benefit to other recovery operations.

Units that have feedwater pipes that go through hopper walls with "slip joints" should be inspected for proper freedom of movement

Small boiler leaks can quickly become large leaks so it is not recommended to operate with known economizer leaks and personnel should be cautious when being near leaks.

Mills should inspect feedwater piping and link piping for Flow Accelerated Corrosion. Typical recovery boiler feedwater quality is in the range for FAC but higher chromium content of piping will provide protection from SAC.

Mills need to be mindful of stub length when plugging tubes. Longer stubs can accumulate deposits if pointing down or can experience steam blanketing if pointing up. Either case can result in accelerated corrosion.

Several reports of superheater tube failures suggested that clearing of condensate from superheater tubes during start up continues to be an issue. Mills should confirm that all tubes are clear before increasing the boiler load and going on line.

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.3 **ESP SUBCOMMITTEE REPORT** – (Cont.)

Mills that have "flat bar" vibration restraints located between generating bank tubes should inspect for erosion under the edges of the flat bars and may want to periodically move the bars up or down the tube.

When modifying casing or skirts around the dissolving tanks and smelt spouts, mills should be cautious not to create stress points that may result in tube cracking.

If fans trip during an ESP, they should not be restarted until it is safe to re-enter the boiler area and inspect that there is no water on the bed. Prior reported explosions indicated that restarting a fan may have dislodged some upper furnace deposits that disturbed the bed and allowed water sitting on the bed to contact molten smelt under the frozen bed surface.

Testing of Rapid Drain Valves

The Subcommittee submitted the following draft language last meeting to be added to Section 2.2 – "Routine Operator Checks" of the ESP guideline to clarify that only one rapid drain line should isolated and tested at a time during the monthly tests:

> **2.2 Routine Operational Checks**
> Only one drain line at a time should be isolated for the monthly motor-operated valve tests; this will allow the remaining drain lines to function as designed if a real ESP is required during the testing period.

This will allow the remaining drain lines to function as designed if a real ESP is required during the testing period. Most mills are doing this now but there have been a few installations that isolate the entire rapid drain system to run the monthly test and then open all the valves together. Once they complete the test, they have to go around and reopen the manual valves. We are just making it clear that that is not the recommended way of running the test. A comment was received from Dave Streit who has a "Cadillac" system on his unit where their system is set up that they don't even have to close the manual valve. They have a double valve system and the logic opens one valve at a time to assure that the other valve is closed. This is above and beyond what we are trying to do here.

The Executive Committee approved the change and it has been posted on the web site for review since the last meeting. If no one has any questions, I would like to submit the change for approval.

CHAIRMAN: I'd like to open the floor for discussion to the members on the proposed changes. Are there any comments from the membership? Since there are no comments or input from the membership to the proposed changes, would the voting members please stand? Those in favor of the proposed changes please raise your hand. Opposed? The proposed changes are approved unanimously.

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.3 **ESP SUBCOMMITTEE REPORT** – (Cont.)

Clarification of "Dedicated Stand –Alone"

The Subcommittee is continuing to work on the appropriate language for a clarification of "Dedicated Stand-Alone" as it refers to the ESP system architecture. The following suggested language has been developed for further discussion:

Recommended Change to second sentence of Chapter 1:

> Upon initiation of the Emergency Shutdown Procedure, ~~a dedicated, stand-alone~~ the system shall perform the following automated actions:

Add paragraph to the after bulleted items on Page 4

> The Emergency Shutdown Procedure functions must be activated and executed either by means of relay technology and hard-wiring or other system as defined in Chapter 4.2 of the *Instrumentation Checklist and Classification Guide*. In the latter case, it must not be possible to carry out reprogramming during operation or unintentionally. Whatever technology is utilized, the BMS or DCS systems can be used to monitor operation of the functions. Any time modifications are made to the system, the system shall be functionally tested prior to putting the unit back on line.

The intent of the suggested language is to emphasize that the system that initiates all the functions of the ESP system such as closing the feedwater stop valve and opening the rapid drain valves can be accomplished by either a hard wired "ESP Relay" or a PLC type system. If a hard wired relay system is used, it is emphasized that the system has to send the signal to the field devices upon initiation by the operator with the only logic being the time delay for the vent valve. The monitoring function of the field devices to confirm the intended operation occurred can be done with some other system such as the DCS or the Boiler Safety System.

List of Operating Boilers

The lists of Operating Boilers in the USA and Operating Boilers in Canada are posted on the BLRBAC Website and will be updated by Jules Gommi. Please submit any updated information to Jules, especially for mill ownership changes.

5. **SUBCOMMITTEE REPORTS -** (Cont.)

5.3 **ESP SUBCOMMITTEE REPORT** – (Cont.)

Jack Clement has retired from the committee after many years of serving as the Secretary and recently as a member of the Subcommittee. The Subcommittee is very appreciative of all the effort and dedication that Jack has given to the work of the Subcommittee. We are in the process of deciding on a replacement and Jack has agreed to work with the Subcommittee until that replacement has been named.

Chris Gore has announced that he will be stepping down after many years of service as well. Therefore, we will be in the process of identifying a replacement for Chris on the committee.

Incident Questionnaires

The Subcommittee appreciates the effort that is required to prepare the incident questionnaires since it is important to receive that information in order to help BLRBAC continue to provide guidelines for the industry.

The ESP Questionnaire continues to be updated and mills are requested to obtain the current version from the BLRBAC website if an incident needs to be reported. The completed form should be submitted to Jules Gommi at the e-mail address listed on the form. Please note that Jules' mail box is limited to a file size of 10 megabytes so please consider this limit when submitting the report. Jules will send out an e-mail confirmation to the mill any time he receives a questionnaire. If the mill does not receive that confirmation within a couple of weeks of submitting the form, please contact Jules to see if there is a problem.

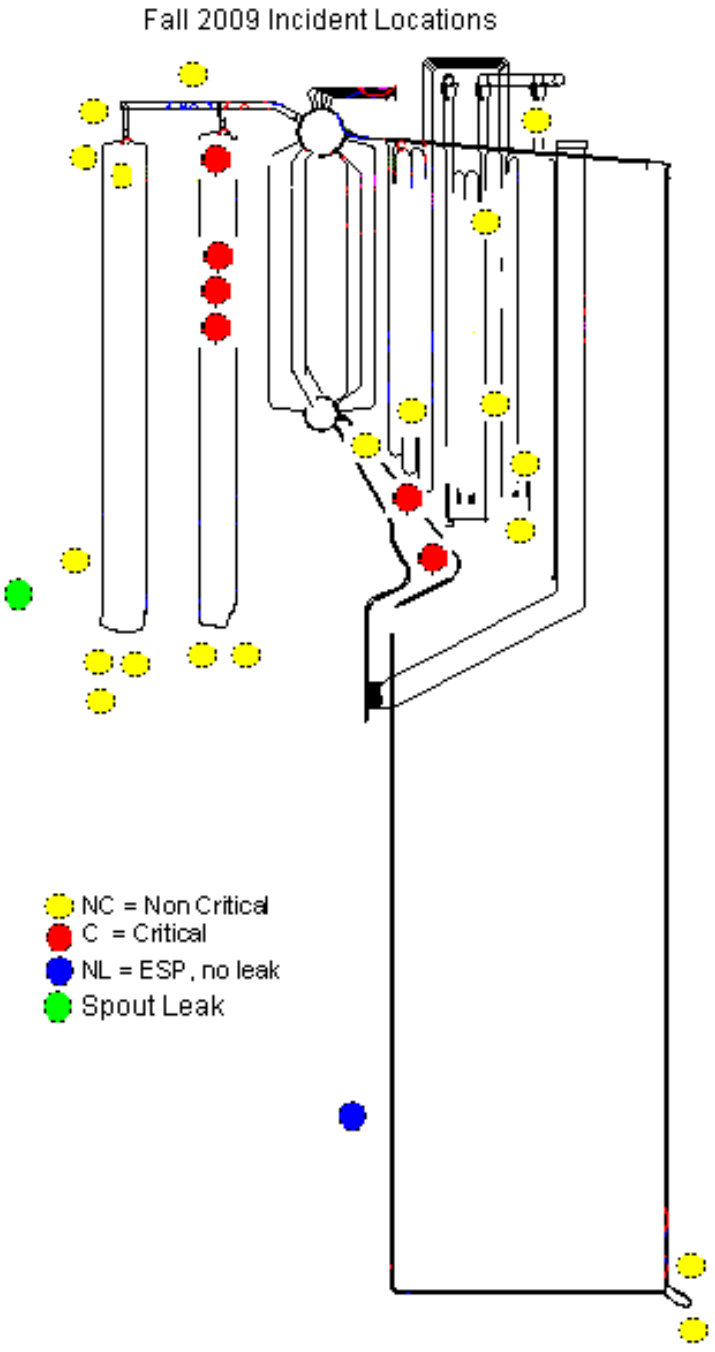

Fall 2009 Incident Locations
NC = Non Critical
C = Critical
NL = ESP, no leak
Spout Leak

Figure 1

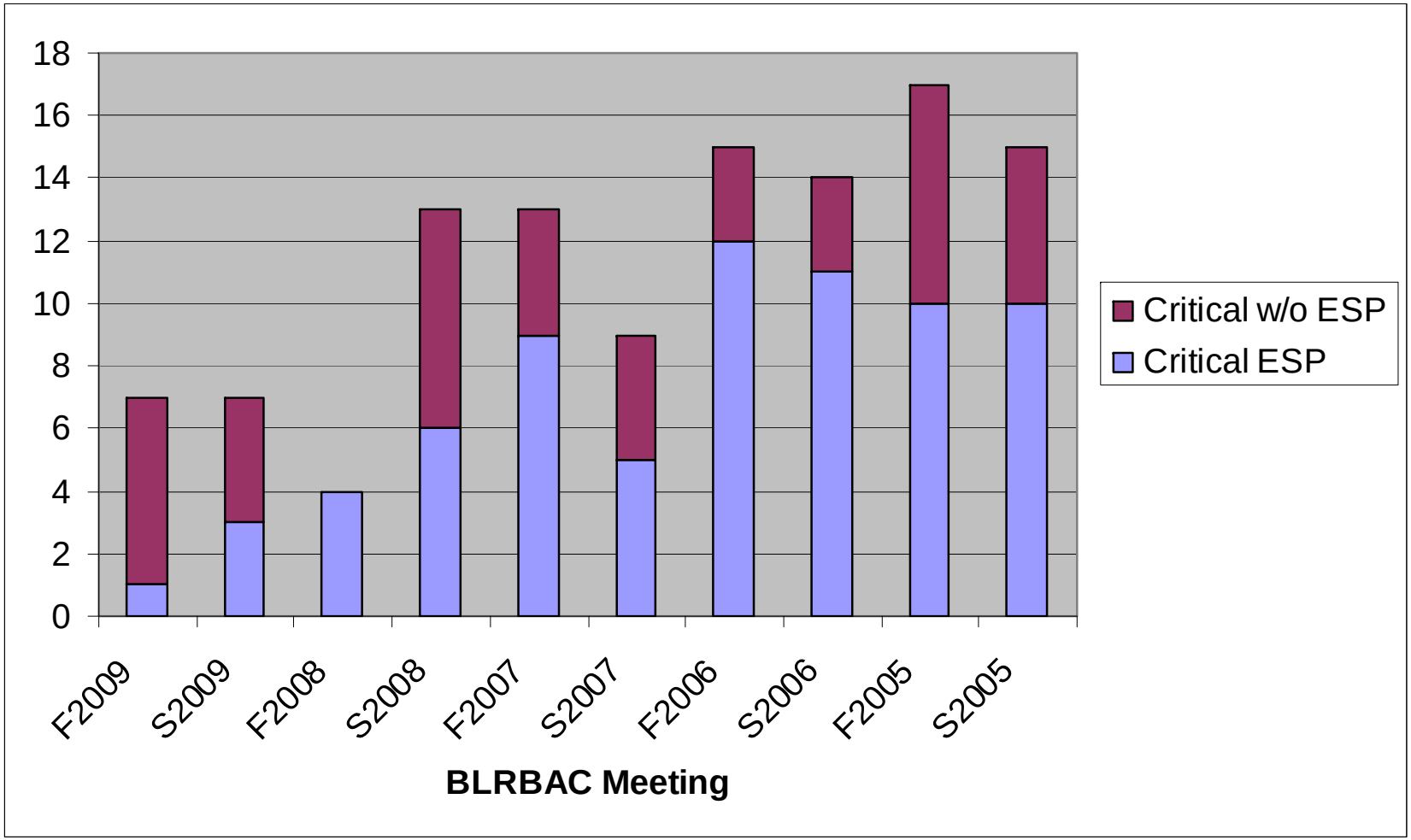

18
16
14
12
10
8
6
4
2
0
F2009
S2009
F2008
S2008
F2007
S2007
F2006
S2006
F2005
S2005
BLRBAC Meeting
Critical w/o ESP
Critical ESP

Figure 2

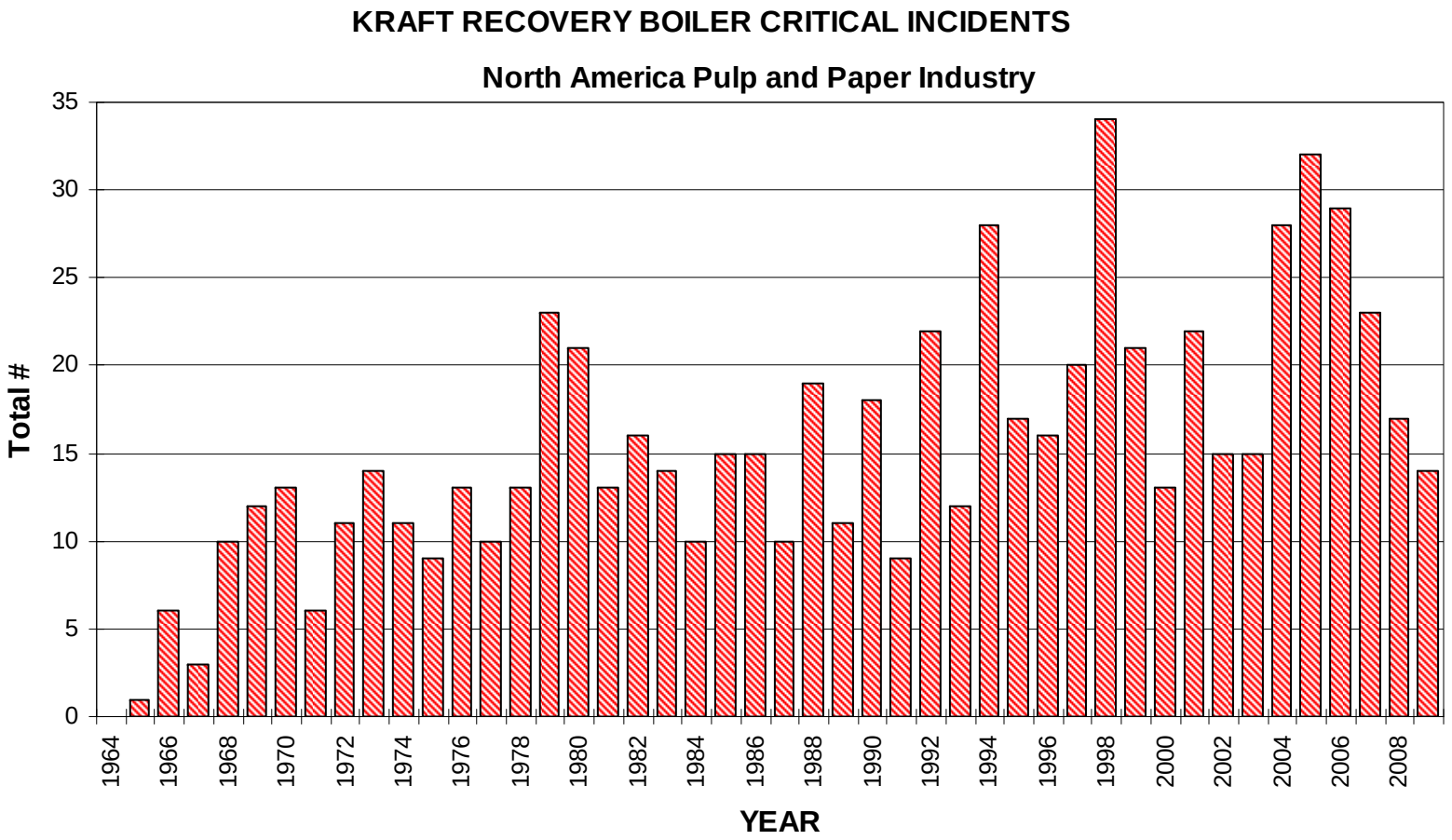
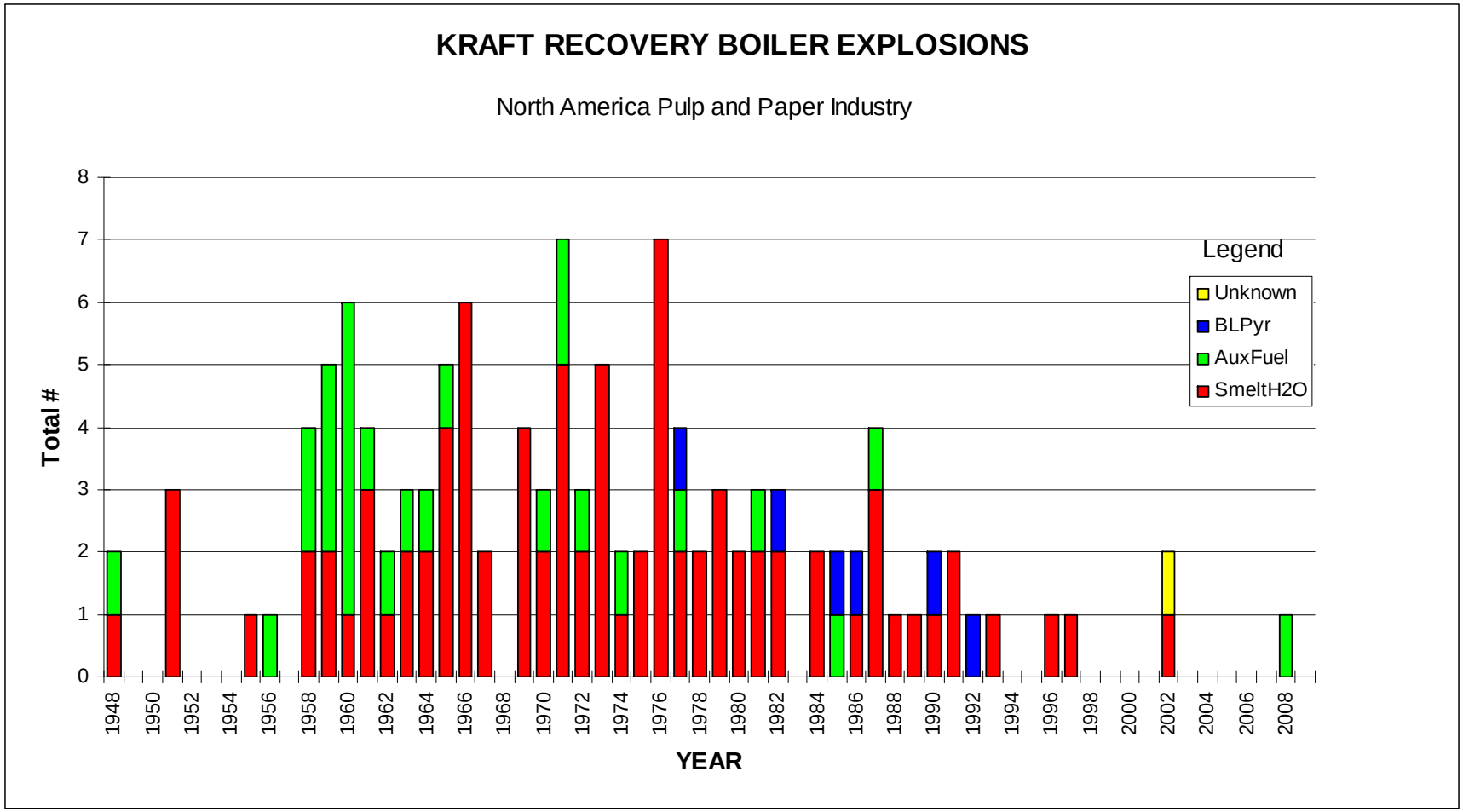


Figure 3

(Critical Exposure Classification Began in 1965, Changed to Critical Incident in 1999)


KRAFT RECOVERY BOILER EXPLOSIONS
North America Pulp and Paper Industry
Total #
YEAR
Legend
Unknown
BLPyr
AuxFuel
SmeltH2O
0
1
2
3
4
5
6
7
8
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
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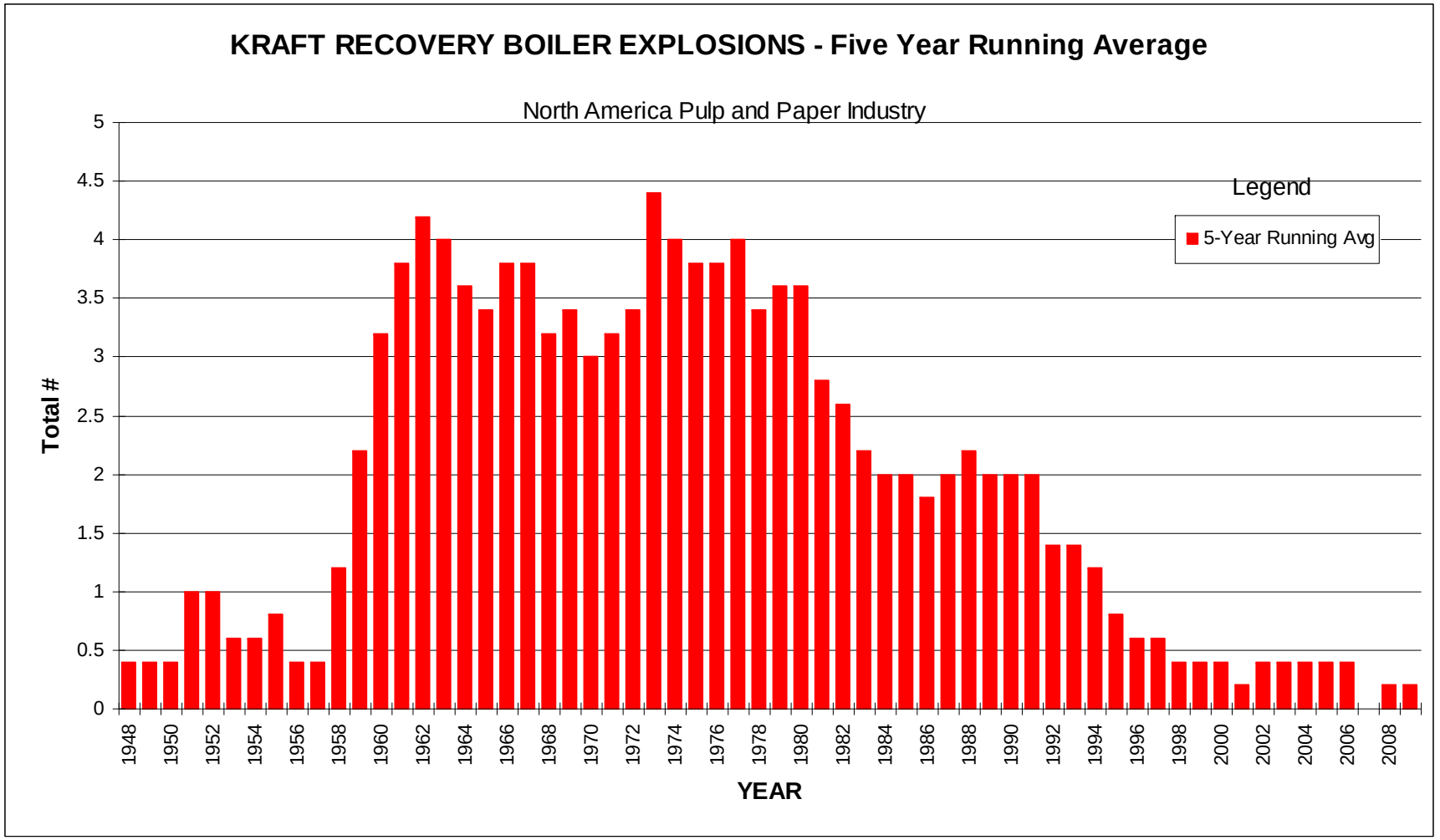
2006
2008

Figure 4


KRAFT RECOVERY BOILER EXPLOSIONS - Five Year Running Average
North America Pulp and Paper Industry
Legend
5-Year Running Avg
Total #
YEAR
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
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1982
1984
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2006
2008

Figure 5

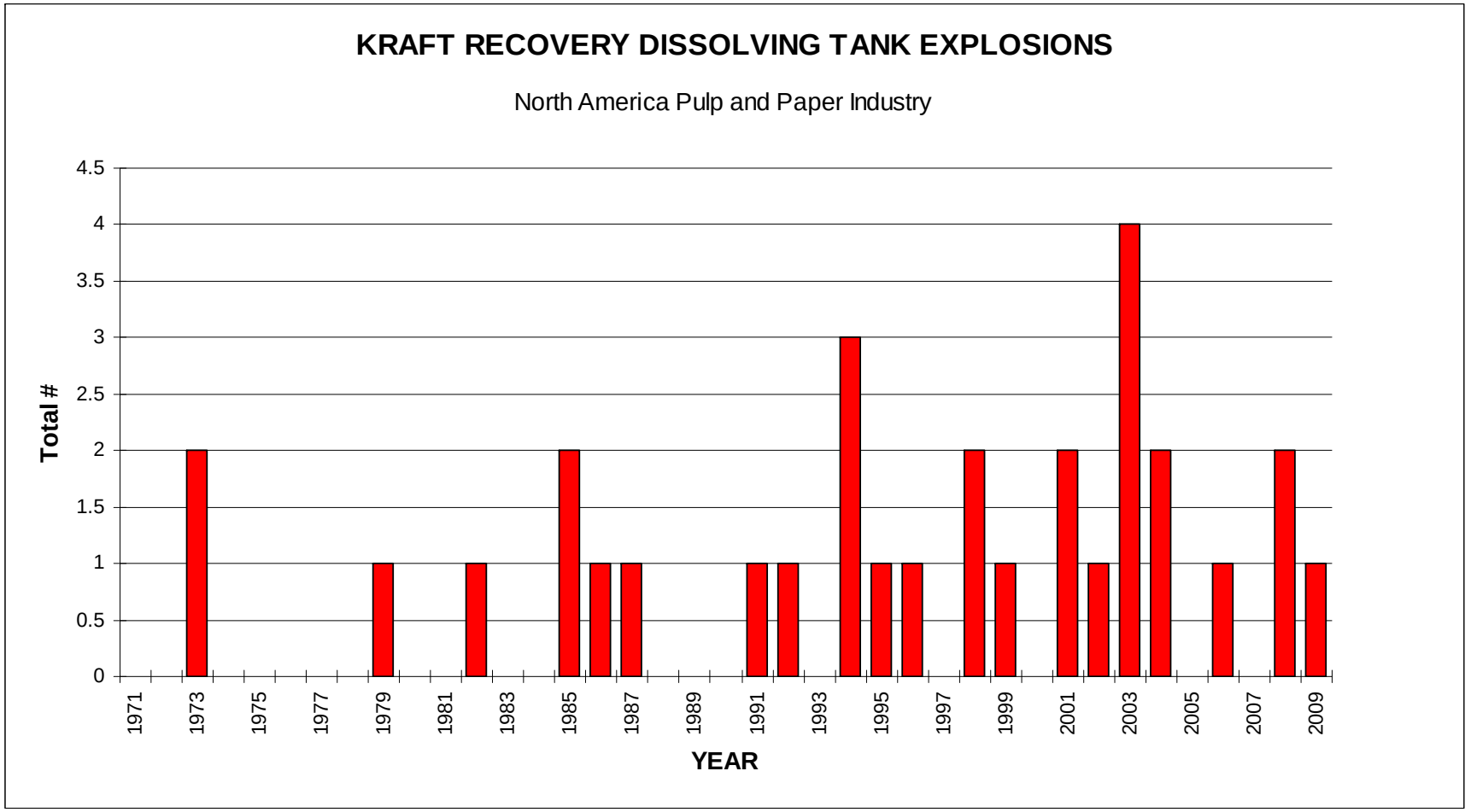

KRAFT RECOVERY DISSOLVING TANK EXPLOSIONS
North America Pulp and Paper Industry
Total #
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
YEAR

Figure 6

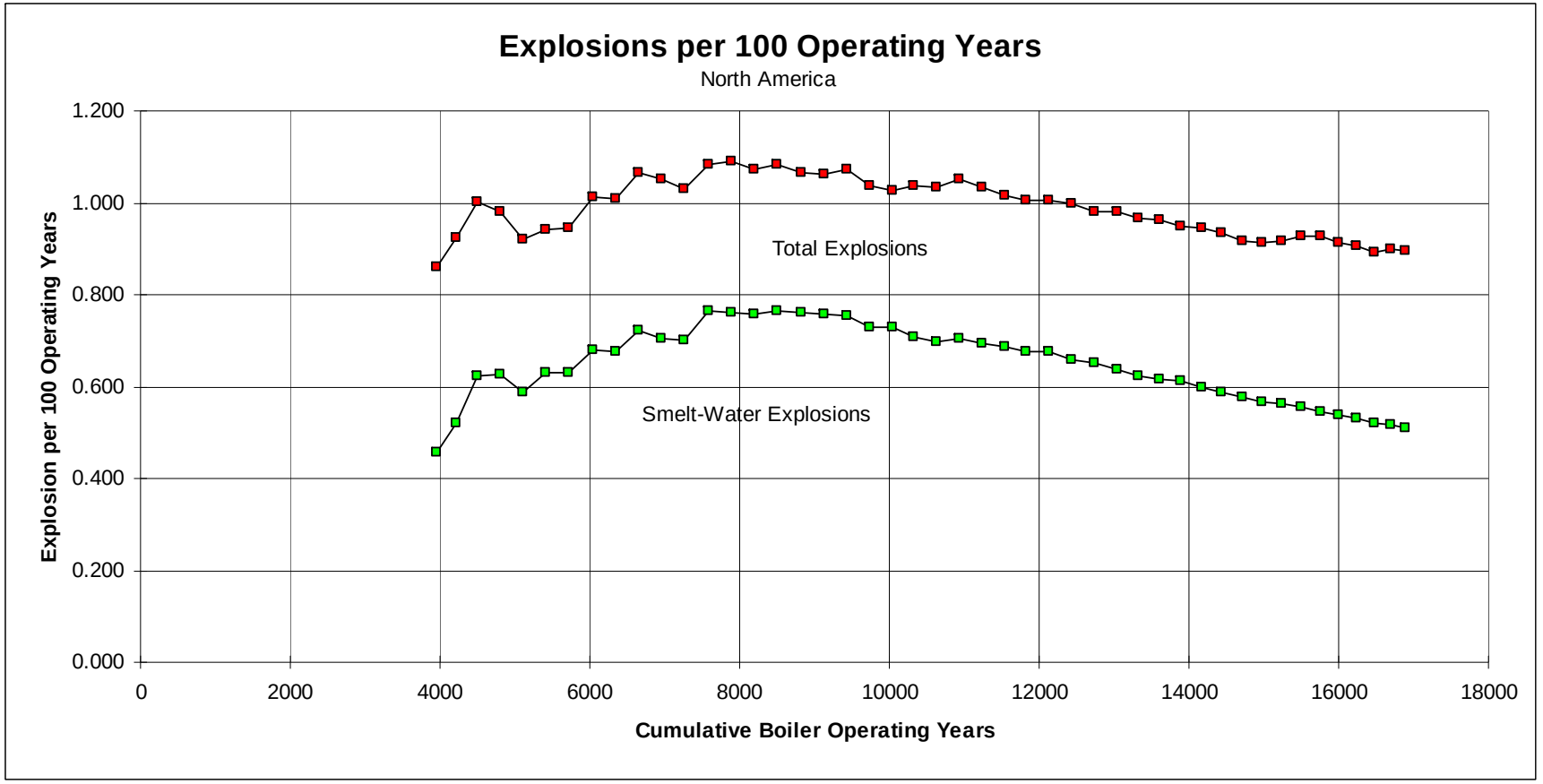

Explosions per 100 Operating Years
North America
Explosion per 100 Operating Years
1.200
1.000
0.800
0.600
0.400
0.200
0.000
Total Explosions
Smelt-Water Explosions
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Cumulative Boiler Operating Years

Figure 7

5. **SUBCOMMITTEE REPORTS -** (Cont.)

5.4 **FIRE PROTECTION IN DIRECT CONTACT EVAPORATORS REPORT** – Craig Cooke

This subcommittee did not meet this session and no report was given.

5.5 **INSTRUMENTATION REPORT** – John Browning reporting for Dave Avery

I am John browning with the Alabama River Group, and Vice-chair of the Instrumentation Sub-committee. Dave Avery was not able to make it this fall.

The Instrumentation Subcommittee met in open session Sunday afternoon. We had four members present. We reviewed assignments and status of our efforts to reconcile and add references to our instrumentation tables.

We met Monday morning in open session with eight members and six guests attending. We reviewed the Anti-Trust Statement and had members and guests introduce themselves. We reviewed and accepted our April minutes.

Under old business, the ESP Subcommittee had asked us to develop a new definition for ESP systems as they have proposed removal of the dedicated, stand alone statement in their document. We continued our work on this definition we had started in the spring. The following was submitted to executive committee and ESP chairman for review.

> **Emergency Shutdown Procedure (ESP) System:** An operator initiated safety control system, composed of sensors, logic solvers, interconnections, and final control elements that take the boiler to the predetermined conditions as defined in the "ESP Recommended Good Practice". The logic solvers can be comprised of electromechanical relays, independent micro-processors, and/or integrated as part of another Recovery Boiler Safety System (RBSS), such as the Burner Management System (BMS).

We then reviewed the proposed RBSS definition. This is being done to remove the reference "SIS" from our document. In its use of the term "SIS", ISA has SIL level requirements that exceed those thought needed for the safe operation of a recovery boiler.

> **Recovery Boiler Safety System (RBSS**): A system composed of sensors, logic solvers, interconnections, and final control elements for the purpose of placing the process in a defined safe state when predetermined conditions are violated. Recovery Boiler Safety Systems include, but are not limited to:
>
> - Emergency Shutdown Procedure (ESP) System
> - Burner Management System (BMS)
> - Flame Supervisory System (FSS)
> - Black Liquor Divert (BLD) System

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.5 **INSTRUMENTATION REPORT – REPORT –** (Cont.)

The committee recommends this definition be added to our document and be used in place of SIS.

In the afternoon session we had 7 members and 10 Guests attending. We continued with review of section 4 of our document. The committee also submitted to the executive committee for comment a recommendation that we replace all references in our document to "Safety Instrumented Systems" with "Recovery Boiler Safety Systems" and "SIS" with "RBSS". Our initial search did not find these terms in the other recommended practices.

We reviewed the **Basic Process Control System definition.**

> **Basic Process Control System (BPCS):** (ISA-S84.01 P. 3.1.5) A system that responds to input signals from the equipment under control and/or from an operator and generates output signals that cause the equipment under control to operate in the desired manner.
>
> Also referred to as a Process Control System.

The committee recommends removal of the ISA reference above for the same reason as stated above.

Document update assignments were reviewed as we are trying to add references to all sections of our checklist.

The committee reviewed and recommends the follow additional changes to our document:

CHAPTER 1 PURPOSE AND SCOPE

The purpose of this Recommended Good Practice is to provide guidelines for the design,

installation, and operation of Recovery Boiler **Basic Process** control Systems and ~~Safety Instrumented Systems (SIS)~~ Recovery Boiler Safety Systems to contribute to operating safety.

CHAPTER 3 GUIDELINES FOR BASIC PROCESS CONTROL SYSTEMS

3.1 Fail Safe Mode

This is to better match our definition section.

In chapter 4, we submitted the addition of Waste stream safety systems to the application list under Guidelines for using a Recovery boiler safety system.

CHAPTER 4 GUIDELINES FOR USING A ~~SAFETY INSTRUMENTED SYSTEM~~ RECOVERY BOILER SAFETY SYSTEM

~~Safety Instrumented Systems~~ **Recovery Boiler Safety Systems**

5. **SUBCOMMITTEE REPORTS -** (Cont.)

5.5 **INSTRUMENTATION REPORT** – (Cont.)

Initiation may be manual, semi-automatic, or automatic. Applications include:

- ESP, Rapid Drain
- Safe Firing of Black Liquor
- Safe Firing of Auxiliary Fuel
- Waste Stream Safety System(s)

We also asked the Executive committee to consider a common definition table that would be used by all committees. This would help with the work smithing efforts between committees and help all the end users.

We would like to thank for stepping up and joining the committee. He has been helpful in the past and will be helpful in the future. Thanks to all guests that came as far as Japan that visited with us.

MIKE POLAGYE: I would just like to comment that during the Executive Committee Meeting last night we did look at the idea of creating a Master Document or Glossary of terms used. We all agreed that this would be a good idea. The proposal is that the BLRBAC Secretary will take on the responsibility to review various documents. Many of the documents have a chapter on definitions and get those terms into one document. The first step would be just to compare and see if there is agreement on how these terms are being used and defined. That document would be maintained and posted on the WEB site as an assembly of the Glossary of terms used in the documents. At the same time we don't want people having to scan between two document to see if a terms is defined or not; so we would propose keeping the existing definitions in the individual documents as well for ease of the person reading the document. With this in place, when revisions are made or when new sections are being written or somebody wants to know if there is there a definition for a given term, they can go to that Master Glossary List to see if there is a definition for the term they want to define and whether or not that definition works for them. So I hope this will allow better coordination and use of the terms.

5.6 **MATERIALS & WELDING REPORT** – Dave Fuhrmann

The Materials and Welding Subcommittee met in a closed morning session on October 5, 2009 with eight of 18 members represented and one guest. The BLRBAC anti-trust statement was read. Membership attendance was reviewed. Joe Nelson and Terry Lane of Georgia Pacific were approved (member and alternate). Discussion ensued concerning two members that have not participated in at least two sessions and could not be reached via telephone or email contact. Both have had employer changes and alternate means of contact will be attempted.

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.6 **MATERIALS & WELDING REPORT –** (Cont.)

Old Business

The subcommittee revised three bulletins during the morning session and approved for Executive Committee review:

a. A lack of detail in Bulletin *1.4 Corrosion Resistant Weld Overlay Applications on Tubes* was addressed, regarding the impact of dilution of base material. The use of approved weld procedures should consider weld technique to minimize penetration and potential compromise of base material code Minimum Wall Thickness.

b. A lack of detail in Bulletin *1.5 Repair of Composite Materials on Tubes* regarding the impact of dilution of base material was addressed. The use of approved weld procedures should consider weld technique to minimize penetration and potential compromise of base material code Minimum Wall Thickness.

c. The misleading direction on the use of PT for corrosion protection to evaluation for base material exposure in Bulletin *1.3 Repair of Pressure Boundary Materials in Tubes* was corrected. PT is only useful for detection of cracks; copper sulfate must be used to detect base material exposure.

New Business:

Work continued on development of procedure *2.4 CORROSION RESISTANT WELD OVERLAY ON BOILER TUBES*

Afternoon Session:

The afternoon session met in an open meeting with eight members present and ten guests.

Call to order and review of the BLRBAC Anti Trust statement.

Guest registration was completed with a solicitation for new members.

a. Chad – GP Cellulose

Review of Closed Meeting Activities

Presentations (available with the meeting minutes). Dave Lang of FM Global made a presentation on the ASME Post Construction Committee work that listed many references in its draft document. (See Appendix C.)

Work continued on development of procedure *2.4 CORROSION RESISTANT WELD OVERLAY ON BOILER TUBES*

Plans for the next meeting may include:

Update status on Individual and Task Team assignments

5. **SUBCOMMITTEE REPORTS -** (Cont.)

5.6 **MATERIALS & WELDING REPORT** – (Cont.)

Continue draft reviews and get subcommittee approval.

Development of a glossary to better define specific terms. Jesse Worsham will develop a draft to present to the group next session.

Develop Technical Bulletins for Materials –

a. Refractory Installation (sloped floor) – Lynn Barrett, Mike Hovinga
b. Refractory Installation (decanting Hearth) – John Heffernan, Dennis Hollenbach
c. Tube coatings (fireside) - Dave Fuhrmann, Fabian Henriques
d. Tube coatings (cold side) – Ron McCarty, Dan Phillips
e. Economizer tube to header welds (MWV Covington)
f. Economizer tube plugs (IP CT)
g. SH clip welds

Presentations of experiences that may be of interest to this group.

a. Refractories Applications
b. Welding Research Council
c. Repairs of cracks in the tube to header weld of economizer mini-headers

5.7 **PERSONNEL SAFETY REPORT** – Robert Zawistowski

The Personnel Safety Sub-committee met in an open session on Monday, October 5, 2009. There were 13 members (out of 16) and 8 guests in attendance during the meeting.

The BLRBAC anti-trust statement was reviewed. The minutes of the last meeting were read and accepted.

Representation at our meeting by regular members and guests included original equipment manufacturers Babcock & Wilcox and Metso Power. Representation from insurance and insurance service companies included Axa Corporate Solutions, FM-Global, and XL GAPS. Operating company representation was present at this meeting with representatives from Delta National Kraft, Georgia-Pacific, International Paper, Kapstone Paper, Lincoln Pulp & Tissue, Northern Pulp N.S., Packaging Corporation of America, Rayonier, Sappi, Thilmany LLC, Verso Paper Company and Weyerhaeuser. Consultant representation included Power Specialists Associates, Inc.

We welcomed new member Jennifer Johnston of Georgia-Pacific to our subcommittee.

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.7 **PERSONNEL SAFETY REPORT** – (Cont.)

We had a detailed discussion about smelt spout deck injuries and safety. Among the key items to come out of this conversation was the use of chain mail to break up smelt splatters. It was reported chain supported from the deck above on a weighted pipe would contain probably over 90% of a smelt splash. The smelt sticks to the chain and is easily broken off once it freezes. One of the main points of the discussion was the first focus effort should be to make every effort to make the first line of protection at the process and then address the additional PPE needed by the operators. All were in agreement with this approach. We will attempt to obtain photos of this arrangement.

Additional discussion was given to face shields; to obtain ones with curved bottoms and extended sides to protect the sides of the head and ears. Also, hardhats with extended brims on the rear side and removable (Velcro) cloth extensions on the rear of hard hats (safari style) were presented as options. One northern mill has adopted using "silver" fire-resistant lined jackets (individually assigned to each operator). Another mill has found use of "cool vests" have been helpful in improving worker comfort when wearing heavier protective clothing in hot work areas. It was reported that "beer can" liquor nozzles tend to have less blowback than nozzles using splash plates.

We discussed developing ideas to prevent splash back by addressing the root of the problem rather than developing protective clothing as the primary source of protection. An example was made of operators having to clear smelt build ups on hoods. Instead of operators having to clear hood smelt build up, determine why the build ups occur, such as a faulty or improperly working hood wash system and then fix it. Another suggestion was to monitor smelt spout cooling water temperature closely. One mill found their system very sensitive to spout cooling water temperature (1 deg. F made a difference). In their case they made sure the alarm temperatures are set so they are alerted before a build up occurs.

It was suggested that AF&PA be consulted on performing a smelt splash research project studying different protective garment materials to determine which materials may be best to make protective clothing from. No information was presented during our meeting by any of the member companies indicating they have tried some of the materials we have listed in prior meeting minutes. We are always interested in feedback on what companies have tried and learning what the results are.

There was a discussion about developing a separate document containing "Best Prudent Practices." This document would contain topics on smelt spouts, air port rodding, chill & blow, etc. Rather than altering the existing Personnel Safety document, this would be a separate, more "living document." It would capture what we know are some of the practices in use by member companies to provide operator protection. As an example, use of "chain mail" in front of smelt spout opening to minimize smelt splashes.

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.7 **PERSONNEL SAFETY REPORT** – (Cont.)

This document could also contain photographs illustrating different safety options that are in use in different mills. Each of the subcommittee members are going to forward suggestions to the Chair for compiling into an initial list. This concept was reviewed by the Executive Committee and initially it has been turned down. In Subcommittee we will work on a format that hopefully will become acceptable.

It had been suggested by the Executive Committee to add references to the ESOP list in our document. In subcommittee discussion we agreed we would use a format similar to one used in Safe Firing of Black Liquor; multiple columns where we list the procedure, its purpose, hazard and reference. A review of all current BLRBAC documents was completed prior to this meeting to identify all of the other BLRBAC document references. A sample table was presented and discussed among the committee members and guests. The content of the table will be modified to not only include the references but to also include purpose and hazard protected.

There was a fairly lengthy discussion about this document and what it should contain. As part of this discussion a related discussion took place about the ability to search information in BLRBAC documents. It was suggested that the Executive Committee should explore the possibility of making the documents more integrated and searchable. There was discussion that it would be helpful if a list of procedures was contained all in one location rather than scattered in several documents. Examples of this document were passed on to the Executive Committee for review and comment.

Training was discussed at length in this meeting as it has been in previous meetings. It was agreed that more needs to be done in the training arena as the experienced workforce gets older and closer to retirement. In general it was agreed that with operation and engineering staffs shrinking, supervisory roles being consolidated, and senior managers tied up in meetings, effective training is taking a "back seat." One subcommittee member noted that it takes commitment from the top of the organization down and it requires having a person dedicated to the process. In effect it needs to become part of the company culture.

Occasionally we still have questions regarding our recommendation for the direction of door opening to protected areas. In discussion with the subcommittee we agreed to add language to our document referencing a letter and including it as an appendix to our document. A generic letter will be submitted to the Executive Committee following this meeting for review and if accepted posted on the website for review.

Between the April 2009 and October 2009 meeting there were no inquiries for clarification or interpretation.

Three "Near misses" were discussed. A recovery boiler was operating that was in the process of a "chill and blow." Personnel not involved with the "chill and blow" were near, but not working on the generating bank hoppers. Ash fell down during the "chill and blow" into the hopper blowing the door open resulting in burns on personnel.

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.7 **PERSONNEL SAFETY REPORT** – (Cont.)

A second near miss was an operator wearing all prescribed protective equipment looking into a generating section hopper door at the beginning of a “chill and blow.” The boiler sootblowing had not yet started, the boiler was just cooling down. While looking in the door ash fell down into the hopper blowing hot flue gas and ash out of the door. The protective equipment prevented injury to the operator.

In the ensuing discussion it was noted these doors intentionally do not have catches on the handles. A number of mills have installed chains on the doors so they can open partially to relieve pressure, but not swing all the way open.

A third near miss occurred when a 4” downcomer off the bottom side of the mud drum ruptured. The tube failed due to stress assisted corrosion cracking in the vicinity of where the hopper was welded to the downcomer. Subsequent X-ray revealed additional cracking on three other downcomers. All tubes were replaced. The ID fan had been operating at 100% prior to the incident. When the tube ruptured the boiler went positive and the operator, trying to figure out how to get the furnace pressure back to normal, missed additional signs there was a tube leak. In this case water actually made it from the hopper over the nose and into the furnace. After about 15 minutes the boiler was ESP’d and later it was found that the water had made it to the bed (visual evidence). It was felt the operator could/should have initiated the ESP sooner based on the evidence. No smelt water reaction was reported.

In closing, we are always welcome to new committee members who can participate in any capacity even if you can only attend meeting intermittently.

CHAIRMAN: The Executive Committee did discuss at some length yesterday how to handle the PPE or whether it is space shields, personnel protective equipment, etc. We have made findings on PPE available through the meeting minutes and up to now anyway we have relied on the members to communicate that information to their organizations. We don't have a separate document and we are not sure that a separate document is right thing to do at this point. We are actually looking for ideas from the membership on what they think would be the best way to communicate this information and keep it in front of the people; whether it is the fire resistant jackets or the face shield information, etc. Beyond PPE, discussion encompassed keeping in front of people some of the stress assisted corrosion issues and similar topics we have addressed at this and prior BLRBAC meetings. I'm not sure we want to have PPE requirements in a document because PPE requirements change both with the government and with design. We don't want to have something out there that someone could come back and say: "Well BLRBAC said we should be wearing this and it didn't work." If you have any ideas for that, certainly feel free to approach us. We would be happy to hear from you.

5. **SUBCOMMITTEE REPORTS -** (Cont.)

5.8 **PUBLICITY & NEWS REPORT** – Craig Cooke

No report was given at this meeting.

5.9 **WASTE STREAMS REPORT** – Wendy Coyle reporting for John Rickard

- Reviewed minutes of last meeting. Accepted with no changes.
- Membership changes – none – Bentley Sherlock & Meville Hedges filling in for Steve Osbourne
- Small attendance in AM session – only 8 folks (6 members present)
- Afternoon session – 15 folks (6 members present)
- Questions since last meeting:
  - CNCG in a load burner – Olli – Question is specific to a certain type of burner that is a load burner which also has the ability to burn CNCG with a pilot flame in lieu of a load burner. Response from group: Guidelines are clear that a waste stream burner cannot be used to maintain a purge credit. A load burner capable of burning CNCG's may be counted for a purge credit, but only when firing standard auxiliary fuel. CNCG's cannot be fired in a recovery boiler until steam load is 50% of MCR per BLRBAC guidelines. Forwarded groups response to Bruce Knowlen, Aux Fuel committee chairman, for information.

  - Dissolving Tank Vent Gases – Wendy – 1) Question regarding the requirement to meet 50% relative humidity when mixing dissolving tank vent gases with heated air. Response from group: Guidelines are currently being reviewed for DNCG and the relative humidity conditions are being evaluated. Proposed language needs to be presented/accepted by the executive committee before any formal changes. 2) Question regarding high dissolving tank pressure interlock. Response from group: Guidelines state that dissolving tank pressure must be "not high" to allow burning. Set point is dependent on the system design. Group agrees this is an important interlock to ensure dissolving tank is under stable operating conditions when burning these gases in the boiler.

  - Mixing of other DNCG's/Chip Bin Gases with Dissolving Tank Vent Gases – Olli – Andritz system design on occasion incorporates adding mix tanks and/or chip bin vent gases into the dissolving tank scrubber system prior to the scrubber/cooler. Group discussed the potential concerns with mixing and they believe further review is required before we can change the current guidelines which state system should be stand alone. Olli to review this section and bring back more information on the Andritz installations. Wendy to gather information from Metso on their installations to determine if they have incorporated this design into the system. Will review at Spring 2010 meeting.

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.9 **WASTE STREAMS REPORT** – (Cont.)

- **Review of Revised Document**
  - Chapter 1 Review - Forward & Introduction
    - Accepted with no changes
  - Chapter 2 Review – Definitions & Abbreviations
    - Added new acronym for dissolving tank vent gases (DTVG)
    - Added definition for MCR
  - Chapter 3 Review – Major considerations
    - Minor changes in wording of Section 3.9
    - Edited Section 3.10 statements regarding conditioning of gases
  - Chapter 4 Items – DNCG – Paul Seefield comments
    - Reviewed Paul's comments with only a few modifications and incorporated into Chapter 4
    - Portion of 4.2.4 regarding the relative humidity requirements after cooling/reheating has been updated, has not yet been submitted for approval to executive committee.
    - DTVG section needs further review and follow up in regard to both the
  - Chapter 5 Items – CNCG
    - No changes
    - Still need to update the flow diagram figures per our discussion in Spring 2009. Ann Plank to mark up hardcopies of each diagram and then scan/email to John for incorporation into the master document.
  - Chapter 6 Items – Blending of Liquid Waste Streams
    - Minor changes were reviewed, with no significant changes to all segments except section 6.7 which deals with Blending of Turpentine (red oil) with black liquor.
    - Section 6.7 revisions by Paul Seefield were reviewed by the group. Some minor edits were made to what had been proposed. Group agreed that we should have a suggested maximum turpentine blending percentage of 0.5%, but also recognizes that some places doing this go up to 1% by volume as is the condition for methanol blending.
    - Reviewed information compiled by Mathias Lindstrom regarding the impacts of blending turpentine on the refractometers. Turpentine is completely miscible with black liquor. In general, turpentine will lower the refractive index approximately 0.5% when mixed with black liquor at 1% by volume. Off-line tests such as a cook or TAPPI method will only be slightly impacted at low addition rates of turpentine. Suppliers of refractometer equipment do not foresee any issues with fouling of prism surfaces or any corrosion issues when blending turpentine with black liquor.

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.9 **WASTE STREAMS REPORT** – (Cont.)

- Chapter 7 Items – Dedicated liquid waste stream burners
  - No changes

- Chapter 8 Items – Chip Bin Gases
  - No changes

- **Waste Streams Survey – Ann Plank**
  - There were only three responses to our survey request, so the group decided back in Spring 2009 to attempt to compile a "users" list of recovery boilers that burn waste streams.

  - Reviewed first cut list from Ann Plank and added information as available. Group plans to continue to gather information to complete this list. Ann will work with information she already has, Mark will gather data on European & Asian installations, Olli will get Andritz installation list. Plan to review updated list in Spring 2010.

  - No new incidents were reported or discussed

- One mill is currently working on a project to burn DNCG in the recovery boiler. Question was asked where to inject the gases – windbox or dedicated nozzles. Feedback from the committee members was to put in dedicated nozzles due to the potential odor issues in ducts, corrosion issues, and safety concerns with burn back.

- One mill is currently using liquid sulfur as a source of makeup. They are blending it with the black liquor in the ash mix tank feeding the boiler. Question was if anyone has any experience with this application. Group stated this was outside the scope of waste streams, but several in the room have dealt with this before. Main considerations are a slow, steady addition rate to prevent upsets to boiler operating conditions.

5.10 **WATER TREATMENT REPORT** – Tom Madersky

Agenda Morning

Sign In/ Introductions

BLRBAC Antitrust Policies

Update Subcommittee Membership Info

Spring 2009 Meeting Minutes (Executive)

Spring 2009 Subcommittee Meeting Minutes

2nd Draft of RB Water Management Instructions & Outline (review manpower, edit instructions, verify subject matter)

Review/edit the Blowdown Heat Recovery System Draft Work up

Review/Edit The Production Template

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.10 **WATER TREATMENT REPORT** – (Cont.)

Agenda Afternoon

Determine Two Systems to be Developed in 2010

Discuss Production Team Leader Assignments/Responsibilities

Summarize and Close

Sign In/Introductions/BLRBAC Antitrust Policies/Update Membership Information

Tom Madersky provided an overview of the meeting goals, and reviewed the agenda after calling the meeting to order around 8:10 am.

Tom Madersky read the BLRBAC anti-trust statement, and reviewed the anti-trust data per BLRBAC guidelines.

Update Subcommittee Membership Info

Tom Madersky reviewed subcommittee membership list with attendees, and modifications will be made pending input from some folks.

Spring 2009 Meeting Minutes (Executive)

Tom Madersky reviewed the meeting minutes from the executive committee meeting.

Spring 2009 Subcommittee Meeting Minutes

Tom Madersky reviewed the Meeting minutes in some detail.

2nd Draft of RB Water Management Instructions & Outline (review manpower, edit instructions, verify subject matter

Tom Madersky reviewed the instructions and outline developed and approved at the previous meeting. He also reviewed priorities and discussed team development assignments.

Alarick Tavares noted that there was no mill representation on two of the groups. Craig Aderman suggested mill input was needed on them, which was supported by Clark Conley. The group made changes to the teams to ensure appropriate representation for OEMs, mills and subject-matter-experts.

Craig Aderman agreed to go into the design and operations group. There was also a suggestion to move one OEM into the maintenance. Rick Morgan agreed he would work with the maintenance group.

Review/Edit Production Template

Tom Madersky began discussion of the Production Outline per the last meeting, also reviewing the priorities. Group agreed that the priorities were OK.

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.10 **WATER TREATMENT REPORT** – (Cont.)

Tom reviewed the template for development. Discussion ensured. Norris said the overview should contain reason why subject was being considered by the committee. Aderman agreed that setting the stage was good for overview, then going back and revising after development is complete.

To begin, everyone agreed that overview should include statement of objectives, which would be identified upon beginning of development. An executive summary type of overview will be added once development is fairly much complete.

Tom Madersky led the group through a review of an example, for deaerators, as an example to model the basic content/design, identifying each component or category of information, noting that the goal was not to put together a training resource, but keeping to the key points.

Clark asked if we should include artwork. Tom said that we should hold off on that for a while. Discussion ensued regarding drawings, level of detail done, etc. Craig suggested to confirm a standard for using art, identifying potential resources for stock art, etc. Group agreed to leave the use of graphics up to the developing group. (Morgan/Lewis said they had resources)

Team leader will be the clearing house for graphics use, and all graphics will be reviewed by the entire sub-committee.

To look at example, Clark asked if they should review variation in deaerator design. Group said yes, but stopped short of 101 type of coverage, which would result in training guide.

There were other comments related to the level of detail needed, and discussion around those points. Madersky suggested that the focus should stay on the issues that if left unattended could cause problems with operation. Level of detail will need to be tied to performance indicators.

Norris suggested that the goal is to provide target audience with data that will help them troubleshoot problems, but not wind up putting together a “40 page” narrative.

Clark said we need to establish a basic format immediately. There was a need identified for the emerging material to be consistent in coverage, level of detail, graphics use, etc. Also, materials need to be geared towards the target audience. Group confirmed that the target audience is owners and operators in the field. Therefore, the goal should be tightly focused, short paragraphs.

Ken Hansen suggested that each of the three groups may wind up with slightly different designs, formats and content, based on the subject matter.

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.10 **WATER TREATMENT REPORT** – (Cont.)

Norris Johnston suggested that chairs of various groups should consider soliciting input from the other groups to get input. Craig said that initially, group should not worry about format first, but on subject matter. Format can be adjusted later, based on the review process of the group.

There was considerable discussion about the overlap of coverage group to group. Clark suggested that there may be a need for overlap, for example between design and other committees. Clark Conley would rather there be some overlap rather than leaving a gap.

Madersky suggested that each group "take their shot" with development, with a review to follow at the next meeting to evaluate coverage and overall organization.

Tom P. and Norris asked if some of the subject matter is actually covered in other BLRBAC guidelines, or if there is some overlap.

Generally, the group discussed the boundaries of coverage and how it impacts this group's actions.

Craig Aderman asked Tom Madersky to check with other BLRBAC subcommittees to confirm what they have/are developing, and to update the sub-committee so duplication of material can be avoided.

Madersky asked if there was value in reviewing that "tags" already identified to confirm subject matter, need for it, etc. More discussion ensured. Madersky suggested that we should keep in mind that all issues covered should be "water-related." Ken said we should perhaps reference other data and other BLRBAC guideline data, not necessarily develop that material.

Buck Denton noted that there were considerable resources available from other resources, (TAPPI, etc.) that the teams could reference vs. detailing out information.

Madersky then led the group through a review of a recovery boiler area content outline, etc. as another example of the initial design/level of detail and general content needs.

Clark Conley suggested that the work of this sub-committee should be to educate the audience to look beyond the initial symptoms that indicate a problem for more underlying reasons for it. Madersky said that he had received feedback asking if that was outside the scope of this group's mission.

Conley answered the question by asking if problems with the operation would/should be addressed in relationship to potential water issues. Ken said that operation and design data had to be included to a degree because those issues impact water.

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.10 **WATER TREATMENT REPORT** – (Cont.)

Rick Morgan asked if there was value in looking at design considerations and confirming what water issues might result based on design. Morgan said that some specific designs actually create a water treatment need, and these items should be addressed. Conley agreed, noting that this approach seeks to identify underlying causes for water problems that may not be obvious to operators and owners.

There was some discussion as an example of the turbine/steam purity requirements and what should be discussed in this group's documents. Consensus of group was to stick with general parameters, stopping short of details on specific turbine OEMs/designs, etc.

Overall, really good discussion on numerous issues to help the group decide what level of detail is appropriate for the development work that will follow.

Norris Johnson summarized that the focus of the group is to identify the things that can cause problems, and provide the data mills will need to improve the operation based on higher awareness of these issues.

Work Through Recovery Boiler Blowdown Heat Recovery System Draft

Madersky suggested that we edit a short section to confirm a level of detail, approach, etc.

Aderman asked if section met criteria stated earlier for what we're going to address: health and safety of people, and health and safety of equipment. Connect the task to the two overriding criteria

The group worked through the 1st draft of the blowdown system section by section. There was considerable discussion, and the document was edited with input from all attendees.

Discussion centered on level of detail and what coverage was appropriate, given the goal of protecting people and protecting equipment from a water treatment perspective.

A major issue discussed was the level of detail—if any—appropriate in talking about control systems, particularly related to E&I issues. Clark Conley asked if instrumentation and controls were being addressed by another BLRBAC subcommittee. Much discussion ensued on what was needed and where such coverage should fit within the BLRBAC umbrella.

Aderman suggested an action item—Tom Madersky was assigned to ask the executive committee about who was addressing the E&I issues, and possibly recommending that they be addressed by an appropriate group focused on these issues.

After review, all attendees indicated their support for using the template as designed for further development activities.

5. **SUBCOMMITTEE REPORTS -** (Cont.)
   5.10 **WATER TREATMENT REPORT** – (Cont.)

A couple of people indicated that the sub-committee should set up a schedule for development. Norris Johnson asked if the group shouldn't begin working on recovery boiler systems first, and there was some support for that approach.

Tom Madersky said that he would have a higher comfort level with dealing with one or two smaller systems first, then moving to the boiler. Such an approach would give everyone a chance to get familiar with both the template and development tasks, which would expedite later work on the recovery boiler.

The group discussed both approaches, and decided to work up one or two smaller sections initially, then transition to the recovery boiler.

Afternoon Session

Attendees broke out into teams and began development work on sections of the feedwater sections of the final deliverable. The groups generated a draft of one subsection.

Plan is to assemble all parts developed and forward to committee chairman Tom Madersky. Tom will distribute to team members for further review. The goal is to review the section at the beginning of the spring meeting.

Work concluded with a review of documents created and critique/editing suggestions.

A couple of action items were added at the conclusion of the review.

Action Items:

- Tom Madersky will seek guidance from the appropriate BLRBAC group on activity related to welding, and report findings back to the subcommittee.

- Tom Madersky will bring the issue of E&I coverage up to the BLRBAC executive board for guidance on subcommittee development efforts, and possibly recommend that another group take the lead in addressing control/instrumentation issues related to operations.

- Tom Madersky will apprise the executive committee of the subcommittee's plan to address two smaller parts of the development work first, transitioning at that time to the recovery boiler. He will report back to the group on the executive committee's response.

- Contact information for the subcommittee will be updated and distributed to members.

- TAPPI, ASME and other agencies will be contacted to confirm ability to quote their resources data within the final deliverable product. THIS ACTION ITEM NEEDS AN OWNER

6. **AMERICAN FOREST & PAPER ASOCIATION RECOVERY BOILER REPORT** – Tom Grant

The AF&PA Recovery Boiler Program is continuing in its efforts to produce greater awareness of safe practices and improvement in the operation, maintenance, safety and efficiency of recovery boilers.

Membership

Currently, 31 companies participate in the Program including 6 non-AF&PA member companies. The Program members represent nearly 95% of the total production of sulphate pulp in the U. S. There are six other companies operating recovery boilers that are not in the Program. We continue to encourage them to join with the current members in the cooperative efforts for the safe operation and research to improve the reliability of the recovery boilers. All companies operating recovery boilers benefit directly from the Program's activities, including the research.

Currently, there are 110 mills operating 173 recovery boilers in the U. S. They produce about 40% of the total energy used in the U. S. pulp and paper industry. The average age of the boilers is about 29 years. Over 67% of the boilers were installed prior to 1979.

Operational Safety Seminars

AF&PA plans to continue to sponsor three Operational Safety Seminars again next year as it has each year since 1985. Over 2,800 superintendents, supervisors, operators and maintenance personnel have attended the seminars. Due to the limited number of registrations for the seminars this year, we had to cancel the three seminars. In 2008, we had a record number of attendees and hope that travel restrictions will be lifted so that the benefits from these seminars will be available to the attendees. As usual, we plan to hold the one seminar in Portland, Oregon and two in Atlanta. We are hoping that we will have sufficient registration to hold them. If your mill wishes to send some people to these seminars, please let me know as soon as possible.

Recovery Boiler Reference Manuals

The Operation and Maintenance Subcommittee is reviewing the AF&PA Recovery Boiler Reference Manuals to include any possible new information. We plan to make any necessary revisions and to put the manuals onto CDs so that they may be readily available to the operators. We only have a handful of hard copies of the current manuals available at this time in case any one wishes to purchase them.

Non-Destructive Technologies for Detecting Water-Side Deposits

The final report for the Non-Destructive Technologies for Detecting Water-Side Deposits was completed last year. The study did not reach its goal in testing the several different technologies, although some showed some promise, it was not what we had hoped. The Advisory Group is continuing discussions of the study with another vendor (Aptech) to determine the prospect of its instrument for future study.

Recommendations and Guidelines in AF&PA Guidelines and Checklist Document

The Operation and Maintenance Subcommittee is reviewing the recommendations and guidelines developed from the Economizer Tube Failure Study. These are being processed so that the AF&PA Guidelines and Checklist document may be updated to include these recommendations.

6. **AMERICAN FOREST & PAPER ASOCIATION RECOVERY BOILER REPORT** – (Cont.)

Study on Smelt Dissolving Tank Explosions

BLRBAC's Safe Firing Subcommittee is studying the results of the study on Smelt Dissolving Tank Explosions to help make a decision for the preferred test methods for this situation. Currently, there are no guidelines for this. The most recent study was on the calculations of green liquor density vs. TTA as a function of composition. The study was sponsored by AF&PA and copies of the study, as well as the first study on dissolving tank explosions, were distributed to all AF&PA Recovery Boiler Program members last year. We hope this study will aid to guide in reducing dissolving tank explosions.

Updating "Kraft Recovery Boilers" Blue Book

The R & D Subcommittee contracted Dr. Tran and other known recovery boiler researchers to update the "Kraft Recovery Boilers" text book. There have been enough commercial advances and research activities documented to warrant a new edition. Dr. Tran will spearhead this effort with the authors for publication at the end of 2011. Copies of the current edition are available for purchase from TAPPI.

TAPPI TIP Sheets

The TIP sheets for economizers based on the study AF&PA sponsored on Economizer Leaks were published earlier this year by the TAPPI Subcommittee. The possibility of TIP sheets for industry use from the other AF&PA sponsored studies on Behavior of Furnace Corners in Explosions; Superheater Study and Floor Tubes is also being discussed by the TAPPI Subcommittee.

Other Research Projects Under Review

The Committee is considering several studies related to recovery boiler safety.

Annual Meetings and Conference

AF&PA's annual Recovery Boiler meetings and Conference will be held in Atlanta February 9th and 10th. As usual, the Conference is open to all operating companies, insurers, vendors and manufacturers. The presentations will include reports on the projects currently sponsored by the AF&PA Recovery Boiler Program and subcommittee reports on their accomplishments, as well as other research being done related to recovery boilers. The object of the Conference is to keep not only the members advised, but also the remainder of the recovery boiler community, as well. We hope that many of you will plan to attend next year's Conference which will be held in Atlanta February.

7. **NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS REPORT** - Terry Parks (Written Report Submitted)

The National Board has a new Executive Director, David Douin, former Chief Inspector from the State of Illinois and the former Chairman of the Board of Trustees. The new Chairman of the Board of Trustees is Robert Aben, Chief Inspector for Michigan

7. **NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS REPORT -** (Cont.)

The National Board Inspection Code (NBIC) 2009 Addendum will be published in December 2009 and available in January 2010. The 2010 Addendum will become mandatory July 1, 2009, and all "R" Certificate holders will be required to have a copy of the current edition and addenda on that date.

NBIC on-line training courses will be available by January 2010; there is a course for each part of the NBIC. A nominal fee will be charged for taking the courses and certificates of completion will be issued after successfully passing the final exam for each course.

In January 2010 the National Board Commission will undergo a change. Two commissions will be available; one for those that only perform in-service inspections, including repairs and alterations and one for those that only perform new construction activities.

The current "A" Endorsement course and exam will be required to obtain the new construction commission; the other endorsements for new construction would be available for this commission (B, N, C, IS, etc.). A new "R" endorsement was established for those that perform repairs and alterations. Those who currently have a National Board Commission will be grandfathered and will retain all of their current endorsements and will receive the new "R" endorsement.

The in-service commission exam body of knowledge now reflects those items that pertain to in-service inspections and repairs and alterations.

A new NBIC Executive Committee was established and met for the first time in July 2009. This committee will act as a steering committee for the NBIC.

8. **TAPPI RECOVERY BOILER SUBCOMMITTEE OF STEAM & POWER REPORT** – Jim Dickinson (See Power Point Presentation included as Appendix D.)

9. **WESTERN CANADA BLRBAC REPORT** – Shawn Casey

The Spring 2009 meeting was held in Richmond, British Colombia. A total of 48 people attended, which included mill representation of boiler manufacturers. There were two incidents reported. All incidents submitted to BLRBAC were discussed. There were three presentations from boiler manufacturers of updates that they had and five technical presentations. So the next meeting is next month in Richmond again at the River Rock Casino again on the November 17th and 18th. Pre-registrations are taken at all mills; so it should be a really good attendance. We are going to focus on green energy for some reason; but I don't know why. I'm the chairman of the Western Canada BLRBAC. If you would like to attend or if you need more information, feel free to contact me.

10. **ACTIVITIES OUTSIDE NORTH AMERICA REPORTS**

No reports were given at this meeting.

11. **OPERATING PROBLEMS SESSION REPORT** – Scott Moyer

We had a group session yesterday afternoon with approximately 150 people attended. We discussed a recent incident involving a floor beam failure that lead to a floor tube leak at a member mill. We also discussed quite a few questions from the members. I appreciate the active participation and the questions submitted. We talked about dissolving tank and spout operations, precipitator operations, ESP procedures and many other topic. We encourage continued participation with that. If you come across any questions that you'd like to have discussed, you can e-mail me when it comes to mind or jot it down somewhere. The better the questions, the better the session will be!

Following the Operating Problems Session we had a presentation of the Inko Test technology. I am working on a team to develop a team to develop a generic Oxial pre-startup check list. I'm still looking for participation from some different areas. So if you are interested, please let me know. Also if you have a checklist that you use that you think is a good one, send it to me and we will incorporate that into the work we are doing.

Following adjournment we will have about a ten minute break and then we will have the Technical Presentations. One will be from Savcor on "Boiler Diagnostic System" and the second will be from NALCO on "Condensate Contamination Control."

CHAIRMAN: Last spring we talked about and we posted on the WEB site and included in the Meeting Notice the list of BLRBAC member contacts and Alternates. We have updated the list as best we could. We deleted some companies that are gone and deleted some people who are no longer active. We did get quite a few responses from the membership. We are asking the company representatives to please look at who your representative and alternate is. Check that the company name is upddate, your address and contact information is updated. It was posted up at the Registration and it will be on line again. Just review that and keep it up to date. We have about tripled the number of operating company in the last ten or fifteen years. We know that there have been some break ups and some consolidations over the last few years. So please take some time to review that and make sure all the information is accurate. We appreciate the participation of everyone.

NEXT MEETING: April 12, 13 & 14, 2010, at the Crowne Plaza Hotel, Atlanta GA. This is the second week in April to avoid a conflict with Easter (April 4th) and Passover (March 29th).

CHAIRMAN: Are there any other new business items from the members that you would like to bring forward? If not, can I have a motion to adjourn the meeting? Second? All in favor of adjournment? The fall meeting of the 2009 BLRBAC is now closed. Everyone have a safe trip home!

DRY SPOUT

Fall 2009 - 1	
Classification:	**Non-Critical**
Location:	**International Paper, Franklin, VA**
Unit:	# 5 RU, 1970 CE #21868, 2-drum DCE, w/ 2008 Alstom Dry Spouts
Unit Size:	1.75 MM lb ds/day; 274,000 lb/hr steam at 600 psig, 750°F, 700 psig design
Incident Date:	31 July 2009
Downtime hrs, leak/total:	41 hrs
ESP?	**No**
Leak/Incident Loc:	Spout level
How discovered:	**Walkdown:** Saw smelt leaking from behind spout
Wash adjacent tube:	N/A
Root cause:	Thermal shock likely due to hot-to-cold cycle during wash down (outage) or cold-to-hot cycle on a startup
Leak detection:	Mass balance
Bed cooling enhanc	No
Last full inspection:	April 09
Sequence of events:	7/31/09 2:00am, Noticed 3/4" smelt stream coming from behind the center spout, perhaps from wall box mounting plate. 3:02am Liquor removed. Closer inspection found center spout cracked and about to break in half. Burned out char bed. Unit taken off line. The other two spouts revealed several cracks. All three spouts changed out. Unit back online 8/1, 6:04pm. On liquor 8:02pm
Repair procedure:	All three spouts changed out
Future prevention:	Washing procedure for spouts and explosion box was reviewed again with each operator to ensure its importance. The dry spouts require a very physical effort to keep clean and the mill is considering changing back to water cooled spouts.

Direct Contact Evaporator Fire

Fall 2009 - 2	
Classification:	**Information Only**
Location:	**International Paper, Augusta, GA**
Unit:	#2 RU, 1966 B&W, PR-89, DCE Cyclone
Unit Size:	1.2 MM lb ds/day; ? lb/hr steam at 875 psig, ?°F-, 1025 psig design
Incident Date:	30 March 2009
Downtime hrs, leak/total:	19 days
ESP?	**No**
Leak/Incident Loc:	Cyclone Evaps and wet-bottom Precipitator inlets
How discovered:	Smothering Steam system alarmed then activated within a 20 seconds. High gas temps at cyclone and precip
Root cause:	Plugged liquor lines, high solids
Sequence of events:	Unit starting up on oil after annual outage with clean cyclone. Difficulty keeping wall wash showers open and clearing plugged liquor supply line to salt cake mix tank. Solids in cyclone higher than normal, 70% +. At the time of black liquor ignition the cyclone exit temperature was approx. 400^{o} F and rose to the alarm set point of 450^{o}F within 20 seconds and continued rising through the trip set point of 550^{o} F in another 10 seconds. When the high temperature trip occurred, the MFT was activated, the 90 psi steam smothering system at the inlet of the cyclone was activated and the FD fan inlet damper went to the closed position. Although the trip logic initiated the ID fan and FD fan shutdown sequence they continued to run as the trip latch on the ID fan steam failed to open. Smelled burning char so they suspected that there was a cyclone fire in progress. Operators then manually actuated the fire water suppression system that ties into the wall wash showers and within 10 minutes manually actuated the fire water suppression system to the inlet of each precipitator per the emergency procedure. PI trends show that the cyclone exit temperature rose to 1000^{o} F+ and stayed above this temperature for approx. 5 minutes. Precipitator exit temperature rose to 700^{o} F+ and stayed above this temperature for approx. 4 minutes also confirming that a fire did occur in the cyclone
Repair procedure:	Repaired severe damage to collector plates and electrodes in precipitator, minor ID Fan damage
Future prevention:	9 Corrective Actions & 5 added technologies. Correct ID Fan trip, damper closure, & steam emit.

ESP ONLY - NO LEAK

Fall 2009 - 3	
Classification:	**ESP-Only, No Leak**
Location:	**MeadWestvaco, Covington, VA**
Unit:	#2 RU, 1991 Gotaverken #61-2500, 1-Drum Large Econ
Unit Size:	5.0 MM lb ds/day; 769,000 lb/hr steam at 1550 psig, 950°F, 1840 psig design
Incident Date:	13 August 2009
Downtime hrs, leak/total:	69.1/70.22
ESP?	**Yes**
Leak/Incident Loc:	ESP – No Leak
How discovered:	Heard steam noise at gun port level
Wash adjacent tube:	N/A
Root cause:	N/A (Leakage in steam-outs)(Failure to shut off steam-outs)
Leak detection:	In-house mass balance
Bed cooling enhanc	Southland Sodium Bicarbonate
Last full inspection:	May 2007
Sequence of events:	Operator heard new steam noise at gun level. No soot blower steam flow. No ID Fan increase. No conductivity drop. Bed appeared wet and cool in one quarter with stack SO2 readings. Steam-water differential OK. Noise still varying, maybe louder. Previously, had lower furnace leaks, so decided to ESP.
Repair procedure:	Pulled these liquor sprays, replaced, and inspected for wear
Future prevention:	1. Steam leaking through two spray guns: main feed will be shut during normal operation; 2. In future, divert the liquor and if noise still exists then ESP; 3. Change liquor spray gun nozzles on a set schedule.

ECONOMIZER HAND HOLE CAP

Fall 2009 - 4	
Classification:	**Non-Critical**
Location:	**Boise White Paper, DeRidder, LA**
Unit:	#1 RU, 1969 B&W, PR-130, 2-Drum Large Economizer
Unit Size:	4.2 MM lb ds/day; 604,000 lb/hr steam at 850 psig, 825°F, 1000 psig design
Incident Date:	16 July 2009
Downtime hrs, leak/total:	24 hr 45 min
ESP?	**No**
Leak/Incident Loc:	Lower econ header handhole crack on outside crown
How discovered:	**Walkdown**.
Wash adjacent tube:	
Root cause:	Weld fatigue failure
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	March 2009
Sequence of events:	During walk down July 16, small leak found in bottom rear econ section. Salt cake conveyor directed to the ground. Plan set to monitor leak with planned repair on July 23rd to minimize mill upsets. On July 22, burned out bed. July 23 made repair. 3:00 pm hydro; 4:00 fire; 10:30 pm on line, 11:45 pm on liquor
Repair procedure:	Hand hole was removed; a new hand hole using the correct welding procedure was installed.
Future prevention:	The use of incorrect welding/preheat procedure has led to previous leaks on this unit and others through out the industry

ECONOMIZER HAND HOLE CAP

Fall 2009 - 5	
Classification:	**Non-Critical**
Location:	**Longview Fiber, Longview, WA**
Unit:	#22 Furn, 1992 ABB-CE, CA 89102, 1-drum, large economizer
Unit Size:	3.7 MM lb ds/day; 623,000 lb/hr steam at 800 psig, 750°F, 1065 psig design
Incident Date:	21 March 2009
Downtime hrs, leak/total:	0
ESP?	**No**
Leak/Incident Loc:	Crack or pin hole in hand hole weld at top of cold econ module
How discovered:	Walk down. Saw steam wisping out from roof insulation at top of cold module.
Wash adjacent tube:	No
Root cause:	
Leak detection:	Yes
Bed cooling enhanc	No
Last full inspection:	Chem clean Oct 05
Sequence of events:	Saturday 3/21/09: During walk down, saw steam wisping out from roof insulation at top of cold econ module. Plan was to check leak every 2 hours until Monday morning. The leak did not get worse. Monday morn 3/23 the skin and insulation removed, and hand hole leak found on the second-from-right side of the first (cold) economizer.
Repair procedure:	EA Services took measurements and made a clamp to seal the leak, as done successfully previously. Installed on Tuesday afternoon and leak is totally sealed. Weld repair will be made during October 2009 annual outage.
Future prevention:	There are 8 separate supply and exit headers for each economizer. Each header has two hand holes. Over 9 years had about a dozen similar leaks.

ECONOMIZER

Fall 2009 - 6	
Classification:	**Non-Critical**
Location:	**MeadWestvaco, Covington, VA**
Unit:	#2 RU, 1991 Gotaverken #61-2500, 1-Drum Large Econ
Unit Size:	5.0 MM lb ds/day; 769,000 lb/hr steam at 1550 psig, 950°F, 1840 psig design
Incident Date:	5 March 2009
Downtime hrs, leak/total:	30.82/38.52
ESP?	**No**
Leak/Incident Loc:	Pinhole leak in #1 (cold) econ module, in weld at lower bottle header-to-riser attachment. Platen 77, tube-12, front pendant
How discovered:	While checking damp ash at disabled ash crusher, found water in drag
Wash adjacent tube:	No
Root cause:	Pinhole in toe of original weld at start-stop point (slag or lop)
Leak detection:	Yes In-house
Bed cooling enhanc	No
Last full inspection:	May 2007
Sequence of events:	5Mar, 05:30 Ash crusher went down. During check, found damp ash, then water in drag. 07:45 Went off liquor and on to aux fuel. Opened side doors and saw water dripping. Burned out bed and did orderly shut down by 14:45. 6 Mar When cool below 325, washed econ. Repair made. 1350 lb hydro OK. Liquor in 22:16
Repair procedure:	Ground out , liquid pen and rewelded.
Future prevention:	Plan for next outages being developed

ECONOMIZER

Fall 2009 - 7	
Classification:	**Non-Critical**
Location:	**MeadWestvaco, Covington, VA**
Unit:	#2 RU, 1991 Gotaverken #61-2500, 1-Drum Large Econ
Unit Size:	5.0 MM lb ds/day; 769,000 lb/hr steam at 1550 psig, 950°F, 1840 psig design
Incident Date:	15 March 2009
Downtime hrs, leak/total:	30.47/32.43
ESP?	**No**
Leak/Incident Loc:	Pinhole leak in #1 (cold) econ module, in weld at lower bottle header-to-riser attachment. Platen 37, tube-7, rear pendant
How discovered:	**Walk down**. Found water in drag. Went off liquor and on to aux fuel. Opened side doors and saw water dripping. Burned out bed and did orderly shut down. 16 Mar When cool below 300, washed econ Repair made. 1350 lb hydro OK. Liquor in 14:45
Wash adjacent tube:	No
Root cause:	Pinhole in original weld at start-stop point (slag or lop)
Leak detection:	Yes In-house
Bed cooling enhanc	No
Last full inspection:	May 2007
Sequence of events:	15 Mar, 05:58: During walk down, found water in drag. 06:19: Went off liquor and on to aux fuel. Opened side doors and saw water dripping. 07:31 pulled fire and did orderly shut down. Repair made. 13:50 Hydro OK. Liquor in 22:16
Repair procedure:	Ground out , liquid pen and rewelded
Future prevention:	Plan for next outages being developed

ECONOMIZER

Fall 2009 - 8	
Classification:	**Non-Critical**
Location:	**Georgia Pacific, Palatka, FL**
Unit:	1976 CE #22974, 2-drum, with Andritz July 2007 Large Economizer
Unit Size:	5.0 MM lb ds/day; 850,000 lb/hr steam at 1200 psig, 900°F, 1400 psig design
Incident Date:	26 February 2009
Downtime hrs, leak/total:	-/23.7
ESP?	**No**
Leak/Incident Loc:	Circumferrential crack 1 1/3” long in toe of weld at supply tube connection to bottle header front side of supply tube –Rear (cold) Economizer lower header, 1st mini header,
How discovered:	**Walk down**
Wash adjacent tube:	No
Root cause:	Mechanical fatigue. Inadequate expansion could have contributed to the failure. During repair, saw economizer inlet header seal plate at the left and right wall casing was binding. Casing was trimmed to allow for the correct header movement
Leak detection:	Yes Nalco RPLI / Trasar
Bed cooling enhanc	No
Last full inspection:	October 200(?9)
Sequence of events:	26Feb 20:30 Saw water coming from rear economizer hopper, nothing above lower headers, so 21:00 began orderly shutdown, 22:39 Liquor out; 27Feb 01:10 Fire out. 07:00 repairs complete. 10:50 Hydro OK. 28Feb 03:45 1st fire. 12:32 On line; 04:10 On liquor
Repair procedure:	Grinding the crack out and making a weld repair
Future prevention:	Tested elements #1-6 at both ends of the front and rear economizer. Used Magnetic Particle Testing of same welds. Thickness and shear wave testing of the supply tubes in these elements. No more indications found. One area of the weld on element #2 looked visually suspicious so weld was reinforced. Thickness tested the lower bottle headers of elements #1 & 2, in the direction of the spray, with no thinning found. Verify feed water pipe expansion clearance during outages and/or installation

ECONOMIZER

Fall 2009 - 9	
Classification:	**Non-Critical**
Location:	**International Paper, Savannah, GA**
Unit:	#15 RU, 1995 Tampella Power, #17441, 1-Drum Large Economizer
Unit Size:	7.4 MM lb ds/day; 1,050,000 lb/hr steam at 1200 psig, 910°F, 1500 psig design
Incident Date:	20 July 2009
Downtime hrs, leak/total:	49.5
ESP?	**No**
Leak/Incident Loc:	Bottom of hot econ module; at a tube plug, where the 1st Jumper Tube to No.1 Platen off the left (west) wall had been previously removed and plugged. 147 ft
How discovered:	Walk down. Saw water in Econ ash conveyor.
Wash adjacent tube:	No
Root cause:	Poor weld (porosity) of original tube plug
Leak detection:	Yes. Mass- Balance – fuzzy logic
Bed cooling enhanc	No
Last full inspection:	Jan 2009
Sequence of events:	Mon, 20July, 05:00, walk down saw water in ash conveyor. No water in other hoppers nor boiler hopper. Began orderly shut down. 09:11 Off line. Doors opened and saw steam and water.
Repair procedure:	Grind out, replace and re-weld tube plug
Future prevention:	The leaking tube plug and the one repaired in 2005 were checked and found to have weld porosity issues. Both were replaced. A decision has been made to replace all 10 tube plugs installed in 2005 with a modified plug design or a cap. This will be done during our Feb 2010 scheduled outage.

ECONOMIZER

Fall 2009 -10	
Classification:	**Non-Critical**
Location:	**International Paper, Mansfield, LA**
Unit:	#2 RU, 1981 B&W, PR-199 or 200, 2-Drum Large economizer
Unit Size:	2.7 MM lb ds/day; 483,000 lb/hr steam at 1250 psig, 900°F, 1475 psig design
Incident Date:	19 March 2009
Downtime hrs, leak/total:	34 hr 8 min
ESP?	**No**
Leak/Incident Loc:	Two leaks, 1/16” pinholes, 4’ above lower header, Module 1, row 4, tube 27, & 7’ above lower header, Module 2, row 5, Tube 13
How discovered:	Control Room Low Drum Level **and** **Walk down**
Wash adjacent tube:	No
Root cause:	Through-wall pitting from water side; on the edge of the tube ERW seam. Past acid cleanings may also have initiated pitting if any wrong parameters. Pitting probably progressed over time.
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	Feb 2009
Sequence of events:	08:45 Saw unusual low drum level, feed wide open but no level increase. Checked FW pumps low pressure and corrected issue. 09:00 Walk down saw water in econ hopper. 09:07 boiler trip on low drum level. Unit and bed allowed to cool. Leaks id’d and repaired.
Repair procedure:	Plugged the upper and lower headers (stubs) by Turner Ind. The procedure entailed prepping 6” stubs (from headers), installing 3000# ¾” pipe cap ¼” inside tube end, preheating to ~300 deg, (GTAW) tig weld with ER70S-2 wire. After root pass, did dye penetrate test, then capped with a two-stringer cap and performed a final PT
Future prevention:	New economizer planned for 2011. This failure reinforces the need.

ECONOMIZER

Fall 2009 -11	
Classification:	**Non-Critical (with injury)**
Location:	**Georgia Pacific Brunswick Cellulose, Brunswick, GA**
Unit:	#5 RU, 1972 B&W PR-145, 2-Drum Large economizer
Unit Size:	3.3 MM lb ds/day; 551,000 lb/hr steam at 1250 psig, 825°F, 1500 psig design
Incident Date:	5 May 2009
Downtime hrs, leak/total:	53/75
ESP?	**No**
Leak/Incident Loc:	Initially, crack at outlet side of short radius 90o elbow in economizer outlet piping above casing in 2" A106 Sched 80 pipe between economizer header and steam drum, elev 177'-8" . Later, 1" hole
How discovered:	Walk down found weeping leak, 4' above walkway; later blew out hole.
Wash adjacent tube:	No
Root cause:	Flow-accelerated corrosion (FAC)
Leak detection:	Yes, Nalco Trasar
Bed cooling enhanc	No
Last full inspection:	July 2008
Sequence of events:	May 5, 02:00: Small weeping leak found in 2" outlet pipe above econ outlet header. Monitored for change for next hours. 10:28: While inspecting, pipe blew out 1" hole. 10:34 Unit shut down.
Repair procedure:	Temporarily installed A106 piping and socket weld fittings on all Economizer outlet 2" piping after UT data confirmed thinning (no other piping below minimum wall thickness).
Future prevention:	Failed pipe had only 0.01% chromium. Permanent repair in August 2009 will be to replace 2" piping with A335 P11 material (1.25% Cr) per OEM recommendations. Conducting further UT testing on #5RB Economizer inlet piping and replace with P11 material as necessary. Also conduct more Feed-water piping UT testing and evaluate FW pH control

ECONOMIZER

Fall 2009 -12	
Classification:	**Non-Critical**
Location:	**Tembec Pulp, Skookumchuck, BC**
Unit:	#51841 1993 ABB, CA 91105, 1-Drum Large economizer
Unit Size:	3.49 MM lb ds/day; 463,000 lb/hr steam at 630 psig, 750°F, 900 psig design
Incident Date:	3 May 2009
Downtime hrs, leak/total:	47 hr
ESP?	**No**
Leak/Incident Loc:	Pin hole leak, ½" below tube-to-top-header weld, top of 1st (cold) econ, 36th from left, 5th tube row from rear
How discovered:	**Wlak down**. Saw water in bottom of 1st econ hopper.
Wash adjacent tube:	No
Root cause:	No thinning or pitting found. Probably from original weld.
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	May 2008
Sequence of events:	May 3, 09:45: During walk down, found water in 1st econ hopper. Removed liquor firing. 10:30 Off liquor. Confirmed leak location. Controlled shutdown. 15:30 Off line. May 4, 08:30 Alstom began repairs. 15:00: Repairs done.16:45 Hydro OK.22:30: 1st fire.May 5, 04:40 Unit on line. 09:30 Liquor fired.
Repair procedure:	Ground out pit, preheated to 300F and welded using 3/32 7018. The weld repair was then tested by Acuren using liquid penetrant.
Future prevention:	Thickness testing was done by Acuren revealing no indications of thinning or pitting on the tube in question or the surrounding tubes.

ECONOMIZER

Fall 2009 -13	
Classification:	**Critical Incident #717**
Location:	**Daishowa-Marubeni, Peace River AB**
Unit:	1990 B&W 2-Drum Large Economizer
Unit Size:	3.49 MM lb ds/day; 463,000 lb/hr steam at 630 psig, 750°F, 900 psig design
Incident Date:	22 December 2008
Downtime hrs, leak/total:	33 hr 7 min
ESP?	**No**
Leak/Incident Loc:	Leak in weld of wafer plug in tube stub at a top header of #2 economizer(3d of 4 modules from rear), 153" elev.
How discovered:	**Acoustic Monitor Alarm**
Wash adjacent tube:	No (They were checked)
Root cause:	Too eroded to confirm, but likely porosity or LOP
Leak detection:	Yes. Triple-5 Acoustic
Bed cooling enhanc	No
Last full inspection:	June 2008
Sequence of events:	9 Dec Unit tripped. Likely start of leak. Econ ash plugging during next weeks. Gradual upward trend of Acoustic noise, but walk-downs found nothing. 22December. Firing full liquor load. Responding to Triple-5, took sootblowers off, and opened doors. Leak heard by operators. Hopper catch diverted away from chemical ash tank. Orderly shutdown. Leak visible while on natural gas. 23December 09:23: Unit off line. Local hand wash of area. Made repairs Dye pen'ed repair. Hydro OK. 24December, 17:30 Unit back on line. 18:30 Liquor fired.
Repair procedure:	Defect ground out. Alstom weld procedure SMA-19 used for repair. 50o preheat. Stick weld with E7018. Dye pen test OK. Hydro OK.
Future prevention:	--

ECONOMIZER

Fall 2009 -14	
Classification:	**Non-Critical**
Location:	**International Paper, Ticonderoga, NY**
Unit:	#1 RU, 1969 B&W, PR-131, 2-Drum, with 1981 B&W Large Economizer
Unit Size:	2.01 MM lb ds/day; 330,000 lb/hr steam at 875 psig, 825°F, 975 psig design
Incident Date:	13 March 2009
Downtime hrs, leak/total:	63 hr
ESP?	**No**
Leak/Incident Loc:	Longitudinal rupture in tube 1" from top economizer header, 1st (cold) module,
How discovered:	**Walk down**, Saw water out of ID Fan drain.
Wash adjacent tube:	No
Root cause:	Localized external tube wastage thinning from previous leak
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	Lower econ bends in 2006, 2007, 2008
Sequence of events:	March 13, 11:40: Saw water out of ID fan drain. Definitely last pass, so did orderly shut down. 11:50 Started to pull liquor. 12:20 liquor out. 21:45 smelt out.21:55 off line. March 14 09:15 start scaffold. 18:30 repairs done. 19:00 NDT done. 22:55 hydro OK. 15Mar 05:50 Scaffold out. 10:30 1st fire. 20:00 unit on line. 16 mar 02:50 liquor fired.
Repair procedure:	Plugged two tubes at the top and bottom headers. Plugged tubes were located at Header 8, Rows 3 and 4, Tube 5. Row 4 was plugged due to thinning(0.095'). Row 2 thickness measured 0.121'. Row 3 thickness measured 0.135'. Thinning of rows 3 and 4 was from the outside in and oriented in the direction of a previous leak (see attachments).
Future prevention:	History of tube failures. Thoroughly clean sides of economizer on next outage. Modify bottom casing around bottom headers to assure headers are not restricted from expansion/contraction. Plug all tubes in the first two rows from ends of the each header. Start plan to possibly replace economizer

ECONOMIZER

Fall 2009 -15	
Classification:	**Critical Incident #718**
Location:	**International Paper, Courtland, AL**
Unit:	#2 RU, 1979 B&W, PR-180, 2-Drum DCE Cyclone
Unit Size:	4.1 MM lb ds/day; 500,000 lb/hr steam at 450 psig, 550°F, 550 psig design
Incident Date:	1 April 2009
Downtime hrs, leak/total:	48 hr
ESP?	**No**
Leak/Incident Loc:	Tube had small grooved leak by rubbing lattice bar just below mid-level baffle inlet mid economizer. Adjacent tube failed, spraying toward furnace. Most of spray was contained in the lower economizer but small amount trickled over the baffle but did not enter the gen bank hopper.
How discovered:	Leak detection alarm. Then saw water on economizer door. Then heard leak at 7th floor
Wash adjacent tube:	Yes
Root cause:	Tube leak was due to rubbing of lattice bar. Adjacent tube failed due to external erosion thinning from nearby leak.
Leak detection:	Yes – internal developed mass balance.
Bed cooling enhanc	No
Last full inspection:	Sept 2008
Sequence of events:	For several days prior to visually confirming leak, got leak alarm and made special rounds and watch trends closely. April 1, 16:38 Alarm went to Level 2. Did specific walk down. 17:00 Saw water on duct door at entrance to cyclone. Heard leak through 7th floor econ door and visually confirmed in lower region. Did orderly shut down. 17:30 pulled liquor.18:30 after trip, restarted gas and oil to urn down bed. April 2, 07:00 Began repairs. Midnight: repair done. April 3, 03:15 Hydro OK. 05:30 remove scaffolds. 13:30 steaming. 18:00 liquor in. 19:00 full rate.
Repair procedure:	Both the leaking tube (row 2) and the one in front of it (removed for access) were plugged top and bottom. . Installed,(2) new header stubs, 2 butt welds and 2 groove fillet welds were made.
Future prevention:	Tubes in the vicinity were checked and no other low readings were found. Will further inspect this area for fretting during the planned April boiler outage. Develop and implement Major Outage inspection plan to perform NDE on other economizer

ECONOMIZER

Fall 2009 -16	
Classification:	**Critical Incident #719**
Location:	**International Paper, Courtland, AL**
Unit:	#2 RU, 1979 B&W, PR-180, 2-Drum DCE Cyclone
Unit Size:	4.1 MM lb ds/day; 500,000 lb/hr steam at 450 psig, 550°F, 550 psig design
Incident Date:	13 May 2009
Downtime hrs, leak/total:	81 hr
ESP?	**No**
Leak/Incident Loc:	Two small leaks in the economizer (tube 43, row 1) a ¼" apart from each other, hot-side module, by mid-level baffle
How discovered:	Low drum level alarm. Steam and feedwater split, Level 1 leak detect, and lower liquor solids. Level 2 Leak detection alarm. Walk down saw water coming out of ductwork.
Wash adjacent tube:	No
Root cause:	Porosity in a previous pad weld repair done to thicken tubes found following April incident.
Leak detection:	Yes – internal developed mass balance
Bed cooling enhanc	No
Last full inspection:	Sept 2008
Sequence of events:	13May, 12:52 liquor out. Install scaffold. 20:15 wet hydro to find leak. 21:30 BE&K start repair, including one caused by welder arc. 14May 02:40 repair done. 03:30 hydro OK. 04:30 scaffold out.
Repair procedure:	Ten tubes plugged according to procedure developed by Technology. Added pad welds repaired.
Future prevention:	All other tubes in the vicinity and across the boiler were visually and UT inspected. More issues found and corrected with the previous repairs made during the planned boiler outage 2 weeks earlier. Develop and implement Major Outage inspection plan to perform NDE on other economizer. Replacing and/or removing the 1st row on the 2nd and 3rd section of economizer.

ECONOMIZER

Fall 2009 -17	
Classification:	**Critical Incident #720**
Location:	**International Paper, Courtland, AL**
Unit:	#2 RU, 1979 B&W, PR-180, 2-Drum DCE Cyclone
Unit Size:	4.1 MM lb ds/day; 500,000 lb/hr steam at 450 psig, 550°F, 550 psig design
Incident Date:	18 June 2009
Downtime hrs, leak/total:	45 hr
ESP?	**No**
Leak/Incident Loc:	Economizer tube leak at old undocumented pad weld repair. Leak at T35-R1 washed out a hole in T34-R2 on the economizer section . Both leaks were small pinholes and located at an elevation about 3 inches above the lattice baffle (just above the site of previous leaks due to lattice bars rubbing on tubes).
How discovered:	Walk down Saw water dripping out of cyclone inlet duct, while going down for cyclone wash.
Wash adjacent tube:	Yes
Root cause:	.Tube #35 (leaked first) = pinhole at the edge of an old pad weld. Tube 34 = thinning and failure in the heat affected zone of an old weld, from erosion from tube 35 leak.
Leak detection:	Yes – internal developed mass balance.
Bed cooling enhanc	No
Last full inspection:	Sept 2008
Sequence of events:	Received Leak Detection alarms for about 1 week prior. Going down for cyclone wash. Saw water dripping out of cyclone inlet duct June 18. Orderly shut down. 04:06 liquor out. Burned out bed. 05:00 unit down. 3 tubes plugged. June 19 10:26 hydro OK. 21:20 steam June 20, 00:50 liqour in.
Repair procedure:	A total of 3 tubes were plugged at the headers and removed.
Future prevention:	Develop and implement Major Outage inspection plan to perform NDE on other economizer. Removing or Replacing 2nd and 3rd Section of economizer (1st row).

SUPERHEATER

Fall 2009 -18	
Classification:	**Non-Critical**
Location:	**SSCC, Fernandina Beach, FL**
Unit:	#5 RU, 1978 B&W, PR-189, 2-Drum Large Economizer
Unit Size:	3.6 MM lb ds/day; 495,700 lb/hr steam at 870 psig, 850°F, 950 psig design
Incident Date:	15 February 2009
Downtime hrs, leak/total:	27.5 hr/46.5 hr
ESP?	**No**
Leak/Incident Loc:	#1- 1” circ. Crack, a through wall crack-type / rounded indication on a superheater tube above the “C” lug attachement weld, Primary superheat platen 14, tube 2, front side -11th Floor; #2 - 1/8”, liquid penetrant inspection revealed a crack-type linear indication on tube 2 of platen 15 at same location “C” lug
How discovered:	Walk down. Heard noise on 11th floor
Wash adjacent tube:	Yes
Root cause:	Excessive cycling of boiler caused stress crack at C lug attachment. Dutchmen installed March 2009 annual outage
Leak detection:	Yes. Trasar
Bed cooling enhanc	No
Last full inspection:	March 2008
Sequence of events:	Feb 14, 20:00: During walk down, heard noise on 11th floor. No other verifications, but pulled liquor and burned large bed out. Still couldn’t hear leak. Put liquor back in with small bed. Feb 15 Again pulled liquor, burned bed out, killed fire, shut fans, and leak was heard OK. Used hydro to locate leak in SH. Repairs made. Further inspections revealed crack-type linear indications on tube 2 of platen 15 (same "C" lug location(s) as platen 14).
Repair procedure:	C & D lugs were cut loose/removed and the failed area was repair welded with a root and additional pad weld reinforcement (approx. 4" x 180°). Initial and final liquid penetrant inspections performed on weld repaired areas revealed no relevant indications. Ultrasonic thickness values obtained on root pass and adjacent tube material (including tubes 1 & 2, platen 15) ranged .157” to .192", where measured. The C & D lugs were cut loose/removed, investigative grinding revealed no appreciable depth(s). Final liquid penetrant inspections revealed no relevant indications. Hydrostatic test revealed no leaks at time of inspection
Future prevention:	Thickness values were obtained on adjacent tubes of platen 15 due to suspect washed/cleaned areas.

SUPERHEATER

Fall 2009 -19	
Classification:	**Non-Critical**
Location:	**Evergreen Packaging, Pine Bluff, AR**
Unit:	#3 RU, 1958 (1960?) B&W, PR-60, 2-drum DCE cyclone, late 1990's new SH
Unit Size:	1.17 MM lb ds/day; 202,000 lb/hr steam at 1250 psig, 825°F, 1425 psig design
Incident Date:	16 February 2009
Downtime hrs, leak/total:	81.95 hr
ESP?	**Yes**
Leak/Incident Loc:	#1. Superheater tube rupture from overheat at elev 55', on primary superheater outlet, 6th platen form east, front platen (soot blower lane . #2. superheater tube leak 2nd row, rear tube 7th platen caused by soot blower rub. #3. **Wall Attachment weld** break caused by the stress of the ESP.
How discovered:	Furnace pressure trip and the noise that followed
Wash adjacent tube:	No
Root cause:	#1 Overheat of tube. #2 Rubbing soot blower. #3 stress of the ESP
Leak detection:	No
Bed cooling enhanc	Yes. In-Plant Fire Protection Personnel applied Sodium Bicarbonate and Nitrogen
Last full inspection:	March 2008
Sequence of events:	Feb 16, 22:20 Unit went down on high furnace pressure trip. Loud noise coming from furnace, with blow back thru gun ports. 22:15 ESP'd unit. Feb 17, 07:00 began NaHCO3 bed cooling.13:30 bed cool done. 16:00 Start unit water wash. Feb 18, 01:30 Stat scaffold. 05:00 Scaffold done. found blown super heater tube on primary superheater outlet, 6th platen from east, front platen (soot blower lane). 09:00 Tube repair done. Started unit fill. Found #2 leak. Feb 19 01:00 Began scaffold. 05:00 repair done on tubes 1 – 4.. 11:30 started fill. 13:45 hydro found leak in attachment weld on front wall EXTERIOR to unit. 14:00 drained unit. 18:15 repair done. Scaffold removed, 20:00 hydro OK. 23:00 1st fire. Feb 20 fired liquor.
Repair procedure:	#1 replaced tube. #2 replaced sections (Dutchman). #3 repair
Future prevention:	Tube was sent for metallurgic evaluation

SUPERHEATER

Fall 2009 -20	
Classification:	**Non-Critical**
Location:	**International Paper Riverdale, Selma, AL**
Unit:	#2 RU, 1981 CE, #28679, 2-Drum
Unit Size:	2.7 MM lb ds/day; 425,000 lb/hr steam at 1425 psig, 860°F, 1720 psig design
Incident Date:	30 April 2009
Downtime hrs, leak/total:	77.5
ESP?	**Yes**
Leak/Incident Loc:	8" Fishmouth rupture in outlet tube #4, Row 5, Platen #23, Primary Superheater outlet bank (1-2).
How discovered:	Control room instruments plus operator heard noise at boiler
Wash adjacent tube:	No
Root cause:	Combination of corrosion reduction in wall thickness and overheating. Microstructural transformations, creep deterioration remote from the failure and heavy internal scaling, and a carburized layer evident on the outside diameter surface of the tube segment.
Leak detection:	No
Bed cooling enhanc	Yes
Last full inspection:	July 2008
Sequence of events:	30Apr09: 02:16 Tube failure indications: ID Fan to 100%, furnace pressure positive, O2 spiked, steam-water separation increased, steam flow dropped. Inspection found loud noise, not a safety valve. 02:32 Unit ESP'd. 19:30 Began bed cooling via Austin N2 injection. 1May09 09:15 Fill for leak hydro. 12:15 After SH back fill, located leak. 12:30 Start scaffold. 19:00 start repair. 2May09 07:00 repair complete. 12:50 Hydro OK. 18:10 1st fire. 3May09 05:25 On line. 08:00 Liquor in.
Repair procedure:	Installed an 18 ft Dutchman, SA 213 T11
Future prevention:	Plan partial new platens & NDT on primary outlet Row 5 in June. Extensive UT done June 2009 outage. Thinned SH tube sections replaced in area of SH, with additional SH tube replacement in future. SH outlet tube have TCs but DCS connection had failed, so repairs will be made

SUPERHEATER

Fall 2009 -21	
Classification:	**Non-Critical**
Location:	**New Page, Wisconsin Rapids, WI**
Unit:	#2 RU, 1976 CE , #27074, 2-Drum DCE Cascade, 1990 ABB superheater
Unit Size:	1.5 MM lb ds/day; 200,000 lb/hr steam at 1275 psig, 900°F, 1450 psig design
Incident Date:	23 May 2009
Downtime hrs, leak/total:	27.5 hrs
ESP?	**No**
Leak/Incident Loc:	Weeper from crack on solid stitch tie weld between tubes 7 & 8 on LTSH II pendant #12; 70' above floor
How discovered:	**Walk down**. During hydro after annual outage.
Wash adjacent tube:	No
Root cause:	Being analyzed.
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	May 2009
Sequence of events:	Unit was down for annual inspection. During post outage hydro, a weeper was seen on a stitch tie weld. Repairs made to it and nearby cracked stitch welds. A successful hydro was completed 27 ½ hours after the leak was discovered.
Repair procedure:	PT testing identified additional cracks on adjacent stitch ties Installed 3 Dutchman tube sections, using hinge pins instead of stitch tie welds.
Future prevention:	Will increase the inspection of stitch ties in future outages and will continue to utilize hinge pins instead of stitch ties

SUPERHEATER

Fall 2009 -22	
Classification:	**Non-Critical**
Location:	**New Page, Wisconsin Rapids, WI**
Unit:	#3 RB, 1989 CE Canada, #CA 86107, 2-Drum DCE cascade
Unit Size:	1.4 MM lb ds/day188,000 lb/hr steam at 1275 psig, 900°F, 1450 psig design
Incident Date:	29 May 2009
Downtime hrs, leak/total:	45.5 hrs
ESP?	No
Leak/Incident Loc:	5 inch long crack in the heat affected zone of a new weld overlay in LTSH II, element #7, "F" loop; 60' above floor
How discovered:	Walk down. with sootblowers off
Wash adjacent tube:	No
Root cause:	Being analyzed
Leak detection:	Yes Stone and Webster Recovery Boiler Advisor mass balance
Bed cooling enhanc	No
Last full inspection:	May 2009
Sequence of events:	29May09 02:30 During walk down, heard high-pitched whistle coming from front SH section. 03:00 Burned out bed. 05:00 pulled liquor. Orderly shut down. Water-washed SH. Built scaffold. Leak-search hydro found leak. Replaced lop. 30May09, 17:30 Hydro OK. 21:00 1st fire. 31May 02:30 on line.
Repair procedure:	Replaced loop.
Future prevention:	A tube sample was sent out for analysis. The results will determine if any changes/modifications to existing procedures are necessary. It has been common practice to weld overlay the 347 stainless loops that are above minimum, with no previous history of failures.

SUPERHEATER

Fall 2009 -23	
Classification:	**Non-Critical**
Location:	**International Paper, Ticonderoga, NY**
Unit:	#1 RU, 1969 B&W, PR-131, 2-Drum, with 1981 B&W Superheater and Large Economizer
Unit Size:	2.01 MM lb ds/day; 330,000 lb/hr steam at 875 psig, 825°F, 975 psig design
Incident Date:	9 May 2009
Downtime hrs, leak/total:	63 hrs
ESP?	**No**
Leak/Incident Loc:	Pinhole leak in first weld from header (4th feed tube from left side of boiler). Primary Superheater Header Feed Supply Tube
How discovered:	**Walk down** during hydro
Wash adjacent tube:	No
Root cause:	Porosity in original 1969 weld.
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	-
Sequence of events:	7-8May09 –Routine outage and unit wash. 9May09 08:00 During hydro, found leak in SH supply pipe. 13:30 start repair. 17:30 Repair done. 19:50 Hydro OK. Put unit up for extended shutdown.
Repair procedure:	Ground out weld defects and rewelded
Future prevention:	All 10 welds in the same location were radiographically tested during the July annual outage. As a result, 6 of the 10 welds were ground out and replaced.

BOILER

Fall 2009 -24	
Classification:	**Critical Incident #721**
Location:	**MeadWestvaco, Mahrt, AL**
Unit:	1966 B&W, PR-97 2-Drum Large economizer
Unit Size:	2.7 MM lb ds/day; 440,000 lb/hr steam at 875 psig, 825°F, 1000 psig design
Incident Date:	31 July 2009
Downtime hrs, leak/total:	80.4 hrs
ESP?	**Yes**
Leak/Incident Loc:	1/16” pinhole, row 26 tube 6 that washed out adjacent tube in row 27, causing a ¾” x ¼” rupture, at elev 86.3’. Pinhole is in weld on new tab used to hold up newly relocated (Feb 2009) flat vibration bars in boiler bank.
How discovered:	**Panel.** DCS High Feed water-to-Steam flow differential alarm
Wash adjacent tube:	Yes
Root cause:	#1 Faulty weld; #2 Eroded from adjacent leak
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	Feb 2009
Sequence of events:	31Jul09, 04:30 DCS alarmed high FW:Steam flow differential. ID Fan ner max, boiler steam flow down. Investigation confirmed boiler bank leak. 06:09 ESP’d unit. 1Aug09 boiler washed and leak repaired
Repair procedure:	Pin hole leak was pad welded and the rupture was repaired using a window plate
Future prevention:	-

UPPER FURNACE

Fall 2009 -25	
Classification:	**Non-Critical**
Location:	**International Paper, Pensacola, FL**
Unit:	#1 RU, 1975 B&W, (PR-171A?) 726-115978, 2-Drum Large economizer
Unit Size:	2.7 MM lb ds/day; 440,000 lb/hr steam at 875 psig, 825°F, 1000 psig design
Incident Date:	16 July 2009
Downtime hrs, leak/total:	28 hr 8 min
ESP?	No
Leak/Incident Loc:	Small pinhole leak in the external face of RHSW waterwall tube at interface with attachment and adjacent to welded sidewall casing, upper furnace, west side of boiler, 7th floor, back corner of superheater section. Tube surface of the failed area was heavily pitted and showed signs of corrosion
How discovered:	Maintenance mechanic working in general area saw small plume of steam coming from wall tube.
Wash adjacent tube:	No
Root cause:	Pitting and general corrosion in area of an attachment, likely stress assisted corrosion cracking (SACC) seen in similar boilers of this age and construction.
Leak detection:	Yes. Mass balance by IP
Bed cooling enhanc	No
Last full inspection:	Oct 2008
Sequence of events:	16Jul09 Mechanic saw small plume of steam coming from area that appeared to be an external water wall tube leak. Removed insulation. Took liquor off boiler. Leak was external Took orderly shut down. Repaired leak Hydro OK. Did orderly start-up.
Repair procedure:	The pinhole indication in the tube was ground and prepared for welding. The area was NDT prior to the repair and no indications were found. The area was welded and NDT with no indication found after repair. The casing adjacent to the failure was found cracked and was also repaired during this incident
Future prevention:	This area and the opposite wall similar area will be inspected for indications of SAC at the next outage. Tube section(s) will be replaced if needed to remove areas with significant SAC. Documented and communicated to mill crews and management. Reviewed procedure with crews for immediate shutdown once a determination was made concerning the leak.

UPPER FURNACE

Fall 2009 -26	
Classification:	**Critical Incident #722**
Location:	**International Paper, Pineville, LA**
Unit:	#1 RB, 1968 CE, #9466, 2-drum DCE cascade
Unit Size:	3.0 MM lb ds/day; 414,000 lb/hr steam at 875 psig, 825°F, 1000 psig design
Incident Date:	23 June 2009
Downtime hrs, leak/total:	46.5
ESP?	**No**
Leak/Incident Loc:	3-3.5 inch split in ERW seam in the nose arch tube adjacent to the LHSW, at 260 feet elevation
How discovered:	**Walk down**. Saw water coming out from under the lagging near the left side wing wall, just below the mud drum.
Wash adjacent tube:	No
Root cause:	Being analyzed. Some severe waterside pitting on both sides of ERW seam.
Leak detection:	Yes Mass balance by Buckman
Bed cooling enhanc	No
Last full inspection:	June 2009
Sequence of events:	23Jun09, Unit just coming on line, only 15 min of liquor, not smelting yet. Saw water coming out from under the lagging near the left side wing wall, just below the mud drum. 01:30 Pulled liquor. Did orderly shutdown. 02:45 fire out. Saw water running down the nose arch. Continued with the cool down of the boiler in order to make repairs.
Repair procedure:	Tube was removed and 3-foot dutch3 foot Dutchman welded in using GTAW
Future prevention:	Additional inspections to be made at next annual outage

UPPER FURNACE

Fall 2009 -27	
Classification:	**Critical Incident #723**
Location:	**International Paper, Franklin, VA**
Unit:	#5 RU, 1970 ABB-CE, #21868, 2-drum DCE, FurnaceRebuilt 1993
Unit Size:	1.75 MM lb ds/day; 274,000 lb/hr steam at 600 psig, 750°F, 700 psig design
Incident Date:	21 May 2009
Downtime hrs, leak/total:	Down for planned outage due to LOO CMO (lack of orders, cold mill outage)
ESP?	**No**
Leak/Incident Loc:	Pin hole (size of a pen head), tube #35 on RHSW behind nose arch at tube attachment weld to a channel in the middle of the Dead Air Space elevation behind nose arch at 99 foot elevation. (count from rear wall).
How discovered:	**Rounds**. Opened furnace door for cool down and saw wet spot
Wash adjacent tube:	No
Root cause:	Awaiting analysis. Probably SAC. Attachment weld failure possibly due to previous wedging during a repair.
Leak detection:	Yes. IP mass balance
Bed cooling enhanc	No
Last full inspection:	April 2009
Sequence of events:	21May09 Upon opening doors for cool down the operator noticed damp discolored/stained salt cake spot up around the 4 ½ floor door slightly below arch. Confirmed no water lances or IK's in play. Confirmed a tube leak somewhere behind the nose arch. The water wash continued and the boiler was dried. After a successful dry-out, the casing was removed with the boiler full and the tube leak was identified.
Repair procedure:	A 12'-4" dutchman was installed from elevation 94' 11" to 107' 3
Future prevention:	Since 2006, the mill started a four phase approach to eliminate attachment weld problems and poor field welds throughout this area

LOWER FURNACE

Fall 2009 -28	
Classification:	**Non-Critical**
Location:	**International Paper, Franklin, VA**
Unit:	#6 RU, 1977 B&W, PR 185, 2 drum, Low Odor, 1985 B&W furnace rebuild
Unit Size:	3.6 MM lb ds/day; 625,000 lb/hr steam at 1500 psig, 875°F, 1700 psig design
Incident Date:	19 June 2009
Downtime hrs, leak/total:	123 hr 35 min
ESP?	**YES.**
Leak/Incident Loc:	½" crack where one side of attachment clip weld pulled out at rear wall tube #28, 4' 2" above center line of rear wall header (3" above center line of and close to spout opening) on **outside** of boiler
How discovered:	**Walk down**. Saw steam vapor in basement.
Wash adjacent tube:	No
Root cause:	Attachment weld failure not done to manufacturer's spec.. Awaiting analysis
Leak detection:	Yes internal mass balance
Bed cooling enhanc	Yes.
Last full inspection:	October 2008
Sequence of events:	19Jun09, 13:20 Saw steam vapor coming from around the dissolving tank in the basement. Checked all other sources around spouts and tank. All OK, so ESP's unit. 4-hour wait. Located leak
Repair procedure:	Installed 18" Dutchman, from 2" below failed clip to 2" above upper clip. Lower clip was detached to avoid future binding stress. Used channel bridge to relieve stress.
Future prevention:	Rear wall of dog house had not been properly attached to boiler wall. The doghouse skirting was inspected thoroughly and any potential binding points during expansion were removed.

BOILER

Fall 2009 –1110	**INTL 1110**
Classification:	**No classification** (Critical Incident**)**
Location:	**Carter Holt Harvey Pup & Paper, Ltd, Kinleith, New Zealand**
Unit:	#4 RB, 1972 CE, CA 70108, 2 drum DCE, with 1996 CE economizer and 1996 Andritz boiler
Unit Size:	2.5 MM lb ds/day; 397,000 lb/hr steam at 650 psig 750°F, ? psig design
Incident Date:	12 February 2009
Downtime hrs, leak/total:	77.5 hr/81.5 hr
ESP?	**No**
Leak/Incident Loc:	#1 pinhole leak in a previously overlaid (but unrecorded) repair of economizer #8 feed tube at 5 o'clock, aiming at boiler tubes. Three thinned. #2 burst generating bank tube (economizer side) along with 2 others thinned. Elev 138 from floor
How discovered:	Boiler trip on high furnace pressure, furnace pressurized, high FW flow, high ID Fan flow. Water was observed coming from the economiser casing and running down into the ash hopper
Wash adjacent tube:	Yes
Root cause:	#1 Flow accelerated corrosion (FAC), #2 Erosion from nearby leak impingement.
Leak detection:	Yes. In house mass balance, steam-water differential
Bed cooling enhanc	No
Last full inspection:	May 2008
Sequence of events:	In week prior, some leak detection indication of steam-water differential, but not confirmed on unit inspections. 12Feb09, 17:30 Boiler trip on high furnace pressure, furnace pressurized, high FW flow, high ID Fan flow, low drum level. Since water was observed coming from the economiser casing and running down into the ash hopper, no ESP was done. 15Feb09 Hydro OK
Repair procedure:	Three boiler bank tubes (No.s 20, 21 and 22) were plugged and the holed economizer feed tube section was replaced using a pup weld. All three generating bank tubes were holed using gouging electrodes at the bottom of the tube
Future prevention:	Must close feed water valve when a trip occurs per BLRBAC. 14 out of 27 economizer feed tubes were scanned for a similar defect and only tube No. 7. showed thinning up to 2.7mm. This tube has been left in service until the planned May09 annual maintenance shut as it was above the code minimum of 2.37mm. The UT scan was carried out only in about 60deg lower arc on the area only. The full extent of the problem will be verified after detailed NDT activity during the May09 shutdown

ECONOMIZER

Fall 2009 –1111	**INTL 1111**
Classification:	**No classification** (Critical Incident**)**
Location:	**Mondo Swiecie, SA, Swiecie, Poland**
Unit:	#N2103000585, 1991 Ahlstrom Finland # 5516, 2 drum, 2002 new Large economizer
Unit Size:	4.8 MM lb ds/day; 573,000 lb/hr steam at 840 psig 825°F, 900 psig design
Incident Date:	1April2009
Downtime hrs, leak/total:	47
ESP?	**No**
Leak/Incident Loc:	Crack in weld on the tube in upper header on 2nd (hot) economizer; 3rd header on right boiler side, 1st row, 3rd tube (inside), +45m above floor
How discovered:	**Walk down**. Saw water coming from hot economizer hopper
Wash adjacent tube:	-
Root cause:	Stress corrosion fatigue cracking due to tube length thermal expansion.
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	October 2008
Sequence of events:	1Apr09 During start-up after some maintenance, during walk down, saw water in ash hopper. Start-up stopped. Cool down, washed economizer. Located leak. Made repair
Repair procedure:	Leaked tube was cut off, ground out, weld cup to header shell. For access to leaked tube 1st and 2nd tube in this row was cut off and plugged on both headers (upper and bottom)
Future prevention:	-

BOILER

Fall 2009 –1112	**INTL 1112**
Classification:	**No classification** (Critical Incident**)**
Location:	**International Paper, Luiz Antonio, Brazil**
Unit:	1992 CBC-Mitsubishi / Andritz, 2 drum large economizer
Unit Size:	3.7 MM lb ds/day; 540,000 lb/hr steam at 942 psig 842°F, 1131 psig design
Incident Date:	22 April 2009
Downtime hrs, leak/total:	60 hr
ESP?	**Yes**
Leak/Incident Loc:	The tube cracked almost 70% of its perimeter in a diagonal direction at the moment of the failure from a weld of upper anti-vibration tie, in the boiler bank elevation 110 feet , hot section (upward) from the furnace to economizer, first tube closer to the soot blower. The same tube at the bottom anti-vibration bar cracked in the same way in a short length.
How discovered:	**Walk down**.
Wash adjacent tube:	No
Root cause:	Fatigue. Broken vibration tie allowed soot blowers to cause excessive vibration of the tube
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	July 2008
Sequence of events:	22Apr0 18:00 During routine walk down, saw moisture on wall insulation, by boiler bank. 19:30 Removed insulation and saw water below soot blower seal box. 20:00 Began orderly shut down, also pulling more gas toward exit. 21:01 Saw significant amount of water (spread) dropping from some boilers bank tubes. 21:15 Sounded alarms. 21:20 ESP'd the unit. **Note: Flash-to-sky ESP not fully effective since started at lower pressure.** Also, FeedWater leak-through, so back-filled somewhat 23Apr09 01:30 After 4 hour wait, started inspection and cool down.
Repair procedure:	Two new pieces of tube and 3 new antivibration bars were replaced
Future prevention:	Program to install new supports 310ss in all first and second tubes in three levels.

Welcome...

Please remember that all BLRBAC Main Committee and Subcommittee meetings, including this session, are to be held in strict compliance with BLRBAC Antitrust Policy.

Discussions involving prices, pricing policy, or any restraint on competition are not allowed.

BLRBAC 1

ESP Subcommittee

Committee Report
Wednesday October 7, 2009

BLRBAC 2

Meeting Attendance

- Closed session Monday October 5th
  - 13 of 13 members represented
  - David Slagel accepted as new member
- Open session Tuesday October 6th
  - 13 of 13 members
  - About 160 guests

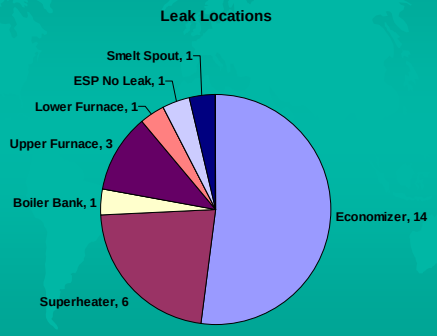
BLRBAC 3

Incident Questionnaire Review

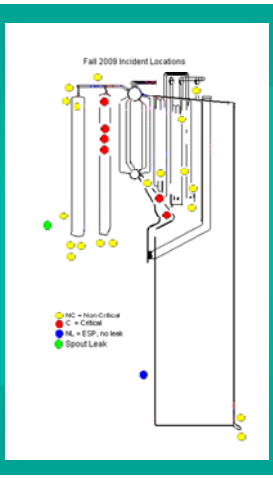
- 27 North American incidents
  - 7 Critical
  - 19 Non-critical
  - Spout Failure
  - 1 ESP No Leak
  - 5 EPD'd
    - 1 Critical
    - 14% of Critical that Should ESP
- 3 International Incidents

BLRBAC 4

Incident Locations

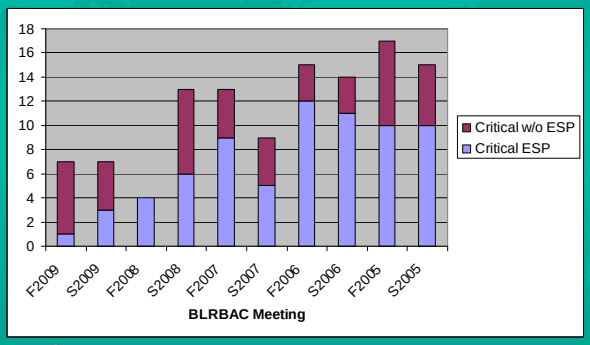


BLRBAC 5



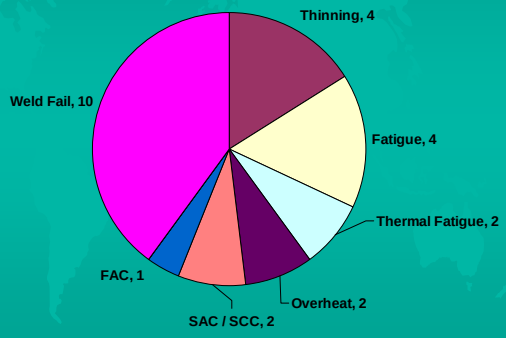
BLRBAC 6

ESP History



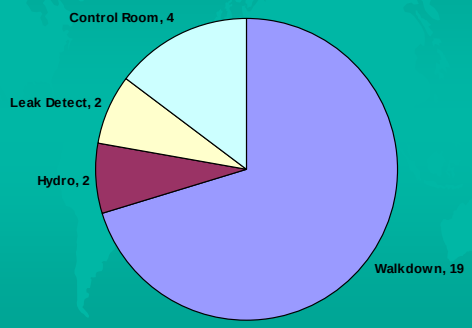
BLRBAC 7

Root Cause



BLRBAC 8

How Discovered



BLRBAC 9

Leak Detection Systems

- Leak Detection Systems installed – 17
  - – Identified leak – 2 both in Economizer
  - – Confirmed leak - 5
  - – Economizer leaks – 10

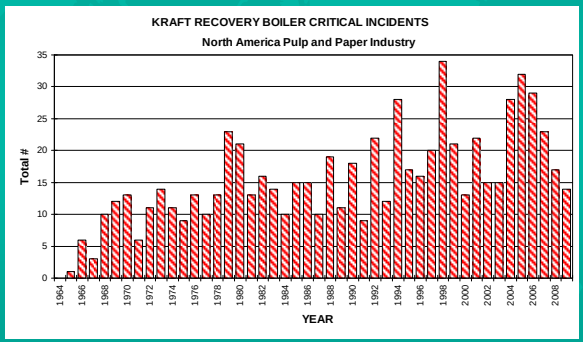
BLRBAC 10

Initiation of ESP

- Ranged from 5 minutes to 1.6 Hrs
- No incidents with smelt water reaction

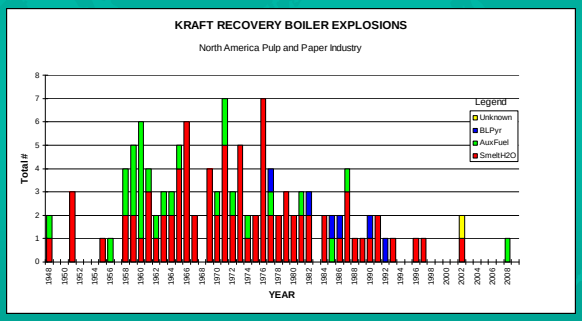
BLRBAC 11

Critical Incidents to Date



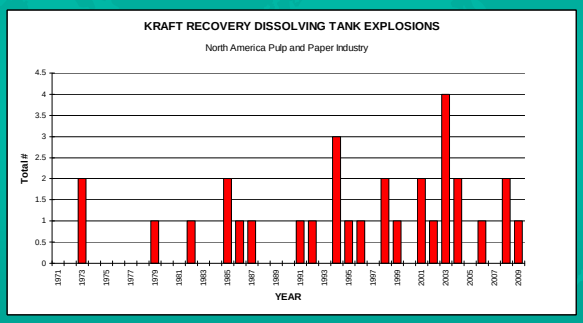
BLRBAC 12

Boiler Explosion History



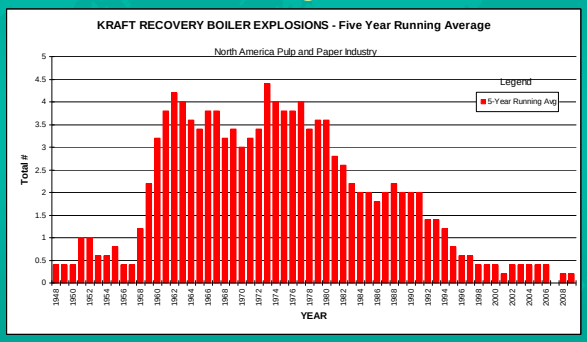
BLRBAC 13

Dissolving Tank Explosions



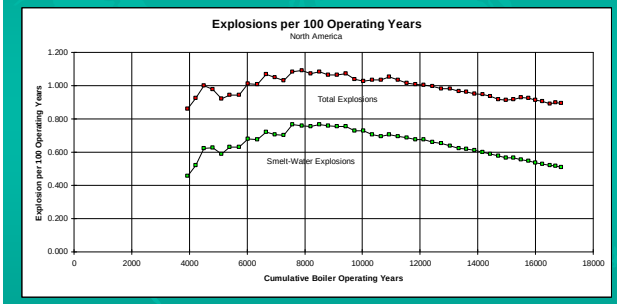
BLRBAC 14

Explosion History - Five Year Avg.



BLRBAC 15

Explosion History per 100 Oper Yr



BLRBAC 16

Learnings

- Need to check expansion slip joints for FW piping through hopper walls
- Small leaks can quickly become large leaks
- Need to check for FAC in feedwater and link piping
  - Typical RB feedwater in range for FAC
  - Higher chrome content of piping provides some protection
- Need to be mindful of stub length for plugged tubes

BLRBAC 17

Learnings

- Clearing of superheater tubes important on start up
- Flat bar vibration restraints need to be checked for erosion
- Use caution in modifying skirts and casing attachments
- Do not restart fans that trip during ESP until after bed has been inspected to confirm no water present

BLRBAC 18

Testing of RDV's

2.2 Routine Operational Checks (add to end)

Only one drain line at a time should be isolated for the monthly motor-operated valve tests; this will allow the remaining drain lines to function as designed if a real ESP is required during the testing period.

BLRBAC 19

ESP Architecture

Suggested Language

Recommended Change to second sentence of Chapter 1:

Upon initiation of the Emergency Shutdown Procedure, a dedicated, stand-alone the system shall perform the following automated actions:

BLRBAC 20

ESP Architecture

Add paragraph after bulleted items on Page 4

The Emergency Shutdown Procedure functions must be activated and executed either by means of relay technology and hard-wiring or other system as described in Chapter 4.2 of the *Instrumentation Checklist and Classification Guide*. In the latter case, it must not be possible to carry out reprogramming during operation or unintentionally. Whatever technology is utilized, the BMS or DCS systems can be used to monitor operation of the functions.
Any time modifications are made to the system, the system shall be functionally tested prior to putting the unit back on line.

BLRBAC 21

Operating Boiler Lists

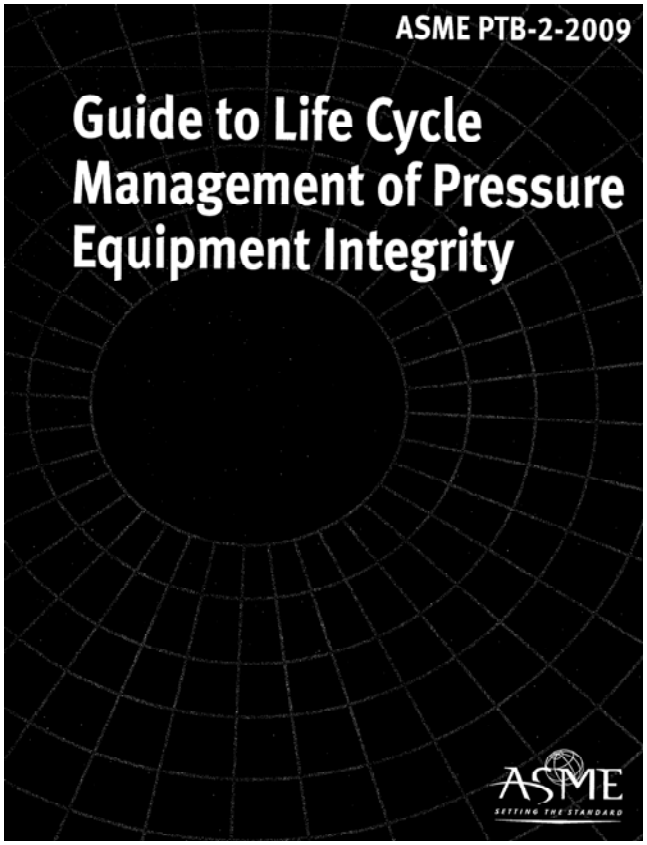
- List of Operating Boilers in US and Canada posted on BLRBAC website.
  - Jules Gommi will maintain
  - Contact Jules with any corrections or updates

BLRBAC 22

Incident Questionnaires

- Obtain Up to Date Questionnaire from website www.blrbac.org
- Submit to Jules Gommi at j.gommi@comcast.net
- 10 meg limit on file size
  - Zip files, compress photos
  - Break into multiple transmissions
- Look for confirmation of receipt from Jules

BLRBAC 23



- CONTENTS

PTB-2-2009

TABLE OF CONTENTS

- Organization

4. Organization of this Guide

This guide is organized by type of equipment as described below. Each equipment type section is intended to stand alone, such that it includes all of the documents for that equipment type. This results in a lot of duplication but should provide a more user-friendly reference. The following equipment types are included.

(a) Guide to documents that apply to boilers including:

(1) Power (steam) boilers

(2) Heat recovery steam generators (HRSGs)

(3) Heating boilers

(4) Unfired steam boilers.

(b) Guide to documents that apply to pressure vessels including:

(1) Typical pressure vessels including towers, drums, reactors, heat exchangers, condensers, air receivers, accumulators, etc.

(2) Large, heavy wall vessels [e.g. >50 mm (2 in)] wall thickness and vessels with high design temperature [e.g. > 370°C (700°F)]

(3) High pressure vessels [e.g. > 70 MPa (10 ksi)] design pressure

(4) Heat exchangers (as a class of pressure vessels).

(c) Guide to documents that apply to storage tanks.

(d) Guide to documents that apply to piping systems.

(e) Guide to documents that apply to piping components including fittings

(1) Some pressure equipment contains components such as flanges, valves, expansion joints and other fittings. Specifications and standards for these components are generally referenced in the new construction codes. A listing of these documents is provided in paragraph 8 of this guide.

(f) Guide to documents that apply to overpressure protection.

(g) Guide to documents that are focused on specific tasks, such as welding and non-destructive examination, that are routinely performed as a part of both new and post construction.

Appendix A contains a summary of each document that is referenced in this guide describing:

(a) Title of the document

(a) Edition that was current when this guide was prepared. The user should check for updates. In particular, note that the general practice is to update or to reaffirm documents that have been ANSI approved every 5 years. Therefore, if an ANSI approved document has an edition date more that 5 years old, it would be prudent to check for updates.

(b) An alternative number for the document (e.g., an ISO number) if applicable

(c) Whether or not the document has been approved by ANSI

(d) Summary of the scope of the document with comments

(e) A description of the way in which the document is typically applied. For example:

(1) Referenced in a purchase specification

- Example using the Power Boiler Section
- (Note where BLRBAC should be listed)

6. Power (Steam) Boilers

These documents are briefly summarized in the paragraphs that follow. A more detailed summary of each document can be found in Appendix A. In electronic versions of this Guideline, the document number in Table 1 is hyperlinked to the description in Appendix A.

Table 1: Power (Steam) Boilers

Specification / Purchase	Design / Construction	Operation
NB-370 NB-23 PCC-3 RP 578 ASCE/SEI 7	BPVC Section I BPVC Section II – Materials - Part A BPVC Section II – Materials - Part B BPVC Section II - Materials Part C BPVC Section II – Materials – Part D BPVC Section V BPVC Section IX RP 578 ASCE/SEI 7 PCC-1	BPVC Section VII BLRBAC?
In-Service Inspection	**Fitness-For-Service**	**Repair**
NB-23 NB-370 PCC-3 RP 573 BPVC Section VII EPRI CS-523 EPRI CS-5208 BPVC Section V CP-189 RP SNT-TC-1A TAPPI?	API 579-1/ASME FFS-1 EPRI CS-5208	NB-23 NB-370 PCC-2 PCC-1 RP 577 RP 578 BPVC Section IX

6.1. Specification (Purchase) of Power (Steam) Boilers

Before acquiring a new boiler, it is important for the equipment owner/user to consider the life cycle cost and pressure integrity requirements for the equipment, including requirements for in-service inspection, testing, maintenance and repair. This will allow the design and construction to be optimized to provide appropriate access for these activities, as well as provide ways for minimizing the impact of possible repairs. Some of the steps in this consideration, and the documents that should be considered for each step, are:

(a) Determine which design and construction codes will be specified. These are described in paragraph 6.2.

(b) Determine legally mandated new construction and in-service inspection requirements. Requirements of legal jurisdictions in the US and Canada can be obtained from NB-370 *National Board Synopsis of Boiler and Pressure Vessel Laws, Rules and Regulations*. Most individual jurisdictions have made the full version of applicable laws and regulations

available on their respective web sites and hard copies are generally made available on request.

(c) Determine potential manufacturers. One useful reference is the National Board *Manufacturer and Repair Directory*, an online searchable directory containing a listing of manufacturers of pressure equipment and pressure relief devices and repair organizations.

(d) Determine third-party or other contractual requirements, such as insurance requirements, that may exist. Some insurance companies have specific requirements for design, construction, inspection and operation of pressure equipment. Some building owners or owner entities impose conditions for use of their facilities that may apply to pressure equipment.

(e) Determine the methods and frequency of in-service inspection that will be needed to ensure equipment integrity. Post construction (in-service) documents that should be considered in the design/specification/ new construction phase are listed in the following paragraphs. Note that some post-construction codes provide for the evaluation of damage in pressure equipment using methods and acceptance criteria that are not permitted by the new construction codes. This is consistent with the intent of many new construction codes to provide a margin for deterioration in service. Therefore, it is not necessary to satisfy all of the new construction rules after the equipment has been placed in service.

(1) NB-23 National Board Inspection Code Part 2 (Inspection) provides rules for in-service inspection that are mandatory in many jurisdictions. NB-370 provides some guidance on this. (Also, see paragraph (b), above).

(2) PCC-3 Inspection Planning Using Risk-Based Methods can be used to develop an optimum, cost-effective inspection program for all pressure equipment. This standard uses an analytical risk-based approach to provide more detailed guidance on developing an optimum inspection plan than does NB-23. However, PCC-3 should be used as a supplement to the basic requirements in NB-23, as permitted by that document. For a small, simple boiler, the basic guidance in NB-23 may be sufficient.

(f) Determine if there are additional documents that should be referenced in the purchase specification. For example:

(1) RP 578 *Material Verification Program for New and Existing Alloy Piping Systems*. The use of material other than the material specified can result in failures in service. "Positive Materials Identification" (PMI) is one way to minimize these failures. Although RP 578 is targeted toward piping systems, the principles can be used for other alloy equipment. Note that PMI is not normally performed on equipment constructed of carbon steel. However, it should be applied in cases where substitution of another alloy for a specified alloy can result in failure with significant safety, health, environmental or financial losses. This can be determined by a risk assessment using the methods of risk-based inspection (Also, see 6.4(b))

(2) ASCE/SEI 7 *Minimum Design Loads for Buildings and Other Structures*. This document is used primarily by manufacturers and designers of pressure equipment to determine the magnitude of earthquake and wind loads.

6.2. Design and Construction of Power (Steam) Boilers

The ASME Boiler and Pressure Vessel Code, Section I (BPVC Section I) provides rules for construction of power boilers. These rules are mandatory in most jurisdictions in the US and Canada,

and are frequently used worldwide. Section I references many other codes and standards, a few of which are listed below. If a user requires Section I construction in a purchase document, the internal references in Section I become mandatory as well.

(a) BPVC Section II – Materials - Part A *Ferrous Material Specifications*

(a) BPVC Section II – Materials - Part B *Nonferrous Material Specifications*

(b) BPVC Section II - Materials Part C *Specifications for Welding Rods Electrodes and Filler Metals*

(c) BPVC Section II – Materials – Part D *Properties (Customary)*

(d) BPVC Section II – Materials – Part D *Properties (Metric)*

(e) BPVC Section V *Nondestructive Examination*

(f) BPVC Section IX *Welding and Brazing Qualifications*

(g) RP 578 *Material Verification Program for New and Existing Alloy Piping Systems*. The use of material other than the material specified can result in failures in service. "Positive Materials Identification" (PMI) is one way to minimize these failures. Although RP 578 is targeted toward piping systems, the principles can be used for other alloy equipment. Note that PMI is not normally performed on equipment constructed of carbon steel. However, it should be applied in cases where substitution of another alloy for a specified alloy can result in failure with significant safety, health, environmental or financial losses. This can be determined by a risk assessment using the methods of risk-based inspection (see 6.4(b))

(h) ASCE/SEI 7 *Minimum Design Loads for Buildings and Other Structures*. This document is used primarily by manufacturers and designers of pressure equipment to determine the magnitude of earthquake and wind loads.

(i) PCC-1 *Guidelines for Pressure Boundary Bolted Flange Joint Assembly* provides guidance on techniques for flange joint assembly to minimize leakage in service.

6.3. Operation of Power (Steam) Boilers

BPVC Section VII *Recommended Guidelines for the Care of Power Boilers*.

6.4. In-service Inspection of Power (Steam) Boilers

The following documents apply to the in-service inspection of power boilers. They should be considered to be good engineering practices, with applicability that depends on the situation. However, in many cases, the manufacturers of power boilers have compiled the guidance of the applicable documents in an installation and operating manual (IOM).

(a) NB-23 *National Board Inspection Code* Part 2 (Inspection) provides rules for in-service inspection that are mandatory in many jurisdictions. NB-370 provides some guidance on this. (Also, see paragraph 6.1(b)).

(b) ASCE/SEI 7 *Inspection Planning Using Risk-Based Methods* can be used to develop an optimum, cost-effective inspection program for all pressure equipment. This standard uses an analytical risk-based approach to provide more detailed guidance on developing an optimum inspection plan than does NB-23. However, PCC-3 should be used as a supplement to the basic requirements in NB-23, as permitted by that document. For a small, simple boiler, the basic guidance in NB-23 may be sufficient.

(c) RP 573 *Inspection of Fired Boilers and Heaters*. Although this document was written based primarily on refinery experience, it can be considered to be generally applicable. It covers process heaters as well as power (steam) boilers.

(d) BPVC Section VII *Recommended Guidelines for the Care of Power Boilers*

(e) EPRI CS-523 *Recommended Practices for Operating and Maintaining Steam Surface Condensers*

(f) EPRI CS-5208 *Life Extension and Assessment of Fossil Power Plants (Conference Proceedings)*.

In implementing an in-service inspection plan, various nondestructive examination (NDE) techniques are often used. Guidance in this area can be found in the following documents:

(a) BPVC Section V *Nondestructive Examination*

(a) CP-189 *ASNT Standard for Qualification and Certification of Nondestructive Testing Personnel*

(b) RP SNT-TC-1A *Personnel Qualification and Certification in Nondestructive Testing*. The major difference between RP SNT-TC-1A and CP-189 is that the latter is a standard while the former is a recommended practice. It is probably not necessary to use both.

6.5. Fitness-for-service Analysis of Power (Steam) Boilers

If damage is discovered in a pressure retaining item, the damage should be either repaired (see paragraph 6.6) or subjected to a fitness-for-service (FFS) assessment to determine whether the item is acceptable for continued service without repair. These methods can also be used in combination (e.g., some portions of the damaged area can be repaired while others could be assessed). The fitness-for-service assessment could result in one or more of the following actions.

(a) Continue operation at current operating conditions with periodic inspection or monitoring for further damage.

(b) De-rate the equipment by reducing pressures, temperatures and/or other loads to reduce stresses.

(c) Repair the equipment.

The following documents can be used for the fitness-for-service (FFS) assessment.

(a) API 579-1/ASME FFS-1 *Fitness-For-Service*. This document provides detailed guidance on the evaluation of many types of flaws to help the user determine whether re-rating or repairs are needed.

(a) EPRI CS-5208 *Life Extension and Assessment of Fossil Power Plants (Conference Proceedings)*.

6.6. Repair of Power (Steam) Boilers

If the FFS assessment (see paragraph 6.5) indicates that a repair is necessary for continued operation, the following documents provide guidance on many repair methods.

(a) NB-23 *National Board Inspection Code* Part 3 (Repairs/Alterations) provides rules for repairs and alterations that are mandatory in many jurisdictions. NB-370 provides some guidance on this.

(b) PCC-2 *Repair of Pressure Equipment and Piping*. PCC-2 provides guidance on a broad range of repair techniques that can be employed.

(c) PCC-1 *Guidelines for Pressure Boundary Bolted Flange Joint Assembly* provides guidance on techniques for flange joint assembly to minimize leakage in service.

(d) RP 577 *Welding Inspection and Metallurgy*. This document can also be used for inspection of new construction.

(e) RP 578 *Material Verification Program for New and Existing Alloy Piping Systems*. The use of material other than the material specified can result in failures in service. "Positive Materials Identification" (PMI) is one way to minimize these failures. Although RP 578 is targeted toward piping systems, the principles can be used for other alloy equipment. Note that PMI is not normally performed on equipment constructed of carbon steel. However, it should be applied in cases where substitution of another alloy for a specified alloy can result in failure with significant safety, health, environmental or financial losses. This can be determined by a risk assessment using the methods of risk-based inspection (see 6.4(b))

(f) BPVC Section IX *Welding and Brazing Qualifications*.

- Examples of Summary of Referenced Standards

A-12 RP 571 *Damage Mechanisms Affecting Fixed Equipment in the Refining Industry*

Current Edition:	First Edition, December 2003 (257 pages)
Alt. Number:	None
ANSI Approved?	No
Scope:	Provides detailed descriptions of the damage mechanisms that can affect pressure equipment in the refining and petrochemical industries.
Application:	Owners and users of piping systems, particularly plant inspection personnel, can use API 571 to assist in identifying the likely causes of damage in equipment. When the most likely types of damage have been identified, an inspection program can be designed to locate the damage before a failure occurs.
Comments:	API 571 provides detailed descriptions of approximately 70 damage mechanisms. Of these, 44 apply generally to a broad range of industries. The description of each damage mechanism includes: A description of the damage and the materials affected. A list of the "critical factors" or variables that lead to the damage. The appearance or morphology of the damage, often with photographs. Prevention/mitigation, inspection and monitoring techniques The descriptions of the damage mechanisms are much more detailed than the descriptions in ASME PCC-3 and API RP 580. Note that WRC Bulletin 489 is a "sister document" to API RP 571.
User:	Purchaser: —; Consultant: S; Owner: P; Inspector: P; Regulator: S P – Primary User S – Secondary User

A-16 RP 575 *Guidelines and Methods for Inspection of Existing Atmospheric and Low-pressure Storage Tanks*

Current Edition:	Second Edition, May 2005 (68 pages)
Alt. Number:	None
ANSI Approved?	Yes
Scope:	This document provides useful information and recommended practices for the maintenance and inspection of atmospheric and low-pressure storage tanks. While some of these guidelines may apply to other types of tanks, these practices are intended primarily for existing tanks that were constructed to API Spec 12A and API Spec 12C, and API Std 620 and API Std 650.
Application:	This RP can be used by inspectors and plant owners as an aid in the proper inspection of atmospheric and low-pressure storage tanks used in refineries and petrochemical plants. It can also be used by consultants and regulators in assessing the adequacy of a plant's inspection program.
Comments:	The main topics covered in this RP are reasons for inspection; causes of deterioration; inspection frequency and scheduling; methods of inspection; leak testing and hydraulic integrity of the bottom; integrity of repairs and alterations; and records. It also includes three appendices: 1) Selected nondestructive examination (NDE) methods, 2) Similar service evaluation tables and 3) Selected bibliography. Some of the information contained in this RP was previously presented as Chapter XIII of the API Guide for Inspection of Refinery Equipment, which is being reorganized as an individual RP. The information in this RP does not constitute, and should not be construed as, a code of rules, regulations or minimum safe practices. The practices described on this RP are not intended to supplant other practices that have proven satisfactory, nor is this recommended practice intended to discourage innovation and originality in the inspection of refineries and chemical plants. Users of this RP are reminded that no book or manual is a substitute for the judgment of a responsible, qualified inspector or piping engineer.
User:	Purchaser: —; Consultant: S; Owner: P; Inspector: P; Regulator: S P – Primary User S – Secondary User

PTB-2-2009

A-19 RP 578 *Material Verification Program for New and Existing Alloy Piping Systems*

Current Edition:	First Edition, May 1999 (7 pages)
Alt. Number:	None
ANSI Approved?	No
Scope:	The purpose of this RP is to provide the guidelines for a material and quality assurance system to verify that the nominal composition of alloy components within the pressure envelope of a piping system is consistent with the selected or specified construction materials to minimize the potential for catastrophic release of toxic or hazardous liquids or vapors. This RP provides the guidelines for material control and material verification programs on ferrous and nonferrous alloys during the construction, installation, maintenance and inspection of new and existing process piping systems covered by ASME B31.3 and API 570 piping codes. This practice applies to metallic alloy materials purchased for use either directly by the owner/user or indirectly through vendors, fabricators, or contractors and includes the supply, fabrication and erection of these materials. **Carbon steel components specified in new or existing piping systems are not specifically covered under the scope of this document.**
Application:	A material verification program for piping systems may involve participation of several groups within the operating plant or the shop of a contractor, vendor or fabricator. When establishing a material verification program, consideration should be given to the roles and responsibilities that each group has within the specific organization. These roles and responsibilities should be clearly defined and documented. Within the operating plant, this can include those groups responsible for purchasing, engineering, warehousing/receiving, operating, reliability, maintenance and inspection.
Comments:	The main topics covered in this RP are extent of verification (new and existing piping); material verification program test methods; evaluation of PMI test results; and marking and record-keeping. When determining the need to perform material verification on carbon steel systems, the effect that the process steam could have on substituted alloy materials should be evaluated. In some cases, the substitution of hardenable alloy materials in carbon steel piping systems resulted in failure and loss of containment. Examples of such systems include wet hydrogen sulfide (H_2S), hydrofluoric acid (HF) and sulfuric acid (H_2SO_4) services.
User:	Purchaser: P Manufacturer: P Owner: P Inspector: P Erector: P P – Primary User S – Secondary User

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A-87 BPVC Section I *Rules for Construction of Power Boilers*

Current Edition:	2007 (248 pages)
Alt. Number:	None
ANSI Approved?	Yes
Scope:	This code covers rules for construction of power boilers, electric boilers, miniature boilers, high-temperature water boilers and heat recovery steam generators to be use in stationary service and includes those power boilers used in locomotive, portable and traction service. The scope of jurisdiction of Section I applies to the boiler proper and to the boiler external piping. Superheaters, economizers and other pressure parts connected directly to the boiler without intervening valves shall be considered as parts of the boiler proper, and their construction shall conform to Section I rules.
Application:	This standard is intended for use by organizations that maintain or have access to engineering and inspection personnel technically trained and experienced in boiler design, fabrication, repair, construction and inspection. Regulators may use as desired.
Comments:	The first part of this document contains a section covering the general requirements for all methods of construction. Subsequent sections cover requirements for boilers fabricated by welding, requirements for boilers fabricated by riveting, requirements for boilers fabricated by brazing, requirements for watertube boilers, requirements for firetube boilers, optional requirements for feedwater heater, requirements for miniature boilers, requirements for electric boilers, requirements for organic fluid vaporizers and requirements for heat recovery steam generators.
User:	Manufacturer: P Consultatnt: P Owner: P Inspector: P Regulator: S P – Primary User S – Secondary User

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A-100 BPVC Section IX *Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operations*

Current Edition:	2007 (276 pages)
Alt. Number:	None
ANSI Approved?	Yes
Scope:	This section of the ASME Boiler and Pressure Vessel Code relates to the qualifications of welders, welding operators, brazers and brazing operators, and the procedures that they employ in welding and brazing according to the ASME Boiler and Pressure Vessel Code and the ASME B31 Code for Pressure Piping. It is divided into two parts: Part QW gives requirements for welding and Part QB contains requirements for brazing. Others sections of the code may specify different requirements than those specified by this section. Such requirements take precedence over those of this section, and the manufacturer or contractor shall comply with them. The main topics in the welding Part QW are welding general requirements; welding procedure qualification; welding performance qualifications; welding data; and standard welding procedure specifications (SWPSs). The main topics in brazing Part QB are brazing general requirements; brazing procedure qualifications; brazing performance qualifications; and brazing data.
Application:	Purchasers can reference this section in purchase specification for new equipment or repairs and modifications to existing equipment. Manufacturers and field contractors need it to comply with the purchase specification when the section is cited therein.
Comments:	This section provides detailed procedures to qualify welders and brazers (operate manual or semi-automatic equipment) and welding and brazing operators (operate machine or automatic equipment) and also the procedures employed. It also contains acceptance standards.
User:	Purchaser: P Manufacturer: P Field Contractor: P Inspector: Regulator: P – Primary User S – Secondary User

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- Examples using the 2 ASNT Programs

A-109 RP SNT-TC-1A *Personnel Qualification and Certification in Nondestructive Testing*

Current Edition:	2006 (31 pages)
Alt. Number:	None
ANSI Approved?	No
Scope:	This recommended practice establishes the general framework for a qualification and certification program for nondestructive testing. In addition, the document provides recommended educational experience and training requirements for the different test methods. Supplementary documents include question and answer lists, which may be used in composing examinations for nondestructive testing personnel. The following apply to this recommended practice. • It is recognized that the effectiveness of nondestructive testing (NDT) applications depends upon the capabilities of the personnel who are responsible for, and perform, NDT. This recommended practice has been prepared to establish guidelines for the qualification and certification of NDT personnel whose specific jobs require appropriate knowledge of the technical principles underlying the nondestructive tests they perform, witness, monitor or evaluate. • This document provides guidelines for the establishment of a qualification and certification program. • These guidelines have been developed by The American Society for Nondestructive Testing Inc., to aid employers in recognizing the essential factors to be considered in qualifying personnel engaged in any of the NDT methods listed in Section 3 (Acoustic Emission Testing, Electromagnetic Testing, Laser Testing Methods, Leak Testing, Liquid Penetrant Testing, Magnetic Flux Testing, Neutron Radiographic Testing, Radiographic Testing, Thermal/Infrared Testing, Ultrasonic Testing, Vibration Analysis, Visual Testing). • It is recognized that these guidelines may not be appropriate for certain employers' circumstances and/or application. In developing a written practice as required in Section 5, the employer should review the detailed recommendations presented herein and modify them, as necessary, to meet particular needs.
Application:	This recommended practice is intended for use by persons who are in charge of the training, qualification and certification of personnel who are responsible for and perform nondestructive testing.

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AMERICAN SOCIETY OF NONDESTRUCTIVE TESTING STANDARDS

A-108 CP-189 *ASNT Standard for Qualification and Certification of Nondestructive Testing Personnel*

Current Edition:	2006 (14 pages)
Alt. Number:	None
ANSI Approved?	Yes
Scope:	This standard specifies the procedures, essential factors, and minimum requirements for qualifying and certifying NDT personnel. The standard: • Establishes the minimum requirements for the qualification and certification of nondestructive testing (NDT) and Predictive Maintenance (PdM) personnel • Details the minimum training, education and experience requirements for NDT personnel and provides criteria for documenting qualifications and certification • Requires the employer to establish a procedure for the certification of NDT personnel • Requires that the employer incorporate any unique or additional requirements in the certification procedure.
Application:	This standard is intended for use by persons who are in charge of the training, qualification and certification of the personnel who are responsible for, and perform, nondestructive testing.
Comments:	A complementary standard to ANSI/ASNT CP189-2006 is ASNT Standard Topical Outlines for Qualification of Nondestructive Testing Personnel (Document No. ANSI/ASNT CP-105-2006). This standard specifies the body of knowledge to be used as part of a training program qualifying and certifying NDT personnel. The scope of ANSI/ASNT CP-105-2006: • Establishes the minimum topical outline requirements for the qualifications of nondestructive testing (NDT) personnel • Details the minimum training course content for NDT personnel • Specifies that the amount of time spent on each topic in each method should be determined by the NDT Level III and the applicable certification document • These topical outlines are progressive; i.e., consideration as Level I is based on satisfactory completion of Level I training course; consideration as Level II is based on satisfactory completion of both Level I and Level II training courses • Topics in the outlines may be deleted or expanded to meet the employer's specific applications or for limited certification, unless stated otherwise by the applicable certification procedure or written practice. Note: While ANSI/ANST CP-189-2006 refers to NDT Level III, it does not cover certification for Level III.
User:	Company: P; Instructor: P; Owner: P; Inspector: S; Regulator: P – Primary User S – Secondary User

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TAPPI Steam & Power/Energy Management Committee

Officers:

- Chairman – Norris Johnston - Hercules
- Vice Chair – John Andrews – Mead-Westvaco
- Secretary – Dave Parrish – Factory Mutual
- Membership Chair – Jim Dickinson – B&W

Subcommittees:

- Recovery & Power Boilers – Alarick Tavares - GP
- Water Treatment– Jim Graham – Buckman Labs
- Energy– Tom Harriz – Jacobs
- Gasification – Dan Chuchro – FM Global

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Membership:

79 members

- 17 Mill
- 16 Suppliers
- 20 Consultants
- 10 AE Firms
- 16 Other (University, Retired, Labs, etc.)

Subcommittee Breakdown:

Recovery & Power Boilers	41
Water Treatment	10
Energy	19
Gasification	9

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Objectives:

To develop & disseminate information, and provide best practice guidelines related to:

- Design & operation of recovery boilers, evaporators, NCG systems & related equipment
- Steam generation from solid fuels, such as coal, bark, wood refuse and MSW
- Thermal and electric power cycle design, operating performance and energy policy considerations
- Design requirements for boiler feedwater systems, monitoring requirements for boiler feedwater and condensate systems and response to feedwater contamination.
- Design, application and operation of gasification technologies for biomass and black liquor.

Activities:

- Develop TIP's (Tech. Info. Papers/Proc.)
- Support TAPPI Conferences with technical program items, coordination

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Recovery Boiler – Recently Released TIP's

- Specification for Procurement of Recovery Boiler Economizer
  - Developed from AF&PA Economizer Study
- Recommended Test Procedures for Black Liquor Evaporators
  - Documents test procedures for evaporators
- Recovery Boiler Sootblowers
  - Two TIP's – "The Basics" and "Practical Guidelines"
- Recovery Boiler Performance Calculation Forms
  - Long Form/in publication form - Short Form/includes spreadsheet

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Recovery Boiler – Past/Recently Released TIP's

- Stripping of Kraft Pulping Process Condensates–Regulations, Design & Operations
- Collection and Burning of Concentrated NCG's – Regulations, Design, Operation
- Recovery Boiler Energy Efficiency Improvements
- Effect of Composition on the First Melting Temperature of Fireside Deposits in Rec. Blrs.
- K and Cl Measurement and Control in the Pulping & Recovery Cycle

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Recovery Boiler – Current Activities:

- Guidelines for Replacement of Generating Bank Tubes with Expanded Joints in Two-drum Boilers
  - Being updated, 5-year mandatory review
  - Just finished, submitted to TAPPI
- Guidelines for Operating and Maintenance Impacting Recovery Boiler Economizers
  - New TIP, Appendix 2 from recent AF&PA economizer study - Jack Clement
  - Recently completed/finalized, in publication

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Power Boiler – Recently Released TIP's:

- "Performance Test Procedure for Boilers Using Biomass as a Fuel"
- "Sampling Procedures for Biomass Fuel for Boiler Performance Testing"
  - TAPPI Technical papers, made into two separate TIP's

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Water Treatment Activities

- Keys to Successful Cleaning of Boilers
  - Mandatory 5-year review
  - Edited, reviewed, released to TAPPI
- Water Quality and Monitoring Requirements for Paper Mill Boilers Operating on High Purity Feedwater
  - Mandatory 5-year review
  - Editing, review underway
- Water Quality Guidelines and Monitoring Requirements for Paper Mill Boilers Operating with Softened Make-up Water
  - Mandatory 5-year review
  - Editing, review underway
- The A-B-C's of Ion Exchange
- Steam Purity
- Boiler Water Considerations: Start-Up, Shutdown, Out-of-Service Storage
  - Panel Discussion planned for 2010 TAPPI Conference
  - TIP development to follow

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Meetings:

- Twice/year
  - Fall Technical Conference + Spring
    - Next Meeting – Oct. 12, 2009 – Memphis (@ TAPPI EPE Conf.)

2009 TAPPI Engineering, Pulping & Environmental Conference

- October 11-14, 2009
- Memphis, TN
- Reyhaneh Shenassa, Metso – Steam & Power Program Chair

Requirements to Join?

- TAPPI Member
- Interest in working on activities of the Subcommittees

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