BLACK LIQUOR RECOVERY BOILER
ADVISORY COMMITTEE

MINUTES OF MEETING
Crowne Plaza Hotel/Atlanta Airport
Atlanta, Georgia
April 12, 13 & 14, 2010

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

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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

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BLRBAC MEETING SCHEDULE

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

SCHEDULE List of Subcommittee activities on Monday and 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.

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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

Materials & Welding Guidleines
(Dated: April 2009)
Safe Firing of Black Liquor in Black Liquor Recovery Boilers
(Dated: April 2010)
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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Subcommittee did not meet in the spring of 2010. Next meeting scheduled for fall of 2010.

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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 Cell: 513-288-5750 Fax: 804-201-2192 **douglas.murch@meadwestvaco.com**	**Sandi Sims** Alabama River Pulp. P. O. Box 100 Perdue Hill, AL 36470 Tel: 251-743-8552 Fax: N/A **sandis@ariver.com**

‡ = Denotes attendance at meeting April 2010

WASTE STREAMS SUBCOMMITTEE

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‡Henry Beder 14150 NE 32nd Place Bellevue, WA 98007 Tel: 425-861-6801 Cell: 425-516-8225 Fax: 425-516-8225 hbeder@comcast.net	**‡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** International Paper 7600 Highway 10 West Pine Hill, AL 36769 Canada T8V 3A9 Tel: 334-963-2362 Cell: 541-285-1867 wendy.coyle@ipaper.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	‡Melville Hedges for: **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	**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	‡**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., Ste 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	

‡ = Denotes attendance at meeting April 2010

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**

‡ = Denotes attendance at meeting April 2010

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, Inc. 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**		

‡ = Denotes attendance at meeting April 2010

Registered for the meeting were:

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

Acuren Inspection
Bundrick, Richard, Longview, TX
Treat, Jim, Southbury, CT

AE&E Austria GmbH & Co KG
Merriman, Nick, Graz, Austria

AirTek Construction
Bringman, Lewis, Linthicum, MD
Johnson, Al, Troy, AL
Wells, John, Troy, AL

Alabama River Pulp
Cosson, Billy, Perdue Hill, AL
John, Perdue Hill, AL
Jordan, Chuck, Perdue Hill, AL
Standridge, Tim, Perdue Hill, AL

Alstom Power
Bush, Joe, Chattanooga, TN
Pollinger, Kevin, Windsor, CT
Rushing, Mike, Monticello, MS

American Forest & Paper Assoc.
Grant, Thomas, Yonkers, NY

Andritz
Collins, Peter, Roswell, GA
Davis, Joe, Roswell, GA
Grace, Todd, Roswell, GA
Kujanpaa, Olli, Roswell, GA
Moser, Alex, Roswell, GA
Phillips, John, Roswell, GA
Rose, Aaron, Roswell, GA
Silva, Ageu, Roswell, GA
Soderlund, Harri, Rosswell, GA
Timotheo, Alvaro, Roswell, GA

Aquilex SRO
DiMaggio, Pat, Norcross, GA
Izzo, Chris, Norcross, GA
Johasz, Mike, Norcross, GA
Lewis, Norcross, GA

Ashland
Johnston, Norris, Lacey's Spring, AL

Atlantic Combustion Tech.
Krygsveld, David, Amherst, NS

Austin Fire Equipment
Tourres, Jack, Prairieville, LA

AXA Corporate Solutions
Abel, Fred, Lyon, France

Babcock & Wilcox
Blazer, Phil, Charlotte, NC
Glidden, Shannon, Soddy Daisy, TN
Hansen, Kenneth, Barberton, OH
Hedges, Meville, Atlanta, GA
Hicks, Timothy, Barberton, OH
Hiner, Larry, Barberton, OH
Kulig, John, Barberton, OH
Sherlock, H. Bentley, Atlanta, GA
Yash, John, Atlanta, GA

BE&K Construction
Dean, Jerry, Gainesville, GA

Boise Inc.
Davis, Matt, Jackson, AL
Erickson, Leonard, Boise, ID
Przybylski, Tom, International Falls, MN
Smith, Brian, Jackson, AL

CNA Risk Control
Walker, Billy, Apex, NC

Registered for the meeting were:

CB Anthony Ross
Adams, Wayne, Clinton, NC

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

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

Clearwater Paper
Wren, David, Lewiston, ID

CORR System
Ruiz de Molina, Eladio, Birmingham, AL

Delta National Kraft
Taylor, Jim, Pine Bluff, AR

Delta Training Partners
Lewis, Sam, Wilmington, NC

Diamond Power
Mangelli, Louis, Lancaster, OH
Youssef, Simon, Lancaster, OH

Domtar Paper Company
Avery, David, Bennettsville, SC
Walker, Robert, Bennettsville, SC
Worsham, Jesse, Bennettsville, SC

EQR Solutions
Hoffman, Nancy, ????

Evergreen Packaging
Bragg, Scott, Canton, NC
Holland, Brook, Canton, NC

F. L. Smidth Airtech
Collier, Cale, Evans, GA

Fluor
Lewis, John, Greenville, SC

FM Global
Baro, Joachim, Hagen, Germany
Cooke, Craig, Oconomowoc, WI
Crysel, Scott, Plano, TX
Hoffman, Daryl, Prosper, TX
Labonte, Guy, Montreal, Que.
Lang, David, Little Elm, TX
Matarrese, Rick, Alpharetta, GA
Morgan, Rick, Plano, TX
Onstead, Jimmy, Plano, TX
Parrish, David, Norwood, MA
Polagye, Mike, Norwood, MA

FPInnovations
Singbeil, Douglas, Vancouver, BC

GE Water
Robinson, James, Trevose, PA

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

Georgia-Pacific
Flach, Don, Palatka, FL
Harrod, Chad, Brunswick, GA
Holm, Ralf, Atlanta, GA
Lane, Terry, Brunswick, GA
Morency, Karl, Atlanta, GA
Moyer, Scott, Palatka, FL
Stefanie, Atlanta, GA
Tavares, Alarick, Atlanta, GA

Glatfelter Co.
Gentzler, William, Spring Grove, PA

Registered for the meeting were:

Global Marine & Energy
DeBeer, Thomas, Woodstock, GA
Veltre, John, Woodstock, GA

Global Risk Consultants
Smith, Andy, Woodstock, GA

GommiTech
Gommi, Julius, Maple Valley, WA

Graphic Packaging International
Broda, William, Macon, GA
Hutchison, Frank, Macon, GA
Jackson, Kevin, Macon, GA

Greif, Allen
Steve, Amherst, VA

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

HSB I&I Co.
Hess, Ron, Buckhead, GA

International Paper
Camp, Bill, Prattville, AL
Clay, Dean, Loveland, OH
Coyle, Wendy, Pine Hill, AL
Fuhrmann, Dave, Loveland, OH
Kiper, Mike, Loveland, OH
MacIntire, Wayne, Loveland, OH
Sargent, Mark, Loveland, OH

Interstate Paper
McLemore, Susan, Riceboro, GA
Smith, Joe, Riceboro, GA
Stapleton, David, Riceboro, GA

Jacobs Engineering
Rickard, John, Greenville, SC

Jansen Technologies
Verloop, Arie, Kirkland, WA

John E. Cover Engineering
Cover, John, Birmingham, AL

Kapstone Paper
Carroll, Billy, Roanoke Rapids, NC
Hehn, Chris, N. Charleston, SC
Manigault, Louis, N. Charleston, SC
Ramsey, Phil, N. Charleston, SC
White, Ben, Roanoke Rapids, NC

K-Patents
Gronowski, Eric, Naperville, IL
Miller, Adam, Naperville, IL

Lincoln Paper & Tissue
Davis, Tim, Lincoln, ME
LaFlamme, Alan, Lincoln, ME

Liquid Solids Control
Sweeney, Michael, Upton, MA

Longview Fibre
Andrews, Mark, Longview, WA

M&M Engineering Assoc.
Moskal, Max, Indian Head Pk., IL

MeadWestvaco
Andrews, John, N. Charleston, SC
Lindstrom, Mathias, Raleigh, NC
Murch, Douglas , Richmond, VA

Registered for the meeting were:

Metso Power
Blackard, Vernon, Orange Beach, AL
Borduas, Pierre, Charlotte, NC
Conley, Clark, Charlotte, NC
Cross, Tom, Charlotte, NC
Dave, Leeds, AL
Langstine, Bob, Charlotte, NC
Morgan, Preston, Charlotte, NC
Morris, Richard, Charlotte, NC
Nichols, Jody, Charlotte, NC
Nika, Kent, Charlotte, NC
Skoog, Mikael, Charlotte, NC
Wasson, Eric, Charlotte, NC
Weikmann, John, Charlotte, NC

National Board of BPVI
Parks, Terry, Columbus, OH

NewPage Corp.
Hollern, Michael, Luke, MD

NORAM Engineering
Bucher, Wayne, Birmingham, AL

Packaging Corporation of America
Bartz, Jerry, Tomahawk, WI
Stelling, John, Tomahawk, WI

Phoenix Pulp & Paper Public
Elaknarat, Kanin, Khon Kaen, Thailand

Power Specialists Assoc. Inc.
Haraga, Rudy, Somers, CT
Jackson, Christopher, Beaverton, OR
Madersky, Tom, Somers, CT
Zawistowski, Bob, Somers, CT

Poyry Engineering
Maasalo, Mikael, Finland
Saunders, Mervin, Vancouver, BC

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

Process Equipment/Barron Industries
Nolen, Ken, Pelham, AL
Ray, Allen, Pelham, AL

Proterra-Power
Proterra, Joe, Gainesville, GA

Purolite Company
Destefano, Frank, Bala Cynwyd, PA

Rayonier
Gray, John, Jesup, GA

RMR Mechanical
Roy, Bob, Cumming, GA

RockTenn
Chambless, Tony, Demepolis, AL
Smith, Josh, Demepolis, AL
vonOepen, David, Demepolis, AL

SAPPI
Aderman, Craig, Westbrook, ME
Boudreau, David, Hinckley, ME
Dorko, Bob, Skowhegan, ME

Savcor Consulting
Duda, Yurij, Surrey, BC

SCG Paper
Sensiriwatana, Phasith, Ban Pong, Thailand

Simpson Tacoma Kraft
Fay, Michael, Tacoma, WA
Kirk, Marc, Tacoma, WA

Registered for the meeting were:

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

Smurfit-Stone Container
Blackwell, Gary, Florence, SC
Dunn, Jonathan, Florence, SC

Teck Metals
Reiter, Brian, Trail, BC
Verhelst, Dominic, Trail

Thilmany
Badtke, Bob, Kaukauna, WI
Glasheen, Mike, Kaukauna, WI

Thompson Industrial Services
Harry, Todd, Savannah, GA
Jackson, Dwayne, Sumter, SC
Nochowicz, Georgi, Decatur, AL

Turner Industries
Queen, Larry, Baton Rouge, LA

Verso Paper
Navojosky, Frank, Jay, ME

Wausau Paper
Fochs, Jeff, Mosinee, WI

Weyerhaeuser
Barreca, Cliff, Vanceboro, NC
Burnette, Richard, Oglethorpe, GA
Currie, Rick, Vanceboro, NC
Hinman, James, Federal Way, WA
Knowlen, Bruce, Federal Way, WA
Slagel, David, Savannah, GA

WSI/Aquilex
Tipperreiter, Jim, ???

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

MAIN COMMITTEE MEETING

INTRODUCTION: BLRBAC Chairman, Len Erickson, called the meeting to order at 8:00 a.m. on Wednesday, April 14, 2010.

CHAIRMAN: I'd like to call to order the spring 2010 business meeting of the Black Liquor Recovery Boiler Advisory Committee. This meeting, as well as all meetings and subcommittee meetings within BLRBAC, is being held in strict accordance with our anti-trust policy. No anti-competitive discussions or pricing policies will be allowed.

OLD BUSINESS

ACCEPTANCE OF THE SPRING 2008 MEETING MINUTES – Len Erickson

I assume everyone has reviewed the meeting minutes from the fall 2009 business meeting. Are there any changes or exceptions to those Meeting Minutes? Do we have a motion to accept the Meeting Minutes? So moved. Second? All in favor? Opposed? The fall 2009 Meeting Minutes have been approved as written.

NEW BUSINESS

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

NEW REGULAR MEMBERSHIP

Chartis Global Marine and Energy Property
Thomas.DeBeer is the designated Representative.
John Veltre is the designated Alternate Representative.

NEW ASSOCIATE MEMBERSHIPS

Atlantic Combustion Technologies, Inc.
David Krgsveld is the designated Associate Representative
David Digdon is the designated Alternate Associate Representative

Austrian Energy & Environment - (a/k/a AE&E Von Roll or AE&E)
Nicholas Merriman is the designated Associate Representative
Mark LeBel is the designated Alternate Associate Representative

National Boiler Service, Inc.
David Duplissey is the designated Associate Representative
Mike Mesamore is the designated Alternate Associate Representative

NEW CORRESPONDING MEMBERSHIPS – None Reported

1. **NEW MEMBERS/REPRESENTTIVE CHANGES REPORT** (Cont.)

REGULAR REPRESENTATIVE CHANGES

Alabama River Pulp Co.
Brad Larrimore Sr. replaced John Browning the designated Representative.
Tim Standridge remains the designated Alternate Representative.

Alstom Power
Kevin Pollinger replaced Mark LeBel as the designated Representative.
Joe Bush remains the designated Alternate Representative.

Newpage Corporation
Mike Hollern replaced Mike Fornetti as designated Representative.
William David Oliver became the designated Alternate Representative.

Thilman, LLC
Matthew McCarty replaced Randall Lamers as designated Representative.
Joe Bush remains the designated Alternate Representative.

ASSOCIATE REPRESENTATIVE CHANGES – None Reported

CORRESPONDING MEMBERSHIP CHANGES

Mondi Swiecie S.A
Robert Graczyk replaced Sebastian Grabowski as Corresponding Representative
Ryszar Maciejak replaced Maciej Kunda as Alternate Corresponding Representative.

MEMBERSHIP COMPANY NAME CHANGES

Wausau Paper (previously d/b/a Wausau-Mosinee Paper)
Jeff Focks remains the designated Representative.
Robert Focks remains the designated Alternate Representative.

*{**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 last evening in a closed session and covered a number of topics. We reviewed the trademark discussion that had been reported previously and it had been unanimously agreed upon to defer that discussion for the future. We are continuing to work on the Operating Procedures and Articles of Association and By-Laws. We hope to have the revisions ready for the membership vote during the business meeting in October of this year. Regarding future meetings, time and location, there was some feedback as far as where meetings are held and what time they are being held. We have done previous surveys for both the hotel location and the time of the year. We find that no matter where you switch the meeting from spring and fall, whether you move it a month or two forward or a month or two backwards, you are still going to end up in the middle of someone's outage schedule. If you move the meetings to summer and winter, you will still have vacations and Christmas to navigate around. It was agreed that we would keep the meeting schedule as it has been and the meeting location at the Crowne Plaza Hotel. Although some people may not think the facilities are ideal, they are very convenient, reasonably priced, and able to accommodate the number and size of the meeting rooms we need.

We also reviewed our Advance registration policy that was revised last year. It was agreed that we would continue to keep the same policy and we are not going to revise it. We are continuing to investigate and will look at the use of credit cards or using PayPal. From our perspective, the cost of doing that can be very substantial as we would have to pay a monthly fee, plus a percentage service fee. That would further increase costs and quite frankly, we haven't had much of a problem so far with our present policy, so there is not a great incentive to change, but we are looking at it. If people have opinions on it or if payment is a problem, please bring that forward to the Executive Committee.

The April 2013 meeting instead of being held during the first week of April, will be held from the 8th thorough the 11th so as to avoid a conflict with Easter.

3. **TREASURER'S REPORT** – Ron Hess

As we discussed before, BLRBAC has two financial accounts, a checking account and a certificate of deposit. As of the first of April the balances were:

Checking Account	**$36,291.00**
Certificate of Deposit	**$14,855.00**

Our legal status is a 501-C (Not-For-Profit) effective again through 2011. The tax filings and paperwork have been completed. So from that standpoint both the financial situation and our tax status are relatively good and current through 2011.

3. **TREASURER'S REPORT** (Cont.)

At the Executive meeting yesterday we discussed and approved a registration fee increase that will be in effect as of the fall 2010 meeting. The last time we had a registration fee increase was eight years ago and it was a $25.00 increase. So we are going to do another increase of $25.00 which will be effective for the fall meeting of this year. Therefore, Advance Registration will be $125.00 and At-Door Registration will be jump up to $200.00. So both of those are a $25.00 increase.

As far as attendance for this particular meeting, we had 164 Advance Registrations and we had 31 At-Door Registrations. The number of paper companies attending this jumped this year. We had 27 paper companies; four boiler companies; three insurance; 22 Associate Members and eight guests of member companies. Attendees from outside North American were: one from Finland; one from Colombia; one from France; and two from Thailand. We thank those individuals for their attendance and traveling the distance to participate.

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

Just a few bits of information: Ron did say that we had eight attendees as guests of members. We encourage our guests to submit applications for membership in BLRBAC, either as a Regular member if they are a paper company, boiler manufacturer or an insurance company that insures the recovery boilers; or as an Associate member, if they provide services to the recovery boiler industry; or as a Corresponding member if they are from a non-North American company and wish to attend and be kept informed of BLRBAC activities. Corresponding members are always welcome to attend when they can. We encourage you to submit your application for membership be by letter or e-mail to Barbara Holich, who provides our Secretarial Services. Her contact information is on the BLRBAC Web site.

For those of you attending for the first time or for those of you who attend infrequently, this is just a reminder that all BLRBAC correspondence with the people who attend the meetings is via e-mails, so please be sure to keep your e-mail address up-to-date and keep you e-mail box empty enough so that new e-mails can get in. We will ensure that you do receive updates of what's going on within BLRBAC. Meeting Minutes are posted on the Web site, any publication revisions that are up for review and comments get published on the WEB site, and Notices go out when these items are posted. We don't send the Meeting Minutes or other documents that are up for Review and Comment directly through the e-mail as that tends to overload the mailbox system and plug things up, but the announcement does go out telling you that they are posted on the WEB site. So when you get those announcements, please open and read them before you hit the delete key and take the time to look at what we posted.

There were some non-North American attendees at this meeting. We haven't received any word from them that they would like to make a presentation, but towards the end of our Main Committee agenda this morning there is a section for other reports and if you wish to make a report, please let us know by that time.

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 notification is received (letter, fax, or e-mail are acceptable). 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.

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 faxed registration forms are of no use to me until the appropriate fees are paid. Therefore please,
DO NOT FAX REGISTRATION FORMS!

CHAIRMAN: Before we move into the Subcommittee Reports, is there any other New Business that membership would like to bring forward? As there is no other New Business, we will proceed with the Subcommittee Reports.

5. SUBCOMMITTEE REPORTS

5.1 AUXILIARY FUEL REPORT – Bruce Knowlen

No report as this subcommittee did not meet. Their next meeting will be in the fall of 2010.

5.2 BLACK LIQUOR REPORT – Mark Sargent

Open Meeting, April 12, 2010 at 8:30 AM Crawford Room with eight members present and approx. 25 guests.

AGENDA:
Opened the meeting.

Reviewed BLRBAC Anti Trust statement
Reviewed and approved the Fall 2009 meeting minutes.

We are continuing to gather information to outline language for a generic emergency procedure for dealing with high green liquor density, impending crystallization, and known or suspected live smelt in the dissolving tank. We discussed what we have developed to date and are asking for anyone with specific information on their particular operation to share their procedures and information with the SFBL subcommittee. We will continue working on this assignment between now and the Fall 2010 meeting.

We continue to review Figure 2 – Permissive Starting Logic Black Liquor Firing as it relates to previously submitted language requiring "boiler on line , stable firing established" as a black liquor header purge requirement. We originally intended to require that recovery boilers be in the header, stable firing established and all SH loops cleared of condensate as a black liquor header purge permissive. Most of the feedback we received this meeting was positive and most all agreed that these are the proper requirements prior to initiating B/L firing. We will continue work on this particular starting permissive with the thought that we will have language ready to submit to the Executive Committee in the Fall 2010 meeting. It is likely we will add logic to Figure 2, language to Chapter 15 and a bulleted item to the generic B/L start-up checklist in Appendix A.

We are continuing the discussion regarding Figure 5 Black Liquor tripping logic. The incident prompting this discussion involved a 3-way header/divert valve. We are reviewing our document and logic sequences to be able to prevent these issues from arising again. We will have a change to Figure 5 ready to be submitted to the Executive Committee for the Fall 2010 meeting.

We fielded a question from Personnel Safety Subcommittee regarding the requirement for sufficient instrument air as a permissive for boiler purge and for protective MFT tripping logic. We have deferred this to the Instrumentation Subcommittee to see if this is applicable.

5. **SUBCOMMITTEE REPORTS** (Cont.)
   5.2 **BLACK LIQUOR REPORT** (Cont.)

We find that there are no requirements in either BLRBAC or in NFPA 85 for instrument air logic other than a low pressure alarm. This was discussed at the open meeting and it is likely we will not make any logic changes for instrument air pressure.

We have made 2 minor changes to the document as follows:

- Made a minor change to Figure 7 showing the recirculation line returning to the top of the pressurized storage tank
- Changed the title of Figure 14 to match the vacuum spout cooling water system design where vacuum is created by tank or piping configuration.

Recent question from a member company that we have fielded and will discuss at the open meeting:

Our new BMS includes a low steam flow trip for black liquor firing.

Our logic: IF [STEAM FLOW < 30% MCR] AND [NO AUX BURNERS IN SERVICE]
THEN TRIP BLACK LIQUOR

We experienced a low steam flow condition this morning on our No. 5 Recovery Boiler due to a turbine trip in the power house. Our 900# steam header increased from its normal of 850 PSIG to something over 950 PSIG, and pushed our recovery boiler steam flow back to less than 100 KPPH, which would have been below the 30% MCR trip limit on our new BMS. We were below 100 KPPH for several minutes, as the power house got the header back under control.

We've seen this scenario before: steam flow decreasing below the trip limit due to steam header pressure swings, even though black liquor is burning correctly. On our No. 4 Recovery Boiler, for example, this has been the cause of at least 3 or 4 trips, maybe more, in the past 2 years.

We understand this trip is intended to protect against incomplete combustion. Do you have any suggestions that could improve our system to avoid this type of trip? We have considered using boiler O2 in addition to steam flow to prove loss of combustion, but we don't want to re-invent the wheel if someone already has a solution.

How do we avoid nuisance trips for situations described above?

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

5.2 **BLACK LIQUOR REPORT** (Cont.)

This was discussed at the Open meeting and we have the following suggestions:

- Review the addition of a small time delay with your insurance carrier to be able to "ride through" process upsets.
- Calculate steam flow from the ERV valve based on percent opening and add to the boiler steam flow transmitter total when this situation arises (most likely the ERV will open under the scenario presented to us.
- Include sootblower steam flow in the boiler <30% steam flow calculation as long as this is superheated steam flow that is after the boiler and is not being measured by the boiler total steam flow calculation.
- Potentially include a sensor on the outlet of the SH outlet safety valve and include this in the boiler total steam flow calculation (most SH safety valves have a known and fixed steam flow through them when lifted.

5.3 **ESP SUBCOMMITTEE REPORT** – John Andrews

The ESP Subcommittee met in closed session on Monday October 5th with 13 members represented. Scott Crysel and Kevin Polinger were welcomed onto the Subcommittee. Scott Crysel represents FM Global and is replacing Dave Parish and Kevin Polinger represents Alstom Power and replaces Mark Lebel. Dave and Mark have served the Subcommittee faithfully for several years and their contributions to the Subcommittee activities are greatly appreciated. The Subcommittee met in open session on Tuesday morning October 6th with 13 members represented and 156 guests. During the open session, the Subcommittee reviewed 46 incident reports from North America and two international incidents. Of the 46 incidents, 13 of the leaks were classified as critical incidents and 27 were non-critical incidents. Three of the reported incidents were spout failures and three were for an Emergency Shutdown Procedure (ESP) that was performed but no leak was found in subsequent inspection. One report was received for a smelt leak through the floor. An Emergency Shutdown Procedure (ESP) was performed in 16 of the incidents including 8 the critical incidents representing 62% of the critical incidents that should have been ESP'd. No reported incidents were classified as an Explosion. The 46 reported incidents are the most incidents reported to the Subcommittee between meetings in several years.

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).

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

> **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.

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

Appendix B contains the slides used by John Andrews during his presentation.

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 and the red marks indicate the location of the critical incidents. The three green marks are for the spout failures and the three blue represent the ESP with no leak. It should be noted that there were several leaks in the floor and lower furnace that were reported representing a high risk for smelt water explosion. It is fortunate that none of those leaks resulted in an explosion.

The leaks locations are summarized as follows:

- 16 – Economizer
- 5 – Superheater
- 3 – Boiler Bank / Steam Drum
- 2 – Upper Furnace
- 11 – Lower Furnace and Floor
- 3 – ESP No Leak
- 3 –Smelt Spout Failure
- 1 – Smelt Leak through Floor

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. An ESP was performed in 62% of the critical incidents that should have been ESP's which is above the recent average.

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

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
- 15 – Thermal or Mechanical Fatigue
- 11 - Erosion or Corrosion Thinning
- 2 – Mechanical Damage
- 3 - Stress Assisted Corrosion or Corrosion Fatigue
- 2 – Unknown

How Discovered

Operator observations during boiler walkdowns continue to be the prevalent method of detecting leaks and accounted for identification of 38 of the leaks (84%). Six (6) of the leaks were identified by the control room and one(1) leak was initially indicated by the leak detections system installed. One leak was discovered by a hydrostatic test during an outage.

Leak detection systems were installed on units in 18 of the incidents (39%). The leak detection system was credited with providing the initial indication of a leak in the economizer that has historically been difficult to detect with leak detection systems. Four 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 four minutes to about 4 days. The median time from the data available was indicated at 36 minutes. It was unfortunate that there were three ESP's performed with no leaks found but the historic lack of reports of ESP with no leak in the past may be indicative that mills were requiring too much confirmation that a leak was present before initiating an ESP.

There were no incidents that reported a smelt water reaction at this meeting although there were several leaks reported in the floor and lower furnace.

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

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 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. 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 bar for 2010 only represents half the year so we are looking at a significant increase in reported critical incidents for the full year.

Figure 4 shows the history of Recovery Boiler Explosions showing the string of years without an explosion was broken with the Aux Fuel explosion at Vicksburg in 2008.

Figure 5 shows the five year rolling average of reported boiler explosions is at 0.2 after finally getting to zero. It will take three 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 year 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 to keep that trending down. Effort should be focused in developing better procedures to handle heavy smelt runs and plugged spouts.

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

Learnings

Who's in Charge? When extra supervision and operators are scheduled during an outage, it would be a good idea to make sure everyone understands who has the responsibility for the various areas of operation so that in an emergency, everyone is not expecting someone else to address the problem.

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

Spout attachment boxes are prone to cracking, especially if they are welded directly to the tubes. This should be an area for periodic inspection to see if Stress Assisted Corrosion or other cracking may be present.

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 point up. Either case can result in accelerated corrosion.

An incident was reported where the floor beam detached at the side wall, probably due to a large slag fall from the upper furnace. This may be an area for inspection during outages, especially if there has been a large slag fall.

In boilers where the rear wall tubes at the top of the nose baffle form a screen between the generating bank and superheater, this area has been prone to cracking at the top of the nose where the screen begins. This should be inspected periodically, especially if the vibration restraints have failed or if there are incidents of stuck sootblowers in the area.

Mills that have installed the necessary wiring to "bypass" the local selector switch on Rapid Drain Valves so that they will open automatically during an ESP if the switch has been inadvertently left in the "Local" position should run a test to verify that the wiring has been installed properly.

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 the following paragraphs 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 other PLC type system. If a hard wired relay system is used, it is emphasized that the system only 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 position feedback from all the field devices can be done with some other system such as the DCS or the Boiler Safety System. We have submitted the language to the Instrumentation Subcommittee for their review and are working with them to coordinate the working in both documents.

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.)

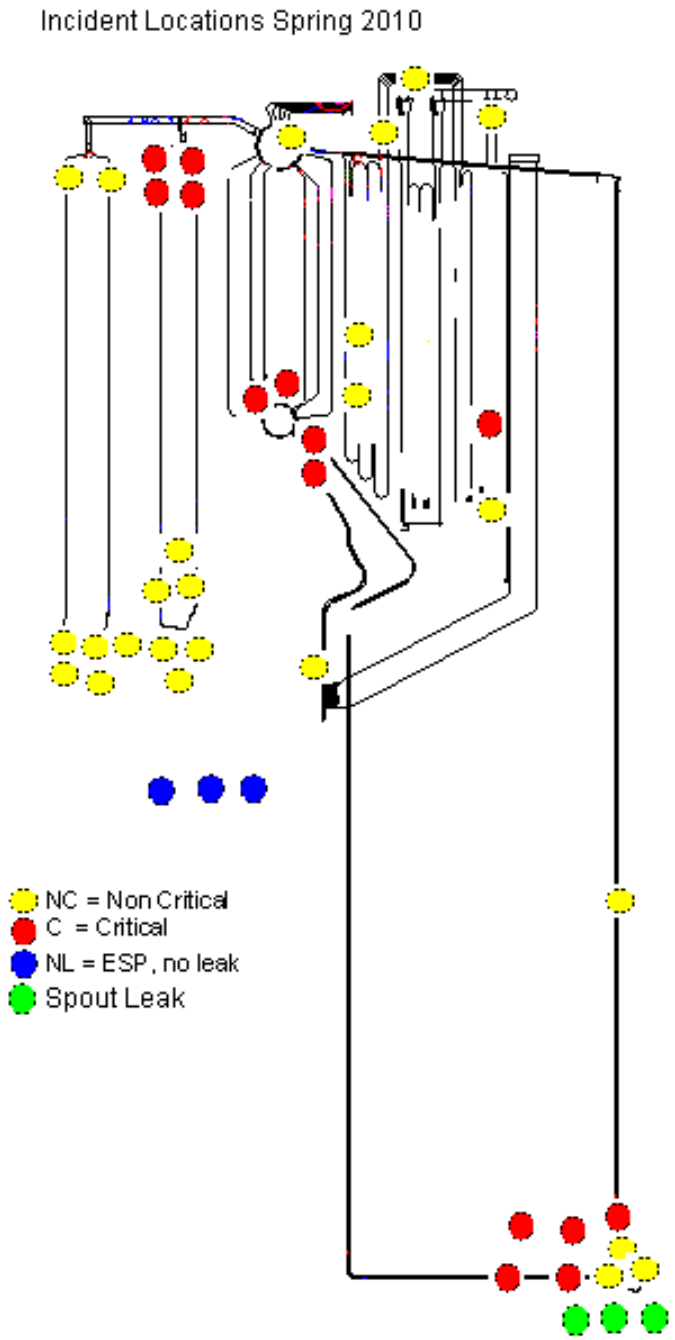
Jack Clement has retired from the committee after many years of serving as the Secretary and recently as a member of the Subcommittee. The Subcommittee is very appreciative of all the effort and dedication that Jack has given to the work of the Subcommittee. We will be in the process of deciding on a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

Figure 1


Incident Locations Spring 2010
NC = Non Critical
C = Critical
NL = ESP, no leak
Spout Leak

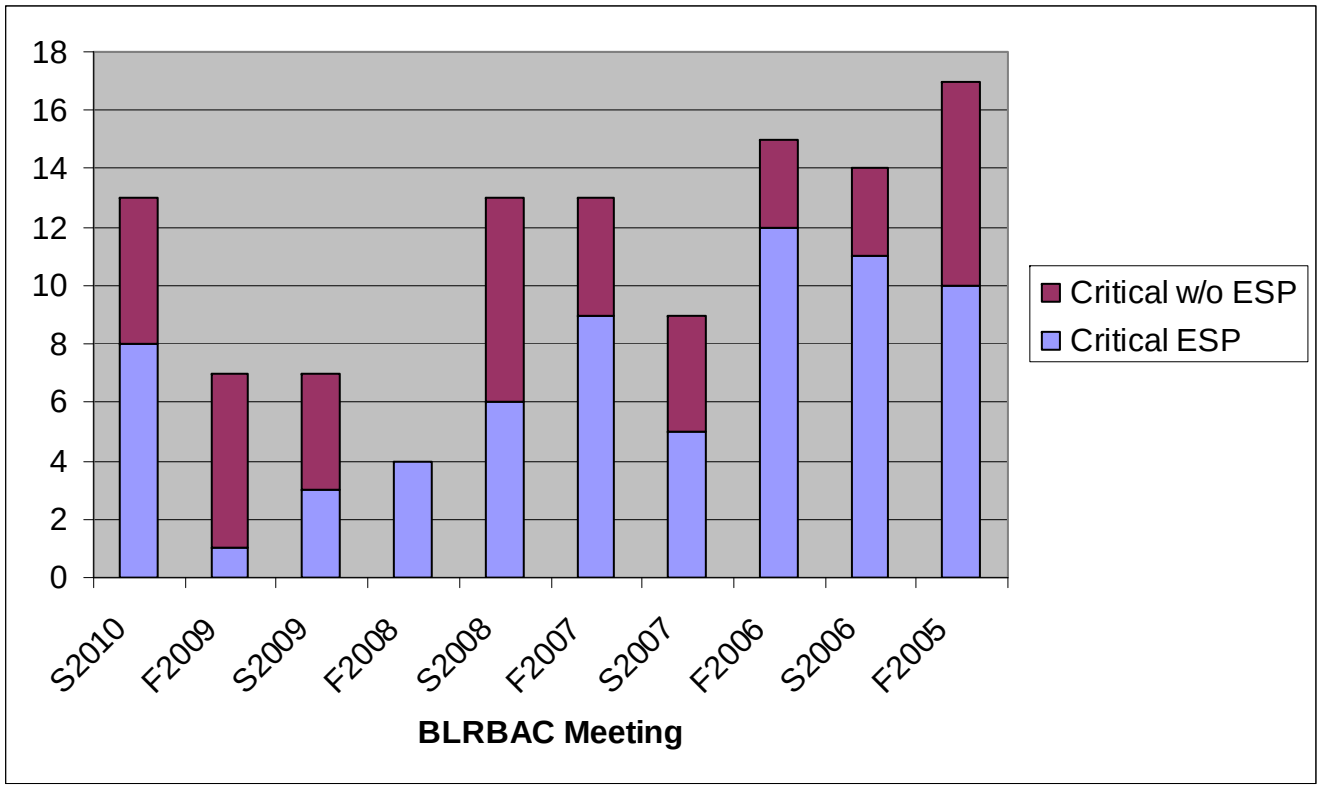

18
16
14
12
10
8
6
4
2
0
S2010
F2009
S2009
F2008
S2008
F2007
S2007
F2006
S2006
F2005
BLRBAC Meeting
Critical w/o ESP
Critical ESP

Figure 2

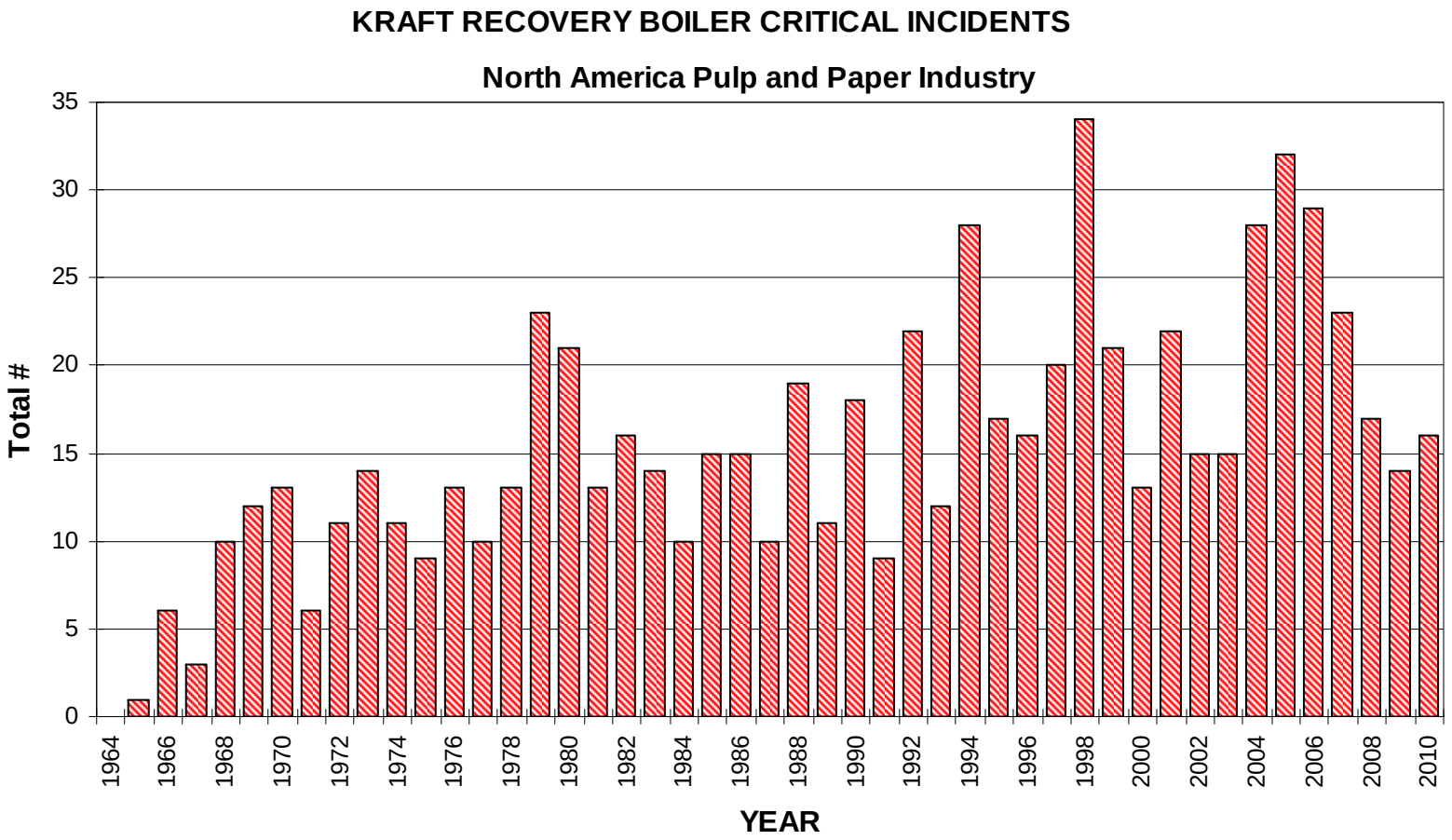


Figure 3

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

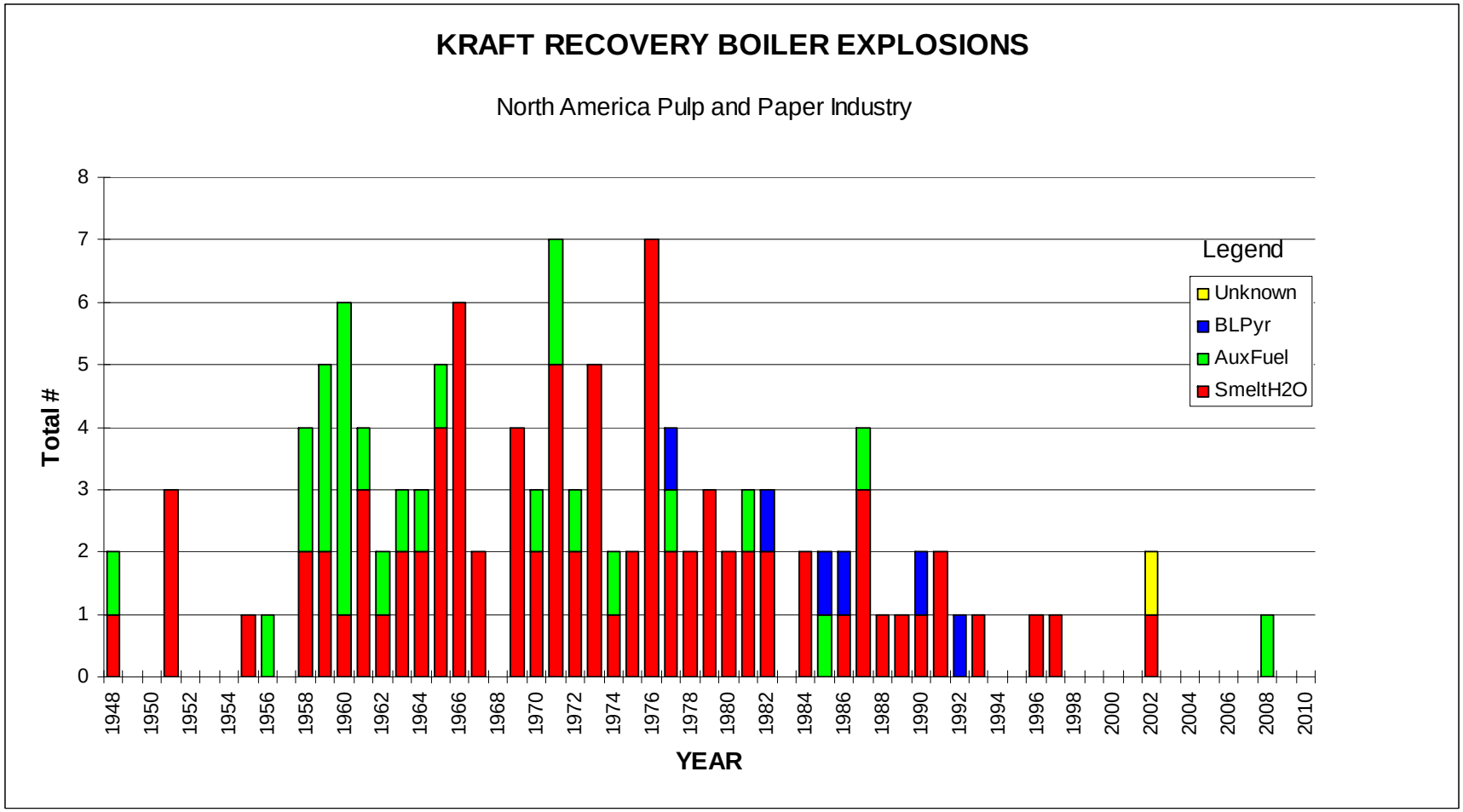

KRAFT RECOVERY BOILER EXPLOSIONS
North America Pulp and Paper Industry
Total #
YEAR
Legend
Unknown
BLPyr
AuxFuel
SmeltH2O
0
1
2
3
4
5
6
7
8
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010

Figure 4

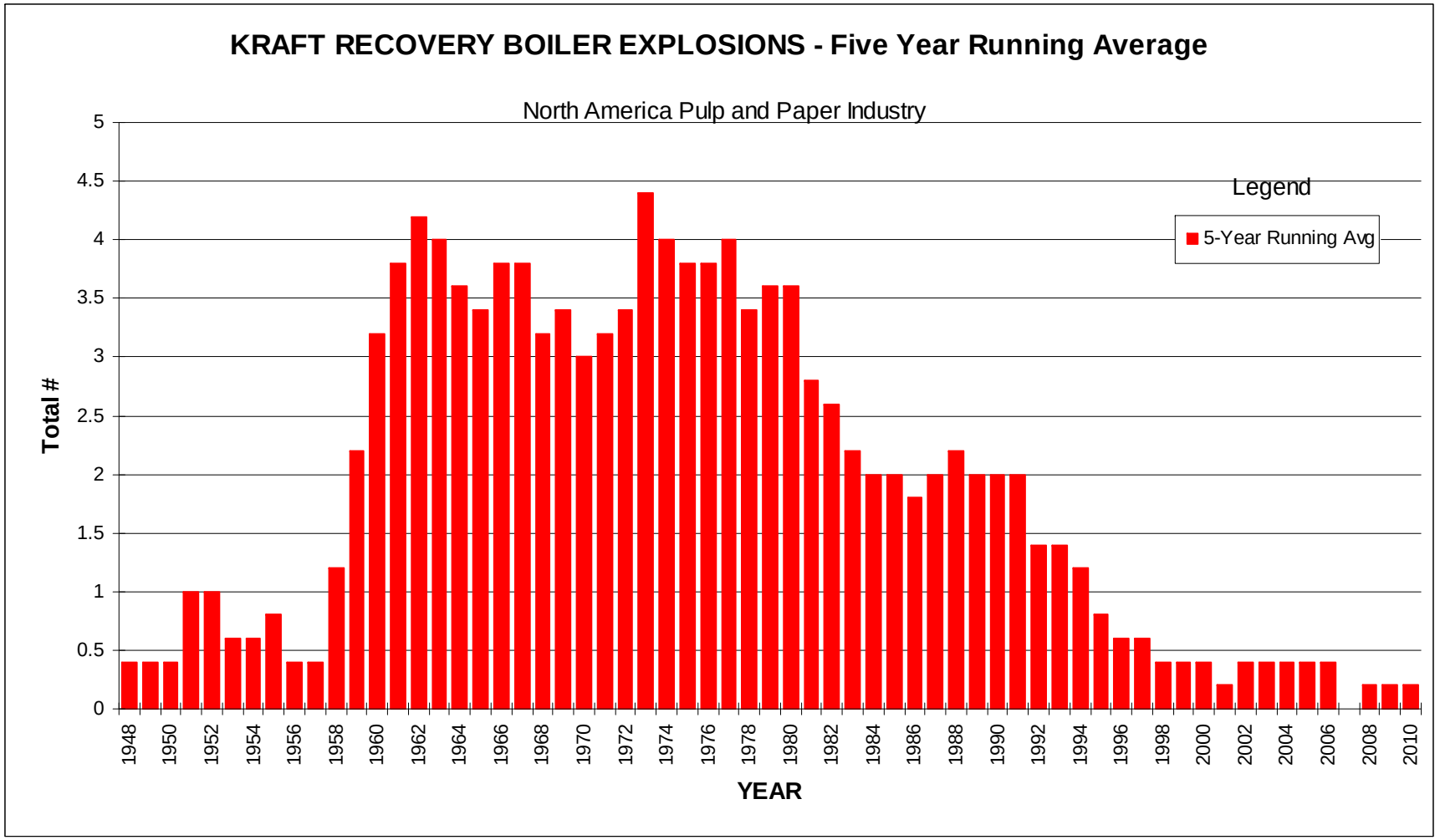

KRAFT RECOVERY BOILER EXPLOSIONS - Five Year Running Average
North America Pulp and Paper Industry
Legend
5-Year Running Avg
Total #
YEAR
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010

Figure 5

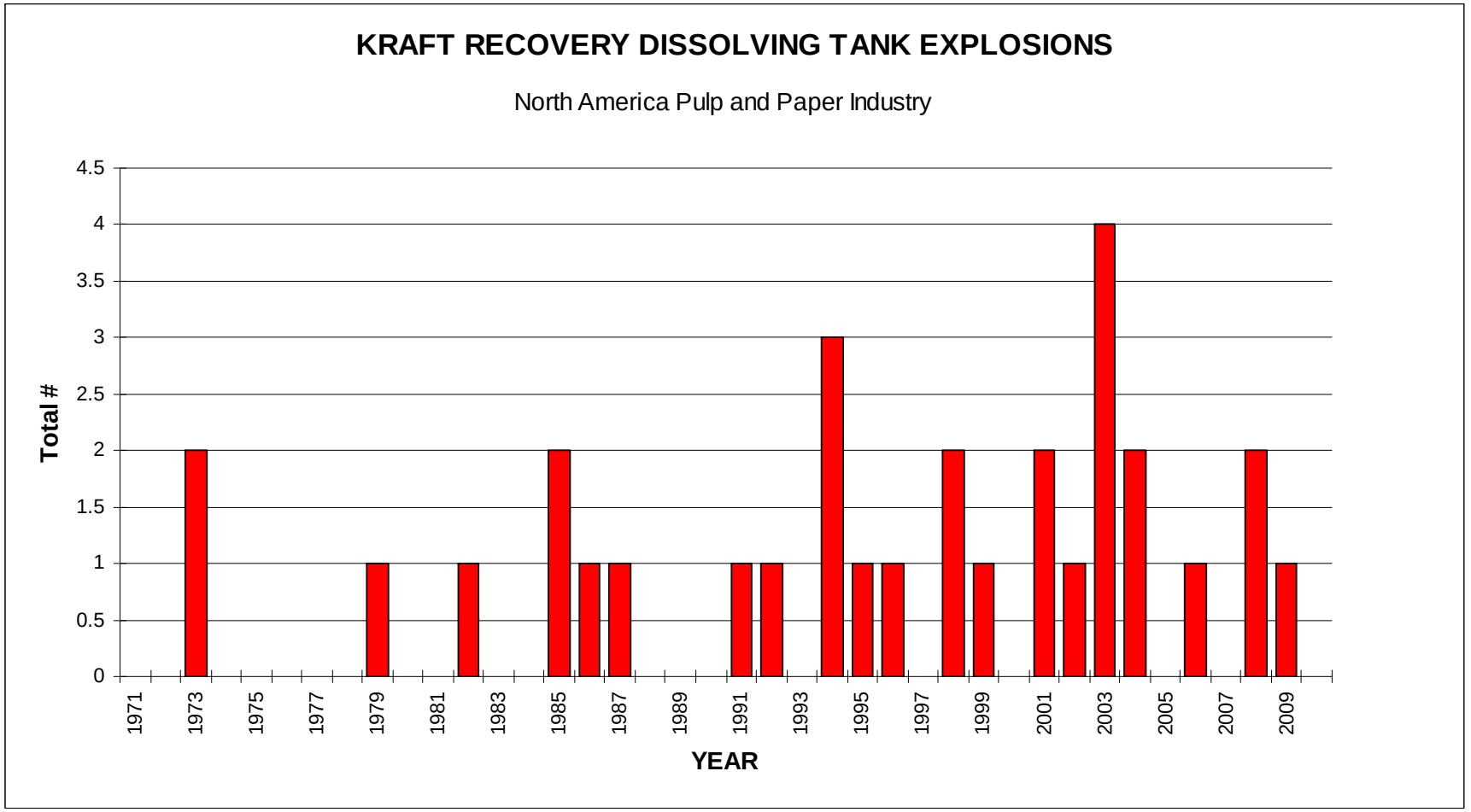

KRAFT RECOVERY DISSOLVING TANK EXPLOSIONS
North America Pulp and Paper Industry
Total #
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
YEAR

Figure 6

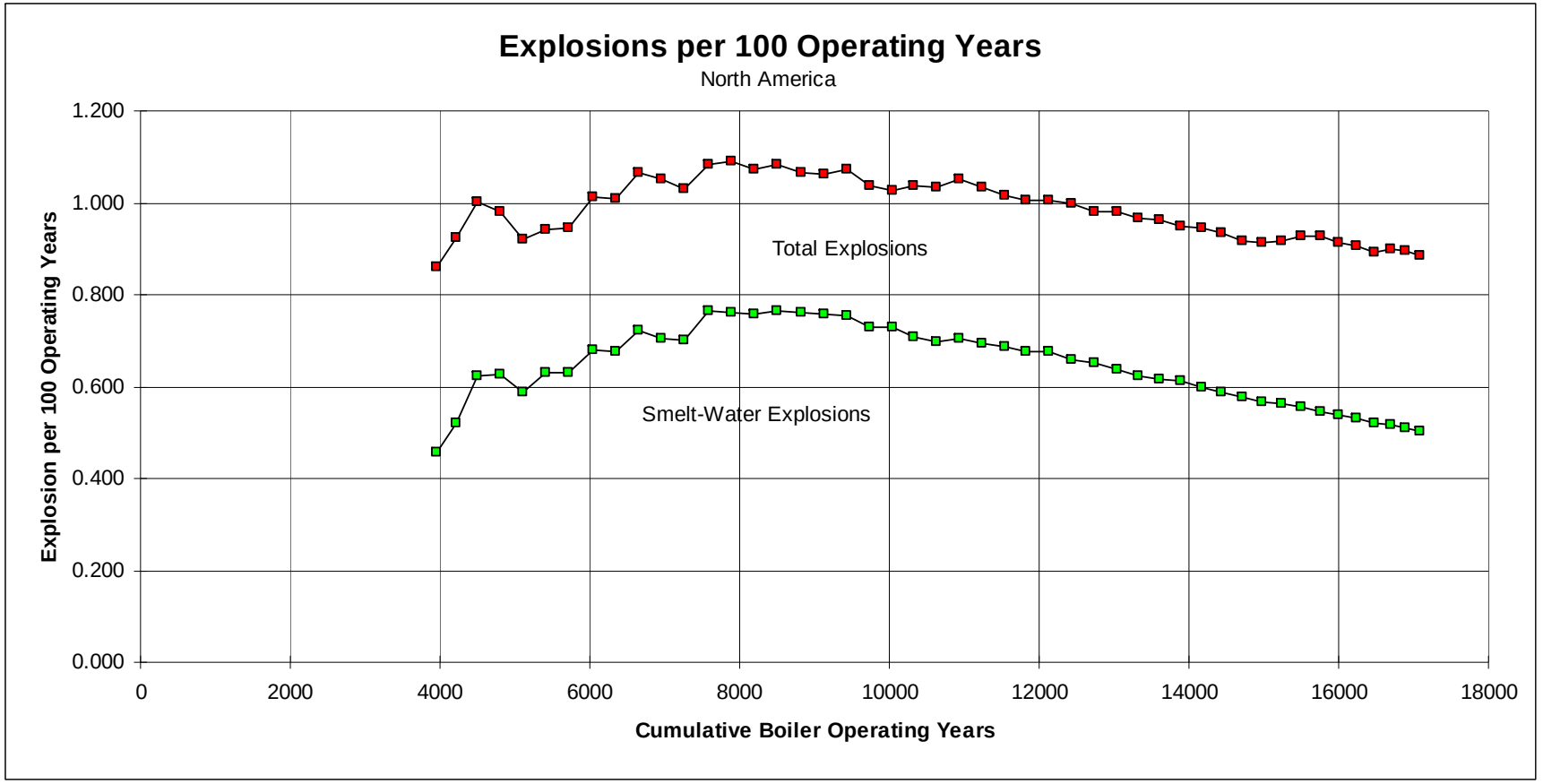

Explosions per 100 Operating Years
North America
Explosion per 100 Operating Years
1.200
1.000
0.800
0.600
0.400
0.200
0.000
Total Explosions
Smelt-Water Explosions
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Cumulative Boiler Operating Years

Figure 7

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

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

Monday morning we held an open meeting of the Fire Protection in Direct Contact Evaporators Subcommittee. There were three members in attendance and four guests.

We recently lost our Chair, Chris Jackson, to the ESP Subcommittee. Our sincere thanks to Chris for his many years of leadership. We welcome Phil Ramsey back to the committee. Nick Merriman will be leaving active involvement on our committee in order to join the Water Treatment Subcommittee. We hope he will see the errors of his ways and return to our group in the not too distant future.

Last and certainly least I became the chair of a real committee! Our last meeting was held in October of 2008. We reviewed and accepted those Minutes. Our subcommittee finished a complete rewrite of our document back in October of 2002. There were major changes from the previous October 1974 version. Revisions were based on accumulated incidents and fires history. There was a major shift from steam as the only recommended fire protection media to a preference of at least some level of water based protection. We continue to learn from the incidents and fires that occur. I encourage you to report any fire incidents no matter how small. All can assure that our guides are correct and provide the best possible advice. The Incident Form that you would fill out is available on the BLRBAC WEB site.

During our meeting we did have an incident to review from March 30, 2009, at International Paper of Augusta, GA. I went through the details during the Operating Problems Session, but will provide a brief summary here. Basically the fire protection systems they had worked well. It proved that water suppression seems to be the key to extinguishing a fire. Previously identified concerns about heat getting to the electrostatic precipitator are again confirmed. Heat can severely damage the plates and if you damage the electrostatic precipitator, it takes a while to get that repaired. There is definitely some production interruption implications. Our present guidelines generally address the issues from this incident, showing that our guides are good. The mill corrective actions and measures are all basically covered in our guides. One issue was not covered. The mill will be installing a recirculating loop from the liquor ring header back to the cyclone, allowing continuous monitoring by density meters while not firing liquor and that was the issue at this loss. It is a classic incident. It was a cyclone evaporator and the question comes up, "Should our guide be including directions specific to cyclone safety during start-up?" I think it should, and any feedback that we can accumulate from the members is good. A way of monitoring solids and flow through the cyclone is needed and I think we will be at least considering some changes in wording there. The incident and one of our guests raised some healthy discussions relating to Section 4.2.3 which deals with the high-high trip on temperature which results in a master fuel trip, activation of the fire protection system and tripping of the ID fan and then also inlet damper to the precipitator needs to be either automatically shut or manually shut.

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

5.4 **FIRE PROTECTION IN DIRECT CONTACT EVAPORATORS** (Cont.)

During this incident the fans failed to stop. They were supposedly arranged to stop, but they didn't stop and that fanned a pretty hot fire. Very hot temperatures were drawn into the precipitator and severely damaged the precipitator. So it does point out that that is a concern. On the flip side, the issues could be pyrolysis gas building up and also the tendency for smoke to get into the building because it is not being vented through the stack. Your feedback and comments will be appreciated.
Our next meeting is scheduled for April 2011. We meet once a year, unless major incidents come up where we would want to get together before that. So are there any questions? Thank you.

5.5 **INSTRUMENTATION REPORT** – Dave Avery

The Monday morning open session was held with 12 members and 5 guests attending. We began with introductions of committee members for the benefit of those in attendance. The first item of business was a review of last fall's minutes, after a moment of discussion they were accepted as submitted. On a good note, the committee was happy to welcome Bill Camp of International Paper back on board as a member.

We pursued a litmus test discussion of last fall's work on our definition for the ESP subcommittee for "ESP Systems"

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 microprocessors, and/or integrated as part of another Recovery Boiler Safety System (RBSS), such as the Burner Management System (BMS).

This definition has been turned back over to the ESP committee for their review.

Included in the discussion was our definition of a

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** (Cont.)

The review reaffirmed our efforts on these definitions. However it was decided that we need to define sensors, logic solvers, interconnections, and final control elements in the definitions section of the document.

After break we fielded a question regarding the requirements for instrument air monitoring within the safe firing safety systems. We considered the advisability of making adequate instrument air an interlock. There is currently no requirement for instrument air as a permissive or interlock only an alarm. After discussion it was determined that air pressure should remain a high priority alarm, but should not be required as a system trip. Systems should be designed fail- safe, so that loss of mill air or instrument air would cause final elements to revert to the "safe" position.

Another topic of interest brought to our attention was how do the new smart digital flame scanners fit in our goal of having safe and reliable field devices for Recovery Boilers? The flame distinguishing features of the new scanners was discussed with respect to the unintended consequences that come with the smart internal logic that can switch between IR and UV modes for distinguishing flames. There is a concern that the internal logic can effectively blind the scanner by switching modes between IR and UV sensitivity during start ups in order to try and distinguish between liquor burning and fossil fuels in the boiler. The problem, depending on the sensitivity, is if the burner flame goes out, will it see a flame from another burner or liquor firing, which it did not see in the "start up" mode, and not shut down the affected burner? It was decided that we need to be looked into further. We will work with Auxiliary fuels to schedule several scanner suppliers to present their technology at our next session. Details are still to be worked out.

The status of updating the Master Draft of the instrumentation checklist was reviewed. We then started work on sections D and G and added them to the Master Draft.

It was also noted that the changes previously approved in October 2007 were never incorporated into the published BLRB Recommended Good Practice document. These were added to the Master Draft and will be submitted publishing into the checklist, while work continues on the Master Draft.

In the afternoon there were 13 members present and 14 guests.

The first item of discussion was a question about consistent and accurate green liquor density reading. Several type devices are currently available. They include traditional bubble tube, in-line refractometers, multiple tank probes, nuclear transmitters, coriolis and near infrared. No clear technology was identified as better than the other.

Work continued on the update of the front end language in our Instrument Guidelines. Four new definitions were added to complement the previous definition updates from the last meeting and work will continue at the next meeting. Those definitions include:

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

> **Final control element**: The field device that alters the process being controlled.
> **Interconnection**: The physical linking of two or more devices for the mutual exchange of signal, process data, or equipment status.
> **Logic solver**: A logic solver is any device that receives input signal(s), makes appropriate decisions based on the nature of the signal(s), and provides an output according to user-defined logic.
> **Sensor:** A device that measures a physical quantity or property and converts it into a signal which can be read by an observer or by an instrument.

We will continue to complete our work on the update and try to stay abreast of the changes in technology.

Don't forget to stop by and check on our work….. We are an interesting group and always have something to think about.

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

Review BLRBAC Anti Trust Statement
"This meeting, as are all BLRBAC meetings, is being held in accordance with BLRBAC Anti-Trust Guidelines"

Attendence
The morning meeting of the Materials and Welding Subcommittee met in open session on April 12, 2010, with ten of 20 members represented and six guests.

Membership attendance was reviewed. Terry Parks, National Board, was approved to replace George Bynog.

There was discussion concerning members that have not participated in at least 2 sessions and could not be reached via telephone or email contact. Some have had employer changes and alternate means of contact have been attempted. A final attempt will be made and if no contact is made, they will be dropped from the membership roles.

Old Business
The subcommittee completed development of section 2.4, Corrosion Resistant Weld Overlay on Boiler Tubes and approved it for Executive Committee review.

Other documents previously modified and under Executive Committee review are:

a. 1.3 Repair of Pressure Boundary Materials in Tubes
b. 1.4 Repair of Corrosion Resistant Weld Overlay Applications on Tubes
c. 1.5 Repair of Composite Materials on Tubes

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

New Business:

Work continued on development of a Materials bulletin *3.X*, Thermal Spray Coatings for Boiler Fire Side Waterwall Tubes

- The format for Materials Bulletins must be developed as the welding bulletin format does not apply

Communications:

- Communication was received on a tube repair method for an A Frame power boiler at a fertilizer company in Pakistan. The proposed approach was to cut a window in the mud drum to plug a failed tube due to limited access from the fireside. The response was to consider cutting through the tube field to the tube, identify the failure cause and consult with the OEM as necessary to correct it.

Afternoon Session:

The open afternoon session met in an open meeting with 13 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. Larry Queen – Turner Industries
b. Yurij Duda – Sancor Consulting

Review of Morning Meeting Activities

Max Moskel of M&M Engineering made a presentation on the Recovery Boiler Problems and focused on Composite Tube Butt Weld Cracking. This presentation is included as Appendix C.

Work continued on development of procedure *3.X*, Thermal Spray Coatings for Boiler Fire Side Waterwall Tubes.

Plans for the next meeting may include:
Update status on Individual and Task Team assignments

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.

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

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

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
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 Subcommittee met in an "open" session on Monday, April 12, 2010. There were nine members (out of 17) and five 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 manufacturer Babcock & Wilcox. Representation from insurance and insurance service companies included Axa Corporate Solutions, Hartford Steam Boiler, FM-Global, and XL GAPS. Operating company representation was present at this meeting with representatives from International Paper, Kapstone Paper, Sappi, Thilmany LLC, Verso Paper Company and Weyerhaeuser. Consultant representation included Power Specialists Associates, Inc. A guest company attending the meeting was Teck Metals.

We welcomed new member Randy Lombardi to our subcommittee replacing long time member Jim Dickinson who retired from B&W this year.

Formatting similar to what is done in Safe Firing of Black Liquor was presented for subcommittee evaluation as a means to disseminate useful information promoting safety practices on various recovery systems such as smelt decks, air port rodding and chill and blows. A three column sheet with “Condition,” “Hazard” and “Suggested Precautions” was reviewed and discussed in subcommittee. Examples of photos illustrating unsafe and/or safe practice were included in the table to provide further information. The subcommittee agreed with the formatting stating it could be expanded upon later if needed. This format will be reviewed with the Executive Committee and if approved, we will start gathering information with the idea that practical safety ideas as well as unsafe practices can be illustrated. It is our plan to make this part of the existing Personnel Safety document, but it will reside in its own separate section.

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

5.7 **PERSONNEL SAFETY REPORT** (Cont.)

Occasionally we still have questions to 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 this letter and including it as an appendix to our document. A generic letter was supposed to be submitted to the Executive Committee following the last meeting for review and if accepted posted on the website for review. In an oversight on my part following the October 2009 meeting this letter was only recently submitted to the Executive Committee just prior to the April 2010 meeting. Following their review, and if accepted, it will be posted on the website for member review and possible vote at the October 2010 meeting.

Between the October 2009 and April 2010 meetings there were no inquiries for clarification or interpretation.

One "near miss" was discussed. A recovery boiler was operating normally and a maintenance worker was on the spout deck making a repair in the vicinity of a spout. The spout adjacent to the one he was working on splashed smelt in the direction of the worker. This could have been prevented by positioning a barrier. It was noted that a "green welder's jacket" was insufficient protection for a direct smelt splash. One operating group suggested draping welding curtain over an adjacent spout to provide additional splash protection.

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

CHAIRMAN: The next report will be from a newly appointed chair, who has big shoes to fill.

5.8 **PUBLICITY & NEWS REPORT** – Dave Parrish (new Chairman - S2010)

Mr. Chairman, Secretary, Committee Members, visitors, if you will just give me a moment to get set up here. Craig explained to me that there are many intricate and extensive issues that are associated with publicizing the meetings and I take this new responsibility very seriously. If you would bear with me for just a moment here, while I find my notes. Oh, here they are!

Craig made all the contacts for posting the notice of this meeting. Craig, thank you very much. I appreciate that. Craig has provided me with a list of cryptic e-mail addresses for notifying and posting of future meeting notices. I have no idea of where these e-mail go, but he says they work.

The Subcommittee did meet in Executive Session. There was a nomination made, which was unanimously approved, electing Craig Cooke as "member in perpetuity" of the Publicity Subcommittee. Craig, there is no escape!

Mr. Chairman, Secretary, Members, thank you very much.

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

5.9 **WASTE STREAMS REPORT** – John Rickard

On April 12. 2010 the Waste Streams Subcommittee met in closed session at 9:00 AM with 11 members present and in open session at 1 PM with 11 members and 25 guests present. One member has resigned, so the total membership is now 14.

At the start of both sessions the BLRBAC antitrust statement was reviewed.

Last meeting's minutes were reviewed and approved by a unanimous vote.

The subcommittee reviewed questions that had been submitted since the last meeting. One question pertained to purge air flow requirements, but it was a misunderstanding of Aux Fuel's purge air requirement. Bruce Knowlen of Aux Fuels helped us out by explaining specifically what their guidelines required. As part of this discussion we learned that DNCG systems should be purged from their final isolation valve to the furnace. This will be added to our guidelines.

The next communication concerned furnace wall corrosion that appeared to be attributable to a CNCG burner. The corrosion started after a new, higher secondary air system was put in operation. Because of the corrosion problem, the CNCG burner will be relocated higher in the furnace with the statement that others have said that "the burner should be at the tertiary air level". The subcommittee discussed the issue and decided that CFD modeling could have been beneficial in identifying that there may be a problem. Although we are not in the burner placement business, there are successful installations with a CNCG burner in the vicinity of the secondary air.

A third question concerned local startup of a CNCG/SOG burner that is part of a load burner. Waste Stream guidelines require that burners be started locally, like the Aux Fuel requirement, and Bruce Knowlen helped us with this issue also. The burner access platform is small. Starting CNCG firing from that platform puts an operator in very close proximity to the furnace and the potential for exposure to noxious fumes and a possible furnace puff. Can that operator inspect the burner, activate a "ready to fire" switch and then start the burner remotely from the control room?

The reason for local startup is ensuring that light off takes place. The recovery furnace environment is especially dirty and flame scanners are not always dependable. Visual proof of a flame is required. For this particular situation, the local burner panel can be relocated a short distance away from the access platform and the burner started from it. The operator should be able to witness light off without being on the local platform.

A question that was originally asked during the fall meeting concerned the permissives required to put dissolving tank vent gas into the furnace. Part of the permissive is the requirement to be below 50% relative humidity. (We have been questioned about this permissive before.) The Finnish guidelines require cooling below a certain temperature and then heating a certain temperature increase above the cooled temperature without reference to relative humidity. We have temperatures for cooling (below 110F) and heating (above 150F) besides the humidity requirement.

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

The goal of these permissives is to not introduce water into the furnace with condensation collecting as a puddle that eventually gets into the furnace. Lowering the gas temperature and then reheating it ensures that there will be no condensation (unless the gas cools again in the transport line). John Lewis will look into these permissives including these topics:

- 110F may be too low for some mills, especially in the summer. Can this temperature be increased?
- Location of the heated gas temperature measurement – it should be close to furnace entry.
- Is a relative humidity requirement necessary if a cooled temperature and a heated temperature are specified? (Relative humidity is not directly measured.)

The guidelines refer to pressure relief with a rupture disk. We received a suggestion to change this to a more generic term. We will change to "pressure relief device such as a rupture disk".

Since load burners are being used for CNCG firing also, we discussed having the guidelines address this type of burner specifically. After discussion, it was decided that the existing guidelines were adequate for present applications.

Our afternoon visitors had questions. One question concerned the effect on the liquor system if a recovery boiler was used as a standby waste stream incinerator. Subcommittee members provided discussion of the variation of sulfur recovery depending on the primary incineration device (lime kiln or other). Also the opinion was expressed that short term usage of a recovery boiler vs. a primary incinerator without sulfur recovery would not have much effect on sulfidity.

Another guest wanted to know if a steam limited recovery boiler would be affected by CNCG firing. The unanimous answer was yes, liquor firing rate would decrease due to the heat input from CNCG.

We have not received many responses to our waste streams survey that is available on the BLRBAC website. To estimate the number of recovery boiler that fire waste streams, we have solicited information from various sources and Ann Plank has compiled it. This does not mean that our survey can be ignored, it is just a method to estimate waste streams in recoveries. Right now, our data is based on gaseous waste streams (DNCG, CNCG, SOG, CBNCG). The chart below compares our inventory of waste stream incineration in recoveries before the first guidelines in 1999 and our present estimate:

	USA	Worldwide, excluding USA
Before 1999	**11**	**24**
Present	**30**	**50**

Please improve the accuracy of this estimate by submitting a survey form.

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

5.9 **WASTE STREAMS REPORT** (Cont.)

The subcommittee wants to get more information on problems with waste stream incineration in recovery boilers to better understand the effectiveness of our guidelines. To help in this area, Hank Beder will keep a log of questions that are asked and Mark Cooper will complete our incident reporting form for use by those who have had problems.

There is a large, general revision to our guidelines that is presently at the Executive committee review stage. Hopefully it will be available for membership use in the near future. Many of the revisions are updates and improved explanations. We have added turpentine as a waste stream that can be blended with black liquor.

The subcommittee meeting was adjourned at 2:30 PM.

5.10 **WATER TREATMENT REPORT** – Tom Madersky

The water treatment subcommittee met Monday morning and Monday afternoon in closed sessions.

Sixteen (16) subcommittee members attended both sessions of the meeting; the subcommittee membership profile for those in attendance was as follows:

- Four (4) OEM's
- Five (5) Mill Representatives
- One FM Global Representative
- Six (6) BLRBAC Associate Members (4 of the 6 in attendance represented water treatment companies.

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Don Flach Georgia Pacific was welcomed as new subcommittee team member.

We would, again, like to thank all the subcommittee members for their participation and valued contributions. We thought we had a very productive meeting that met all of the objectives as planned.

The meeting activities were as follows:

The BLRBAC Antitrust Policy was reviewed; the membership lists updated and the fall 2009 Subcommittee meeting minutes were summarized.

The primary objectives of the Spring 2010 committee meeting were to:

- Perform a final edit on the Blowdown Heat Recovery System document
- Perform a second edit on the Feedwater System document
- Make the required changes to both documents
- Initiate production of the Attemperation, Smelt Spout Cooling, and Economizer documents

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

The edits and subsequent changes to the first two documents were completed in-situ. Those changes were then reviewed with the committee membership prior to the close of the afternoon session and accepted

It should be noted that the illustrations associated with those two documents require some editing. Once edited, we will submit both documents to the executive committee for their review and final approval in advance of the fall 2010 meeting.

To ensure continuity as we prepared to develop resource materials for the third and forth systems, we revisited our statement of committee objectives and reviewed instructional guides and resource production templates.

A point of major emphasis was made regarding how to structure the guidelines. The development of specific guidelines was to focus upon SOPs and ESOPs. End users would be provided with a brief explanation as to why the guideline was relevant and what line items considerations could be incorporated by the end user into the SOP/ESOP. The membership was in agreement with the development strategy and objective.

We then divided the subcommittee up into three production teams.

In our afternoon session, we completed the first draft of the attemperation system section and we partially completed the first draft of the economizer section.

We determined that the smelt spout cooling water system was already a resource that had been developed in the Safe Firing of Black Liquor committee and that resource will be cross referenced in our document.

We closed our meeting at 4PM and provided the executive committee with a summary of the Spring subcommittee activities.

The fall 2010 meeting will be an open session in the morning and a closed session in the afternoon.

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 six 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

In 2009, we had to cancel the three scheduled Operational Safety Seminars due to the limited number of registrations caused by the economic conditions. Late last year, we contacted all mills to determine whether they would plan to send people to the seminars this year. As a result of those contacts, we determined there would not be enough registrations for the Portland OR seminar. Thus, we did not plan one there. The responses to our contacts showed that potential registrations for seminars in April and May in Atlanta would be about 50 people for each. We therefore scheduled one seminar April 26 – 27th and one May 11 – 12th. Indications are that we should surpass these numbers by the time of the seminars. Each company representative and mill were contacted and requested to seriously consider sending people to these valuable training sessions. We are hoping that we will have at least these numbers. If your mill wishes to send some people to these seminars, please let me know as soon as possible.

The monitors for these seminars for the past several years, Dr. Tom Grace and Mr. Ron Mc Carty, have decided to retire. Messrs. Jules Gommi and Bob Phelps have agreed to replace them and will attend the April session as observers. The Committee decided to revert back to the two half day sessions instead of the day and one-half day sessions. The seminars have also been reformatted to further improve the discussions and "preaching and teaching" the information available.

Recovery Boiler Reference Manuals

The Operation and Maintenance Subcommittee is reviewing the AF&PA Recovery Boiler Reference Manuals to include any possible new information and to have them available electronically. They will be bookmarked in the PDF to improve ease of use and the file can be searched for key words.

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. Of the potential technologies that were evaluated, Aptech appeared to have the only one with significant potential. The company was invited to the annual meeting and Conference to present an outline of its technology, but unfortunately it had to cancel at the last minute. EPRI has sponsored two demonstrations of the Aptech technology on utility boilers.

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

The Committee is investigating whether the results of those demonstrations indicate whether the technology may be applicable to recovery boiler. If the feedback is positive, then the Committee will consider additional follow-up with Aptech.

Recommendations and Guidelines in AF&PA Guidelines and Checklist Document

The Operation and Maintenance Subcommittee is finalizing the recommendations and guidelines developed from the Economizer Tube Failure Study. These are being processed so that the AF&PA Guidelines and Checklist document will be updated and include these recommendations. It is expected that the revised document will be available shortly. As soon as it is available, all members will be notified. It will be available on the AF&PA website.

Study on Smelt Dissolving Tank Explosions

The study of green liquor density versus TTA as a function of green liquor composition sponsored by AF&PA was completed last year. The final report was distributed to AF&PA Recovery Boiler Program members in addition to the BLRBAC Safe Firing Subcommittee. BLRBAC is working with the results of the study to revise the smelt dissolving tank guidelines.

Updating "Kraft Recovery Boilers" Blue Book

Dr. Tran and other known recovery boiler researchers are updating the 15 chapters for the "Kraft Recovery Boilers" text book. There have been enough commercial advances and research activities documented to warrant a new edition. Dr. Tran is spearheading 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 Economizer Leak study sponsored by AF&PA have been published by the TAPPI Subcommittee and are available from TAPPI. 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 sponsoring several studies, such as the interaction of shatter jets with smelt flow, guidelines for designing smelt dissolving tanks and a scientific basis for evaluating how best to dry out a recovery boiler after a water-wash to minimize out-of-service corrosion.

AF&PA Website and Connection with BLRBAC

The Committee is working to update the AF&PA website to include recovery boiler information so that it is easily accessible. BLRBAC has agreed to add information regarding the Operational Safety Seminars and contacts at AF&PA on its website.

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

Annual Meetings and Conference

AF&PA's annual Recovery Boiler meetings and Conference was held in Atlanta February 9th and 10th. As usual, the Conference is open to all operating companies, insurers, vendors and manufacturers. The presentations included 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

I have eight items to report on for this meeting:

a) The National Board Inspection Code (NBIC) 2009 Addendum was published in December 2009 and became available in January 2010; it becomes mandatory July 1, 2010.

b) The NBIC 2010 Edition will be published as the 2010 Addendum to the 2007 Edition and will be published in July 2010, be available in August 2010, and become mandatory December 31, 2010. This is being done to sync the publication date with the ASME Boiler and Pressure Vessel Codes.

c) In July 2011 a new edition will be published and be available in August 2011 becoming mandatory in December 2011. The next edition of the NBIC will be published in July 2011. There will no longer be any addenda published for the NBIC.

d) NBIC Part 3 on-line training courses will be available midyear 2010; eventually there will be a course for each part of the NBIC. A nominal fee will be charged for taking the courses. Certificates of completion will be issued after successfully passing the final exam for each course.

e) The NBIC is now available as a subscription from HIS.

f) The NBIC Executive Committee is considering a proposal to create a new Part 4 and possibly a new Part 5 to the NBIC. The New Part 4 will be all of the requirements for Pressure Relief Devices (PRD) and the New Part 5 will be a stand-alone Supplement part for specific pressure-retaining items, such as, historical boilers, locomotive boilers and Yankee dryers. The new supplement part would combine all the requirements from Parts 1, 2, and 3 for each item.

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

g) In January 2010 the National Board Commission changed. Two commissions are now available; one for those that only perform in-service inspections, including repairs and alterations and one for those that only perform new construction activities.

Successful completion of the In-service Commission exam is required to obtain the In-service Commission. The National Board created a new Inspector Course (IC) to help prepare in-service commission candidates for taking the exam. The body of knowledge now reflects those items that pertain to in-service inspections and repairs and alterations.

The current "A" Endorsement course and successful completion of the "A" exam is required to obtain the New Construction Commission; the other endorsements available for New Construction Commission are the B, N, C, and IS. A new A_R endorsement was established for the New Construction Commission for those inspectors that would like to perform repair and alteration inspections. To obtain the A_R endorsement the authorized inspector is required to successfully complete the NBIC Part 3 online training course. Those who currently have a National Board Commission were grandfathered and retained all of their original endorsements.

h) The in-service commission exam is now administered by AMP, a worldwide testing agency, as well as, by the Jurisdictions. The exam may be taken at anytime during the year at any AMP facility. The Jurisdictional exams are still offered four times a year; in the third week of March, June, September, and December.

8. **TAPPI RECOVERY BOILER SUBCOMMITTEE OF STEAM & POWER REPORT** – Alarick Tevaris (new Chairman - S2010)

No written report, but slides used during report are included as an Appendix D to these Meeting Minutes.

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

Our spring meeting was held last week April 7th & 8th 2010 at the River Rock Casino in Richmond, BC. We had very good attendance approximately seventy people attended which were made up of mill personnel, boiler manufacturers and suppliers. The boiler manufacturers gave the updates and there were five technical papers presented. Four submitted incidents were discussed, another one was just verbally discussed as the report was not available at the time, hopefully this report will be available at the next meeting.

Our next meeting will be held the first week of November of this year again in Richmond BC. If you would like to come, please give me your e-mail address and I'll sent out an invitation. It should be interesting as we are going to ask Co – Generation Plants if they want to attend on our second open meeting day, as we are trying to increase the meeting attendance.

Thank you again for the things I have learned at this meeting and which I can take back to our membership at Western Canada BLRBAC.

10. **ACTIVITIES OUTSIDE NORTH AMERICA REPORTS**

No reports were given at this time.

11. **OPERATING PROBLEMS SESSION REPORT** – Scott Moyer (report given by Len Erickson)

There were approximately 100 people who attended the Operating Problems Session yesterday. We did learned that Scott likes trick questions. If any of you have been in the military, you know that they have a form and procedure on how you write tests. You must have answers wherein one is obviously wrong, one that is kind of wrong and one that might be wrong and then you have the correct answer, but Scott doesn't have a clue.

There were a number of operating questions out there and a number of topics were covered, such as, water treatment, chemical cleaning deposits, where do you take tube samples, etc. Good discussions were held and following that we had a good presentation.

NEXT MEETING: October 4, 5 & 6, 2010, at the Crowne Plaza Hotel, Atlanta GA.

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? Opposed? The spring meeting of the 2009 BLRBAC is now closed. Everyone have a safe trip home!

Appendix A – Summary of Incidents

ESP ONLY - NO LEAK

Spring 2010 - 1	
Classification:	**ESP Only – No Leak**
Location:	**Smurfit-Stone, Fernandina Beach, FL**
Unit:	#5 RB, 1978 B&W, PR 189, 2-drum Large Economizer
Unit Size:	3.0 MM lb ds/day; ,495,700 lb/hr steam at 870 psig, 800°F, 1000 psig design
Incident Date:	May 5, 2009
Downtime hrs, leak/total:	59.4 / 59.4
ESP?	**Yes**
Leak/Incident Loc:	No Leak
How discovered:	Walk down. Heard steam blowing noise.
Wash adjacent tube:	n/a
Root cause:	Leaking poppet valve
Leak detection:	Yes
Bed cooling enhanc	No
Last full inspection:	March 2007
Sequence of events:	**5 May** 04:15 During walk down, heard steam blowing noise. Shut soot blowers. Still heard noise. 05:05 ESP's unit. **6May** 06:00 Checked unit. Did hydro. No leak. Found leaking poppet valve and isolation valve leaking by..
Repair procedure:	Changed out poppet valve.
Future prevention:	-

ESP ONLY - NO LEAK

Spring 2010 - 2	
Classification:	**ESP Only – No Leak**
Location:	**Alabama River Pulp, Perdue Hill, AL**
Unit:	APP 1992, 1991 B&W, PR-216, 1-Drum Large Economizer
Unit Size:	6.4 MM lb ds/day; 898,000 lb/hr steam at 1225 psig, 900°F, 1425 psig design
Incident Date:	October 16, 2009
Downtime hrs, leak/total:	32.37 hrs
ESP?	**Yes**
Leak/Incident Loc:	ESP Only, No leak
How discovered:	During mock ESP exercise
Wash adjacent tube:	n/a
Root cause:	Operator error
Leak detection:	
Bed cooling enhanc	no
Last full inspection:	
Sequence of events:	During routine training of a mock ESP, the actual ESP buttons were pushed by mistake instead of the lights and horns pushbuttons.
Repair procedure:	n/a
Future prevention:	Extra training; Secured ESP button covers with ties; Replace light/horn pushbuttons with switches

Appendix A – Summary of Incidents (Continued)

ESP ONLY - NO TUBE LEAK (SMELT LEAK)

Spring 2010 - 3	
Classification:	**ESP Only – No (Water) Leak**
Location:	**International Paper, Mansfield, LA**
Unit:	#1 RB, 1981 B&W, PR-199, 2 Drum Large Economizer
Unit Size:	3.74 MM lb ds/day; 483,000 lb/hr steam at 1250 psig, 915°F, 1475 psig design
Incident Date:	December 1, 2009
Downtime hrs, leak/total:	120 hr 20 min / n/a
ESP?	**Yes**
Leak/Incident Loc:	No tube leak. Smelt leak through floor.
How discovered:	**Walk down**. (Smelt observed leaking out of vestibule)
Wash adjacent tube:	n/a
Root cause:	ESP cause: Mistakenly heard to ESP; Smelt leak cause: Refractory eroded away in crotch, rear wall to floor
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	-
Sequence of events:	During walk down, saw smelt leaking out of vestibule (similar to October smelt leak). Called for sounding ESP ALARM to evacuate, but control room thought was call for actual ESP system, so was pushed instead. Smelt leak was in crotch between floor tubes and rear wall, 4 ft from east wall. Refractory had eroded allowing smelt to penetrate through to seal strip and into lower vestibule. Discovered refractory across rear wall hadn't repelled the smelt, creating smelt layers down to the seal strip. All refractory across rear wall crotch was removed and new poured. Added inspection found thin floor tubes from smelt erosion which were replaced and studs will be added.
Repair procedure:	Repair to the crotch seal strip and installed the two Dutchmen. The Dutchmen were installed using TIG weld on the root and cap with ER70S TIG rod
Future prevention:	Inspection of condition of refractory will take place during annual outage. Full floor UT to be done on annual outage

ECONOMIZER HAND HOLE CAP

Spring 2010 - 4	
Classification:	**Non-Critical**
Location:	**International Paper, Texarkana, TX**
Unit:	1972 B&W PR-144, 2-Drum Large Economizer, 1985 B&W Lower Economizer
Unit Size:	2.6 MM lb ds/day; 408,000 lb/hr steam at 650 psig, 750°F, 775 psig design
Incident Date:	September 13, 2009
Downtime hrs, leak/total:	0. (Repaired during outage) ?
ESP?	**No**
Leak/Incident Loc:	Crack in Econ hand hole cap weld, external leak. Lower economizer rear outlet header, LHSW cap on the RHSW section. Outlet header elevation 88 feet
How discovered:	**Walk down**. Saw water coming down side of economizer.
Wash adjacent tube:	No
Root cause:	Failed weld
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	May 09
Sequence of events:	During walk down, saw water coming down side of lower economizer. Investigation found outlet header hand hole cap leaking.
Repair procedure:	Gouged out the old cap, repaired the seat and welded a new cap
Future prevention:	Have had similar failures

ECONOMIZER HAND HOLE CAP

Spring 2010 - 5	
Classification:	**Non-Critical**
Location:	**Alabama River Pulp, Perdue Hill, AL**
Unit:	1978 B&W, PR-192, 2-Drum, Large economizer
Unit Size:	5.5 MM lb ds/day; 711,000 lb/hr steam at 1300 psig, 900°F, 1425 psig design
Incident Date:	October 1, 2009
Downtime hrs, leak/total:	40hr 10 min./40 hr 10 min
ESP?	**No**
Leak/Incident Loc:	¼"x1/8" pinhole in hand hole cap in lower header, hot economizer
How discovered:	**Walk Down**. Saw water in economizer hoppers
Wash adjacent tube:	No
Root cause:	Suspect porosity in weld
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	April 09
Sequence of events:	During walk down, saw water in hoppers. Used orderly shutdown. Leak repaired. Hydro OK
Repair procedure:	Pinhole ground out and weld repaired
Future prevention:	-

ECONOMIZER HAND HOLE

Spring 2010 - 6	
Classification:	**Non-Critical**
Location:	**International Paper Riverdale, Selma, AL**
Unit:	#1 RB, 1966 B&W, PR-98, 2-drum Large Econ; 1997 B&W Economizer
Unit Size:	1.4 MM lb ds/day; 290,000 lb/hr steam at 650 psig, 700°F, 725 psig design
Incident Date:	October 16, 2009
Downtime hrs, leak/total:	23.25
ESP?	**No**
Leak/Incident Loc:	¼" weld defect in hand hole cap, left side, lower header, first water pass, cold module economizer
How discovered:	**Walk down**. Saw water in economizer hopper.
Wash adjacent tube:	No
Root cause:	Bad stick weld
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	-
Sequence of events:	**16Oct** During walk down, saw water in economizer hopper. Shut soot blower. Leak noise heard. Orderly shut down. 23:15 Pulled liquor. **17Oct** 05:00 Fire out. Repaired done. 23:15 First fire. **18Oct** 06:45 Liquor fired
Repair procedure:	Mechanically closed the defect and welded hemihead cap over it. PT'd OK
Future prevention:	Use TIG weld since 5 years ago. Will remove hemihead and replace hand hole cap in 2010.

Appendix A – Summary of Incidents (Continued)

ECONOMIZER HAND HOLE

Spring 2010 - 7	
Classification:	**Non-Critical**
Location:	**Daishowa-Marubeni Intl, Peace River, AB**
Unit:	1990 B&W Contract 7614, 2-drum Large economizer
Unit Size:	3.785 MM lb ds/day; 563,000 lb/hr steam at 925 psig, 815°F, 1125 psig design
Incident Date:	January 26, 2010
Downtime hrs, leak/total:	31.26/37.37
ESP?	**No**
Leak/Incident Loc:	Pinhole in wed of hand hole cap of lower economizer header of cold (rear) bank
How discovered:	**Walk down**. Saw small wet salt cake ice sickles at economizer outlet damper
Wash adjacent tube:	No
Root cause:	Porosity pinhole in weld exposed after surface corroded.
Leak detection:	Yes
Bed cooling enhanc	No
Last full inspection:	June 2009
Sequence of events:	26Jan During walk down, saw small wet salt cake ice sickles at economizer outlet damper. Checked hoppers for water or moisture. Concluded it was small hand hole cap leak. Diverted sluice liquor. 28Jan Took orderly shut down. Made repairs. Hydro OK. 29Jan Start-up
Repair procedure:	Welded 6 full passes with new cap.
Future prevention:	Assure 6 full passes with overlap to prevent any one porosity site form exposure.Replae all older caps.

ECONOMIZER HAND HOLE CAP

Spring 2010 - 8	
Classification:	**Non-Critical**
Location:	**International Paper, Riegelwood, NC**
Unit:	1974 CE, Contract 23771, 2-drum DCE Cascade, & 1991 Tampella Rebuild
Unit Size:	2.64 MM lb ds/day; 326,000 lb/hr steam at 600 psig, 725°F, 1000 psig design
Incident Date:	March 1, 2010
Downtime hrs, leak/total:	35 h 10 min
ESP?	**No**
Leak/Incident Loc:	Leak in hand hole cap of lower economizer header, left side
How discovered:	**Maintenance Observed walk down**. Saw steam and water flow from under lagging at rear of economizer
Wash adjacent tube:	No
Root cause:	Porosity in weld of welded hand hole cap
Leak detection:	Yes. mass balance
Bed cooling enhanc	No
Last full inspection:	Oct 2009
Sequence of events:	1Mar 10:00 E/I Tech prepping to PM calibrate XS O2 meter on 4RB. Saw steam and small flow of hot water from under the lagging on rear side of economizer. He and field operator investigated the casing and saw more steam coming from under corner lagging. Determined to be an economizer leak near the lower header. No chance of getting water into the furnace. Took controlled shut down. Burned out bed Took unit off line in an orderly fashion. 12:35 Boiler off line. Unit cooled down with fans. Opened bolt on economizer doors. Leak seen to be on a hand hole cap on the lower supply header. Casing removed. Hand hole cap removed, cleaned up and rewelded.
Repair procedure:	Hand hole cap removed, cleaned up and rewelded.
Future prevention:	-

Appendix A – Summary of Incidents (Continued)

ECONOMIZER

Spring 2010 - 9	
Classification:	**Non-Critical**
Location:	**Alabama River Pulp, Perdue Hill, AL**
Unit:	1978 B&W, PR-192, 2-Drum, Large economizer
Unit Size:	5.5 MM lb ds/day; 711,000 lb/hr steam at 1300 psig, 900°F, 1425 psig design
Incident Date:	January 26, 2009
Downtime hrs, leak/total:	37.5/37.5
ESP?	**No**
Leak/Incident Loc:	Leak 1: Left side of lower header of rear econ, Row1 Tube 1 Pinhole, washed leak 2: Row 2 plugged Tube 1 stub was washed out just under plug weld by leak 1
How discovered:	**Walk down**. Saw wet salt cake in precipitator ash.
Wash adjacent tube:	**YES**
Root cause:	Suspect external corrosion. Awaiting test result.
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	Sep 08
Sequence of events:	**Walk down**. Saw wet salt cake in precipitator ash. Leak found in rear economizer. Reduced load. Saw location. Orderly shut down Repairs made. Hydro OK
Repair procedure:	Row 1 pinhole ground out and weld repaired. Row 2 plug removed and reattached with fillet weld.
Future prevention:	-

ECONOMIZER

Spring 2010 - 10	
Classification:	**Non-Critical**
Location:	**Boise Paper, Jackson, AL**
Unit:	#2 RU 1974 CE, #24272, 2-Drum DCE Cascade; w/1984 Foster-Wheeler economizer
Unit Size:	1.7 design/2.4 current MM lb ds/day; 325,000 lb/hr steam at 650 psig, 700°F, 750 psig design
Incident Date:	21 April 2009
Downtime hrs, leak/total:	16.8
ESP?	**No**
Leak/Incident Loc:	¼" diam pinhole, 1" from tube-to-header weld, lower economizer header
How discovered:	**Acoustic system fluctuations then Walk down**. Saw water dripping from lower econ casing
Wash adjacent tube:	No
Root cause:	Not yet known Leak out of HAZ. Suspect water-side pitting (Sample to be taken Dec 09)
Leak detection:	Yes Triple 5 Acoustic. Gave prior indication
Bed cooling enhanc	No
Last full inspection:	Oct 08
Sequence of events:	20Apr09 14:50 Triple-5 notice of trend fluctuations in 2 econ sensors. Check showed no sign of noise or leak. No FW-steam diff of note. Crew focus on area. 21Apr 02:50 saw water dripping from econ casing. Began orderly shutdown. No visual confirmation. 10:00 Pulled liquor. Leak easily seen. Unit cooled, locked out, and econ area water washed. Repair made. 19:55 Repair complete. 21:10 Hydro OK. 22:50 oil fire . 22Apr 02:50 liquor fire
Repair procedure:	Weld overlay with visible dye pen.
Future prevention:	Several alarms and trend fluctuations occur regularly with the Triple 5 acoustic leak detection system, operators continue to respond quickly to any variances due to past success of the system

Appendix A – Summary of Incidents (Continued)

ECONOMIZER

Spring 2010 - 11	
Classification:	**Critical Incident #724**
Location:	**Boise Paper, Jackson, AL**
Unit:	#2 RU 1974 CE, #24272, 2-Drum DCE Cascade; w/1984 Foster-Wheeler economizer
Unit Size:	1.7 design/2.4 current MM lb ds/day; 325,000 lb/hr steam at 650 psig, 700°F, 750 psig design
Incident Date:	2 May 2009
Downtime hrs, leak/total:	24.5
ESP?	**No**
Leak/Incident Loc:	¼" diam pinhole, 1.5" from tube-to-header weld, upper economizer header
How discovered:	**Walk down**. Saw water dripping from lower econ casing. No acoustic trends.
Wash adjacent tube:	No
Root cause:	Not yet known Appear to be out of HAZ. Suspect waterside pitting. Sample to be taken Dec09.
Leak detection:	Yes Triple 5 Acoustic. Did not detect this leak, but did detect two prior leaks.
Bed cooling enhanc	No
Last full inspection:	Oct 08
Sequence of events:	2May09 20:40 During walk down, saw water dripping from lower econ header. Believed was in lower header like 11 days prior. Began orderly shut down. 3May09 01:45 Liquor out. Unit cooled, locked out, cleaned and scaffolded. 15:00 Weld overlay repair complete. 17:00 Hydro OK. Added UT and RT done in area. No thinning found. 21:35 Oil fire in. 4May 02:15 Liquor fire in.
Repair procedure:	Weld overlay.
Future prevention:	Economizer tube stock and header plugs were ordered following this incident so we could remove any future failed tube in this area to allow us to perform a failure analysis and identify root cause.

ECONOMIZER

Spring 2010 - 12	
Classification:	**Non-Critical**
Location:	**New Page Corp, Luke MD**
Unit:	#3 RB, 1972 CE Contract 23069, 2-drum DCE Cascade, 1997 Economizer
Unit Size:	3.45 MM lb ds/day; 460,000 lb/hr steam at 600 psig, 715°F, 750 psig design
Incident Date:	August 7, 2009
Downtime hrs, leak/total:	33/33
ESP?	**No**
Leak/Incident Loc:	Crack in lower economizer attachment weld of tab that used to hold 1/4 "x1" flat bar alignment anchors, hot side row 2, tube 9; Washed ½"x2" tear row 2, tube 8 **rupture**, eroded by 1st leak
How discovered:	**Control Panel** (Steam/Feed water differential; low drum level)**+ Low Drum Trip**:
Wash adjacent tube:	**Yes**
Root cause:	Crack in old attachment weld
Leak detection:	Yes
Bed cooling enhanc	No
Last full inspection:	Oct 08
Sequence of events:	Operating normal. 07:00 Slight drop in solids fired. 07:20 Received steam/feed water differential alarm. Then drum level and solids began to drop to 66%. Began orderly shut down. Boiler tripped on low drum level. Repairs made. Operating pressure check of economizer done during start-up.
Repair procedure:	Tube crack ground out and rewelded. Ruptured tube cut to 18" stub each header and stub ends plugged and dye-checked. Start-up
Future prevention:	-

Appendix A – Summary of Incidents (Continued)

ECONOMIZER

Spring 2010 - 13	
Classification:	**Critical Incident #725**
Location:	**Verso Paper, Quinnesec, MI**
Unit:	#1 RB, 1985 B&W, PR-203, 2-Drum Large Economizer
Unit Size:	3.84 MM lb ds/day; 600,000 lb/hr steam at 600 psig, 752°F, 800 psig design
Incident Date:	September 8, 2009
Downtime hrs, leak/total:	27 hrs 57 min/
ESP?	**No**
Leak/Incident Loc:	½" to 3/4" long circumferential crack in tube 90, row 3, 1inch below top rear header of 2nd water pass
How discovered:	**Acoustic (Triple-5) indication** preceded mass balance (AAI) alarm; followed by walk down confirmation.
Wash adjacent tube:	No
Root cause:	Probably stress crack
Leak detection:	Yes Triple-5 Acoustic and AAI Mass
Bed cooling enhanc	No
Last full inspection:	April 2009
Sequence of events:	**Early Sep**: Slight increase in acoustic signals. **8Sep** 13:00: Acoustic and mass balance alarms; Confirmed at panel leak NOT in furnace. Walk down saw water dripping from baffle plate, seen through 6th floor econ door. Orderly shut down. **9Sep** 12:06 pulled liquor. 21:00: Bed burned out. Start cooling. 23:00 Removed lagging. Confirmed leak location. **10Sep** 01:00 Drain unit, lock out, start repair. 02:45 Repair complete. 04:30 Hydro OK. 07:21 Fire in unit. 14:11 On line. 16:03 Liquor fired
Repair procedure:	Welded SMAW with 7018; 350oF preheat, dye pen tests
Future prevention:	Will add inspection hatches on top of econ at 2010 outage fo easier NDE on econ header.

ECONOMIZER

Spring 2010 - 14	
Classification:	**Critical Incident #726**
Location:	**New Page Corp, Luke MD**
Unit:	#3 RB, 1972 CE Contract 23069, 2-drum DCE Cascade, 1997 Economizer
Unit Size:	3.45 MM lb ds/day; 460,000 lb/hr steam at 600 psig, 715°F, 750 psig design
Incident Date:	September 9, 2009
Downtime hrs, leak/total:	31/31
ESP?	**No**
Leak/Incident Loc:	Pin hole in upper economizer tube plug weld done month earlier, hot side row 2, tube 8; Washed ½"x2" tear row 1, tube 8 **rupture**, 24" below header, eroded by 1st leak
How discovered:	**Control Panel** (Sudden drop in drum level)**+ Low Drum Trip**:
Wash adjacent tube:	**Yes**
Root cause:	Bad weld
Leak detection:	Yes
Bed cooling enhanc	No
Last full inspection:	Oct 08
Sequence of events:	Operating normal. 23:55 drum level dropped rapidly, steam/feed water alarm sounded, and unit tripped on low drum level. No bed disruptions. Unit secured. Repairs made. Leak checked by static water at 90% of normal header pressure.
Repair procedure:	Tube plug removed and rewelded. Ruptured tube cut to 18" stub each header and stub ends plugged and dye-checked. Start-up
Future prevention:	-

Appendix A – Summary of Incidents (Continued)

ECONOMIZER

Spring 2010 - 15	
Classification:	**Non-Critical**
Location:	**Verso Paper Androscoggin, Jay ME**
Unit:	#1 RB, 1965 CE # 2564, 2-Drum Large Economizer
Unit Size:	1.8 MM lb ds/day; 296,000 lb/hr steam at 900 psig, 825°F, 1050 psig design
Incident Date:	October 5, 2009
Downtime hrs, leak/total:	28.5 hr/28.5 hr
ESP?	**No**
Leak/Incident Loc:	1/8" pinhole leak in weld around old tube plug in original small economizer lower header.
How discovered:	**Walk down.** Saw water leaking from casing
Wash adjacent tube:	No
Root cause:	Poor weld penetration (lop) at the start/stop point of the weld on the tube plug.
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	May 2009
Sequence of events:	5Oct 18:00: During walkdown, saw water coming from economizer casing next to lower header, left side. Controlled shut down. Burned out bed. 22:00 pulled fire. Leak found at weld around existing tube plug in original small economizer lower header. Leak repaired. Unit hydroed OK. 7Oct 02:45: Unit on line
Repair procedure:	Plug was removed and a new plug installed and welded into place
Future prevention:	-

ECONOMIZER

Spring 2010 - 16	
Classification:	**Non-Critical**
Location:	**PH Glatfelter, Spring Grove, PA**
Unit:	#3 RB, 1993 Andritz Contract 400003, 1-Drum Large Economizer
Unit Size:	2.67 MM lb ds/day; 434,000 lb/hr steam at 850 psig, 825°F, 1140 psig design
Incident Date:	October 29, 2009
Downtime hrs, leak/total:	38.5/38.5
ESP?	**No**
Leak/Incident Loc:	1 ½" circumferential crack of feeder tube off of lower economizer inlet header, crack was at swedge fitting just above orfice plate; 1st tube in from left lower inlet header
How discovered:	**Walk Down**.
Wash adjacent tube:	No
Root cause:	Stress assisted corrosion. Possible manufacturing defect of swedge fitting and orifice assembly
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	June 2009
Sequence of events:	29Oct 02:00 Saw wet ash in Econ ash hopper Shut soot blowers. Forward econ and boiler ash hoppers dry. Leak getting worse. Started orderly shut down. 30Oct 03:00 Off liquor. 07:00 Off line 19:00 unit cool. Started repairs. 30 Oct 05:30 Repairs done. 17:00 on line. 17:30 On liquor.
Repair procedure:	Ground out crack and weld repaired. Swedge fitting with orfice plate to be replaced on annual outage
Future prevention:	Conduct annual inspection of economizers' lower header seal plates. During a Christmas scheduled outage the tubes on the lower header of Econo I & II were checked using digital xraying . 6 cracks were found and repaired. This included one found on the original tube leak location. (180 degs. from first) All cracks were on the first three tube in from the casing seals. All repaired tubes to be replaced on annual outage

Appendix A – Summary of Incidents (Continued)

ECONOMIZER

Spring 2010 - 17	
Classification:	**Non-Critical**
Location:	**International Paper Co, Mansfield, LA**
Unit:	#1 RB, 1981 B&W, PR-199, 2 Drum Large Economizer, 2008 B&W Economizer
Unit Size:	3.74 MM lb ds/day; 483,000 lb/hr steam at 1250 psig, 915°F, 1475 psig design
Incident Date:	February 10, 2010
Downtime hrs, leak/total:	45/45
ESP?	**No**
Leak/Incident Loc:	1/4" pinhole in weld, tube 42A; Eroded weld, 43A; Eroded weld 44A to failure, all at top header, cold bank, center of center module
How discovered:	**Walk down**. Saw water in economizer hopper.
Wash adjacent tube:	Yes, Yes (twice)
Root cause:	Porosity in weld
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	-
Sequence of events:	During walk down, saw water in ash hopper. Pulled liquor. Opened doors to locate leak. Found in cold pass, safe side of baffle. Close exam of charts showed slight, but growing, steam-water difference.
Repair procedure:	Ground out welds and rewelded to code. Plugged 3 tubes. Added pad welds and other repair.
Future prevention:	Will grind out some welds that that welder did during shop fabrication. Will target hardest-to-access area to insure against longer downtime if had failures.

ECONOMIZER

Spring 2010 - 18	
Classification:	**Non-Critical**
Location:	**Domtar, Johnsonburg, PA**
Unit:	1993 Tampella #90132, 1-Drum Large Economizer
Unit Size:	2.8 MM lb ds/day; 400,000 lb/hr steam at 1250 psig, 900°F, 1600 psig design
Incident Date:	Oct 30, 2009
Downtime hrs, leak/total:	28.9/28.9
ESP?	**No**
Leak/Incident Loc:	Pinhole leak in weld between tube and lower economizer header, #1 Econ.
How discovered:	Walk down. Saw wet ash
Wash adjacent tube:	No
Root cause:	Stress-assisted corrosion (probable); Poor shop welds, stress corrosion fatigue cracking caused by a combination of thermal expansion of the tube length, and the cantilever effect of the sloped portion of the tube.
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	September 2008
Sequence of events:	30 Oct 01:15: Walk down saw water in economizer ash hopper conveyor. Did orderly shutdown. 03:55: liquor out. Bed burned out. Unit locked out. 31Oct 13:45 Began econ water wash. Drained unit. 20:35 Repairs complete. 22:10 Hydro OK.1Nov 01:43 1st fire. 07:35 On Line. 08:50 On Liquor.
Repair procedure:	Ground out defect and did weld repair.
Future prevention:	Many similar leaks during past 7 years.

Appendix A – Summary of Incidents (Continued)

ECONOMIZER +

Spring 2010 - 19	
Classification:	**Critical Incident #727**
Location:	**International Paper, Courtland, AL**
Unit:	#2 RB, 1979 B&W PR-180, 2-drum DCE Cyclone
Unit Size:	4.2 MM lb ds/day; 500,000 lb/hr steam at 450 psig, 550°F, 550 psig design
Incident Date:	January 21, 2010
Downtime hrs, leak/total:	50/50
ESP?	**No**
Leak/Incident Loc:	Bad weld in previously plugged tube in economizer upper header, hot side; Hydro found leak from small pit 1" from mud drum, rear side
How discovered:	**Walk down**. Routine inspection while down for cyclone wash
Wash adjacent tube:	No
Root cause:	Bad weld in out-of-center tube plug at upper header done in Fall 2009. Boiler: External corrosion and pits.
Leak detection:	Yes. Mass balance
Bed cooling enhanc	No
Last full inspection:	Nov 2009
Sequence of events:	21Jan: 01:08 Liquor out. 14:15 going back up. During routine inspection walk down while down for cyclone wash, found moisture in econ hopper. No water in boiler bank hoppers. Unit not smelting. 15:00 Did orderly shut down. Did repair. 22Jan: 06:00 On hydro, found pinhole leak in boiler tube 1" from mud drum, rear side. Did repair. 17:00 Hydro OK. 23Jan 01:23 Steaming. 03:30 Liquor in.
Repair procedure:	Econ: Removed plug and replaced with new plug. Boiler: plugged mud drum
Future prevention:	Inspect other plugs in econ during Spring 2010. Inspect mud drum tubes.for corrosion and pits.

SUPERHEATER

Spring 2010 - 20	
Classification:	**Non-Critical**
Location:	**Kapstone Paper Co, Charleston, SC**
Unit:	1984 B&W, PR-206, 2-Drum Large Economizer
Unit Size:	4.5 MM lb ds/day; 691,000 lb/hr steam at 1450 psig, 880°F, 1725 psig design
Incident Date:	August 11, 2009
Downtime hrs, leak/total:	0/0 (During shut down)
ESP?	**No**
Leak/Incident Loc:	Circular crack on secondary superheater inlet header drain line
How discovered:	During shut down inspection, saw steam blowing and wet salt cake in penthouse
Wash adjacent tube:	No
Root cause:	Drain line was in a bind where it penetrated the casing, cracking the pipe
Leak detection:	Yes. In-house DCS Leak Detection Trends
Bed cooling enhanc	No
Last full inspection:	August 17, 2009 ?
Sequence of events:	11Aug During shut down inspection, saw steam blowing and wet salt cake in penthouse. After cooling, located leak in inlet header drain line
Repair procedure:	Replaced 2-ft section of header drain line. Replaced drain line fillet weld with new SA 335-P-22. Did dye pen and hydro.
Future prevention:	Inspected other drain line sites. All OK.

Appendix A – Summary of Incidents (Continued)

SUPERHEATER

Spring 2010 - 21	
Classification:	**Non-Critical**
Location:	**New Page Corp, Wisconsin Rapids, WI**
Unit:	#1 RU 1967 CE, #1166, 2-Drum DCE
Unit Size:	1.5 MM lb ds/day; 200,000 lb/hr steam at 1275 psig, 900°F, 1450 psig design
Incident Date:	20 August 2009
Downtime hrs, leak/total:	84
ESP?	**No**
Leak/Incident Loc:	½" rupture at bottom of pit, in outlet of LTSH in refractory seal in penthouse
How discovered:	**Walk down**
Wash adjacent tube:	No
Root cause:	Pitting from local Cl-assisted corrosion
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	May 2009
Sequence of events:	20Aug morning: During walk down, water seen dripping out of SH thermocouple junction box at side of penthouse. Steam wisping found inside. No control room indications. Thought to be from recent washing and rain, but closely watched, and started bed burnout. Additional wet boxes found. Liquor pulled. Unit and penthouse reinspected. Noted that while penthouse was open, box moisture disappeared. Unit put back on line. A few hours later, moisture and steam reappeared. Noon Unit off liquor. Cool unit and prep for hydro. 21Aug early morn: Hydro found leak in LTSH tube in outlet pendant refractory box seal. Unit washed and scaffolded. Dutchmen installed on several externally-corroded thinned tubes. 23Aug 10:30 Hydro OK. 24Aug Early AM Unit on liquor.
Repair procedure:	Installed dutchman
Future prevention:	Since tubes in refractory box not readily visible, will schedule inspections during annual outages

SUPERHEATER

Spring 2010 - 22	
Classification:	**Non-Critical**
Location:	**International Paper, Texarkana, TX**
Unit:	#2 RB, 1976 B&W PR-186, 2-Drum Large Economizer
Unit Size:	4.55 MM lb ds/day; 763,600 lb/hr steam at 1050 psig, 813°F, 1200 psig design
Incident Date:	January 20, 2010
Downtime hrs, leak/total:	43/43
ESP?	**No**
Leak/Incident Loc:	1-1/4" longitudinal split in superheater tube, elev 159'-8" (IK#10)
How discovered:	"Walk down" - While doing maintenance work there
Wash adjacent tube:	No
Root cause:	Thermal cycling from condensate blowing out of the IK
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	Oct 2009
Sequence of events:	Mechanic replacing IK poppet valve saw steam blowing back out of the lance tube when he removed poppet valve. After further investigation, a leak could be heard with all the IK's out of the unit and steam valved out.
Repair procedure:	By Code
Future prevention:	Inspected and replaced all traps. Implemented a routine inspection. Inspect all IK's for proper slope. Will inspect all IK lanes at the first opportunity.

Appendix A – Summary of Incidents (Continued)

SUPERHEATER

Spring 2010 - 23	
Classification:	**Non-Critical**
Location:	**International Paper Riverdale, Selma, AL**
Unit:	#2 RB, 1981 CE Contract 28679, 2-drum Large economizer
Unit Size:	2.7 MM lb ds/day; 425,000 lb/hr steam at 1425 psig, 860°F, 1720 psig design
Incident Date:	January 31, 2010
Downtime hrs, leak/total:	57.5
ESP?	**No**
Leak/Incident Loc:	1" rupture crack in penthouse in failed weld of thermocouple pad on primary superheater outlet tube 4, row 5, platen 24, about 16" below header. During hydro, 4 more leaks found in SH tube-to-header joint, from longitudinal cracks extending into header.
How discovered:	**Walk down**. Saw steam leaking from penthouse door
Wash adjacent tube:	No
Root cause:	Bad weld. Possible long term/short term overheat
Leak detection:	Yes
Bed cooling enhanc	No
Last full inspection:	July 2008
Sequence of events:	**31Jan** During walk down, saw steam leaking from penthouse door. Orderly shut down. **1Feb** Found crack. Did repair. **2Feb** During hydro, found 4 more leaks in tube-to-header welds, all in primary outlet header. Made repairs. Hydro OK.
Repair procedure:	1st leak: Replaced 18" section of T-11 with T-22 Dutchman. On 4 other leaks, ground out cracks, and rewelded with GTAW heliarc.
Future prevention:	Check thickness of surrounding tubes (outlet of primary). Superheater is scheduled to be replaced in May 2010. Will now include replacing primary SH outlet and secondary SH outlet header

SUPERHEATER

Spring 2010 - 24	
Classification:	**Non-Critical**
Location:	**Smurfit-Stone, Fernandina Beach, FL**
Unit:	#4 RB, `1970 B&W PR-126, 2-drum Large Economizer
Unit Size:	3.0 MM lb ds/day; 492,000 lb/hr steam at 900 psig, 825°F, 1000 psig design
Incident Date:	April 23, 2009
Downtime hrs, leak/total:	130.2 / 138.8
ESP?	**Yes**
Leak/Incident Loc:	1" crack in "C"-lug attachment weld, 9th floor, Superheater (+during hydro Economizer hand hole cap 2.5" linear indication, lower header, cold module)
How discovered:	Walk down. Heard noise between 8th & 9th floor
Wash adjacent tube:	No
Root cause:	Fatigue (Stress)
Leak detection:	Yes. Nalco TRASAR RBLI (didn't indicate)
Bed cooling enhanc	Yes NaHCO3+N2, injection, Southland Fire
Last full inspection:	March 2008
Sequence of events:	23Apr During walk down, heard noise between 9th and 10th floor. Shut soot blowers. Noise still there. ESP'd unit. **24Apr** 00:30 Walk down inspection. 02:00 Southland arrived. 06:30 bed cooled. Did hydro to locate leaks. 10:30 Water wash. **25Apr** 05:15 Wash done Installed scaffold. Repairs made. Detailed inspections done. Upon hydro, 2-1/2" indication leak found in economizer hand hole cap, bottom header, cold module. Repaired.
Repair procedure:	Replaced two 3' bottom bends with Dutchmen. On econ cap, ground out fillet weldment and rewelded.
Future prevention:	Detailed inspections done.

Appendix A – Summary of Incidents (Continued)

BOILER (Steam Drum)

Spring 2010 - 25	
Classification:	**Non-Critical**
Location:	**International Paper, Courtland AL**
Unit:	#3 RB, 1991 B&W 1-drum Large Economizer, 2003 B&W circulation upgrade
Unit Size:	5.1 MM lb ds/day; 672,000 lb/hr steam at 1300 psig, 900°F, 1525 psig design
Incident Date:	January 12, 2010
Downtime hrs, leak/total:	78/78
ESP?	**No**
Leak/Incident Loc:	1" circumferential crack, external side of seal weld, in 4" riser rolled into steam drum, outside of penthouse
How discovered:	**Walk down**. Saw steam wisping from insulation
Wash adjacent tube:	No
Root cause:	Improper rolling of 4" pipe into drum (metal not sufficiently disrupted into drum seat grooves); then excess axial stress on seal weld.
Leak detection:	Yes. Mass balance.
Bed cooling enhanc	No
Last full inspection:	April 2009
Sequence of events:	11Jan midday. During walk down, saw steam wisping from insulation under end of steam drum. Stripped insulation. Found small stream of steam/water flowing from 4" riser connection. 12Jan 16:00 Took orderly shutdown Did repairs On hydro, found leak from ½" stress crack at crotch plate above boiler bank door opening, at #40IK tube #9. Repaired.
Repair procedure:	Installed Dutchman, properly rolled it in and seal welded on drum ID.
Future prevention:	Replaced remaining 3 similar connections. Will replace door opening May 2010.

BOILER

Spring 2010 - 26	
Classification:	**Critical Incident #728**
Location:	**CPLP Northwood Pulp (CanFor), Prince George, BC**
Unit:	#1 RB, 1966 CESL Canada, CA64127, 2-Drum DCE Cascade, w/1990 Alstom Boiler
Unit Size:	3.5 MM lb ds/day; 459,500 lb/hr steam at 625 psig, 750°F, 750 psig design
Incident Date:	July 2, 2009
Downtime hrs, leak/total:	/56 hours
ESP?	**No**
Leak/Incident Loc:	Tubes near Boiler lower drum, cold (rear) side, near-drum corrosion thinning Row 39 tube 3
How discovered:	**Panel**. Water, steam split increased. Verified by quiet walk down found noisy area in economizer hopper
Wash adjacent tube:	Yes. 7 nearby tubes thinned
Root cause:	Near-drum corrosion thinning. Maybe caused by faulty soot blower.
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	2004 NDC
Sequence of events:	2Jul 15:00 Saw feed water-steam flow split. 15:15 Isolated soot blowers in prep for quiet walk down. Found noise at economizer hopper. Saw water in hopper.15:40 Controlled shut down.15:45 All fuel out. 16:30 Used rapid drain valves to drain boiler.
Repair procedure:	8 tubes plugged.
Future prevention:	Near-drum corrosion survey done at next outage.

Appendix A – Summary of Incidents (Continued)

SCREEN

Spring 2010 - 27	
Classification:	**Critical Incident #729**
Location:	**Evergreen Packaging, Canton, NC**
Unit:	#10 RB, 1965 B&W, PR-87, 2-drum DCE Cyclone, 1992 rebuild
Unit Size:	2.9 MM lb ds/day; 374,000 lb/hr steam at 425 psig, 750°F, 505 psig design
Incident Date:	September 16, 2009
Downtime hrs, leak/total:	165/165
ESP?	**Yes**
Leak/Incident Loc:	Rupture in Screen header supply tube at 5th floor where goes through ash hopper wall
How discovered:	Boiler trip (
Wash adjacent tube:	No
Root cause:	Severe localized corrosion (90% through) of tube ERW seam.
Leak detection:	No
Bed cooling enhanc	Yes. NaHCO3-N2 injection by Southland
Last full inspection:	April, 2009
Sequence of events:	16Sep 04:24 Drum level started dropping, feed water started opening, furnace pressure went high, causing Hi-P alarm. (Initial thought: More buildup at cyclones). 4:25 Boiler tripped, feed water put on manual. Saw no drum level, and not rising. Did walk down (delayed due to elevator usage). Heard steam leak noise at 7th floor; worse on 6th floor. Saw water leaking from ash hoppers. In hopper, water was rushing down hopper. Heard noise at 5th floor. Found steamy fog and noise there. 04:55 Cut off feed water. Check at spout level found middle 2 spouts plugged and water running out of 1st and 4th spouts. 05:03 ESP'd unit.
Repair procedure:	Replaced supply tube.
Future prevention:	Replaced all original screen header supply tubes like the one that failed. In 2010, will replace the rest of the tubes that were installed in the 1992 rebuild. Will begin survey of potential Stress Assisted Corrosion (SAC) areas in Spring 2010 outage. Added new trends to DCS and Process book displays to help determine tube leaks

SCREEN

Spring 2010 - 28	
Classification:	**Non-Critical**
Location:	**Georgia-Pacific Corp, Palatka, FL**
Unit:	1976 CE Contract 22974 2-Drum Large Economizer
Unit Size:	5.0 MM lb ds/day; 850,000 lb/hr steam at 1200 psig, 900°F, 1500 psig design
Incident Date:	January 16, 2010
Downtime hrs, leak/total:	36/36
ESP?	**No**
Leak/Incident Loc:	1/16 x 3/16" crack, 3/8" above reducer at top of screen supply bottle header (360o ID corrosion line) Spraying. Xray showed crack around the entire ID circumference with no internal wastage.
How discovered:	**Walk down**
Wash adjacent tube:	No
Root cause:	SAC pitting at a manufacturing defect during fabrication.
Leak detection:	Yes: RBLI Nalco TRASAR, system still disrupted from earlier upset.
Bed cooling enhanc	No
Last full inspection:	Oct 2009
Sequence of events:	15Jan 22:00 Saw small dripcoming from screen tube drain header. Shut nearby sootblowers. No indication from leak detector nor control panel. 16Jan 04:00 Concluded leak NOT from soot blowers. Open access panel. Concluded leak was external to unit. Started orderly shut down. 11:30 Unit shut down. Evacuated area until unit pressure below 600 psig Leak then observed in screen bottle header. Repaired leak. 17Jan 11:30 Hydro OK; 14:56 fire in unit; 23:30 Unit on line
Repair procedure:	Made cut completely through supply tube at crack. The tube prepped and welded. RT Inspection then hydroed.
Future prevention:	

Appendix A – Summary of Incidents (Continued)

BOILER SCREEN

Spring 2010 - 29	
Classification:	**Critical Incident #730**
Location:	**Howe Sound P&P, Port Mellon, BC**
Unit:	1991 B&W, Y-5781, 1-drum large economizer
Unit Size:	5.732 MM lb ds/day; 854,000 lb/hr steam at 1225 psig,8960°F, 1575 psig design
Incident Date:	January 26, 2010
Downtime hrs, leak/total:	60/80
ESP?	**Yes**
Leak/Incident Loc:	Crack on cold side of tubes at the membrane termination, Furnace Screen, 165 feet above floor
How discovered:	**Walk down**. Saw wet streak outside bull nose cavity
Wash adjacent tube:	No
Root cause:	Weld crack at membrane termination between two tubes
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	Oct 2009
Sequence of events:	15:30 During walk down saw wet streak outside bull nose cavity. Shut soot blowers. No noise; no panel indications. 16:20 Pulled liquor. 17:07 Saw wet spot in center of unit. Unit ESP'd. Repairs made. Hydro OK
Repair procedure:	Both tubes were removed, tube stubs were installed, welds were x-rayed
Future prevention:	-

UPPER FURNACE

Spring 2010 - 30	
Classification:	**Non-Critical**
Location:	**Lincoln Paper & Tissue, Lincoln ME**
Unit:	#2 RB, 1972 B&W, PR-151, 2-drum Large Economizer, 2002 B&W metal-sprayed floor
Unit Size:	1.7 MM lb ds/day; 250,000 lb/hr steam at 600 psig, 650°F, 750 psig design
Incident Date:	September 19, 2009
Downtime hrs, leak/total:	24/--
ESP?	**No**
Leak/Incident Loc:	Crack in crotch plate weld attachment at soot blower opening, 66' above bed, in superheater region
How discovered:	**Walk down**. Saw leak at soot blower opening.
Wash adjacent tube:	No
Root cause:	Thermal stresses from crotch plate attachment weld to soot blower opening tube
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	Sept 2009
Sequence of events:	During annual outage, unit was chemical cleaned and hydroed. During hydro walk down, saw leak at soot blower opening.
Repair procedure:	Cracks ground out and NDT'd with dye penetrant, then TIG-welded. Inspected other openings. Hydro OK
Future prevention:	Inspected other blower openings in area. Continue with future close inspections.

Appendix A – Summary of Incidents (Continued)

UPPER FURNACE

Spring 2010 - 31	
Classification:	**Critical Incident #731**
Location:	**International Paper, Prattville, AL**
Unit:	#1 RB, 1967 CE, Contract 1965, 2-drum DCE cascade; 2007 Andritz rebuild
Unit Size:	2.1 MM lb ds/day; 320,000 lb/hr steam at 900 psig, 830°F, 1040 psig design
Incident Date:	October 26, 2009
Downtime hrs, leak/total:	0/0 (during outage)
ESP?	**Yes**
Leak/Incident Loc:	1/8" long crack in soot blower #23 wall tube opening, 89 feet above floor
How discovered:	Walk down.
Wash adjacent tube:	No
Root cause:	Thermal fatigue crack in too-large plate wrongly seal-welded to IK wall sleeve; propagated into tube, aggravated by leaking poppet valve temp cycles.
Leak detection:	Yes. Ashland / Hercules Water Mass & Chemical Balance Didn't show. Not stabilized from a trip two days prior
Bed cooling enhanc	No
Last full inspection:	Oct 2008
Sequence of events:	26Oct During walk down, no soot blowers, heard noise by IK23. No noise at floors above or below. Notified control room. Valved out some poppets to isolate. Did detailed water chemistry and leak detection review – all normal. Since still unknown, did ESP.
Repair procedure:	Replaced tube
Future prevention:	All similar sootblower openings (22) PT'd and 5 openings (including leak) had indications. Removed, where possible, the closure plates at the sootblower openings and removed the welds between the wall box sleeve and closure plates.

LOWER FURNACE

Spring 2010 - 32	
Classification:	**Non-Critical**
Location:	**Simpson Tacoma Kraft Co, LLC, Tacoma, WA**
Unit:	#4 RB, 1973 CE, #21971, 2-Drum, Alstom Large Economizer (was LAH 'til 2002)
Unit Size:	3.7 MM lb ds/day, 540,000 lb/hr steam at 950 psig, 825°F, 1000 psig design
Incident Date:	April 30, 2009
Downtime hrs, leak/total:	85/109
ESP?	**Yes**
Leak/Incident Loc:	Cold side crack, tube #38, propagated from attachment weld, spout refractory box, 3' above floor
How discovered:	**Walk down**. Saw steam blowing & water dripping from the furnace casing along right side, near front wall
Wash adjacent tube:	No
Root cause:	Improperly terminated attachment weld on smelt refractory box
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	Jan 2009
Sequence of events:	**30 April** 10:15: Saw steam blowing & water dripping from the furnace casing along right side, near front wall. Verified by others. 10:21 Unit ESP'd. **1 May** 10:21: Confirmed ESP functions OK. Checked bed with a type-K tc through primary air port. 12:20 char temp <1000°F.
Repair procedure:	A 2"x1" window was cut from Tube # 38 on cold side of boiler. Normally a full section of tube would be removed, but here tubes 38 & 39 are directly touching. So, cutting full section from Tube 38 risked nicking Tube 39. After "window" welded in, weld integrity verified by dye penetrant (PT) and magnetic particle (MT) tests
Future prevention:	Leak was of original boiler construction. Time didn't allow checking all refractory box attachment welds, and added risk of damage in exposing these sites. If another similar leak occurs then all refractory box weld termination sites should will be checked.

Appendix A – Summary of Incidents (Continued)

LOWER FURNACE

Spring 2010 - 33	
Classification:	**Non-Critical**
Location:	**International Paper, Pine Hill, AL**
Unit:	1982 B&W , PR-201, 2-drum Large Econ
Unit Size:	3.9 MM lb ds/day; 600,000 lb/hr steam at 1550 psig, 850°F, 1750 psig design
Incident Date:	11 June 2009
Downtime hrs, leak/total:	51 hrs 25 min
ESP?	**No**
Leak/Incident Loc:	¼" crack in front wall tube at upper corner of tertiary wind box, 4 ft above tertiary level
How discovered:	**Walk down**.
Wash adjacent tube:	No
Root cause:	Weld defect gave stress for fatigue cracks to develop
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	May 2009
Sequence of events:	11Jun09, 07:40 During walkdown, saw leak, confirmed external to wall. 08:20 start orderly shutdown, 19:09-21:42 waterwash; 12Jun, 07:00 start repairs, 13Jun 01:00 repairs done, 02:00 start filling; 13Jun 07:55 hydro OK, 11:34 first fire, 19:25 on line; 14Jun 02:30 liquor fire
Repair procedure:	Installed dutchman.
Future prevention:	X-rayed similar configurations. Document and communicate to crews and management.

LOWER FURNACE

Spring 2010 - 34	
Classification:	**Non-Critical**
Location:	**Simpson Tacoma Kraft Co, LLC, Tacoma, WA**
Unit:	#4 RU, 1973 CE Contract 21971, 2-drum, Alstom Large economizer (was LAH 'til 2002)
Unit Size:	3.7 MM lb ds/day; 540,000 lb/hr steam at 950 psig, 825°F, 1000 psig design
Incident Date:	September 14, 2009
Downtime hrs, leak/total:	198 / 222
ESP?	**YES**
Leak/Incident Loc:	Axial crack ~ 6" above floor, at weld attachment of spout refractory box to crown of tube.
How discovered:	**Walk down**. Saw water flowing from rear wall metal skirting next to spout flange during routine spout inspection and cleaning.
Wash adjacent tube:	
Root cause:	Corrosion fatigue, from OD surface at improperly terminated attachment weld of refractory box. Is cyclic stresses imposed on the tube wall in the presence of a corrosive environment. The leak actually developed when the OD crack merged with an ID crack.
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	Jan 2009
Sequence of events:	**14Sep09** 08:15 on liquor, saw water leaking from back wall metal skirting of spout mounting plate. Water was low volume, low pressure. Took sample and analyzed for chemicals and decided was from weak wash stream. No water was near smelt in spout. Reduced load. 08:55 Reinvestigated site and concluded was not from cooling water. **08:58 ESP'd** unit. 24 hour wait period.**15Sep09** 08:58 Confirmed ESP went OK. 10:00 Bed Type K TC's read < 1000oF Access allowed.
Repair procedure:	Tube was sectioned out and replaced. The spout refractory box vertical mounting plates were relocated from the crown of the tube to the membrane between tubes
Future prevention:	During the same outage, this same repair procedure was performed for the other 7 water wall tubes for the four smelt spouts. All four smelt spout openings (6 tube packs and the adjacent straight wall tubes) will be replaced during the Feb 2010 annual outage

Appendix A – Summary of Incidents (Continued)

LOWER FURNACE

Spring 2010 - 35	
Classification:	**Non-Critical**
Location:	**New Page, Wisconsin Rapids, WI**
Unit:	#2 RU, 1976 CE, Contract 27074, 2-drum DCE Cascade
Unit Size:	1.5 MM lb ds/day; 200,000 lb/hr steam at 1275 psig, 900°F, 1450 psig design
Incident Date:	December 3, 2009
Downtime hrs, leak/total:	68h 50 min
ESP?	**Yes**
Leak/Incident Loc:	½" longitudinal attachment weld crack at corner of spout refractory box, ~ 12" above hearth, external to unit.
How discovered:	**Walk down**. Saw steam & condensate coming from next to doghouse
Wash adjacent tube:	No
Root cause:	Failed attachment weld of spout refractory box
Leak detection:	No
Bed cooling enhanc	Yes. NaHCO3-N2 by Southland
Last full inspection:	May 2009
Sequence of events:	**3Dec** 21:18 During walk down, saw wisp of steam and dripping water coming from seams in lagging just below spout level 2 feet next to spout. Started bed burnout. Shut weak wash. Leak still there. Pulled doors. Still undetermined. 23:20 ESP'd unit. **4Dec** 07:30 Bed over 1000of. 06:00 Southland began injection
Repair procedure:	Window Weld Repair – entire crack was removed by cutting a window (hole saw) out of tube and performing a PT test to verify the entire crack had been removed
Future prevention:	-

LOWER FURNACE

Spring 2010 - 36	
Classification:	**Critical Incident #732**
Location:	**Delta Natural Kraft, Pine Bluff, AR**
Unit:	#1 RU, 1957 CE Contract 6256, **3 Drum** DCE Cascade, new floor
Unit Size:	**.75** MM lb ds/day; 100,000 lb/hr steam at 450 psig, 750°F, 675 psig design
Incident Date:	January 5, 2010
Downtime hrs, leak/total:	46.25/46.25
ESP?	**Yes**
Leak/Incident Loc:	½" circumferential crack between pin studs, left side wall at primary port rodder level
How discovered:	**Walk down**. Saw spray of steam coming from lower wall tube in furnace
Wash adjacent tube:	No
Root cause:	Unknown
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	July 2009
Sequence of events:	**5Jan** 06:30 Unit off line. Had pulled liquor, burned bed out and pulled natural gas for maintenance (chill and blow and economizer tube repair). 06:45 While looking through gun port, saw spray of steam coming from lower wall tube in furnace. ESP'd the unit. 14:30 Inspection found no ill effects. Did water wash. **6Jan** 05:00 Hydro to find leak. 07:00 Did repairs. 16:00 X-rayed welds 19:00 Hydro OK 20:00 Gas fire. **7Jan** 03:45 on line. 05:30 Liquor in.
Repair procedure:	Removed 2-foot of bad tube and replaced with Dutchman.
Future prevention:	Have tube analyzed. Similar failure near by. Plan to replace that side wall.

Appendix A – Summary of Incidents (Continued)

LOWER FURNACE

Spring 2010 - 37	
Classification:	**Critical Incident #733**
Location:	**Boise Inc, Jackson, AL**
Unit:	#2 RB, 1974 CE Contract 24272, 2-drum, DCE Cascade
Unit Size:	2.4 MM lb ds/day; 325,000 lb/hr steam at 650 psig, 700°F, 750 psig design
Incident Date:	February 2, 2010
Downtime hrs, leak/total:	31.2 / 36.7
ESP?	**Yes**
Leak/Incident Loc:	½" crack, cold side of tube at attachment weld, 1" above spout opening at junction of wind box scallop seal bar
How discovered:	**Walk down.** During shutdown for scheduled maintenance, saw water flowing from under doghouse near spout
Wash adjacent tube:	No
Root cause:	Likely stress cracking starting at attachment weld where two scallop plates were butt-welded at the crown of the tube.
Leak detection:	Yes. Triple-5 acoustic
Bed cooling enhanc	No
Last full inspection:	Dec 2009
Sequence of events:	2/2/09 03:00 Pulled liquor for scheduled maintenance outage. 06:25 Oil pulled. 07:50 Saw water spraying in doghouse above spout. Notified control room. Alarms to clear building. 07:55 Shut spout cooling water, 08:10 Shut shatter steam. Furnace draft began pulling water up spout into furnace. 08:26 **ESP'd unit**. 4-hr mandatory wait. 12:30 Entered bldg. Began scaffold. 20:00 located leak. Dye pen and repairs performed. 2/3/2010 03:15. Hydro OK. 04;15 Replaced all spouts and doghouse in place. 10:05 Oil fire. 15:40 Liquor fire.
Repair procedure:	Attachment welds were removed via grinding. All crack indications were removed via grinding. Base metal build-up was performed and was followed by visible dye-penetrant testing.
Future prevention:	Replace this tube during the 2010 annual outage. All attachment welds in the area of the primary air ports on the left wall will be visually and/or PT tested. Similar inspection will be scheduled for each of the other three walls during future outages.

Appendix A – Summary of Incidents (Continued)

SPOUT

Spring 2010 - 38	
Classification:	**Non-Critical**
Location:	**Lincoln Paper & Tissue, LLC, Lincoln, ME**
Unit:	#2 RU, 1972 B&W PR-151, 2-Drum Large Econ, w/ 2008 B&W Spouts
Unit Size:	1.7 MM lb ds/day; 250,000 lb/hr steam at 600 psig, 650°F, 750 psig design
Incident Date:	June 30, 2009
Downtime hrs, leak/total:	23.75 Liq to liq
ESP?	**No**
Leak/Incident Loc:	Front tip of spout thinned. These are custom B&W water-cooled insertable, with trough and end plate made of Inconel 625
How discovered:	Walk down. Saw slight spray of water
Wash adjacent tube:	No
Root cause:	Corrosion/erosion of Inconel 625 trough and tip, from smelt flow and maybe from vapors from shatter sprays and new doghouse weak wash wall wash spray
Leak detection:	n/a
Bed cooling enhanc	No
Last full inspection:	n/a
Sequence of events:	29Jun 15:00: Saw slight spray of water from end of west spout. No interaction with smelt flow. Orderly shut down, with close watch for change. 30Jun 02:00 Reduced liquor. 05:15 Pulled liquor. 09:15 Off line with no bed Staged doghouse for in-place repair. 11:00 Started spout repair. 14:00 repairs complete 19:00 Completed replacement of corroded spout water lines. Spouts hydroed OK. 22:45 Unit fired 1Jul 03:50 On line. 05:00 On liquor
Repair procedure:	Ground out and dye penetranted crack in leaking spout. Root welded with Inconel rod and filled in, Dye penetranted again. Overlaid with Inconel. Both spouts had thinning. Built up both spout troughs and end plates with Inconel.
Future prevention:	Both spouts replaced mid September 2009. Reduced wall wash splashing (angle of sprays) and maintaining adequate draft with dissolving tank vent fans. Lowered wall-wash headers 12”. Putting a ceramic coating over metal spraying on spouts as a trial to reduce corrosion. (Process developed by metal spray contractor Wear-Tech) Did not have smelt spout corrosion issues before installed doghouse wall wash system. However, successfully rid doghouse of unsafe smelt build-up on doghouse walls.

Appendix A – Summary of Incidents (Continued)

SPOUT

Spring 2010 - 39	
Classification:	**Non-Critical**
Location:	**Boise Paper, Jackson, AL**
Unit:	#2 RU 1974 CE, #24272, 2-Drum DCE Cascade;1984 Foster-Wheeler econ; 2008 Alstom spouts
Unit Size:	1.7 design/2.4 current MM lb ds/day; 325,000 lb/hr steam at 650 psig, 700°F, 750 psig design
Incident Date:	September 12, 2009
Downtime hrs, leak/total:	0/0
ESP?	No
Leak/Incident Loc:	1. Outlet of smelt spout tip cooling tube thinned to .010", then impacted by rodding tool. 2. Smelt leak around spout insert refractory
How discovered:	Rounds. 1. Saw water misting from spout during rodding. 2. Saw smelt coming from behind spout
Wash adjacent tube:	No
Root cause:	1. Local corrosion and abrasion of corrosion from smelt flowing over water-cooled tip of spout. ID deposit-free. Possible insufficient cooling water. 2. Insertable portion of the spout refractory seal had failed due to overheat from no cooling water allowing smelt leak.
Leak detection:	Yes. Acoustic Sensors Triple 5 (AMS 2)
Bed cooling enhanc	No
Last full inspection:	Oct 08
Sequence of events:	11Sep night: normal intermittent spout flows due to low-flow. 12Sep 04:00 Saw west spout not running, so rodded it. Saw water "misting" from lower right outlet due to a cooling water leak. 04:25 Shut cooling water and plugged spout. 18Sep 11:20 Saw smelt flow from top of dissolving tank (DT) to floor. Did master fuel trip. Barred all entry. Found smelt flowing from behind DT splash shield. No smelt flow from spout or its mounting plate. Cooled bed. 9 hours later all temp probes under 600oF. Removed and replaced spout.
Repair procedure:	Removed and replaced spout.
Future prevention:	Past experience running with plugged spout was satisfactory. Will continue search for root cause.

SPOUT

Spring 2010 - 40	
Classification:	**Non-Critical**
Location:	**Domtar Espanola, Espanola ON**
Unit:	#3 RB, 1982 CE Canada, #CA-80113, 2-Drum Large Economizer, w/2008 Alstom spouts
Unit Size:	4.6 MM lb ds/day; 688,400 lb/hr steam at 900 psig, *427°F?*, 1075 psig design
Incident Date:	December 8, 2009
Downtime hrs, leak/total:	13.5 hr
ESP?	**No**
Leak/Incident Loc:	Triangular hole in spout trough area side
How discovered:	Spout rounds walk down
Wash adjacent tube:	n/a
Root cause:	Impact of sharp tip spout rod penetrated thinned wall of trough
Leak detection:	n/a
Bed cooling enhanc	n/a
Last full inspection:	n/a
Sequence of events:	8Dec Saw water on back wall of doghouse. Wall wash deflection plate had come apart at weld, allowing wall wash t splash onto back wall. Turned off wash water. 05:35 Opened "A" spout small door and heard crackling and spitting. Opened big door. Saw more violent activity and steam at tip of spout. Eruption at end of spout followed with splattering and loud crackling. Closed big door. Saw pencil-size jet of steam crossing smelt flow. 05:50 Shut spout water and packed spout. 06:10 Planned for shut down to replace spout.
Repair procedure:	Replaced spout. These are insertable water-cooled carbon steel spouts using head tank
Future prevention:	Ground off sharp tips of lance rods to rounded profile. This spout had been in 15 months. Replace all spouts on annual basis.

Appendix A – Summary of Incidents (Continued)

FLOOR

Spring 2010 - 41	
Classification:	**Critical Incident #734**
Location:	**Alabama River Pup Co Inc, Perdue Hill, AL**
Unit:	1978 B&W PR-192, 2-Drum Large Econ, 1995 Bottom
Unit Size:	5.5 MM lb ds/day; 700,000 lb/hr steam at 1225 psig, 900°F, 1425 psig design
Incident Date:	March 26, 2009
Downtime hrs, leak/total:	18 days 5 hours
ESP?	**Yes** within 4 min of rupture
Leak/Incident Loc:	8" rupture of carbon steel floor tube-to-membrane weld at interface of smelt-run composite tubes and studded CS tubes, along left side, 3' from front (top)wall.
How discovered:	Rupture gave large discharge of steam; Panel showed loss of steam, increase of feed water and falling drum level
Wash adjacent tube:	No
Root cause:	Poor weld quality at many sites is suspected. Front floor beam fell, leaving floor unsupported. Bed weight stressed membrane welds; weakest weld failed. The bear claw connecting welds to trapeze piece are suspect. The tube-to-membrane weld is suspect. The tie bar above the floor support beam was repaired where it had been joined together with poor quality welds. Porosity, lack of fusion, and lack of penetration were all found associated with these welds
Leak detection:	No
Bed cooling enhanc	Yes Nitrogen propelled sodium bicarbonate induction with a lance
Last full inspection:	2008
Sequence of events:	26March 02:35: Heard "boom" in unit. (There was NO explosion.) Saw panel changes: loss of steam (590,000#/hr fell to 330,000#/hr), increase of feed water (640,000#/hr to 1,000,000#/hr) and falling drum level. (-.2" to -9.0"); Manually opened the feed water regulating valve to 100% to try to maintain steam drum level; Saw steam coming from every floor of building from bottom to top; couldn't observe unit due to hot steam; Spout cooling water temps rose 149F to 160F; 02:38 Did master fuel trip; 02:39 Did ESP. Extent of damage: The floor support beam had dropped down several feet and the bear claw and trapeze system assembly were damaged The floor tubes were deformed and the membrane was split between the left smelt run and the stubbed floor section. The lower vestibule was torn up as the leak trajectory passed through it.
Repair procedure:	The floor support beam was replace in kind. The tie bar above the failed floor support beam was repaired. The floor smelt runs were replaced with upgraded inconel overlay panels.
Future prevention:	Floor beam inspections should be given higher priority with special attention to cracking or dislocation observations. Assure the weld quality of the tie bars and all welds associated with the floor beam assembly. Consider additional floor support beams.

Appendix A – Summary of Incidents (Continued)

FLOOR

Spring 2010 - 42	
Classification:	**Critical Incident #735**
Location:	**Weyerhaeuser Flint River, Oglethorpe, GA**
Unit:	#1 RB, 1980 B&W, PR-198, 2-drum large econ (5-pass), 1994 new floor
Unit Size:	5.28 MM lb ds/day; 749,000 lb/hr steam at 900 psig, 825°F, 1175 psig design
Incident Date:	December 9, 2009
Downtime hrs, leak/total:	67h 53min
ESP?	**Yes**
Leak/Incident Loc:	3/16" dia hole on top of floor tube, in middle of thinned area, adjacent to the floor-to-front-wall butt weld, 24" from the front wall, on the sloped B&W floor.
How discovered:	**Control room** DCS tube leak alarm, water residuals and steam/feed water differential.
Wash adjacent tube:	No
Root cause:	External furnace side corrosion
Leak detection:	Yes - In-house mass balance
Bed cooling enhanc	No
Last full inspection:	Oct 2008
Sequence of events:	Several days of indications on DCS and walk downs. **9Dec** 09:30 Pulled liquor. 10:05 Heard roaring noise. 10:10 Saw steam spraying from floor onto front wall. ESP'd unit. 12-hour wait. 22:10 Entered area 23:10 Inspection showed no ill effects. **10Dec** 01:12 Began water wash. 13:47 Wash complete. 20:00 Found hole in carbon steel side of floor tube adjacent to composite tube field weld line. Did repair. **11Dec** 10:40 Repairs complete. 18:30 Hydro OK 18:45 Start up.
Repair procedure:	Installed 18" Dutchman. Overlaid 11 adjacent thinned tubes, all near butt weld line..
Future prevention:	Will study cause of metal loss from external corrosion. Replaced 27 tubes, 8' long

FLOOR

Spring 2010 - 43	
Classification:	**Critical Incident #736**
Location:	**Delta Natural Kraft, Pine Bluff, AR**
Unit:	#1 RU, 1957 CE, #6256, **3-**Drum **DCE Cascade, new floor**
Unit Size:	.750 MM lb ds/day; 100,000 lb/hr steam at 450 psig, 750°F, 675 psig design
Incident Date:	18Aug09
Downtime hrs, leak/total:	102.41/102.41
ESP?	**YES – Less than 5 minutes after discovery**
Leak/Incident Loc:	½" Circumferential crack near pin stud in Floor Tube, next to side wall, 3' from front wall
How discovered:	**Walk down**. While firing natural gas only during precipitator repairs, saw decanting hearth smelt bed churning thru gun port
Wash adjacent tube:	No
Root cause:	Unknown. Sample out for analysis
Leak detection:	No
Bed cooling enhanc	Yes. Mill staff hand lance with dry low-P steam through primary air ports
Last full inspection:	Floor July 2005
Sequence of events:	Possible indication 4 days earlier checked out OK. **18Aug** Unit on Natural gas for precipitator repairs. 08:30 Checking hearth from gun ports, observed smelt churning and splashing at one place. Leak suspected. 08:35 ESP initiated.16:45 walk down to check ESP functions – all OK. 17:30 staff returned. 18:30 started steam lance cool down of 1200-1300oF bed. **19Aug** 07:30 Bed at 555oF.07:40 Start water wash. 18:00 Fill for leak hydro. Leak found in floor tube. Unit drained. 4 more cracks found in same tube nearby. 4' section replaced, also involving interfering sidewall Dutchmen. **22Aug** 04:10 repairs complete and hydro good. Noon: Steaming. 13:35 Liquor in.
Repair procedure:	4' floor tube replaced and sidewall Dutchmen installed
Future prevention:	Sample being analyzed. More frequent complete furnace floor inspection (from 5 year to 3 year cycle). (next: July 2010)

Appendix A – Summary of Incidents (Continued)

SMELT LEAK THROUGH FLOOR

Spring 2010 - 44	
Classification:	**Non-Critical**
Location:	**Lincoln Paper & Tissue, Lincoln ME**
Unit:	#2 RB, 1972 B&W, PR-151, 2-drum Large Economizer, 2002 B&W metal-sprayed floor
Unit Size:	1.7 MM lb ds/day; 250,000 lb/hr steam at 600 psig, 650°F, 750 psig design
Incident Date:	July 18, 2009
Downtime hrs, leak/total:	88.1/88.1
ESP?	**No**
Leak/Incident Loc:	14' of 1" carbon steel membrane burn-through in furnace floor, half-way back on one side between tubes 1 & 2 (3"x.220 SA 210A)
How discovered:	**Walk down.** Odor of burning oil fumes.
Wash adjacent tube:	na
Root cause:	poor shop attachment weld of membrane. Found no weld penetration on firebox side.
Leak detection:	n/a
Bed cooling enhanc	No
Last full inspection:	July 2008
Sequence of events:	**18Jul** 20:30 During walk down, had odor of burning oil fumes. Found smelt running from bottom of unit onto floor, into drains, and used oil barrel. Smelt crackling with water and oil barrel rumbling. Isolated area. Set up fire alert. 20:50 Pulled liquor Smelt flow stopped. Burned out bed. Orderly shut down. **19Jul** 01:40 Off line. 13:30 Water washed unit. **20Jul** 02:00 Wash done. 12:30 Cleaning floor. 15:00 Did inspection and repairs. Found had also burned through vestibule **21Jul** 11**:**00 repairs done. **13:00** hydro OK for repairs, but found econ hh leaks. 16:00 Did repairs. 22:00 repairs done. **22Jul** 01:30 hydro OK. 02:53 first fire 13:05 Liquor fired.
Repair procedure:	Cut out faile membrane area.Mag particle of tubes. Ground out superficial cracks and TIG-welded. Installed membrane with MIG, full penetration. NDT again. Hydro found lower economizer header hand hole leaks. Ground out and repaired. Hydro OK.
Future prevention:	Boroscoped tube ID and saw some scaling along membrane interface, so will sample and inspect further. Results later showed no overheat of tubes More metal spraying the area. AT Sept outage, ground it out and rewelded. Chemial cleaned to remove some interior deposits.

Appendix A – Summary of Incidents (Continued)

BELOW FLOOR

Spring 2010 - 45	
Classification:	**Non-Critical**
Location:	**Simpson Tacoma Kraft Co, LLC, Tacoma, WA**
Unit:	#4 RB, 1973 CE, #21971, 2-Drum, Large Economizer
Unit Size:	3.7 MM lb ds/day, 590,000 lb/hr steam at 500 psig, 700°F, 1000psig design, (temporary 575)
Incident Date:	1 November **2007**
Downtime hrs, leak/total:	45.5/60.3
ESP?	**Yes**
Leak/Incident Loc:	Pinhole leaks in vertical run of 4 inch Sched 40 feed water pipe, 3 feet below the floor tubes
How discovered:	**Walk down**. Saw steam & water blowing out from furnace wall casing at hearth level
Wash adjacent tube:	No (but caused by doghouse weak wash wall showers.)
Root cause:	Erosion of the outside caused by doghouse weak wash wall showers flowing over the tube
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	Jan 2007
Sequence of events:	1 Nov 11:05: Saw steam and condensate blowing from SE corner of unit. Checked wall showers and shatter sprays, but still there. Couldn't determine if above or below hearth, 11:32 ESP'd unit. 2Nov 11:32: Checked bed with 2 type-K tc's on ¾" pipes. 14:15 bed temp less than 1000oF. Made repairs.
Repair procedure:	Pad welding pieces of carbon steel over the corroded areas. Patches were sized to cover thin areas as shown by UT readings of the pipe's wall thickness. After welding was complete, further UT readings were performed to verify no further thin areas.
Future prevention:	Boiler casing around the weak wash showers was also patched to limit penetration of weak wash into the lower vestibule. The mill plans to make major repairs around the areas of the weak wash showers and smelt spout enclosures during the 2008 Repair and Maintenance Outage. This should prevent weak wash from getting inside the boiler casing

BELOW FLOOR

Spring 2010 - 46	
Classification:	**Non-Critical**
Location:	**Simpson Tacoma Kraft Co, LLC, Tacoma, WA**
Unit:	#4 RB, 1973 CE, #21971, 2-Drum, Large Economizer
Unit Size:	3.7 MM lb ds/day, 590,000 lb/hr steam at 500 psig, 700°F, 1000psig design, (temporary 575)
Incident Date:	13 November **2007**
Downtime hrs, leak/total:	50 hr/74 hr 44 min
ESP?	**Yes**
Leak/Incident Loc:	Pinhole leak, top of Nov 2 pad weld, 4" 90 deg Sch 40 El, feed water pipe, 3' below floor tubes
How discovered:	**Walk down**. Saw new flow of water from lower vestibule adjacent to east dissolver (right side)
Wash adjacent tube:	No
Root cause:	Faulty weld
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	Jan 2007
Sequence of events:	13 Nov Morn: Saw new flow of water from lower vestibule adjacent to east dissolver (right side). Checked showers weak wash. Leak still there. 07:25: Turned on RED flashing lights, pulled liquor, and installed RED tape. 08:10: Area manager overrode approach & ESP'd the unit. 14 Nov 08:10 Checked ESP result. 08:30 Checked bed with 2 type-K tc's on ¾"x15' pipes. 0905 char temp at 430°F, chart temp slope almost flat. Predicted peak temp <500°F. 09:10: Unit accessed. Repairs made.
Repair procedure:	The 90 deg EL along with a vertical and horizontal stub were replaced
Future prevention:	Crew & supervisor assumed leak was very similar to Nov 1 leak, & thus believed water could not enter furnace and not an ESP situation. Area manager felt assumption was incorrect as no one knew exact location, extent, and size of leak. Although tardy, the initiation of the ESP was correct.

Appendix A – Summary of Incidents (Continued)

BOILER

Spring 2010 – 1113	**Intl 1113**
Classification:	**Not classified (Non-Critical)**
Location:	**International Paper do Brazil, Luis Antonio, Brazil**
Unit:	#LAN, 1989-92 CBC, 2-drum Large economizer
Unit Size:	1620 dst /day; 240 ton/hr steam at 65 kgf, 450°C, 67 kgf design
Incident Date:	March 3, 2010
Downtime hrs, leak/total:	44
ESP?	**No**
Leak/Incident Loc:	15 mm crack crossing fin welded onto tube of soot blower opening, elev 32500 m, mid bank boiler side wall, on cold (econ) side of baffle plate (ESP not required)
How discovered:	**Walk down**. Saw small flow of water at soot blower opening casing
Wash adjacent tube:	No
Root cause:	Under study. Possible themal fatigue, stress from fin size, poor soot blower support
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	August 2009
Sequence of events:	During walk down, saw small flow of water at soot blower opening casing on cold (econ) side of baffle plate (ESP not required). Did orderly shut down. Repaired crack. Water-washed unit. Hydro OK. Started unit up.
Repair procedure:	Replaced cracked tube plus replaced matching tube that had start of crack.
Future prevention:	Reduce fin extension; Change soot blower support.

ECONOMIZER

Spring 2010 - 1114	**Intl 1114**
Classification:	**Not classified (Non-Critical)**
Location:	**International Paper do Brazil, Luis Antonio, Brazil**
Unit:	#LAN, 1989-92 CBC, 2-drum Large economizer, econ by Andritz 2005
Unit Size:	1620 dst /day; 240 ton/hr steam at 65 kgf, 450°C, 67 kgf design
Incident Date:	February 6, 2010
Downtime hrs, leak/total:	50
ESP?	**No**
Leak/Incident Loc:	Crack in weld of feed water tube to lower mini-collector header of economizer II, bottom of hot module
How discovered:	**Walk down**. Saw water in ash hopper
Wash adjacent tube:	No
Root cause:	In study. Possible stress on tubes from movement of header
Leak detection:	No
Bed cooling enhanc	No
Last full inspection:	August 2009
Sequence of events:	During walk down, saw water in ash conveyor hopper under economizer module II. Did orderly shut down. 23-hour for smelt cool-down. Water wash unit Crack repaired. Hydro OK. Unit started up.
Repair procedure:	Eliminated crack and welded
Future prevention:	Repaired and added tie bars

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 April 14, 2010

BLRBAC 2

Meeting Attendance

- Closed session Monday April 12th
  - 13 of 13 members represented
  - Scott Crysel and Kevin Polinger accepted as new members
- Open session Tuesday April 13th
  - 13 of 13 members
  - About 160 guests

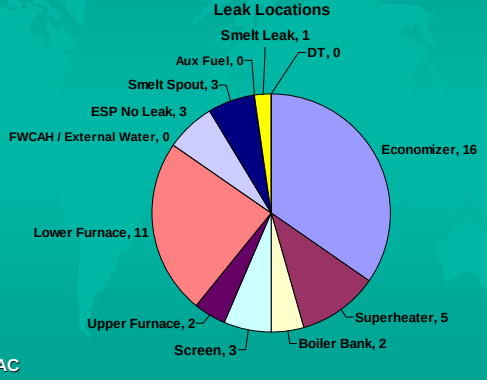
BLRBAC 3

Incident Questionnaire Review

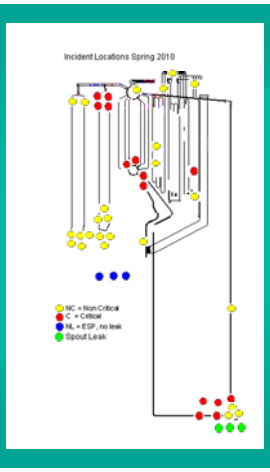
- 46 North American incidents
  - 13 Critical
  - 27 Non-critical
  - 3 Spout Failure
  - 3 ESP No Leak
  - 16 EPD'd
    - 8 Critical
    - 62% of Critical that Should ESP
- 2 International Incidents

BLRBAC 4

Incident Locations

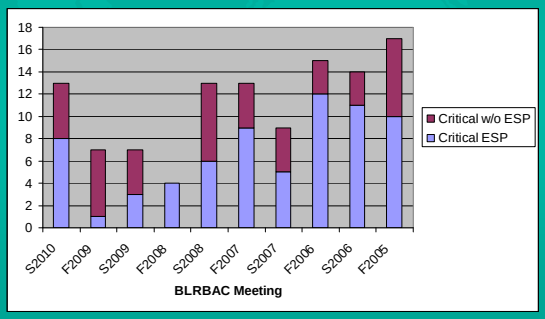


BLRBAC 5



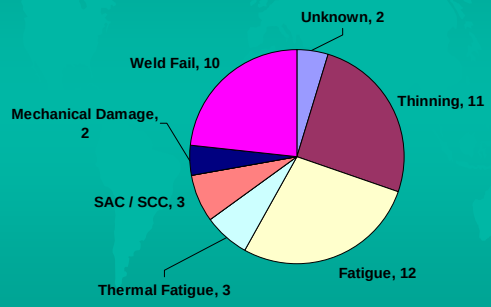
BLRBAC 6

ESP History



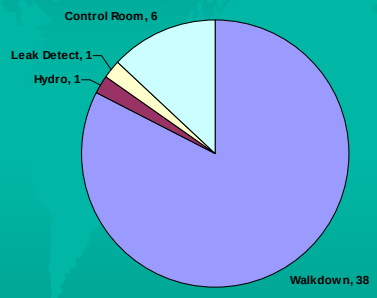
BLRBAC 7

Root Cause



BLRBAC 8

How Discovered



BLRBAC 9

Leak Detection Systems

- Leak Detection Systems installed – 17
  - – Identified leak – 1 in Economizer
  - – Confirmed leak - 4
  - – Economizer leaks – 8

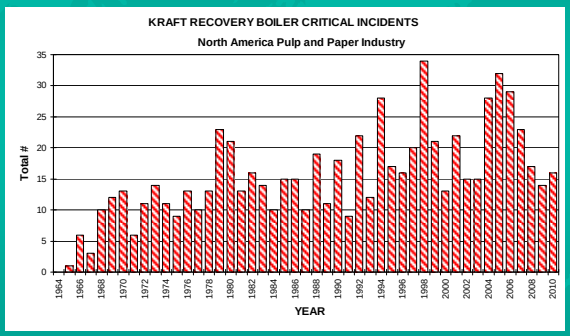
BLRBAC 10

Initiation of ESP

- Ranged from 4 minutes to 4 days
- Median time to ESP 36 minutes
- No incidents with smelt water reaction but several close calls

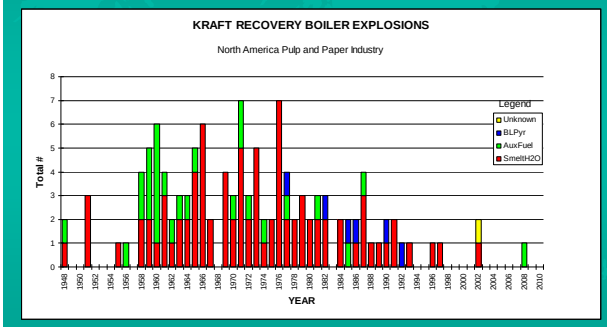
BLRBAC 11

Critical Incidents to Date



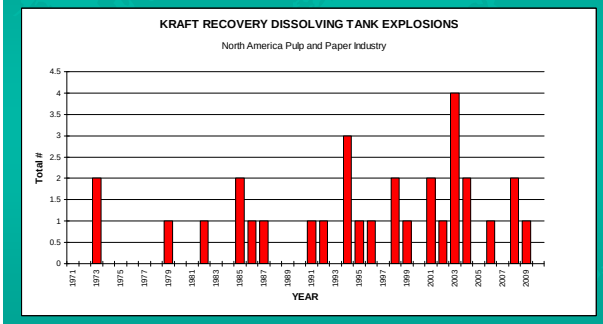
BLRBAC 12

Boiler Explosion History



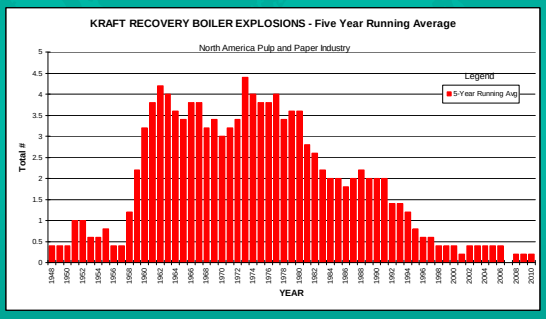
BLRBAC 13

Dissolving Tank Explosions



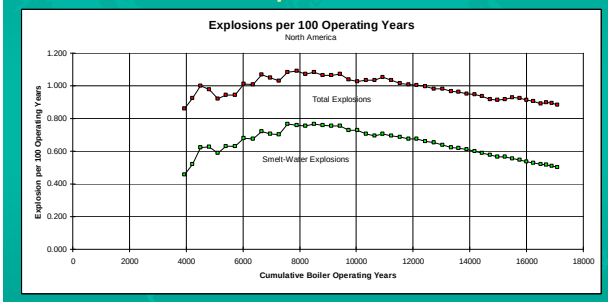
BLRBAC 14

Explosion History - Five Year Avg.



BLRBAC 15

Explosion History per 100 Oper Yr



BLRBAC 16

Learnings

- Need to clarify "Who's in charge" during double coverage of shifts
- Small leaks can quickly become large leaks so limit personnel activity at leak location
- Spout attachment boxes are prone to cracking especially if welded to tubes
- Need to be mindful of stub length for plugged tubes

BLRBAC 17

Learnings

- May need to inspect floor beam attachments periodically – especially after large slag fall
- Rear wall tubes going to generating bank screen are prone to cracking
- Need to verify that wiring to bypass local selector switches actually works.

BLRBAC 18

Appendix B – ESP Report: PowerPoint Slides (Continued)

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 19

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 20

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 21

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 22

Recovery Boiler Problems

Composite Tubes 304L SS

- "Balding" (hydroxide corrosion)
- Air port and wall tube thermal cracking
- Floor tube cracking (SCC)
- Finger-Nail Corrosion (Carbon Steel)
- Butt Weld Cracking

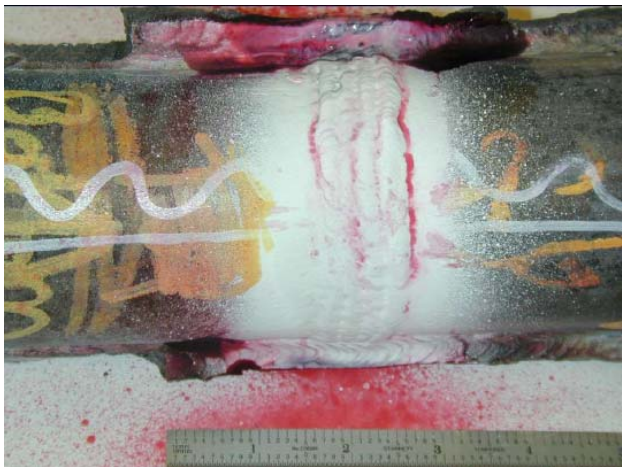
Balding

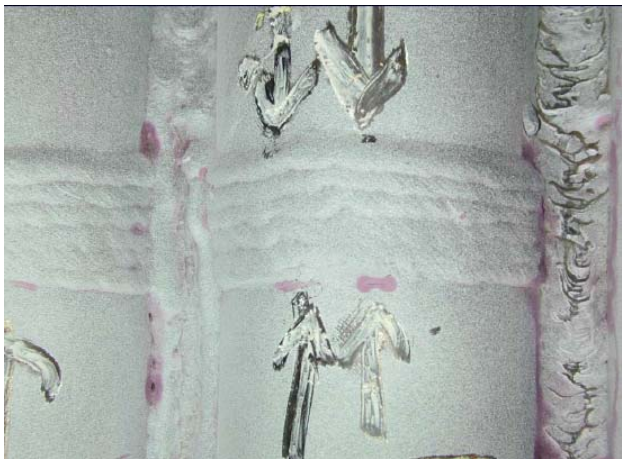
Thermal Cracking

Stress Corrosion Cracking


Finger Nail Corrosion – C.S.

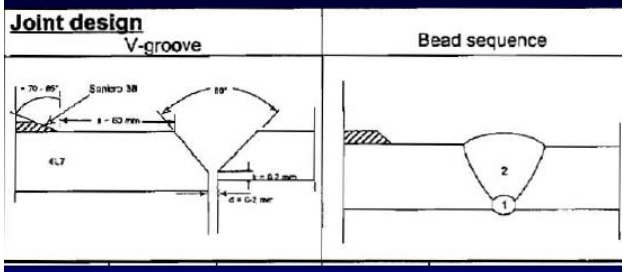

Butt Weld Cracking



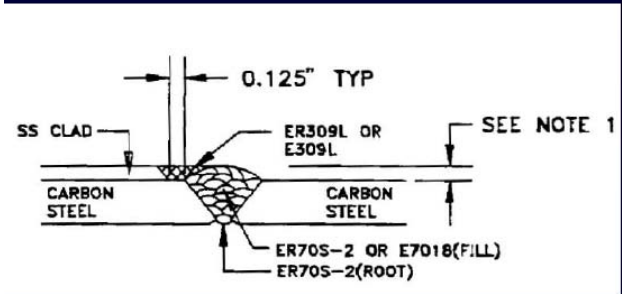


Composite-to-Carbon Steel

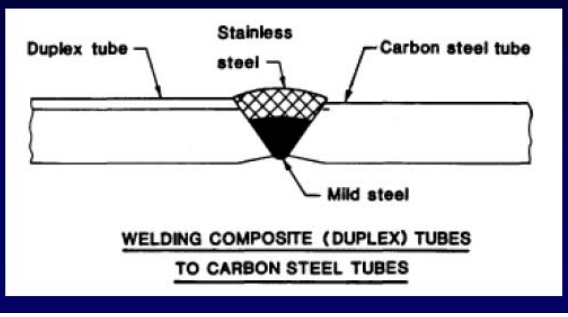
Sandvik



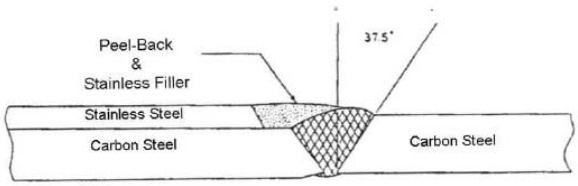
B&W Construction

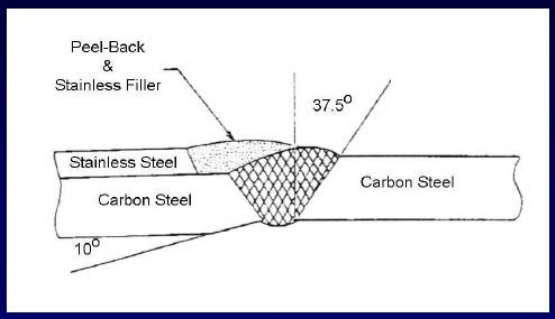


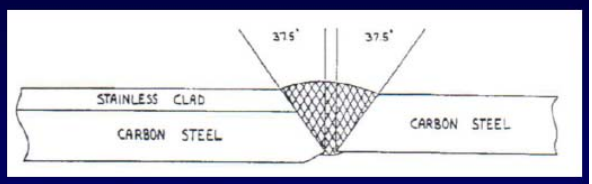
AF & PA Recovery Boiler Manual

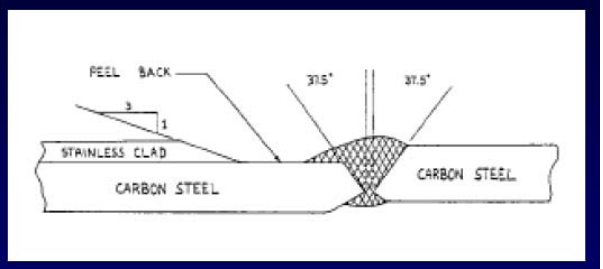


WELDING COMPOSITE (DUPLEX) TUBES TO CARBON STEEL TUBES



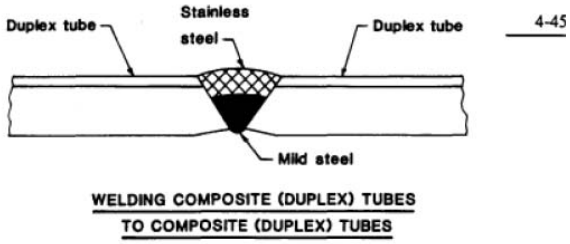




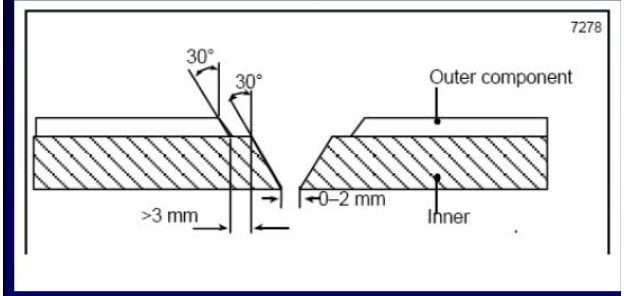


Butt Welds Composite-to-Composite

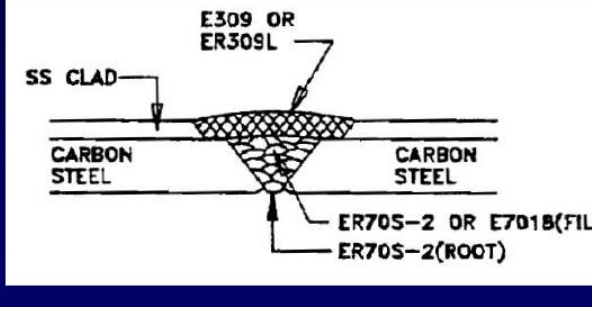
AF & PA Recovery Boiler Manual



Sandvik



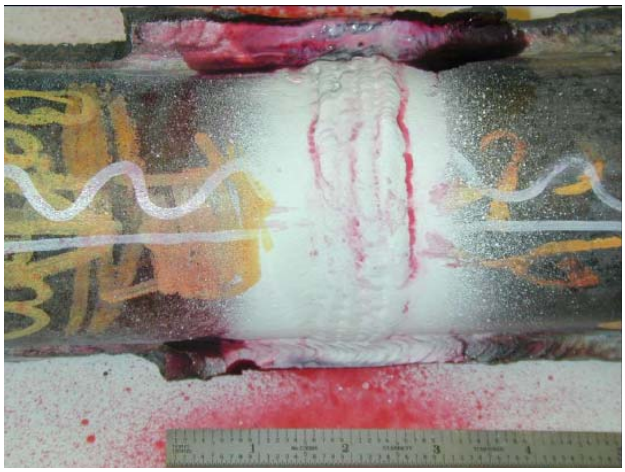
B&W

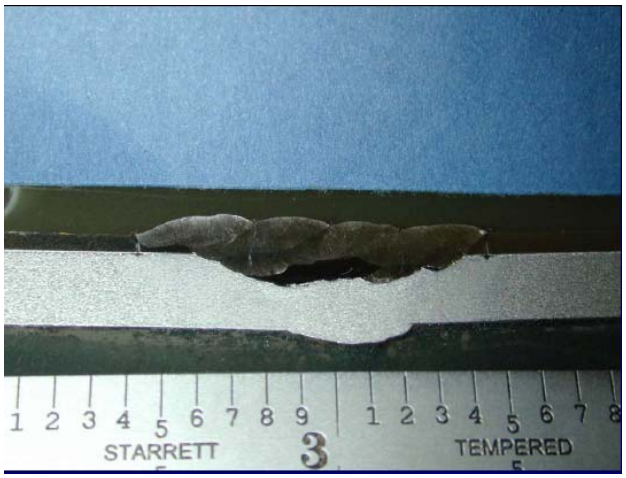


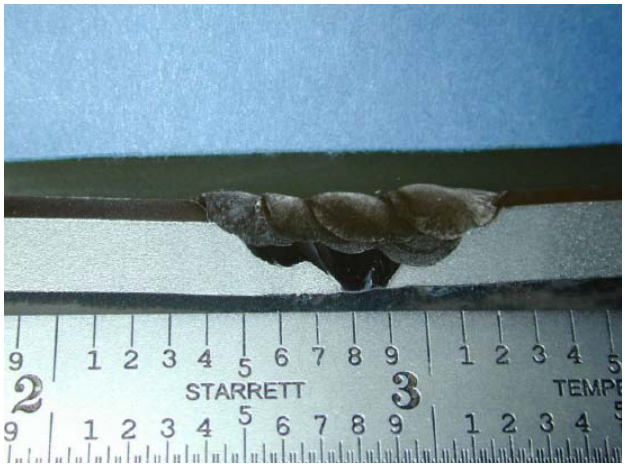
Case History
Composite-to-Composite

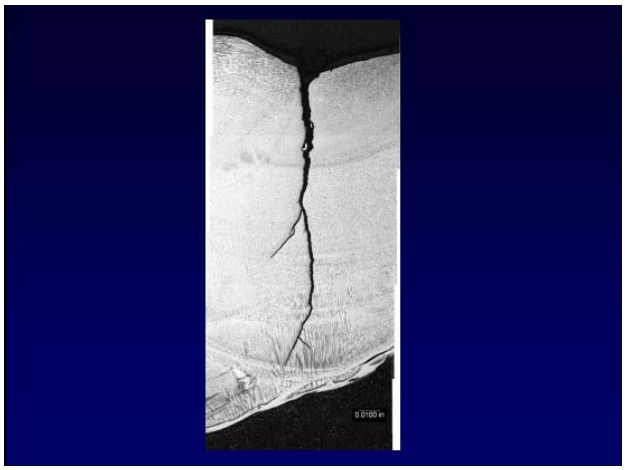
Weld Cracking

Appendix C – Materials & Welding Presentation – Composite Tube Butt Weld Cracking (Cont.)









Thermal fatigue is the likely damage mechanism

- Cracking in Primary Air Port region
- Weld caps (ER309L)
  - Cracking is usually interbead
  - Can progress into carbon steel
  - High coefficient of thermal expansion SS
  - Low thermal conductivity SS
  - Susceptible welds have excessive reinforcement, > 4 mm

Butt Welds Most Subject to Thermal Fatigue

- Too many cover passes
- Heavily convex weld profile
- Excessive cover weld penetration
- Ropey welds

Testing for Problematic Welds

- Visual
- PT
- Ultrasonic
- Grinding + UT Thickness (Destructive)
- Magnetic Liftoff?
- Radiographic

Crack Prevention

- Use Alloy 825 composite tubes
- Minimize cover weld passes (3 max.)
- Maintain weld cap thickness 2 - 4 mm
- Consider Alloy 625 filler for 304L tubes
  - (Potential for weld corrosion due to low Cr)

Summary

- Butt weld cracking in PAP region
- Damage mechanism: thermal fatigue
- Welding procedures vary
  - Composite-to-Composite
  - Composite-to-Carbon
- Detection susceptible welds is difficult

Summary (cont.)

- Crack prevention
  - Alloy 825 tubes
  - Follow weld procedures
  - Consider Alloy 625 for cover pass on 304L

References

- Bennett, Dave & Meiley, Steve, "Optimizing the Fabrication Sequence for Composite-to-Carbon Steel Field Welds in Recovery Boiler Tubing," TAPPI Engineering Conference (1991)
- AF&PA Recovery Boiler Manuel, Vol. 2, Par. 4.5.4.9.1 (1991)
- Wensley, A., Ramberg, M. and Asbey, S., "Corrosion of Butt Welds in the Lower Waterwalls of Black Liquor Recovery Boilers," International Corrosion Conference (2007)

TAPPI Steam & Power/Energy Management Committee

Officers:

- Chairman – Norris Johnston - Hercules
- Vice Chair – John Andrews – Mead-Westvaco
- Secretary – Dave Parrish – Factory Mutual
- Membership Chair – Steve Wilson – AMEC

Subcommittees:

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

1

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

2

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 – Released TIP's

- Specification for Procurement of Recovery Boiler Economizer (2009)
  - Developed from AF&PA Economizer Study
- Recommended Test Procedures for Black Liquor Evaporators (2008)
  - Documents test procedures for evaporators
- Recovery Boiler Sootblowers (2009)
  - 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 – Released TIP's

- Stripping of Kraft Pulping Process Condensates–Regulations, Design & Operations (2008)
- Collection and Burning of Concentrated NCG's – Regulations, Design, Operation (2008)
- Recovery Boiler Energy Efficiency Improvements (2008)
- Estimating the First Melting Temperature of Fireside Deposits in Recovery Boilers (2004)

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Recovery Boiler – Released TIP's:

- Chloride and Potassium Measurement and Control in the Pulping and Chemical Recovery Cycle (2005)
- Guidelines for Replacement of Generating Bank Tubes with Expanded Joints in Two-drum Boilers (2009)
- Guidelines for Operating and Maintenance Impacting Recovery Boiler Economizers (2009)
  - Appendix 2 from recent AF&PA economizer study

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Power Boiler – Released TIP's:

- Performance Test Procedure for Boilers Using Biomass as a Fuel (2008)
- Sampling Procedures for Biomass Fuel for Boiler Performance Testing (2008)

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Water Treatment Activities

- Keys to Successful Cleaning of Boilers
  - Mandatory 5-year review in 2009
- 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:

- Meetings are held twice per year
  - Next Meeting – April 14 – Atlanta (@ BLRBAC)
    - Technical Presentation on Steam Network Controls, Merv Saunders (Poyry)
  - Fall PEERS Conference
  - Monday October 18, 2010
  - Norfolk, VA

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