



BLACK LIQUOR RECOVERY BOILER ADVISORY COMMITTEE

MINUTES OF MEETING Crowne Plaza Hotel/Atlanta Airport Atlanta, Georgia April 4, 5 & 6, 2011

OBJECTIVE

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

Bylaws - 2.1

OFFICERS

- Chairman:** **Scott Moyer (new)** Tel: 386-329-5609
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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/wp
IRS Employer ID/Tax ID (IRS E.I.N.T./T.I.N) --- #13-366-5137**

EXECUTIVE COMMITTEE

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BLRBAC SUBCOMMITTEES

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| <p>EMERGENCY SHUTDOWN PROCEDURES John Andrews, Chairman MeadWestvaco Corporation 5255 Virginia Ave. North Charleston, SC 29406 Tel: 843-746-8214 Fax: 843-740-4510 john.andrews@mww.com</p> | <p>FIRE PROTECTION IN DIRECT CONTACT EVAPORATORS Craig Cooke-Vice Chairman FM Global 815 Byron Drive Oconomowoc, WI 53066 Tel: 262-567-7370 Fax: 972-731-1820 craig.cooke@fmglobal.com</p> |
| <p>INSTRUMENTATION David Avery, Chairman Domtar Paper Company P. O. Box 678 Bennettsville, SC 29512 Tel: 843-454-8937 Fax: 843-479-9481 david.avery@domtar.com</p> | <p>MATERIALS & WELDING Dave Fuhrmann, Chairman International Paper 6285 TriRidge Blvd. Loveland, OH 45140 Tel: 513-248-6954 Fax: 513-248-6679 dave.fuhrmann@ipaper.com</p> |
| <p>PERSONNEL SAFETY Robert Zawistowski, Chairman Power Specialists Associates, Inc. 531 Main Street Somers, CT 06071 Tel: 860-763-3241, Ext. 135 Fax: 860-763-3608 bob.zawistowski@psaengineering.com</p> | <p>PUBLICITY & NEWS RELEASE Dave Parrish – Chairman FM Global 1151 Boston-Providence Turnpike Norwood, MA 02062 Tel: 781-255-4734; Fax: 781-962-9375 david.parrish@fmglobal.com</p> |
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BLRBAC MEETING SCHEDULE

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|---------------|----------------|-------------------------|-----------|-------------|
| Fall | October | 10, 11 & 12* | -- | 2011 |
| Spring | April | 2, 3 & 4 | -- | 2012 |
| Fall | October | 8, 9 & 10 | -- | 2012 |
| Spring | April | 8, 9 & 10 | -- | 2013 |
| Fall | October | 7, 8 & 9 | -- | 2013 |
| Spring | April | 7, 8 & 9 | -- | 2014 |

*** = BLRBAC Executive Committee revision due to plans for TAPPI Mtg. 1st week in October 2011.**

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

■ Past Chairman Lon Schroeder

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

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.

Mrs. Barbara Holich
BLRBAC Secretarial Services
(new) 5500 Irish Spring Street
(new) Las Vegas, NV 89149

Frank's Cell Phone: 630-512-0144
(new) Barbara's Cell Phone: 630-640-1805
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These are available at the **BLRBAC INTERNET ADDRESS:**

www.blrbac.org/wp

BLRBAC Guidelines & Recommended Practices

-  *Waste Stream Incineration*
(Dated: October 2010)
-  *Emergency Shutdown Procedure*
(Dated: October 2009)
-  *Safe Firing of Black Liquor in Black Liquor Recovery Boilers*
(Dated: April 2010)
-  *Materials & Welding Guidelines*
(Dated: April 2009)
-  *Safe Firing of Auxiliary Fuel in Black Liquor Recovery Boilers*
(Dated: April 2009)
-  *Fire Protection in Direct Contact Evaporators and Associated Equipment*
(Dated: April 2008)
-  *Personnel Safety & Training*
(Dated: October 2007)
-  *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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| <p>Chad Harrod Georgia Pacific Cellulose Brunswick Cellulose, Inc. PO Box 1438 Brunswick, GA 31520 Tel: 912-265-5780 x7757 Fax: 912-264-9076 chad.harrod@gapac.com</p> | <p>Kevin R. Huelsbeck FM Global Property Insurance Midwest- Chicago Ops N8955 Willow Lane Menasha, WI 54952. 920.205.5529 (cell) 847.430.7699 (fax) kevin.huelsbeck@fmglobal.com</p> | <p>Greg Kornaker Babcock & Wilcox Company P. O. Box 351 Barberton, OH 44203-0315 Tel: (330) 860-2009 Fax: (330) 860-1105 gjkornaker@babcock.com</p> |
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No meeting held in April of 2011

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‡ Denotes attendance at meeting in April of 2011

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‡ Denotes attendance at meeting in April of 2011

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| <p>‡ Jennifer Johnston Georgia-Pacific Corporation 133 Peachtree St. NE Atlanta, GA 30303 Tel: 404-652-4632 Fax: 404-654-4821 jennifer.johnston@gapac.com</p> | <p>‡ Randy Lombardi Babcock & Wilcox Company 20 S. Van Buren Avenue Barberton, OH 44203-0351 Tel: 330-860-2028 Fax: 330-860-8944 rlombadi@babcock.com.com</p> | <p>Louis Mangelli Diamond Power International, Inc. P.O. Box 40145 Baton Rouge, LA 70835-0145 Tel: 225-907-8185 lmagelli@diamonpower.com</p> |

‡ Denotes attendance at meeting in April of 2011

PERSONNEL SAFETY SUBCOMMITTEE (Cont.)

| | | |
|---|---|---|
| <p>‡ Preston Morgan Metso Power 2430 Toringdon Drive, Ste. 201 Charlotte, NC 28277 Tel: 704-414-3402 Fax: 704-541-3683 preston.morgan@metso.com</p> | <p>Frank Navojosky Verso Paper. Riley Street Jay, ME 04239 Tel: 207-897-1444 Fax: N/A frank.navojosky@versopaper.com</p> | <p>Lynn Rawls XL GAPS 206 Rawls Road Perkinston, MS 39573 Tel: 601-928-9420 Fax: 601-928-9420 lynn.rawls@xlgroup.com</p> |
| <p>John Stelling Packaging Corp. of America N. 9090 County Road E. Tomahawk, WI 54487 Tel: 715-453-2131, Ext. 309 Fax: 715-453-0470 jstelling@packagingcorp.com</p> | <p>Arthur Thomson Domtar Pulp & Paper Products, Inc. 2005 Mission Flats Road Kamloops, BC V2C 5M7 Tel: 250-828-7372 Fax: 250-828-7745 art.thomson@n.domtar.com</p> | |

‡ Denotes attendance at meeting in April of 2011

SAFE FIRING OF BLACK LIQUOR SUBCOMMITTEE

‡Mark Sargent – Chairman

International Paper
6283 Tri-Ridge Blvd.
Loveland, OH 45140-7910
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Fax: 901-214-0894

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|---|---|--|
| <p>‡Clif Barreca Weyerhaeuser P. O. Box 1391 New Bern, NC 28563 Tel: 252-633-7696 Fax: 252-633-7657 clif.barreca@weyerhaeuser.com</p> | <p>‡Joe Bush Alstom Power 1119 Riverfront Parkway Chattanooga, TN 37402 Tel: 423-752-2931 Fax: 423-752-2660 Cell: 423-619-8123 joe.bush@power.alstom.com</p> | <p>Mark Donahue Fossil Power Systems, Inc. 10 Mosher Drive Dartmouth, NS Canada B3B 1N5 Tel: 902-468-2743, Ext. 238 Fax: 902-468-2323 Cell: 902-469-2323 donahuem@fossil.ca</p> |
| <p>‡Len Erickson Boise, Inc. P. O. Box 50 Boise, ID 83728-0001 Tel: 208-384-4933 Fax: 208-384-7637 lenerickson@boiseinc.com</p> | <p>‡Larry Hiner Babcock & Wilcox P. O. Box 351 Barberton, OH 44203-0351 Tel: 330-860-6525 Fax: 330-860-9295 lahiner@babcock.com</p> | <p>Guy Labonte FM Global 600 de la Guachetiere Ouest Montreal, Que H3B 4Lb Canada Tel: 514-876-7412 Fax: 514-942-3651 guy.labonte@fmglobal.com</p> <p>‡Dave Parrish - Substitute</p> |
| <p>‡Scott Moyer Georgia Pacific P. O. Box 919 Palatka, FL 32178-0919 Tel: 386-312-1190 Fax: 386-325-6187 scott.moyer@gapac.com</p> | <p>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</p> | <p>Sandi Sims Alabama River Pulp P. O. Box 100 Perdue Hill, AL 36470 Tel: 251-743-8552 Fax: N/A sandis@ariver.com</p> |

‡ Denotes attendance at meeting in April of 2011

WASTE STREAMS SUBCOMMITTEE

‡ John Rickard – Chairman

Jacobs Engineering
 P. O. Box 5456
 Greenville, SC 29606
 Tel: 864-676-6393
 Fax: 864-676-6005

john.rickard@jacobs.com

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|---|--|---|
| <p>Henry Beder 14150 NE 32nd Place Bellevue, WA 98007 Tel: 425-861-6801 Cell: 425-516-8225 hbeder@comcast.net</p> | <p>‡ Mark E. Cooper FM Global 550 Burrard Street, Suite 1788 Bentall 5 Vancouver, BC V6C2B5 Canada Tel: 604-694-8262 Cell: 425-877-9735 mark.cooper@fmglobal.com</p> | <p>‡ Wendy Coyle International Paper 7600 Highway 10 West Pine Hill, AL 36769 Tel: 334-963-2362 Cell: 541-285-1867 wendy.coyle@ipaper.com</p> |
| <p>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</p> | <p>‡ Olie Kujanpaa Andritz 10745 Westside Parkway Alpharetta, GA 30004 Tel: 770-640-2571 Fax: 770-640-2455 olli.kujanpaa@andritz.com</p> | <p>‡ 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</p> |
| <p>‡ Melville Hedges For Steven L. Osborne Babcock & Wilcox 20 S. Van Buren Avenue Barberton, OH 44203 Tel: 330.860.1686 Fax: 330.860.9023 slosborne@babcock.com</p> | <p>Winston “Jerry” Pate Georgia Pacific P. O. Box 709 Brewton, AL 36427 Tel: 251-867-8371 Fax: 251-867-1153 winston.pate@gapac.com</p> | <p>‡ 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</p> |

‡ Denotes attendance at meeting in April of 2011

WASTE STREAMS SUBCOMMITTEE (Cont.)

| | | |
|--|---|--|
| <p>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</p> | <p>‡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</p> | <p>‡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@jansenboiler.com</p> |
| <p>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</p> | | |

‡ Denotes attendance at meeting in April of 2011

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

| | | |
|---|--|---|
| <p>‡Craig Aderman Sappi Fine Paper NA 89 Cumberland St. P.O. Box 5000 Westbrook, ME 04098-1597 Office: 207-856-3517 Cell: 207-831-2472 craig.aderman@sappi.com</p> | <p>‡Clark Conley Metso 2900 Courtyards Drive Norcorss, GA 30071 Tel: 770-263-7863 Fax: N/A clark.conley@metso.com</p> | <p>Buck Dunton ChemTreat 4301 Dominion Blvd. Glen Allen, VA 23060 Tel: 804-935-2000 Fax: N/A buckd@chemtreat.com</p> |
| <p>‡Don Flach Georgia-Pacific Corp. 133 Peachtree St. Atlanta, GA 30303 Tel: 386-336-5584 don.flach@gapac.com</p> | <p>Frank Gabrielli Alstom Power 2000 Day Hill Road Windsor, CT 06095 Tel: 860-285-5646 Fax: N/A frank.gabrielli@power.alstom.com</p> | <p>‡John Gray Rayonier 4470 Savannah Highway Jesup, GA 31545 Tel: 912-588-8213 Fax: N/A john.p.gray@rayonier.com</p> |
| <p>‡Ken Hansen Babcock & Wilcox 20 South Van Buren Avenue Barberton, OH 44203 Tel: 330-860-6443 Fax: N/A kehansen@babcock.com</p> | <p>‡Norris Johnston Ashland Hercules Water Tech. 37 Hough Road Lacey's Spring, AL 35754 New York, NY Tel: 256-650-0049 Mobile: 256-520-1011 njohnston@ashland.com</p> | <p>‡Dave Kittel Rayonier Performance Fibers, LLC 1 Gum Street Fernandina Beach, FL 32034 Ph: 904-27701486 Fax: 912-427-5382 david.kittel@rayonier.com</p> |

‡ Denotes attendance at meeting in April of 2011

WATER TREATMENT SUBCOMMITTEE (Cont.)

| | | |
|--|--|--|
| <p>David Krygsyfeld Atlantic Comb</p> | <p>‡Sam Lewis Delta Training 4020 Oleander Drive Wilmington, NC 28403 Tel: 910-790-1988 Fax: N/A slewis@deltatraining.com</p> | <p>‡Mitch Morgan Nalco 1601 W. Diehl Road Naperville, IL 60563-1198 Tel: 630-305-1000 Fax: N/A jmorgan@nalco.com</p> |
| <p>‡Rick Morgan FM Global Granite Parkway Plano, TX 75024 Tel: 972-731-1869 Fax: N/A rick.morgan@fmglobal.com</p> | <p>Richard Morris Metso 3430 Toringdon Way, Suite 101 Charlotte, NC 28277 Tel: 704-281-4703 Fax: N/A richard.morris@metso.com</p> | <p>Kurt Parks Packaging Corp. of America 5495 Lake Park-Clyattville Road Valdosta, GA 31601 Office: 229-559-2257 Cell: 229-415-8557 Fax: N/A kparks@packagingcorp.com</p> |
| <p>Tom Przbylski Boise, Inc. 400 Second Street Int'l. Falls, MN 56649-2327 Tel: 218-285-5011 Fax: N/A tomprzybski@boisepaper.com</p> | <p>Jim Robinson GE (Infra, Water) 4636 Somerton Road Trevose, PA 19053 Tel: 215-942-3381 Fax: N/A james.robinson@ge.com</p> | <p>Alarick Tavares Georgia Pacific 133 Peachtree Street Atlanta, GA 30303 Tel: 404-652-4000 Fax: N/A ajtavare@gapac.com</p> |
| <p>‡Alvaro Timotheo Andritz 1115 N. Meadow Parkway Roswell, GA 30076-3857 Tel: 770-640-2500 Fax: N/A alvaro.timotheo@andritz.com</p> | | |

‡ Denotes attendance at meeting in April of 2011

Registered for the meeting were:

A.H. Lundberg Associates

Plank, Ann, Bellevue, WA
Seefeld, Paul, Jacksonville, FL

AbitibiBowater

Maxwell, Don, Sylacauga, AL
Nixon, John, Catawba, SC
Owen, Kevin, Calhoun, TN
Pody, Eddie, Coosa Pines, AL

Acuren Inspection

Harley, Todd, Minden, LA
Maness, Jason, Minden, LA
Spires, L. P., Minden, LA
Wood, Tommy, Minden, LA

AirTek Construction

Bringman, Lewis, Linthicum, MD

Alstom Power

Bush, Joe, Chattanooga, TN
Harmon, John, Windsor, CT
Hollenbach, Dennis, Windsor, CT

AMEC

Wilson, Steve, Tucker, GA

American Forest & Paper Assoc.

Grant, Tom, Yonkers, NY

Andritz

Collins, Peter, Roswell, GA
Kujanpaa, Olli, Roswell, GA
Merriman, Nick, Graz, Austria
Phillips, John, Roswell, GA
Sopanen, Jari, Roswell, GA
Timotheo, Alvaro, Roswell, GA

Aquilex

Hohenstein,Carolynn, Norcross, GA
Power, Stacy, Norcross, GA
Tipperreiter, Jim, Norcross, GA

Armstrong International

Shelley, John, Orange Park, FL
Smith, James, Morristown, TN

Ashland Hercules Water

Johnston, Norris, Lacey's Spring, AL

ASTS

Clay, Dean, Milford, OH

Atlantic Combustion Tech.

Digdon, David, Amherst, NS

AXA Matrix Risk Consultants

Hayes, Michael, Miamisburg, OH

Babcock & Wilcox

Blaser, Wade, Richmond, SC
Blazer, Phil, Charlotte, NC
Hansen, Kenneth, Barberton, OH
Hedges, Meville, Atlanta, GA
Hiner, Larry, Barberton, OH
Hovinga, Mark, Barberton, OH
Kulig, John, Barberton, OH
Lance, Gail, Barberton, OH
Lombardi, Randy, Barberton, OH
Pon, Ronald, Napa, CA
Sherlock, H. Bentley, Atlanta, GA
Yash, John, Atlanta, GA

BE&K Construction

Dean, Jerry, Birmingham, AL

Boiler Island Air Systems

MacCallum, Colin, West Vancouver, BC,
Canada

Boise Inc.

Davis, Matt, Jackson, AL
Erickson, Leonard, Boise, ID
Miller, Jason, Deridder, LA

Registered for the meeting were:

Brunswick Cellulose

Harrod, Chad, Brunswick, GA
Lane, Terry, Brunswick, GA

Buckeye Technologies

Baker, Randy, Perry, FL
Das, Raul, Perry, FL
Streit, David, Perry, FL

Buckman Laboratories

Henry, Dan, Memphis, TN

CB Anthony Ross

Adams, Wayne, Clinton, NC
Shanahan, Dennis, Columbia, MD

Charles Higginbotham, PE, LLC

Higginbotham, Charles, St. Simons Island,
GA

Chartis

DeBeer, Thomas, Woodstock, GA
Veltre, John, Acworth, GA

ChemTreat

Graham, Jim, Collierville, TN

Clearwater Paper

Bliss, John D. , McGehee, AR
Frei, Steve, Lewiston, ID
Manyon, John, Lewiston, ID
Wiley, George, McGehee, AR

CNA Risk Control

Walker, Billy, Apex, NC

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
Myers, Fred, Sequim, WA

Domtar

Avery, David, Bennettsville, SC
Crouse, Ray, Bennettsville, SC
Gore, Chris, Bennettsville, SC
Hawkins, Charles, Kingsport, TN
Suresh, Arun C., Kingsport, TN
Worsham, Jesse, Bennettsville, SC

Entech Products

Mathis, Steven, Alabaster, AL

Extra Hand Plant Support Services

Phelps, Bob, Chester, VA

Fluor

Lewis, John, Greenville, SC

FM Global

Baro, Joachim, Frankfurt, Germany
Cooke, Craig, Oconomowoc, WI
Cooper, Mark, Woodinville, WA
Crysel, Scott, Plano, TX
Evans, David, North Olmsted, OH
Hoffman, Daryl, Kirkland, WA
Huelsbeck, Kevin, Menasha, WI
Lang, David, Little Elm, TX
Meehan, Thomas, Brewer, ME
Miller, Danny, Charlotte, NC
Moberg, Eric, Plano, TX
Morgan, Rick, Plano, TX
Onstead, Jimmy, Plano, TX
Parrish, David, Norwood, MA
Polagye, Mike, Norwood, MA

Registered for the meeting were:

FPInnovations

Singbeil, Douglas, Vancouver, BC, Canada

George H. Bodman, Inc.

Bayse, Michael, Kingwood, TX
Bodman, George, Kingwood, TX

Georgia-Pacific

Flach, Don, Palatka, FL
Holm, Ralf, Atlanta, GA
Johnston, Jennifer, Atlanta, GA
Morency, Karl, Atlanta, GA
Moyer, Scott, Palatka, FL
Presley, Stefanie, Atlanta, GA
Taveres, Alarick, Atlanta, GA

Glatfelter

Gentzler, William, Spring Grove, PA

Global Risk Consultants

Smith, Andy, Woodstock, GA

GommiTech

Gommi, Julius, Maple Valley, WA

Graphic Packaging International

Dickerson, Randall, West Monroe, LA

Greif

Hartless, Mike, Amherst, VA
Jenkins, Greg, Amherst, VA
Richeda, Brian, Amherst, VA

Howe Sound Pulp & Paper

Casey, Shawn, Port Mellon, BC

International Paper

Camp, Bill, Prattville, AL
Coyle, Wendy, Pine Hill, AL
Fuhrmann, Dave, Loveland, OH
Hall, Carlton, Redwood, MS

International Paper (Cont.)

Kiper, Mike, Loveland, OH
MacIntire, Wayne, Loveland, OH
Sargent, Mark, Loveland, OH
Warnock, Josh, Redwood, MS

International Quality Systems

Beehoo, Isabel, Santiago, Chile
Ferrada, Gabriel, Santiago, Chile

Interstate Paper

Helmuth, David, Riceboro, GA
Poppell, Randy, Riceboro, GA
Smith, Joe, Riceboro, GA

Jacobs Engineering

Rickard, John, Greenville, SC

Jansen

LeBel, Mark, Atlanta, GA
Verloop, Arie, Kirkland, WA

John E. Cover Engr.

Cover, John, Birmingham, AL

Kapstone

Carroll, Billy, Roanoke Rapids, NC
Coyne, Joe, Roanoke Rapids, NC
Walker, Steven, Roanoke Rapids, NC

KGRA Energy

Capilouto, Christine, Lake Forest, IL

K-Patents

Gronowski, Eric, Naperville, IL
Hamalainen, Arto, Naperville, IL
Miller, Adam, Naperville, IL
Prairie, Dan, Naperville, IL
Pyorala, Keijo, Naperville, IL

Registered for the meeting were:

LENRO Inc.

Olavessen, Len, Millington, TN

Liquid Solids Control

Sweeney, Michael, Upton, MA

Longview Fibre

Andrews, Mark, Longview, WA

MeadWestvaco

Andrews, John, N. Charleston, SC

Metso Power

Bird, Jennings, Lancaster, SC
Borduas, Pierre, Charlotte, NC
Burelle, Raymond, Charlotte, NC
Conley, Clark, Charlotte, NC
Cross, Tom, Charlotte, NC
Gantt, Melissa, Charlotte, NC
Mathis, David, Charlotte, NC
Morgan, Preston, Charlotte, NC
Nichols, Jody, Charlotte, NC
Skoog, Mikael, Charlotte, NC
Tanguay, Eric, Charlotte, NC
Weikmann, John, Charlotte, NC

Nalco

Hoefs, Steve, Naperville, IL
Morgan, Mitch, Naperville, IL

National Board of BPVI

Parks, Terry, Columbus, OH

National Boiler Service

Duplissey, David, Trenton, GA
Mesamore, Mike, Trenton, GA

NewPage Corporation

Hollern, Michael, Luke, MD

NORAM Engineering

Bucher, Wayne, Birmingham, AL

Packaging Corporation

Lykins, Michael, South Elgin, IL

Power Specialists Associates

Bailey, Chuck, Somers, CT
Madersky, Lee Anne, Somers, CT
Madersky, Tom, Somers, CT
Zawistowski, Bob, Somers, CT

Praestare Engineering

Harris, Joel, Dothan, AL

Process Equip/Barron Industries

Nolen, Ken, Pelham, AL
Ray, Allen, Pelham, AL

Proterra-Power

Proterra, Joe, Gainesville, GA

Purolite

Davis, Howard, Bala Cynwd, PA
Destefano, Frank, Bala Cynwd, PA
Downey, Don, Bala Cynwd, PA

Rayonier

Gray, John, Jesup, GA
Kittel, Dave, Fernandina Beach, FL

RMR Mechanical

Roy, Bob, Cumming, GA

RockTenn

vonOepen, David, Demopolis, AL

SAPPI

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

Registered for the meeting were:

Savcor Consulting

Duda, Yuriy, Vancouver, BC

Smurfit Kappa Carton de Colombia

Rojas, Carlos, Cali, Colombia

Smurfit-Stone

Baker, Ken, Florence, SC

Buzzell, Maurice, La Tuque, Que

Caldwell, Michael, Jacksonville, FL

Campbell, Bob, West Point, VA

Dunn, Jonathan, Florence, SC

Edens, Chad, Hopewell, VA

Jordan, Ron, Florence, SC

Lee, Heyward, Florence, SC

Pentecost, Rich, Scottsboro, AL

Southern Environmental

Harris, Don, Pensacola, FL

Thilmany

Basler, Dan, Kaukauna, WI

Glasheen, Mike, Kaukauna, WI

Thompson Industrial Services

Jackson, Dwayne, Sumter, SC

Watson, Duncan, Sumter, SC

Verso Paper

Dupuis, Joseph, Jay, ME

Haines, Garold, Jay, ME

Weyerhaeuser

Albrecht, Fleet, Vanceboro, NC

Barreca, Cliff, Vanceboro, NC

Hinman, James, Federal Way, WA

Knowlen, Bruce, Federal Way, WA

Rutledge, Chuck, Federal Way, WA

Slagel, David, Pt. Wentworth, GA

XL GAPS

Goddard, Robert, Tupelo, MS

Franks, James, Somerville, TN

Sides, Michael, Ocoee, FL

MAIN COMMITTEE MEETING

INTRODUCTION: BLRBAC Chairman, Scott Moyer, called the meeting to order at 8:00 a.m. on Wednesday, April 6, 2011.

CHAIRMAN: The Main Committee Meeting is called to order. This meeting, as well as all meetings and subcommittee meetings within BLRBAC, is being held in strict accordance with our anti-trust policy as can be seen on the screen.

OLD BUSINESS

ACCEPTANCE OF THE FALL 2010 MEETING MINUTES – Scott Moyer

Minutes were posted for the fall 2010 meeting. Are there any corrections? Do I have a motion to accept? So moved. Second? Are the voting members all in favor? Opposed? The fall 2010 Meeting Minutes have been accepted as written.

NEW BUSINESS

1. NEW MEMBERS/REPRESENTATIVE CHANGES REPORT – Mike Polagye

NEW REGULAR MEMBERSHIP - None Reported

NEW ASSOCIATE MEMBERSHIPS

Armstrong Heat Transfer Group - Granby, Quebec, Canada - a provider of steam air heaters for recovery boilers.

James Smith is the designated Associate Representative

John Shelley is the designated Alternate Associate Representative

Purolite Company, Balacynwyd, PA - a provider of ion exchange resins for water treatment

Frank DeStefano is the designated Associate Representative

Howard Davis is the designated Alternate Associate Representative

NEW CORRESPONDING MEMBERSHIPS – None Reported

REGULAR REPRESENTATIVE CHANGES

Alstom Power

Joe Bush remains the designated Representative

John Harmon replaced Kevin Pollinger as the designated Alternate Representative

1. NEW MEMBERS/REPRESENTATIVE CHANGES REPORT – (Cont.)

ASSOCIATE REPRESENTATIVE CHANGES

GE Water & Process Technologies

Kenneth Welch replaces James Robinson as the designated Associate Representative
Lee Dupree replaces Daniel Setaro as designated Alternate Associate Representative

CORRESPONDING MEMBERSHIP CHANGES - None Reported

MEMBERSHIP COMPANY NAME CHANGES

GE Water & Process Technologies → previously d/b/a Echolochem, Inc.

{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 – Scott Moyer

The Executive Committee met in closed session Tuesday afternoon. In attendance were:

| | | |
|---------------|---|-------------------------------------|
| Mike Polagye | - | Secretary |
| Len Olavessen | - | Treasurer |
| Jimmy Onstead | - | Insurance Company Representative |
| John Wiekman | - | Boiler Manufacturers Representative |
| Dave Fuhrmann | - | Owners Representative |
| Jim Hinman | - | Vice-chairman |
| Scott Moyer | - | Chairman. |

The committee covered a number of topics:

The fall Executive Committee minutes were voted on and accepted as written.

A draft of operating policies and procedures for BLRBAC was reviewed and developed further. These will be an appendix to the BLRBAC operating procedures. These will be finalized for the fall 2012 meeting

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

October 2012 marks the 50th Anniversary of BLRBAC. We are looking for volunteers to organize the BLRBAC 50th anniversary event. An organizing team of Len Olavessen, Len Ericson and Dean Clay will start evaluating logistics and setting up a plan for organizing this event.

Ron Hess has retired from HSB and BLRBAC
Dean Clay is retiring from IP.

The member Company list needs to be reviewed. The updated list was posted to web site and has been in the registration room for markups. If the list does not accurately reflect your company's membership, please send corrections to Mike Polagye or Barbara Holich on company letterhead.

3. **TREASURER'S REPORT** – Len Olavessen

We had a total of 209 paid registrations; 169 Advance registrations and 40 At Door registrations. We had a total of five attendees from outside of North America. We had two from Chile, one from Colombia, one from Germany and one from Austria. The breakdown of representations is 23 paper companies, four boiler manufacturers, five insurance companies, 29 Associate members and then we had seven guests of member companies.

The checking account as of yesterday afternoon contained \$50,976.36. Don't get too excited because we still have a lot of bills to pay. The Certificate of Deposit has \$19,982.59 in it as of April 1st. The receipts for this meeting slightly exceeded our budget which is really great. So we are tracking right along and we are looking good financially since we are able to pay all the bills.

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

I have three items for my report this morning.

First is the every meeting reminder that all communication from BLRBAC is via e-mail. Therefore, it is important to let Barbara Holich know if your e-mail address changes. Barbara's contact information can be found on the Contact Information page of the BLRBAC website.

The second item is the BLRBAC website. As I mentioned last October, MicroSoft is no longer supporting the FrontPage software my web master had been using and we had to switch to a different software package. To achieve this, the operating website address was changed and is now www.blrbac.org/wp. A link on the old website should appear if you go there, although depending on web browser settings, you may have to hit "Refresh" several times before you see it.

4. **SECRETARY'S REPORT** – (Cont.)

And the third item is I'd like to take this opportunity to invite anyone who is interested in volunteering to be the new web master for BLRBAC to speak with me at the coffee break or let me know by e-mail or phone. The increasing responsibilities of my current web masters paying job is making it more difficult for him to give this the attention he would like.

That concludes my report. Are there any questions?

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 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.

4. **SECRETARY'S REPORT** – (Cont.)

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 BLRBAC has discontinued use of their fax machine.

I am again requesting that all Meeting Registration Forms be completed in their entirety. This form is the only way I can confirm the accuracy of the BLRBAC database and e-mail address book.

5. **SUBCOMMITTEE REPORTS**

5.1 **AUXILIARY FUEL REPORT** – Bruce Knowlen

The Auxiliary Fuel Subcommittee did not meet during the spring 2011 BLRBAC meeting. However, there is a change being announced about our document: The common permissive starting and tripping logic figures have had a statement included -

**Note: Incineration of
Non-Condensable Gas
Waste Streams is Not
Encouraged by
BLRBAC**

This statement is no longer needed and will be removed. The Waste Stream Incineration document now exists to provide direction and support for processing these streams in the recovery boiler. A new release of the Auxiliary Fuel document will be placed for use having only this change and a new date.

The Auxiliary Fuel Subcommittee expects to hold an open meeting in the fall of 2011. Other updates and modifications to the document will be discussed at that time. The subcommittee invites you to provide your concerns and questions to be placed on our agenda and to join us as we consider all of these.

5.2 **BLACK LIQUOR REPORT** – Mark Sargent

The Safe Firing of Black Liquor Subcommittee met in a closed meeting on April 4 2011 at 8:30 AM Lombard Room with seven members present and in an open meeting at 1:00 PM Crawford Room with seven members present and approximately 40 guests.

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

AGENDA:

Opened the meeting.

Reviewed BLRBAC Anti-Trust statement

Reviewed and approved the fall 2010 Meeting Minutes.

We have prepared language changes and are submitting this language to the Executive Committee for Chapter 10 – dissolving tanks for guidelines dealing with:

- high green liquor density
- impending crystallization
- known or suspected live smelt in the dissolving tank

We have prepared language changes and are submitting this language to the Executive Committee for Figure 2 – Permissive Starting Logic Black Liquor Firing as it relates to requiring:

- boiler on line
- superheater loops cleared of condensate
- stable firing established

These changes will be an operator action just after the black liquor header purge and prior to initiating black liquor firing. We are proposing to also add language to Chapter 15, 15.6 describing the suggested requirements prior to initiating black liquor firing. These changes are being recommended as a means to try and prevent short term overheat failures of superheater tubes.

We have prepared language changes and are submitting this language to the Executive Committee for Figure 5 – Protective Black Liquor Tripping Logic as follows:

- If the black liquor header valve fails to position
- OR
- If the black liquor divert valve fails to position
- This would constitute a black liquor divert condition

This essentially means that if the header valve or divert valve are in the wrong positions as commanded then a fail to the safe (divert) position would occur

We have received a suggestion to include some permissives for DCE's in Figure 1, shared starting logic for Safe Firing of Auxiliary Fuel and Safe Firing of Black Liquor. We will propose the changes to the Safe Firing of Auxiliary Fuel Subcommittee for their thoughts and if we are in agreement will submit the changes to the Executive Committee.

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

We fielded several questions regarding the proper black liquor conditions for DCE's as it relates to Safe Firing of Black Liquor. We do not have specific guidelines but will work with the Fire Protection in DCE Subcommittee and the ESP Subcommittee.

We will request of the ESP Subcommittee to add sections in the ESP Questionnaire that member companies can report to BLRBAC any incidents of dissolving tank crystallization or incidents of live smelt observed in the dissolving tank.

Have been requested to review locations to divert very high solids (>70%) black liquor. The issue is personnel safety if diverting to an atmospheric dump tank or mix tank. We will review and discuss at the fall 2011 meeting.

5.3 **ESP SUBCOMMITTEE REPORT – John Andrews**

The ESP Subcommittee met in closed session on Monday April 4th with 13 members represented. The Subcommittee met in open session on Tuesday morning April 5th with 13 members represented and 165 guests. The Subcommittee accepted two new members during the closed session on Monday. John Harmon of Alstom replaces Kevin Pollinger and Wayne MacIntire of IP replaces Dean Clay. A plaque was presented to Dean Clay at the open session to recognize his many years of participation on the ESP Subcommittee and in BLRBAC.

During the open session, the Subcommittee reviewed 26 incident reports from North America and three international incidents. Of the 26 incidents, 5 of the leaks were classified as critical incidents and 19 were non-critical incidents. One of the reported incidents was a spout failure and one was for an Emergency Shutdown Procedure (ESP) that was performed but no leak was found in subsequent inspection. There were no boiler explosions or smelt dissolving tank explosions reported this session. An Emergency Shutdown Procedure (ESP) was performed in 5 of the incidents including 3 of the critical incidents representing 75% of the critical incidents that should have been ESP'd.

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:

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

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

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

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

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

Incident Locations

The general locations of the leaks for boilers in North America are shown in Figure 1, which displays a typical boiler, not representing any particular style or model. The yellow marks are the non-critical incidents and the red marks indicate the location of the critical incidents. There is one green mark for the spout failures and the one blue represents the ESP with no leak. One incident reported a non critical superheater leak but discovered a critical leak in the roof during the outage.

The leaks locations are summarized as follows:

- 11 – Economizer
- 5 – Superheater
- 4 – Boiler Bank / Steam Drum
- 4 – Upper Furnace
- 1 – Screen
- 1 – ESP No Leak
- 1 – Smelt Spout Failure

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

ESP History

Figure 2 shows the history of Critical Incidents with and without an ESP reported at each meeting for the last 6½ years. For the incidents reported at this meeting, an ESP was performed in 75% of the critical incidents that should have been ESP's which is about the recent average.

Root Cause

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

- 10 – Weld Failure
- 6 – Thermal or Mechanical Fatigue
- 7 – Erosion or Corrosion Thinning
- 1 – Overheat
- 1 – Stress Assisted Corrosion or Corrosion Fatigue
- 1 – Unknown

How Discovered

Operator observations during boiler walkdowns continue to be the prevalent method of detecting leaks and accounted for identification of 11 of the leaks (40%). Although this session it was the lowest percentage that for recent history. Seven (7) of the leaks were identified by the control room and five (5) leaks were initially indicated by the leak detection system installed. Four leaks were discovered by a hydrostatic test during an outage.

Leak detection systems were reported to be installed on units in 16 of the incidents (62%). This represents an increase over prior years. The leak detection systems were credited with providing the initial indication of 5 leaks and confirmed two additional leaks indicating that the systems may be becoming more reliable. Another indication that leak detection system are becoming more effective is that they provided the initial indication for four economizer leaks which have traditionally been difficult to detect with the leak detection systems.

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 one minute to 4:55 hours.

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

The median time from the data available was indicated at 10 minutes which is a significant reduction from prior years. It was unfortunate that there was an ESP performed with no leak 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.

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. 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. If you submitted a report for the Spring Meeting that is not reported here, please contact Jules to see what might have happened.

Figure 3 shows the critical incidents reported each year. The bar for 2011 represents the first half of the year so we are starting off the year below average. 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. The good news is that we have accumulated several years since then without an explosion.

Figure 5 shows the five year rolling average of reported boiler explosions is at 0.2 after finally getting to zero. If we avoid a boiler explosion for the next couple of years, it will be back to zero. Keep up the good work!

Figure 6 shows the history of dissolving tank explosions and there were none reported this session. But recent history indicates that dissolving tank explosions continue to be a problem. Following the recommendations in Section 10 of Safe Firing of Black Liquor would have prevented many of the reported dissolving tank incidents in the past.

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

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, increased to just under 0.9 explosions per 100 boiler years because of the two dissolving tank explosion reported during the Fall 2010 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.

Learnings

There are several learnings that come from review of the incident reports that may be of value from the industry. This is not a complete list but a few items that stand out.

The importance of clearing superheater tubes even after a short shutdown was shown in one incident. It does not take long to accumulate condensate in the bottom of superheater loops after a trip, especially if there is some leakage in an attemporator spray water valve or if there has been a high drum level during the trip. We continue to see the importance of monitoring superheater tube thermocouples during the start-up.

It was also reported that the superheater thermocouples should be mounted on the tube at least 12” below the outlet header to minimize the influence of the header metal temperature.

The importance of maintaining dilution flow to the Direct Contact Evaporator after an upset condition, especially an ESP was shown. It is critical to have a system that can keep the DCE solids under control during the evacuation period after the ESP. A high drive amp alarm is also very important to indicate the possibility for a DCE drive trip. Mills should review how the DCE drive could be reset if it trips during an ESP evacuation period.

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

We saw that leaking sootblower poppet valves can create tube leaks. Mills should consider developing a method to indicate leaking poppet valves. A steam flow alarm that indicates continued flow when all blowers are at rest was one suggested idea. The use of a “heat gun” to check the tube temperatures to see lance tube stays hot after it has been idle for a while was another idea.

Several mills have reported operating with economizer leaks or handhole leaks for extended periods. Even though it would not result in the chance for a smelt water reaction, continued operation of leaks can spray on other tubes or the header and create a much larger problem. It was seen in one incident where the unit operated with a handhole leak that there was obvious washing of the header. This could potentially result in extended downtime for header repairs.

Sometimes it’s hard to tell the difference between drum level shrink and low drum level from a tube leak. After a boiler trip, as the steam bubbles collapse in the boiler water circuit, the drum level will drop quickly and as you add feedwater, the cooler water will further cause the bubbles to collapse, driving the drum level down. It is important to look for other indicators of a tube leak such as high furnace pressure or increase in ID fan speed to confirm the leak.

Process changes and changes in boiler operation can affect corrosion patterns in a unit. If you make a major change in the boiler operating conditions such as air distribution or flow patterns or if you make changes in liquor chemistry, it is a good idea to look for changes in corrosion pattern inside the furnace.

Even though it is not a normal practice in North America, we saw from an international incident that you don’t clean boilers from the inside! Large accumulations of salt cake in the furnace can be dangerous to personnel if they fall from the upper furnace. Make sure the unit is sufficiently clean before allowing personnel access inside the boiler.

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 Subcommittee met with a group from the Instrumentation Subcommittee to agree on the recommended architecture and align the language in the two documents.

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

The ESP system has several characteristics that set it apart from the normal boiler safety systems.

- The system must be “Energize to Actuate” to prevent the inadvertent opening of a drain valve on a failure of the system.
- The system must remember Last State during power failures so that the system does not reset if power is lost and then restored during an ESP.
- The system requires minimal logic
- The system seldom requires changes
- An alternate means must be provided to perform all required actions
- Management of Change issues - Inadvertent change of ESP logic must not be possible

In an attempt to satisfy the above criteria, the following language changes to the ESP Document has been submitted to the Executive Committee for review:

Recommended Change to second sentence of Chapter 1:

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

Add paragraph to the after bulleted items on Page 4

The Emergency Shutdown Procedure functions must be “energized to activate” and executed either by means of relay technology and hard-wiring or other Recovery Boiler Safety System as defined in Chapter 4 of the *Checklist and Classification Guide for Instruments and Control Systems*.

It must not be possible to alter the system unintentionally or to alter the system during operation of the boiler. Any time modifications are made to the system, the system shall be functionally tested prior to putting the unit back on line. Whatever technology is utilized, the BMS or DCS systems can be used to monitor operation of the functions.

Delete “Dedicated Stand Alone” definition from Section 3.24

If anyone has any comments or questions concerning the proposed language changes, please contact John Andrews or Jules Gommi.

5. SUBCOMMITTEE REPORTS – (Cont.)

5.3 ESP SUBCOMMITTEE REPORT – (Cont.)

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.

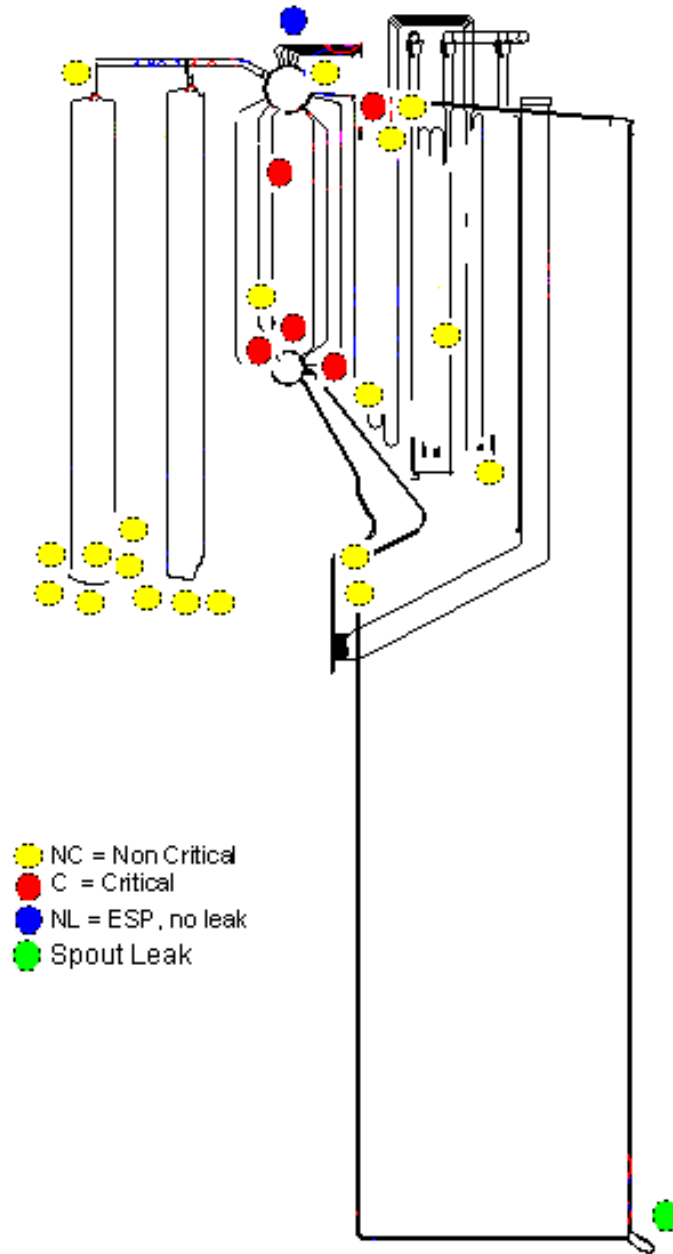
Incident Questionnaires

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

Spring 2011 Leak Locations



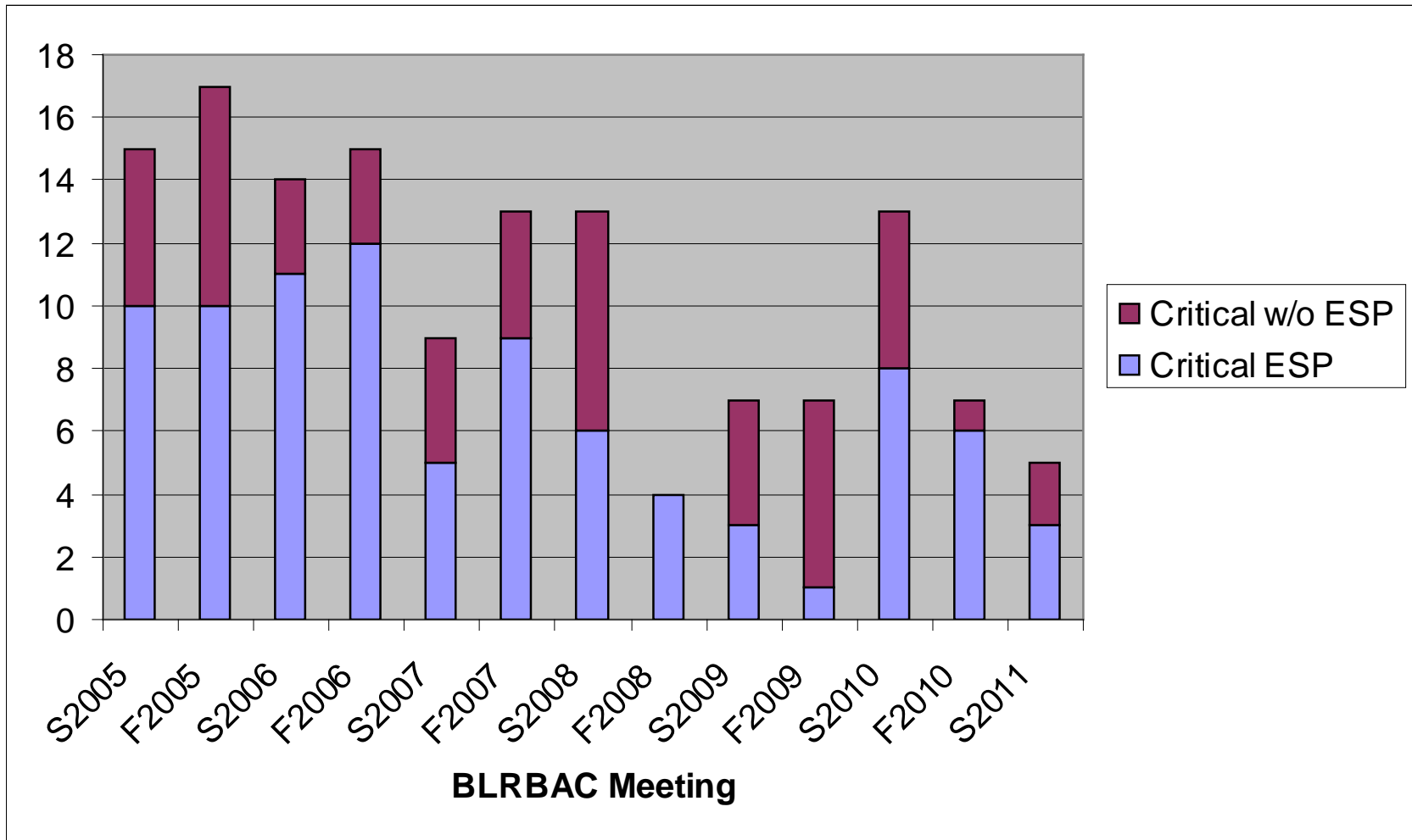


Figure 2

KRAFT RECOVERY BOILER CRITICAL INCIDENTS North America Pulp and Paper Industry

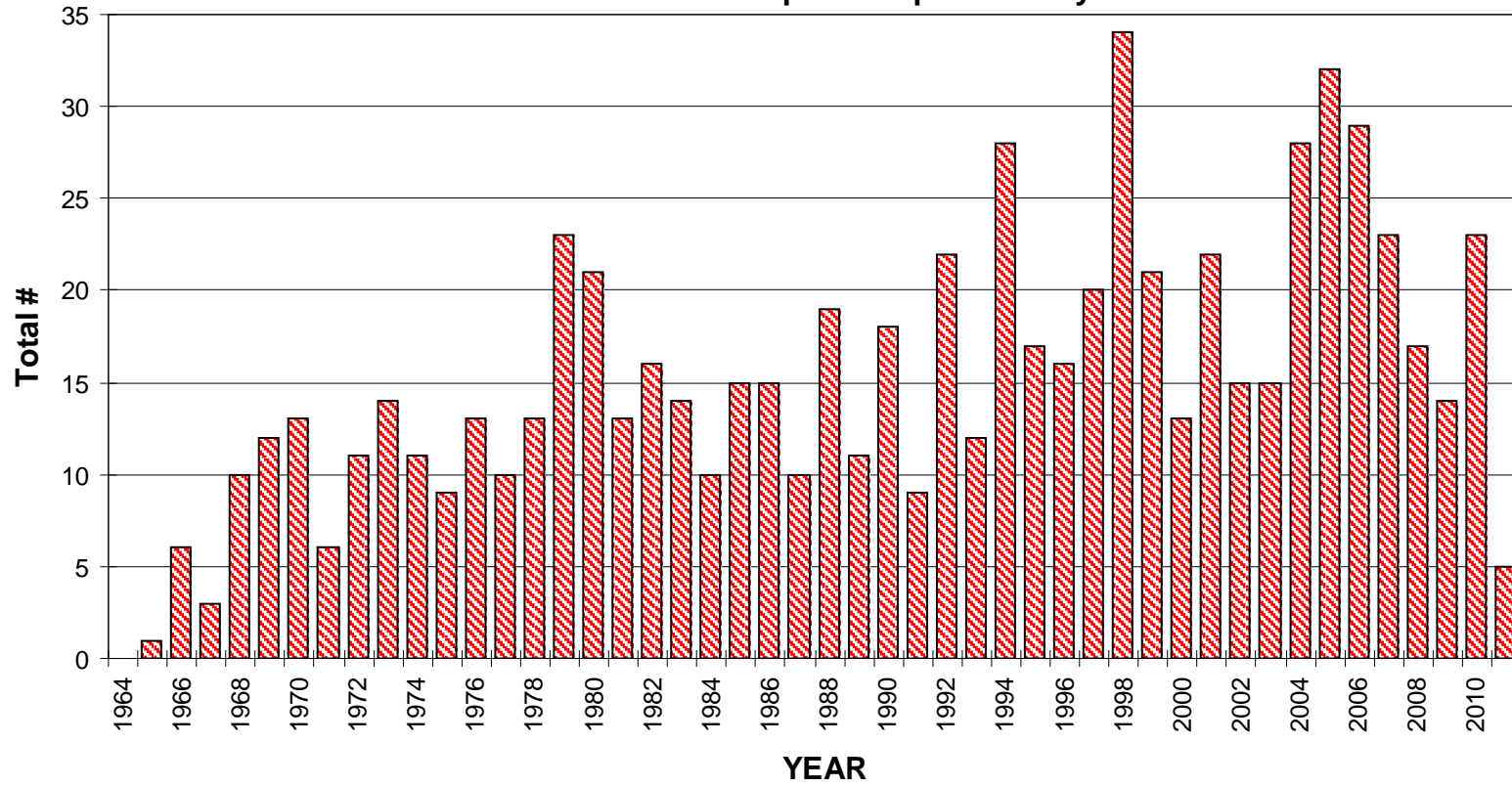


Figure 3

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

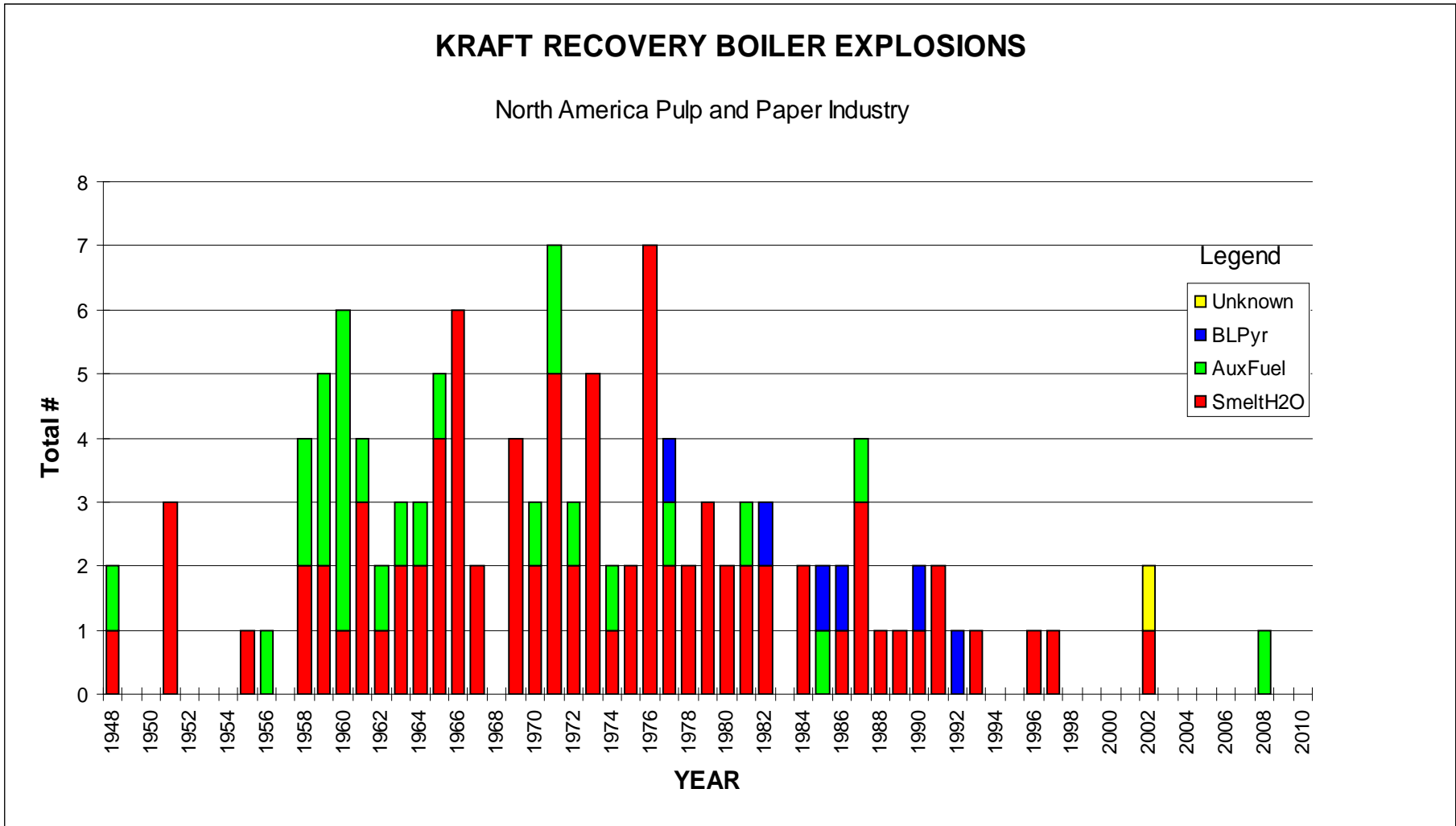


Figure 4

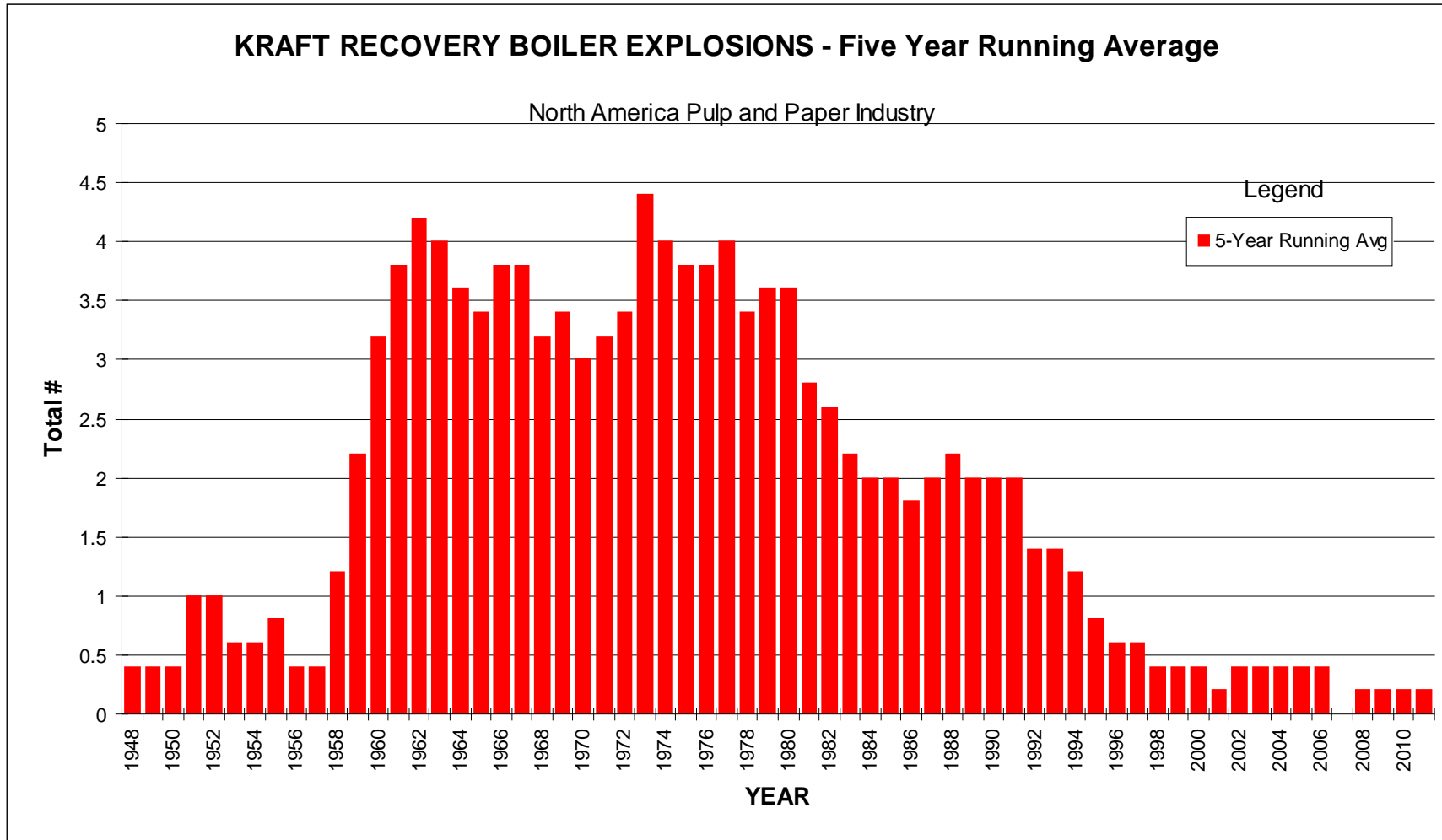


Figure 5

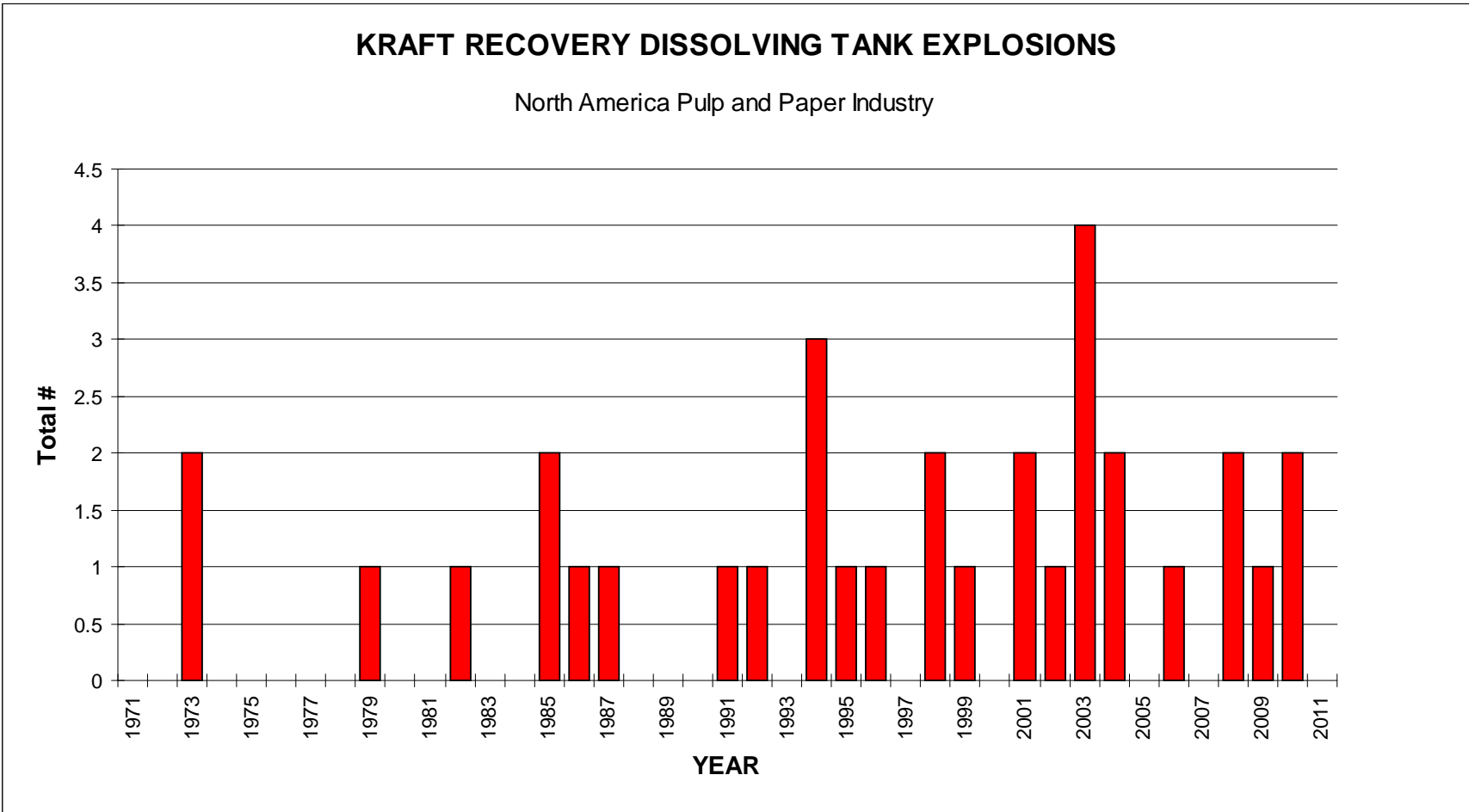


Figure 6

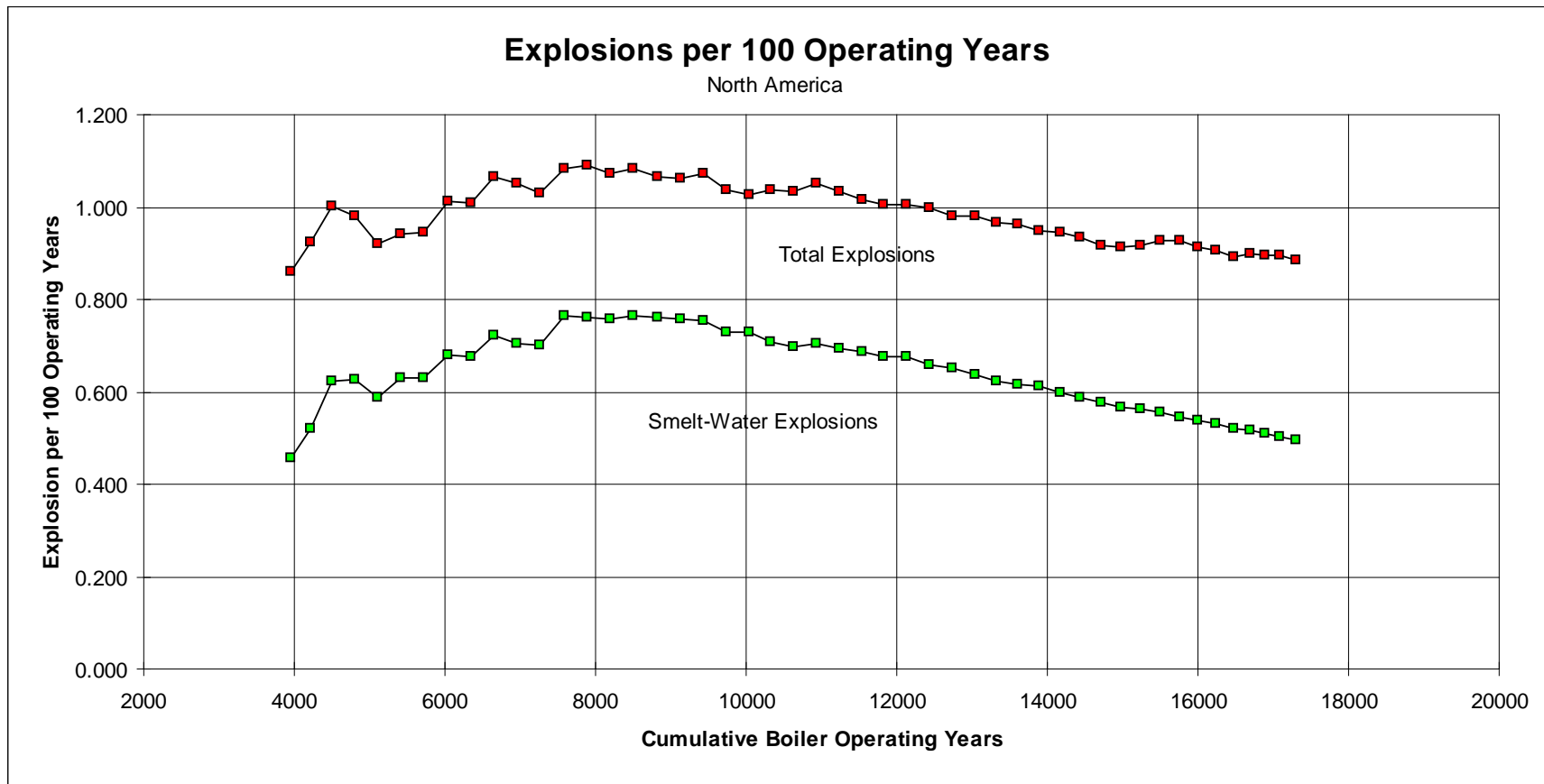


Figure 7

5. **SUBCOMMITTEE REPORTS** – (Cont.)

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

The Fire Protection in Direct Contact Evaporators Subcommittee met Monday morning in open session. There were 12 attendees; six of them were members and we welcomed three new of the guests as members to our committee. We reviewed the anti-trust policy. We accepted the April 2010 Minutes. We meet on an annual basis. Our next meeting will be April 2012. Please remember to fill out Direct Contact Evaporator Incident Forms for fires no matter how small. We need to share all of your experiences out there.

We reviewed a Cascade evaporator fire and a detailed presentation was made yesterday. We want to take this opportunity to thank NewPage for promptly filling out the Incident Form and sharing their experiences. We learned things from that incident and are looking at them with respect to the recommendations in our recommended practice. Overall, our guideline is good, but there may be some revisions to it based on this incident. We are likely to be adding some additional clarifications. There is going to be more communication with some of the other committees. So that is all good.

Again we will meet in April of 2012 and everybody is welcome to attend. It is an open meeting. Any questions?

5.5 **INSTRUMENTATION REPORT** – Dave Avery

The Instrumentation Subcommittee met in open session on Monday morning with 10 out of 17 members and 10 guests present. Our session began with introductions of members and guests. We read the BLRBAC Anti-trust statement and continued on with a review of last October's minutes, which were accepted. A discussion for posting a non-secured excel spread sheet of the BLRBAC Instrumentation Checklist and Classification Guide on the BLRBAC web site for membership download followed. The committee has concerns that end user would have to recognize that the downloaded version could not be used as the official list as it requires customization for the specific boiler. Also, the list as posted would be the for information use only. The committee was split on providing the file and further discussion on this item will be required for a reasonable solution.

The attendees were given an opportunity to ask any questions they would like. No response was received so the grouped moved on to review of our definition for "ESP Systems" in preparation for a joint session with the ESP Subcommittee.

5. SUBCOMMITTEE REPORTS – (Cont.)

5.5 INSTRUMENTATION REPORT – (Cont.)

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 was developed in conjunction with a new definition for RBSS:

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

We reaffirmed the Instrumentation Subcommittee’s belief that this definition addresses the age old question on what is “A Dedicated Stand-Alone System”. At the conclusion of the review, three subcommittee members (David Avery, Bruce Knowlen and Jari Sopenan) left the meeting to attend a joint session between ESP and Instrumentation to resolve the “Dedicated Stand-alone” issue. The Instrumentation Subcommittee continued working under the direction of the Vice-chair John Browning on section “G” of the checklist during the joint meeting.

At the joint meeting a robust conversation lead to a consensus:

Recommended Change to second sentence of Chapter 1:

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

Add paragraph to the after bulleted items on Page 4

The Emergency Shutdown Procedure functions must be activated and executed either by means of relay technology and hard-wiring or other Recover Boiler Safety System as defined in Chapter 4 of the *Instrumentation Checklist and Classification Guide*. It must not be possible to alter the system unintentionally or during operation of the boiler. Any time modifications are made to the system, the system shall be functionally tested prior to putting the unit back on line. Whatever technology is utilized, the BMS or DCS systems can be used to monitor operation of the functions.

5. **SUBCOMMITTEE REPORTS – (Cont.)**

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

Both subcommittees feel like we have properly addressed the “Dedicated Standalone” issue and how our technologies have evolved and actually been installed. The subcommittees will modify their respective guidelines to capture these changes. At the conclusion of the joint session, the instrumentation subcommittee representatives left to update the front-end of the Instrumentation Checklist and Classification guide.

The checklist revisions deleted references to Safety Instrumented System (SIS) and replaced with new term Recovery Boiler Safety System (RBSS) in the Instrument Checklist and Classification Guide (front end). This part of the document is being submitted to the executive committee for posting on the web site. This will support the changes mentioned above.

The subcommittee in the afternoon session met with 12 members and 4 visitors. The group reviewed section ‘G’ Black and Green Liquor Systems changes captured by David Boudreau in his reconciliation between the different “Recommended Good Practices”. Dave has a few additional notes to make and then that section will be submitted for review. The committee will submit the sections individually to get our document updated as fast and as accurately as possible.

As work continues on the Checklist a legend will be developed to cross reference the committee’s “class 1/Class 2”, Should/Should, Recommended/Suggested”, etc... This is a review of the BLRBAC recommended practices for the differences in priority wording.

The committee will adjust our standard meeting agenda to include a review of all new changes that have been approved by the membership. That will help us insure that these changes get incorporated into the Checklist in a timely manner.

Finally, the subcommittee invites you to participate with us. You will never have more fun at BLRBAC than a good day with us!

5.6 **MATERIALS & WELDING REPORT – Jesse Worsham for Dave Fuhrmann**

Review BLRBAC Anti-Trust Statement

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

Attendance

The morning meeting of the Materials and Welding Subcommittee met in open session on Monday, April 4, 2011, with 16 of 20 members represented and 22 guests.

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

Old Business

Minutes of fall 2010 meeting reviewed and approved.

Changes that were posted for member review are:

October 2010 – Draft

“Recommended Good Practice” deleted from document title. The contents of this document are guidelines.

Section 1.3, Repair of Pressure Boundary Material in Tubes, revised to clarify PT is only useful for detection of cracks and copper sulfate must be used to detect base material exposure.

Section 1.4, Corrosion Resistant Weld Overlay Applications on Tubes, and Section 1.5, Repair of Composite Materials on Tubes, revised to add:

- **Detail regarding the impact of dilution of base material**
- **The selection of approved weld procedures should consider weld technique to minimize penetration and potential compromise of base material code Minimum Wall Thickness**

Added new Section 2.4, Corrosion Resistant Weld Overlay on boiler tubes

CHAIRMAN: Are there any questions or comments on the proposed changes? Hearing none, do I have a motion to approve this document? Second? Voting members please rise. All in favor? Opposed? Thank you. The changes have been approved unanimously.

New Business:

A draft of a bulletin for Thermal Spray Coatings (Initial) for Boiler Fire Side Waterwall Tubes was reviewed, modified and approved for submittal to the Executive Committee.

A draft of a Definitions and Acronyms section was reviewed, modified, and approved for submittal to the Executive committee.

A draft of a smelt spout removal and installation traveler was reviewed, modified and approved for submittal to the Executive Committee.

Discussion was generated on the number of continued failures reported on weld in handhole cap failures. It was decided that the Executive Committee should be approached on whether additional information could be gathered from the incident reports that would indicate whether the Materials and Welding Guideline Procedure is being followed.

5. **SUBCOMMITTEE REPORTS – (Cont.)**

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

Communications:

- A question was received from ECP Technology, a Division of IQS in Chile regarding replacing lower loops of the super heater and the need to flush. Our response was that BLRBAC had no guidelines, but there is a need to consider what might be in the tube, the superheater design, and concern for protecting downstream equipment. Drainable superheaters and water soluble contaminants could be flushed. To protect downstream equipment from welding debris, a steam blow, designed for proper velocities by a qualified engineering firm would be required for removal in a non-drainable pendant superheater.

Afternoon Session:

The open afternoon session met in an open meeting with 16 members present and 10 guests.

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

Guest registration was completed with two joining the subcommittee:

Larry Queen – Turner Industries
Yurij Duda – Sancor Consulting

Review of Morning Meeting Activities

Plans for the next meeting may include:

Development of documents for tube plugs, tube rolling, use of copper sulfate

Update the glossary to better define specific terms and acronyms.

Continue work on Technical Bulletins for Materials –

- a. The format for Materials Bulletins must be developed as the welding bulletin format does not apply
- b. Refractory Installation (sloped floor) – Lynn Barrett, Mike Hovinga
- c. Refractory Installation (decanting Hearth) – John Heffernan, Dennis Hollenbach
- d. Tube coatings (cold side) – Ron McCarty, Dan Phillips
- e. Economizer tube to header welds
- f. Economizer tube plugs (IP CT)
- g. SH clip welds

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

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

5. **SUBCOMMITTEE REPORTS** – (Cont.)

5.7 **PERSONNEL SAFETY REPORT** – Robert Zawistowski

The Personnel Safety Subcommittee met in an "open" session on Monday, April 4, 2011. There were seven members (out of 17) and 24 guests in attendance during the meeting.

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

We welcomed new subcommittee member Chris Suresh of Domtar – Kingsport, TN. Chris joined our subcommittee at the end of the April 2011 meeting.

Representation at our meeting by regular members and guests included original equipment manufacturer Babcock & Wilcox and Metso. Representation from insurance and insurance service companies included FM-Global. Operating company representation was present at this meeting with representatives from Boise, Clearwater Paper, Domtar, Georgia-Pacific, Glatfelter, Graphic Packaging, Greif, International Paper, Longview Fibre, Kapstone, Sappi, Smurfit-Stone, Thilmany-LLC, Verso Paper Company, and Weyerhaeuser. Consultant representation included Acuren, ASTS. G.H. Bodman, and Power Specialists Associates, Inc.

The emergency stairwell "door opening letter" was briefly discussed. The draft letter was posted for review and was voted on at the conclusion of this report.

We discussed adding additional language to our document to expand on the purpose of doors swinging in a direction opposite to what most codes and OSHA specify. Rather than alter the language in our document it was decided to reference the new letter. It was felt there was enough explanation in the letter which will be an appendix to our regular document.

Discussion on the topic of smelt spouts was opened with a review of protective clothing. There were no reports of anyone trying to fabricate protective garments since the last meeting. A Power Point presentation "Smelt Proof or Not" was reviewed that was submitted by a member of the Personnel Safety Subcommittee. This short presentation contained some photos along with descriptions of what provided good along with poor protection from molten smelt splashes for face shields and jackets. The shields tested held up well when in a vertical position, more damage was sustained when the shields were in a horizontal position. "Green Welders Jackets" did not survive well and were not recommended. A Nomex jacket also did not work well. A PetroLite 9000 jacket did the best shedding most of the liquor and exhibited only minor burn through based on the tests conducted at this mill.

An introduction/disclaimer was reviewed for the draft of our new document. Some additional modification will be made before sending to the Executive Committee for their review.

In our subcommittee meeting we first section discussed in detail was "Smelt Spouts." A lively discussion was held regarding the usage of product and company names adjacent to products that worked well and ones that did not work well. This will be discussed with the Executive Committee.

5. **SUBCOMMITTEE REPORTS – (Cont.)**

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

We then discussed a section on “Port Rodding.” This section requires more drafting for review at the next meeting in October 2011.

We then moved on to discuss “Chill & Blow.” We discussed “Conditions” and “Hazards” associated with this operation. This section requires more drafting for review during the October 2011 meeting.

A list of photographs needed for our document is listed below. Any photographs you are willing to share can be e-mailed to bob.zawistowski@psaengineering.com

We would like to obtain photos of the following examples:

- Smelt spout protective chain mail
- Smelt spout rods for clearing spouts, ports and liquor guns
- Examples of safety catches on ash hopper doors
- Automatic smelt spout rodders
- Automatic port rodders
- Automatic gun cleaners
- Protective Clothing
- Face Shields that work or do not work
- Green and Black liquor sample stations

For now I am also collecting manufacturer information on products that work well or do not work well.

A section on liquor gun changing, liquor stream testing and a section on sootblowers will be added to the document as well.

Between the October 2010 and April 2011 meetings there was one inquiry for information. The request was for additional information supporting door opening direction into emergency stairwells. An explanation was drafted and reviewed by the Subcommittee as well as an Executive Committee member before responding to the question.

Two “near misses” were discussed. An NDE contractor was on a “green tag” scaffold during an outage. The upper hand rail was not properly attached and a worker leaned on the rail. He would have fallen about 40’ if not caught by a co-worker.

5. SUBCOMMITTEE REPORTS – (Cont.)

5.7 PERSONNEL SAFETY REPORT – (Cont.)

In a second scaffolding incident, a boiler inspector was walking on a “green tag” scaffold. There was a “gap” in the platform that the scaffold contractor “filled” by using “9-wire” to secure a 4” X 4” piece of steel floor platform. The section of platform was not wired down and when the inspector stepped on the 4” X 4” the platform “rolled” allowing his leg to fall through the platform. Two additional instances of this modification to the scaffold were identified and fixed.

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

Lastly, we do have a document up for vote. It has to do with the stairwell doors. What we do is we have a generic letter that we put together to assist you in getting a variance from the local jurisdictions. The letter has been on the WEB for membership review. There were no comments that came back on it. I will put the letter up right now and just go over it very briefly. It has been reviewed by the Executive Committee and I would like to put it to a vote from the membership.

This is the generic letter that has been given to me. It has been changed very little, but it states:

The purpose of this letter is to request a variance regarding the direction of door opening in enclosed stairwells in the mills, such and such, boilers. Please note that this request is for the recovery boiler enclosed stairwell doors only. This does not refer to the bottom door going out of the building from a stairwell to the world or other building. It is only within the building. NFPA Life and Safety Code 101 currently requires that the doors open into the stairwell. This is to prevent a group of people pushing at once against an emergency exit door in an attempt to escape a dangerous situation. In a paper mill recovery boiler, however, the situation is likely to be very different. The most probably scenario in a boiler explosion, the viability of the enclosed stairwell as an emergency egress move is more likely if the door frames prevents the door from opening into the stairwell. Additionally the recovery boiler building is usually occupied by a small group of individuals who are regularly trained in the operation and evacuation of the recovery boiler. Visitors to the recovery boiler area are also trained in the proper emergency responses before being allowed in the recovery boiler building. In the event of a recovery boiler explosion in an enclosed stairwell is the primary egress suit. The smelt water interaction can cause the release of high pressure steam in high temperature water into the building due to the failure of tubes and/or piping. For these reasons the Black Liquor Boiler Advisory Committee (BLRBAC) Sections 1.16 and 1.32 recommends that the doors to the enclosed stairwell in a recovery boiler building open into the boiler area. It further requires these door to be pressure resistant and self-closing, but not lockable. Based on this information, we are requesting a variance from NFPA Life and Safety Code 101 for the enclosed stairwells in ??? recovery boilers. This variance will apply only to these specific stairwells.

5. **SUBCOMMITTEE REPORTS – (Cont.)**

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

One thing I'll add before we can vote. This does not change and it is not saying that we are requiring you to go and change what you have out there. This is only if you wish to pursue this avenue in a new construction or if you as an operator or owner choose to modify your stairwells and you are trying to get the variance. Some people out there have found they have door that go the other way and they have latching mechanisms. They have run their own precautionary tests or evaluations on their doors and they are happy with what they have. We are not telling them to change anything. This is strictly if you wish to pursue it.

CHAIRMAN: Any questions or comments on the letter?

MEMBER: In the letter you have the Black Liquor Boiler Advisory Committee. It should be Black Liquor Recovery Boiler Advisory Committee.

CHAIRMAN: Yes, thank you. Any further comments, questions or concerns? With the minor change, do I hear a motion to approve this document? Second? Voting members please rise. All in favor? Opposed? Thank you. This addition to the Personnel Safety Document passed unanimously. This will added as an appendix. If you are looking for it, that is where you will find it.

5.8 **PUBLICITY & NEWS REPORT – Dave Parrish**

May I please have your undivided attention here with no distractions. There will be some modifications made to the subcommittee reports in the future. Secretary please make a note. Reports will be presented in order of importance. Publicity & News Release will be the first presentation at all future meetings.

Getting into the statistics here, I've done some serious analysis. There were five notices sent out announcing the meeting. One of those went to TAPPI and they have, I believe, three venues for setting up notification. So with that in mind, there were eight recipients. Of those eight, there was only one notice that did not get posted. That is an extremely high success ratio. In view of that my compensation here has been significantly increased. I appreciate that. Thank you.

Are there any questions? I obviously have been very successful here and I do expect a recognition award for that success.

CHAIRMAN: It's in the mail! Your reward is that you are allowed to continue in your position.

5.9 **WASTE STREAMS REPORT – John Rickard**

On April 4, 2011, the Waste Streams Subcommittee met in closed session at 9:00 AM with nine members present.

At the start of both the morning and afternoon session, the BLRBAC antitrust statement was reviewed.

5. **SUBCOMMITTEE REPORTS – (Cont.)**

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

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

The subcommittee reviewed membership and will contact members who have not been able to attend meetings.

No questions have been received since the fall meeting, but we have gotten feedback on red oil firing experience.

During the last BLRBAC meeting, BLRBAC approved a revision to the Waste Streams Guidelines. The guidelines contain revisions in all areas.

We worked on comments to the revised guidelines, including some that were identified during our previous meeting in the fall.

In Chapter 6, blending liquid waste streams with black liquor, the following changes were discussed, agreed to and voted in:

- The red oil experience concluded that poor blending of red oil (similar to turpentine) results in erratic liquor burning. Consistent burning results from better mixing of the waste stream and liquor. An injection quill that places the waste stream into the center of a black liquor pipe will provide better mixing. This improved injection method can benefit both turpentine and methanol
- In all starting and tripping logic diagrams in Chapter 6 there is a firing permissive and trip for "Full Recirculation" along with a requirement that the boiler be firing black liquor above a minimum boiler load. Full recirculation only occurs when not firing black liquor, so using full recirculation as a permissive is redundant. It will be removed.
- Some black liquor firing systems use partial recirculation when firing black liquor. Turpentine can be blended into these systems only if the recirculated liquor stream returns to a tank vented to a CNCG system or a pressurized tank vented to evaporators. We propose that the liquor pump suction line is another acceptable destination for partial recirculation black liquor containing a waste stream. This change applies to turpentine and methanol. It is also useful for soap and tall oil.

We revised the turpentine guidelines wording for these changes during the meeting. John Lewis will take that work and expand it to all of the applicable waste streams in Chapter 6.

Ann Plank presented the results of partial recirculation when turpentine is blended with liquor. The turpentine concentration stabilizes at a slight increase, turpentine stays emulsified and the tank that receives the recirculation flow and will generate turpentine vapors due to hot liquor.

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

The committee considered and included the following additional revisions to the guidelines:

- Change “100% LEL” to “LEL” since “100% LEL” is redundant. This will be changed on page 11 and page 102.
- Change “stream” to “concentration” in relation to the UEL on page 15 paragraph 3.2.
- Reviewed the use of the words “velocity” and “speed” in relation to flame propagation. “Speed” will be used in the name of the term: Flame Propagation Speed. Otherwise, “velocity” will be used. These corrections occur in several locations.
- We corrected a statement on page 17 concerning the frequency of turpentine explosions so that it does not infer that we have detailed knowledge of those explosions.
- Flow sheet labeled Figure 6 in Chapter 5 has a valve shown out of place for both the CNCG and the SOG lines. The valve marked CG4 on both lines and it must be moved upstream so that it is located between the connections for CG5 and CG6.

The subcommittee has targeted the spring 2012 meeting to present the above revisions (and future revisions) to the Executive Committee in hope of having them presented to the full membership during the fall 2012 meeting.

A new issue came up that will require guidelines changes. Environmental requirements more frequently want “ventless” changes from one incineration device to another. For CNCG/SOG, going from another incineration device to a recovery boiler presently requires that, prior to gas introduction, the line must be purged and preheated with steam and the CNCG/SOG igniter must be in service. If another incineration device trips, the gases must be vented while the recovery boiler is prepared for gas introduction (Such requirements don’t necessarily exist for lime kilns, incinerators or power boilers so a ventless transfer can be made from a recovery boiler to a non-recovery boiler.) Ann Plank will follow up and report on a new system that is being designed for ventless transfer. Olli Kujanpaa will check on European experience with ventless transfer.

The afternoon meeting started at 1 PM and was open to guests. Eight subcommittee members and six visitors were present.

The morning’s progress was reviewed with our guests and the floor opened for questions.

There is an interest in learning more about the composition of the various gaseous waste streams that are commonly burned. The subcommittee will look into inviting an expert to the afternoon fall meeting to discuss gas composition. Melville Hedges will look into persons who can help us in this area.

5. **SUBCOMMITTEE REPORTS – (Cont.)**

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

The subcommittee meeting was adjourned at 2 PM.

During the fall meeting, the subcommittee will discuss ventless transfer technique and guidelines for ventless transfer. Also, there may be a presentation on NCG composition during the open session.

JOE PROTERRA: When you burn the oil or turpentine, do you guys have a warning in your document about raising the liquor Btu content? Some recovery boilers are steam flow limited and if adding oil or turpentine to the liquor raises their Btu values, they may not be able to burn as much liquor. I was just wondering if you had something in your document about that?

JOHN RICKARD: I'm sure there is discussion of that point. We also limit the amount of oil or turpentine that can be added to a very small percentage of the liquor flow, so you can't put a lot of oil or turpentine in. Also, the ratio of turpentine generated to black liquor flow is generally pretty small in any mill. The bigger problem is probably soap. There are a lot of people that burn soap and blend that. Mills with recovery boilers that are steam flow limited will have to watch the heating value addition when blending soap with the liquor.

5.10 **WATER TREATMENT REPORT – Tom Madersky**

The Water Treatment Subcommittee met Monday morning and afternoon in closed session. Eleven subcommittee members attended the morning session; twelve (12) attended the afternoon session.

The subcommittee membership profile for those in attendance was as follows:

- Three OEMs
- Three Mill Representatives
- One Insurance Representative
- Five Associate Members (2 of the 5 in attendance representing water treatment companies)

We welcomed two new associate members and one new mill representative.

Norris Johnston and I would again like to thank all of the subcommittee members for their contributions to this undertaking.

The spring meeting activities were as follows:

The BLRBAC Antitrust Policy was reviewed; membership lists updated and key line items from the fall 2010 subcommittee meeting minutes were discussed in detail.

At this point in time there are **five sections** in various stages of production and editing.

The **Feedwater and the Boiler Blowdown Heat Recovery Systems** have been reviewed by the executive committee and a subsequent final edit has been performed by the water subcommittee during this session.

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

Once we have an opportunity to proof the text edits made by the subcommittee, both of these documents will be forwarded to the Executive Committee for their final approval.

The **Attemperation and the Economizer System** production steps are almost complete. The subcommittee should have these two systems edited and ready for an homogenizing edit in the fall of 2011. We anticipate that we will have this section ready for submittal to the Executive committee by the Spring of 2012.

The **Boiler Drum and Header Circuitry** section is in the early production phase and will remain a work in progress throughout the next two subcommittee sessions. This resource should be completed in 2012.

Since **all five of these resources are closely inter-related**, we are requesting that the Executive Committee delay the posting of any completed sections until such time that the **Boiler Drum and Header Circuitry** section is edited and deemed complete.

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 a few other companies (Clearwater Paper [formerly Potlatch], Evergreen [Pine Bluff AR mill], KPAQ Paper, Temple Inland and Woodland Pulp [formerly Domtar's mill] 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 102 mills operating 171 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 30 years. Over 67% of the boilers were installed prior to 1979.

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

Recovery Boiler Explosions

We are very happy with the outstanding efforts of those operating the recovery boilers; we have no explosions to report. We hope this will continue. It is a great accomplishment to have had only one explosion in the last 3 years and only three in the last 13 years. Looking back at John Andrews' charts, we see very few years when there were no explosions. Although we continue to have a number of critical incidents during these last few years, we have not had any explosions. We continue to stress the need for training in the safe operations of the boilers. The Committee has increased its efforts to research ways to reduce dissolving tank explosions.

Operational Safety Seminars

Last year we had a total of 93 attendees for the two seminars in Atlanta. They represented 13 companies from 24 mills. We have scheduled two seminars in Atlanta this year, one April 12 – 13th and one May 10 – 11th. Registrations have been coming in slowly and we have room for anyone wanting to attend. We ask that all companies seriously consider sending people to these valuable seminars.

The Committee reverted back to the two half day sessions instead of the day and one-half day sessions at the request of a number of companies to avoid additional time away from the mill. The seminars have also been reformatted to further improve the discussions and “preaching and teaching” the information available.

Recovery Boiler Reference Manuals

The AF&PA Recovery Boiler Reference Manuals have been reviewed to include any possible new information. They will be available electronically. They will be bookmarked in the PDF to improve ease of use and the file can be searched for key words. They are being converted to MicroSoft Word so that future revisions may be made easier.

Review of the AF&PA Recovery Boiler Audit Guidelines

The Operation and Maintenance Subcommittee is reviewing the AF&PA Recovery Boiler Audit Guidelines which was last revised in 2004. We expect that the revised document will be completed by the end of the year.

Recommendations and Guidelines in AF&PA Guidelines and Checklist Document

The Operation and Maintenance Subcommittee finalized 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 Research & Development Subcommittee completed two studies concerning Smelt Dissolving Tank Explosions. The most recent study sponsored by AF&PA was the study of green liquor density versus TTA as a function of green liquor composition. That one was completed last year. The committee is now looking at a proposal to sponsor a study for “Mitigating the Risk of Smelt-Water Explosions in Dissolving Tanks.” The committee is also considering a possible future study of heavy smelt runoffs.

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

Evaluation of Drying Out Recovery Boilers After A Water Wash

The Research & Development Subcommittee is considering a scientific basis study for the evaluation for drying out recovery boilers after a water-wash to minimize out-of-service corrosion. The Committee will take into consideration a number of various aspects for this possible future study.

Updating “Kraft Recovery Boilers” Blue Book

Work on updating the 15 chapters for the “Kraft Recovery Boilers” text book is continuing. There have been enough commercial advances and research activities documented to warrant a new edition. Dr. Tran and other known recovery boiler researchers are aiming to have final drafts reviewed later this summer and expect to have the book ready for publication at the end of 2011. Copies of the current edition are available for purchase from TAPPI.

Other Research Projects Under Review

The Committee is considering sponsoring several studies, such as the interaction of shatter jets with smelt flow and guidelines for designing smelt dissolving tanks.

AF&PA Website and Connection with BLRBAC

The Committee has updated the AF&PA website to include recovery boiler information so that it is easily accessible. BLRBAC has added information regarding the Operational Safety Seminars and contacts at AF&PA on its website for which AF&PA expresses its thanks. (www.afandpa.org)

Annual Meetings and Conference

AF&PA’s annual Recovery Boiler meetings and Conference was held in Atlanta February 8th and 9th. As usual, the Conference was 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 outside of AF&PA 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 in early February 2012.

7. **NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS REPORT - Terry Parks**

No report was given at this meeting.

8. **TAPPI RECOVERY BOILER SUBCOMMITTEE OF STEAM & POWER REPORT – Alarick Tavaris**

(See Appendix B for *"TAPPI Power and Recovery Boiler Subcommittee Update"*)

9. **WESTERN CANADA BLRBAC REPORT – Shawn Casey (report given by John Andrews)**

The 2010 fall meeting was held in Richmond, British Columbia. A total of 79 people attended, which included mill representation and boiler manufacturers. Twelve out of fifteen mills had a representative attend.

9. **WESTERN CANADA BLRBAC REPORT – (Cont.)**

There were three incidents reported, all of which were submitted to BLRBAC for the spring 2011 meeting, were discussed. The importance of submitting all incidents to Atlanta for learning's from which all mills benefit was reemphasized. There were three presentations from boiler manufacturers of updates on what is new. The operation and troubleshooting session continues to be a success.

The next meeting is being held in Richmond, British Columbia and is scheduled for April 12 and 13, 2011.

Thanks was expressed to the BLRBAC membership here in Atlanta and the continued support given to our Western Canada BLRBAC membership. Learning's from this spring's meeting will be again taken back to Western Canada BLRBAC.

If anyone who would like information about these meetings and would like to attend or present technical papers please contact Shawn Casey. Western Canada BLRBAC meets after the Atlanta BLRBAC in the spring and fall of each year.

10. **ACTIVITIES OUTSIDE NORTH AMERICA REPORTS**

No reports were given at this meeting.

11. **OPERATING PROBLEMS SESSION REPORT – Jim Hinman**

Yesterday afternoon we had the Operating Problems Session. It started out with a 20 question quiz along the lines of what Scott Moyer started a number of years ago. I think everybody enjoys the conversation especially since the quiz is not graded. It is something just to get the conversations going and hopefully some learning is taking place.

We had a lot of submitted questions yesterday which I really appreciate. I counted them and there were 44 questions submitted for discussion. Obviously many of those questions breed other questions. I want to encourage people to come to the Operation Sessions. It is a good open forum to get information if you are having issues or problems.

We had a couple of technical presentations. One was by Colin MacCallum from Boiler Island Air Systems and one by John Shelley from Armstrong. After Colin MacCallum's presentation on "Design Considerations for Reducing the Risk of Dissolving Tank Explosions", he said he forgot to mention that his papers were available in the back of the room. If you did not pick up one yesterday, there are additional copies available now in the back of this room.

Right after a short coffee break there are two additional Technical Presentations to be given:

Wade Blazer - Babcock & Wilcox - "Induction Heat Tube Extraction for Generating Bank Replacement"

Isabel Beehoo - International Quality Systems - "Control of Mechanical Integrity through NDT for Recovery Boilers"

CHAIRMAN: Our next meeting will be at the Crowne Plaza Hotel here in Atlanta on October 10, 11 & 12, 2011. **Please remember the meeting is the second week in October to avoid a conflict with the TAPPI PEERS Conference that's scheduled for the first week that month.**

Is there any other business by the BLRBAC membership? Any questions or comments? If not, I believe this concludes our open meeting. Do I have a motion to adjourn the meeting? Second? All in favor? Opposed? This concludes the spring 2011 BLRBAC joint meeting. I hope everyone will stay for the coffee break and the two technical presentations that will follow. Have a safe trip home!

Appendix A – Summary of Incidents

ESP ONLY - NO LEAK**SPRING 2011 - 01**

Classification: ESP Only – No Leak (and Cascade Fire – joint discussion with Fire Protection in DCE)
Location: NewPage Corp, Wisconsin Rapids, WI
Unit: RU-2, 1976 CE, # 27074, 2-drum, DCE cascade
Unit Size: 1.5 MM lb ds/day; 215,000 lb/hr steam at 1275 psig, 900°F, 1450 psig design
Incident Date: February 6, 2011
Downtime hrs ESP/total: 12/193
ESP? ESP Only – No Leak
Leak/Incident Loc: No leak found
How discovered: Dark bed indications on camera, steam/feedwater differential and low drum level alarm
Wash adjacent tube: N/A
Root cause:
Leak detection: No
Bed cooling enhanc Yes. NaHCO₃ on N₂, Southland
Last full inspection: June 2010
Sequence of events: **6Feb** 21:45 Helper saw the unit was darker than normal and getting darker. Called it in to control room. Started to add gas gun. Control room charts indicated growing steam//water differential, (120kpph), feed control valve wide open, and low drum level alarm sounded. 21:50 ESP'd unit. Unit evacuated (not control room).

22:25 Cascade drive tripped on high amps. **7Feb** 00:42 High opacity alarm, cascade outlet high temp alarm, and steam smother valve opened, all indicating cascade fire. Reset cascade drive at MCC. Pushed button to restart cascade drive, and eard and felt a rumble. Precipitator in and out dampers closed to help extinguish fire. Later damage found to 1/3 of cascade tubes, ductwork and expansion joints to ID fan, and ID fan shaft and blades.
Repair procedure: N/A
Future prevention: -

Appendix A – Summary of Incidents (Continued)

ECONOMIZER HAND HOLE CAP**SPRING 2011 - 02**

| | |
|----------------------------------|--|
| Classification: | Non-Critical |
| Location: | Boise, DeRidder, LA |
| Unit: | No. 1, 1969, B&W, PR-130, 2 drum, 2 econ |
| Unit Size: | 4.1 MM lb ds/day; 604,000 lb/hr steam at 850 psig, 825°F, 1000 psig design |
| Incident Date: | September 24, 2010 |
| Downtime hrs, leak/total: | 16.5 hrs / 41.9 hrs (including scheduled waterwash) |
| ESP? | No |
| Leak/Incident Loc: | 1/8" pinhole weld failure on hand hole cap, hot econ right side of center lower header |
| How discovered: | Walk down. Saw damp salt cake in economizer drag chain. |
| Wash adjacent tube: | No |
| Root cause: | Slag pockets between root pass and cap on hand hole weld |
| Leak detection: | Yes. RBLI Didn't alarm |
| Bed cooling enhanc | No |
| Last full inspection: | March 2010 |
| Sequence of events: | 24Sep: 19:30 Walk down saw moisture in economizer drag chain. Determined leak was in lower economizer. Boiler tripped due to plugged draft tap. Further confirmed leak. For scheduling, unit put back on liquor until planned water wash on Oct 13. Closely monitored. No significant increase. 12Oct: 22:15 Controlled shut down. Off liquor. Repair made. Unit water washed. 14Oct: 16:10 unit on liquor.. |
| Repair procedure: | MT, preheat, Weld repair, MT following root pass, weld repair complete, final MT |
| Future prevention: | PT/MT remaining hand holes during 2011 annual outage and repair/replace as needed |

Appendix A – Summary of Incidents (Continued)

ECONOMIZER HAND HOLE CAP

SPRING 2011 - 03

| | |
|----------------------------------|--|
| Classification: | Non-Critical |
| Location: | Boise Cascade LLC, Jackson, AL |
| Unit: | #2 RU, 1974 CE, #24272, 2-drum DCE cascade, 1984 Foster Wheeler economizer |
| Unit Size: | 2.4 MM lb ds/day currently; 325,000 lb/hr steam at 650 psig, 700°F, 750 psig design |
| Incident Date: | October 29, 2010 |
| Downtime hrs, leak/total: | 0/2 |
| ESP? | No |
| Leak/Incident Loc: | Small crack in hand hole cap weld, lower econ header |
| How discovered: | Walk down. Saw water dripping from lower econ casing |
| Wash adjacent tube: | No |
| Root cause: | Weld failure-undetermined cause |
| Leak detection: | Yes |
| Bed cooling enhanc | No |
| Last full inspection: | December 2009 |
| Sequence of events: | <p>29Oct 07:30 During walk down, saw water dripping from lower econ casing. Lower econ doors opened. No water seen, but leak noise heard. 14:30 Lowered liquor for better visual exam. 16:30 Verified leak spraying perpendicular to header toward rear casing, and going into cascade. 18:38 With crew informed, restart liquor, monitor leak, develop contingency plans for repair, and continuously reassess magnitude of leak.</p> <p>Risk Assessment:</p> <ul style="list-style-type: none"> • There is no way for the water to enter the furnace. • The leak is not – to this point – creating a personnel hazard. • The leak is not causing collateral damage in that no other pressure parts are being contacted from the leaking water. • A significant increase in the magnitude of the leak should be seen in decreased dilution requirements to the cascade or erratic steam drum level control. There is instrumentation and appropriate alarms for both of these parameters in the DCS <p>Make rounds hourly to assess the leak. Monitor cascade dilution for any significant changes. Monitor steam / feedwater differential display for any changes</p> |
| Repair procedure: | <p>7Nov Annual Outage. Leaking hand hole cap removed and replaced with nipple type. Leaking cap was removed, seat was repaired and PT tested, and nipple style cap was installed to mitigate future failures.</p> |
| Future prevention: | All hand hole caps were PT tested, and two other caps on lower header and two caps on upper header were replaced with nipple type caps. Due to similar type failures in recent history, mill elected to installed nipple style cap to mitigate future failures |

Appendix A – Summary of Incidents (Continued)

ECONOMIZER HAND HOLE CAP

SPRING 2011 - 04

| | |
|----------------------------------|---|
| Classification: | Non-Critical |
| Location: | International Paper, Vicksburg, MS |
| Unit: | 1967 B&W, PR-105, 2-drum DCE cyclone |
| Unit Size: | 3.0 MM lb ds/day; 495,000 lb/hr steam at 1020 psig, 825°F, 1200 psig design |
| Incident Date: | November 3, 2010 |
| Downtime hrs, leak/total: | 50 |
| ESP? | No |
| Leak/Incident Loc: | ¼" long crack at the weld of a four inch Econ Hand Hole cap on the cold side inlet (lower) header |
| How discovered: | Walk down. Saw water around insulation at cyclone inlet |
| Wash adjacent tube: | No |
| Root cause: | Bad weld quality or poor preparation of the header surface |
| Leak detection: | Yes |
| Bed cooling enhanc | No |
| Last full inspection: | April 2010 |
| Sequence of events: | 2Nov 23:30 During walk down, saw water around insulation at cyclone inlet. No water in boiler hoppers. Confirmed leak was safe from furnace. No instrument indications. Did orderly shut down. Burned out bed. Took unit off line. |
| Repair procedure: | Cap was replaced. |
| Future prevention: | Two previous failures of this cap. Plan project to replace all 24 caps with different type. |

ECONOMIZER

SPRING 2011 - 05

| | |
|----------------------------------|---|
| Classification: | Non-Critical |
| 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: | October 13, 2010 |
| Downtime hrs, leak/total: | 34/44 |
| ESP? | No |
| Leak/Incident Loc: | Small rupture/split 1-2" above forward economizer bank lower header. |
| How discovered: | Leak Detection alarm |
| Wash adjacent tube: | No |
| Root cause: | A thinned or pitted area on the tube. Tube sent for analysis. |
| Leak detection: | Yes. |
| Bed cooling enhanc | No |
| Last full inspection: | Oct 4, 2010 |
| Sequence of events: | 10 thru 12 Oct: Night shift got leak detection alarm, worse each day, but no walk down confirmation. 13Oct Leak detection alarm stronger, slight drop in solids (1/2%) Inspections. 13:00 Saw leak at lower econ header. Began orderly shut down. 17:00 Fire out. 14Oct 02:00 Began repair. 11:00 Repair done. 15:00 Hydro OK. 18:00 Fired unit. 15Oct 01:30 On steam 08:15 On liquor |
| Repair procedure: | Tube was removed and headers plugged/capped. |
| Future prevention: | Plan to replace 30 year old economizer in 2011. |

Appendix A – Summary of Incidents (Continued)

ECONOMIZER**SPRING 2011 - 06**

| | |
|----------------------------------|---|
| Classification: | Non-Critical |
| 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: | October 24, 2010 |
| Downtime hrs, leak/total: | 84 |
| ESP? | No |
| Leak/Incident Loc: | Tube tore out of economizer lower header. |
| How discovered: | Leak Detection alarm; Saw water at cyclone inlet ducts |
| Wash adjacent tube: | No |
| Root cause: | Internal (O2) and external pitting and external corrosion thinning, soot blower erosion, SAC. |
| Leak detection: | Yes. In house |
| Bed cooling enhanc | No |
| Last full inspection: | Oct 4, 2010 |
| Sequence of events: | 23Oct Leak detection mass balance in alarm. Nothing found. 24Oct 17:00 Walk down saw water at cyclone inlet duct. Started shut down. No water in boiler hoppers. 17:33 Rapid drum level loss, high furnace pressure, ID Fan increase. 17:37 Unit trip on Low Drum. Confirmed leak in economizer. Unit cooled. 25Oct 02:00 Lock out. Began repairs. 26Oct 17:00 Repairs done. Fill for hydro. 20:00 Hydro found two more leaks. 27Oct 06:00 Second repairs done. Fill for hydro. 10:00 Hydro OK. 18:00 Fired unit. 28Oct 02:30 Unit on Lne. 06:13 Unit on liquor |
| Repair procedure: | Tube was removed and headers plugged/capped. Three added leaks replaced. Four thinned tubes removed. |
| Future prevention: | Numerous tube failures have occurred the past 10 years. Will bypass two vulnerable modules. Do extensive UT at outages. Plan to replace 30 year old economizer in 2-3 years. |

ECONOMIZER**SPRING 2011 - 07**

| | |
|----------------------------------|--|
| Classification: | Non-Critical |
| 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: | November 30, 2010 |
| Downtime hrs, leak/total: | 60 |
| ESP? | No |
| Leak/Incident Loc: | Tube ruptured and tore 90% around weld out of economizer lower header. |
| How discovered: | Leak detection alarm. Unit tripped on low drum level; High furnace pressure blowback; AND saw water at cyclone inlet ducts. |
| Wash adjacent tube: | Yes – thinning of the header |
| Root cause: | Internal (O2) and external pitting and external corrosion thinning, soot blower erosion, SAC. |
| Leak detection: | Yes. In house |
| Bed cooling enhanc | No |
| Last full inspection: | Oct 4, 2010 |
| Sequence of events: | Nov Leak detection mass balance in alarm for long time. Nothing found. 28Nov 11:00 Leak detection alarm increased. 29Nov 16:00-21:00 BL Solids decreasing 1%.21:30 Close inspection found nothing. 30Nov 03:43 Drum level falling rapidly. Feed water increasing. ID Fan increasing. Furnace pressure went positive with blowback.03:45 Unit trip on low drum. Water seen at cyclone inlet ducts. Verified economizer leak. Unit cooling. 14:00 Unit locked out. Began repairs. 1Dec 19:00 Repairs done. Began hydro fill. 23:00 Hydro OK. 2Dec 05:00 Fired unit. 13:10 Unit on line. 15:45 Fired liquor. |
| Repair procedure: | Tube was removed and headers plugged/capped. Repair made to thinned header. Four thinned tubes removed. |
| Future prevention: | Numerous tube failures have occurred the past 10 years. Will bypass two vulnerable modules. Do extensive UT at outages. Plan to replace 30 year old economizer in 2-3 years. |

Appendix A – Summary of Incidents (Continued)

ECONOMIZER**SPRING 2011 - 08**

| | |
|----------------------------------|---|
| Classification: | Non-Critical |
| Location: | International Paper, Pensacola, FL |
| Unit: | RB 1, 1975 B&W PR-171A, 2-drum w/ 1996 Tampella Large econ |
| Unit Size: | 2.89 MM lb ds/day; 455,000 lb/hr steam at 850 psig, 850°F, 1000 psig design |
| Incident Date: | Oct 1, 2010 |
| Downtime hrs, leak/total: | 24hr 28 min |
| ESP? | No |
| Leak/Incident Loc: | 3/16" linear hole on tube surface (pinhole on ID), at 5 th floor economizer mini-header at finned tube shop weld |
| How discovered: | Panel. Leak detection alarm |
| Wash adjacent tube: | Yes – minor thinning |
| Root cause: | Weld porosity followed by corrosion |
| Leak detection: | Yes IP mass balance |
| Bed cooling enhanc | No |
| Last full inspection: | March 2010 |
| Sequence of events: | 1Oct 16:55 Leak detection gave alarm. 17:40 Found 2-5 gpm water in econ hopper; 18:25 none in boiler hopper. 19:05 Saw leak in econ, between floor 5 & 6. 19:35 Decided to do normal shutdown 21:20 Pulled liquor. 22:15 Leak ID'd with dust gone. 2Oct 00:18 bed out, unit shut down. Made repairs. Did hydro OK. 12:33 Unit on line. 14:13 Liquor fired. |
| Repair procedure: | Hole ground out; NDT confirmed. Welded repair. NDT tested OK. Thinned area nearby NDT'd ok. |
| Future prevention: | Similar leak in sister unit. Large scale NDT with RT testing planned. Informed crew & management of findings. |

ECONOMIZER**SPRING 2011 - 09**

| | |
|----------------------------------|---|
| Classification: | Non-Critical |
| Location: | International Paper, Riegelwood, NC |
| Unit: | #5 RU, 19821 CE 20980 2-drum; w/2004 Kvaerner Large economizer |
| Unit Size: | 6.96 MM lb ds/day; 969,000 lb/hr steam at 850 psig, 825°F, 1130 psig design |
| Incident Date: | October 14, 2010 |
| Downtime hrs, leak/total: | - |
| ESP? | No |
| Leak/Incident Loc: | 2" crack in weld from scallop bar attachment to 7th bottle header, top of rear economizer. |
| How discovered: | Conveyor bog down found |
| Wash adjacent tube: | No |
| Root cause: | porosity in a factory weld |
| Leak detection: | Yes. (i-house mass balance, didn't detect. |
| Bed cooling enhanc | No |
| Last full inspection: | May 2010 |
| Sequence of events: | 14 Oct. Unit at 60% low load. 11:50 rear econ conveyor bogged down. Found rear econ leak. 12:20 Slowed unit to 20%. Began bed burnout. 20:00 unit off line. |
| Repair procedure: | Ground out crack, Dye pen. Weld repair. |
| Future prevention: | May 2011 Plan NDT inspection for similar cracks. Have manufacturer review QC. |

Appendix A – Summary of Incidents (Continued)

ECONOMIZER**SPRING 2011 - 10**

| | |
|----------------------------------|---|
| Classification: | Non-Critical |
| Location: | Harmac Pacific, Nanaimo, BC, Canada |
| Unit: | #5 RB, 1951 CE, CA 51126, 3-drum Large econ |
| Unit Size: | 1.1 MM lb ds/day; 210,000 lb/hr steam at 600 psig, 750°F, 775 psig design |
| Incident Date: | December 6, 2010 |
| Downtime hrs, leak/total: | 30 hr |
| ESP? | No |
| Leak/Incident Loc: | Two pin holes on exterior of steam drum rear where 26 - 2.5" economizer outlet pipes enter. |
| How discovered: | Walk down. Heard noise. |
| Wash adjacent tube: | No |
| Root cause: | Slag inclusions in seal weld |
| Leak detection: | No |
| Bed cooling enhanc | No |
| Last full inspection: | Oct 2010 |
| Sequence of events: | 6Dec Boiler on line at normal load. Operator does shift walk down with soot blowers off and opens doors during the walk down. Heard noise, isolated soot blowers. Noise continued and informed shift Engineer and Chief engineer. Liquor pulled and bed burned out. Unit cooled and hydro performed. Scaffold installed and leak located |
| Repair procedure: | Grind out defects and weld repair |
| Future prevention: | Inspect the other inlets for weld quality issues |

ECONOMIZER**SPRING 2011 - 11**

| | |
|----------------------------------|--|
| Classification: | Non-Critical |
| Location: | Boise, Inc, Wallula, WA |
| Unit: | #3 RU, 1973 CE # 23772, 2-drum Large econ, 2003 Andritz economizer |
| Unit Size: | 3.15 MM lb ds/day; 650,000 lb/hr steam at 600 psig, 750°F, 710 psig design |
| Incident Date: | January 18, 2011 |
| Downtime hrs, leak/total: | 48 hrs |
| ESP? | No |
| Leak/Incident Loc: | 1" circumferential crack in weld zone of a feeder tube-to-header attachment weld, economizer inlet header above ash hopper |
| How discovered: | Panel. Ash hopper overflow conductivity spiked. |
| Wash adjacent tube: | Yes. |
| Root cause: | Possibles: Improper stress relief in header assembly; Casing movement binding at boiler outlet expansion joint; Broken or damaged alignment bars; Induced vibration and movement from soot blowing. |
| Leak detection: | Yes: Acoustic sensors –Did not indicate leak |
| Bed cooling enhanc | No |
| Last full inspection: | June 2010 |
| Sequence of events: | 18Jan 19:30 Ash hopper overflow conductivity spiked. Operator walk down inspection found washed area on hopper wall. (Ash hopper had plugged sporadically for 7-10 days.) Found leak. Boiler taken off liquor and off line in orderly manner. Repairs made to assembly #24 feeder tube weld. Additional NDT was performed and three other areas were repaired, including washed thinned tube. . |
| Repair procedure: | Ground out crack and repaired. NDT tested. Mag particle testing on others. |
| Future prevention: | Additional inspection and repair plans are being generated for April 2011. Plan with manufacturer for possible lower header replacement or reweld of tubes. |

Appendix A – Summary of Incidents (Continued)

ECONOMIZER**SPRING 2011 - 12**

Classification: Non-Critical
Location: Zellstoff Celgar, Castlegar, BC
Unit: #506 RU, 1993 Gotaverken # 612730-20010, 1-drum Large economizer, Sloped hearth
Unit Size: 5.8 MM lb ds/day; 950,400 lb/hr steam at 900 psig, 850°F, 1250 psig design
Incident Date: January 5, 2011
Downtime hrs, leak/total: 24/24
ESP? No
Leak/Incident Loc: Pinhole leak in economizer tube-to-header weld
How discovered: Walk down. Saw water in the economizer ash conveyor
Wash adjacent tube: No
Root cause: Lack of fusion at weld pass termination that allowed for a weld fissure and resultant pinhole to form
Leak detection: --
Bed cooling enhanc --
Last full inspection: --
Sequence of events: Routine operator round revealed the presence of water in the #2 Economizer ash conveyor. The unit was shutdown in a routine manner
Repair procedure: Leak excavated and rewelded with E-7018-1-H4. Dye penetrant inspection performed pre and post repair
Future prevention: Develop an NDE program to check the headers next scheduled outage.

SUPERHEATER**SPRING 2011 - 13**

Classification: Non-Critical
Location: Temple-Inland, Orange TX
Unit: RB1, 1967 B&W PR 108a, 2-drum, DCE cyclone, sloped hearth
Unit Size: 2.77 MM lb ds/day; 239,000 lb/hr steam at 850 psig, 800°F, 975 psig design
Incident Date: Nov 11, 2010
Downtime hrs, leak/total: 39.8
ESP? No
Leak/Incident Loc: 6" (80%) circumferential crack at tongue-&-groove lug attachment weld, in secondary superheater, 4th tube in third platen from right wall, just above bottom loop, just before boiler screen
How discovered: Panel Alarms. DCS mass balance alarmed and furnace pressure went positive
Wash adjacent tube: No
Root cause: Fatigue at poor weld start contour (stress riser) from thermal cycling from frequent water wash
Leak detection: Yes. Confirmed leak.
Bed cooling enhanc No
Last full inspection: August 2010
Sequence of events: **11Nov10.** 17:22 Mass balance alarm. Walk down didn't find. 21:00 Furnace pressure went positive & ID Fan went to 105%. Feedwater/steam flow differential at 30K. Suspected SH leak. Started orderly shutdown. 22:20 RBLI alarmed. 22:50 walkdown confirmed SH leak in primary section. 23:00 Liquor out. **12Nov** 02:20 Bed burned out; Fire out.
Repair procedure: Installed dutchman
Future prevention: Inspect T&G lug attachment welds.

Appendix A – Summary of Incidents (Continued)

SUPERHEATER**SPRING 2011 - 14**

| | |
|----------------------------------|--|
| Classification: | Non-Critical |
| Location: | Longview Fibre, Longview WA |
| Unit: | #18 RB, 1965 CE, #2964, 2-drum DCE Cascade, 1997 ABB-CE superheater |
| Unit Size: | 2.1 MM lb ds/day; 367,000 lb/hr steam at 800 psig, 750°F, 975 psig design |
| Incident Date: | Nov 1, 2010 |
| Downtime hrs, leak/total: | None – found during outage |
| ESP? | No |
| Leak/Incident Loc: | 1.5 inch circumferential crack at top of 1 st section primary (low temp) superheater inlet tube just below the high crown seal |
| How discovered: | Observed. Saw water leaking in furnace after fill for hydro |
| Wash adjacent tube: | No |
| Root cause: | Likely fatigue from swing and swaying from soot blowers. Alstom also attributed some to thermal expansion differentials between casing and tubes. |
| Leak detection: | No |
| Bed cooling enhanc | No |
| Last full inspection: | Oct 2009 |
| Sequence of events: | 1Nov Unit down for annual. Scaffolders in furnace saw water coming from ceiling. Scaffolded to roof. Did prehydro to locate. Repaired. Hydro OK |
| Repair procedure: | Replaced 3' tube section; RT'd. Reinstalled high crown seal. |
| Future prevention: | 3d time since 1997. Alstom recommended steam-cooled spacers |

SUPERHEATER**SPRING 2011 - 15**

| | |
|----------------------------------|---|
| Classification: | Non-Critical |
| Location: | Thilmany LLC, Kaukauna, WI |
| Unit: | #10 RB, 1961 B&W PR-63, 2-drum DCE Cyclone |
| Unit Size: | 1.17 MM lb ds/day; 187,700 lb/hr steam at 600 psig, 800°F, 700 psig design |
| Incident Date: | October 11, 2010 |
| Downtime hrs, leak/total: | 24 |
| ESP? | No |
| Leak/Incident Loc: | Crack in weld of tie clip attachment of last primary superheater loops, ~65' above hearth, over arch, midway between top and bottom of SH loop. |
| How discovered: | Walk down during maintenance hydro. |
| Wash adjacent tube: | No |
| Root cause: | Possible lop Lack of penetration; or stress from salt cake buildup from start-shut cycles. |
| Leak detection: | No |
| Bed cooling enhanc | No |
| Last full inspection: | October 2009 |
| Sequence of events: | Unit down for scheduled maintenance. Did routine shut down hydro Discovered small drip from superheater. Did repair. Hydro OK. |
| Repair procedure: | Removed tie clip, ground out weld, dye penetrant checked the area, welded up crack, dye penetrant checked the weld, reattached clip. |
| Future prevention: | Confirmed value of hydro during mill maintenance outage. |

Appendix A – Summary of Incidents (Continued)

SUPERHEATER & ROOF TUBE

| | |
|----------------------------------|---|
| SPRING 2011 - 16 | |
| Classification: | Critical Incident 744 (due to roof tube leak) |
| Location: | Boise, DeRidder, LA |
| Unit: | #1 RU, 1969 B&W, # PR-130, 2-drum with 1986 B&W large econ |
| Unit Size: | 4.1 MM lb ds/day; 604,000 lb/hr steam at 850 psig, 825°F, 1000 psig design |
| Incident Date: | February 3, 2011 |
| Downtime hrs, leak/total: | 65/76 |
| ESP? | Yes |
| Leak/Incident Loc: | Thin-lipped rupture Primary Superheater tube 2 Platen # 12 center loop, (hot side superheater) Also Pin-hole leak in roof tube No 104 that failed during ESP or during hydro |
| How discovered: | Unit tripped on high furnace pressure; Loud pop and blowing noise. |
| Wash adjacent tube: | No |
| Root cause: | Short term overheat due to condensate in loop during hot restart Shingle plate rubbing on roof tube |
| Leak detection: | Yes Nalco RBLI / Trasar |
| Bed cooling enhanc | Yes |
| Last full inspection: | March 2010 |
| Sequence of events: | 3Feb: 04:37 Unit tripped due to instrument line freeze. 05:05 Unit on line. 05:10 Igniters tripped; repurge unit. 05:18 Refired unit. 05:43 Unit on line. 05:49 Liquor in. 05:47 Heard “pop”. Unit tripped on high furnace pressure; Heard blowing noise. Mill header pressure erratic. 06:10 ESP'd unit. 4-hour evacuation. 10:10 began investigation. 12:15 Saw ruptured SH tube. Bed still hot. 17:30 Contractor began NaHCO ₃ bed cooling. 20:00 Bed below 400oF. 21:10 Began waterwash. 4Feb 09:00 Scaffolded unit. 12:30 Started repair with Dutchman loop. 18:00 Repair done. 23:45 Hydro. Found pinhole leak in roof tube from rubbing shingle plate. 5Feb 10:00 repaired roof tube. 14:30 Hydro OK. 21:30 Unit fired. 6Feb 05:00 Unit on line. 21:00 On liquor SH: Installed Dutchman loop and X-ray. Roof pinhole welded and X-ray |
| Repair procedure: | Install automatic SH vent valve for startup to get loops blown clear. Continue SH TC monitoring. |
| Future prevention: | Add monitoring of SH inlet gas temp. Repair longer section of roof tube at next outage. |

SUPERHEATER

| | |
|----------------------------------|--|
| SPRING 2011 - 17 | |
| Classification: | Non-Critical |
| Location: | International Paper, Ticonderoga, NY |
| Unit: | #1RU, 1969 B&W, 2-drum Large Economizer |
| Unit Size: | 2.01 MM lb ds/day; 300,000 lb/hr steam at 850 psig, 825°F, 975 psig design |
| Incident Date: | February 10, 2011 |
| Downtime hrs, leak/total: | 96 hrs |
| ESP? | No |
| Leak/Incident Loc: | Ruptured superheater tube at roof line, secondary section inlet |
| How discovered: | Furnace went positive |
| Wash adjacent tube: | No |
| Root cause: | Superheater tube Fatigue from swinging (broken clips), (less likely uncleaned tube) |
| Leak detection: | No |
| Bed cooling enhanc | No |
| Last full inspection: | August 2010 |
| Sequence of events: | 10Feb 21:30 Furnace went positive, performed immediate shutdown. Re-fired on oil to smelt out the bed |
| Repair procedure: | Cap superheater platen at tube stubs at the headers and removed the platen |
| Future prevention: | Clearing superheater tubes thoroughly, replace superheater platen |

Appendix A – Summary of Incidents (Continued)

BOILER

SPRING 2011 - 18

| | |
|----------------------------------|---|
| Classification: | Critical Incident 745 |
| Location: | International Paper, Ticonderoga, NY |
| Unit: | #1 RU, 1969 B&W, PR-131, large econ, 1984 B&W 2-drum boiler, |
| Unit Size: | 2.01 MM lb ds/day; 300,000 lb/hr steam at 875 psig, 825°F, 975 psig design |
| Incident Date: | November 19, 2010 |
| Downtime hrs, leak/total: | 116 |
| ESP? | Yes |
| Leak/Incident Loc: | Crack of cold side boiler tube at surface of mud drum |
| How discovered: | Walk down saw water spraying into boiler hopper during off-liquor chill-&-blow |
| Wash adjacent tube: | No |
| Root cause: | Near-drum corrosion. (No vibration mechanical fatigue evident) |
| Leak detection: | No |
| Bed cooling enhanc | No |
| Last full inspection: | August 2010 |
| Sequence of events: | 19Nov 05:00 Liquor out and bed down for chill-&-blow. 06:50 Walk down saw water spraying into boiler hopper. Continued smelt-out. Policy review called for ESP. 11:45 ESP'd unit. 4-hour wait. ESP functions verified. Small mound of bed char monitored until cool. Water wash. Repair. |
| Repair procedure: | Leaking tube removed. Plugs welded into both drums. Root and cap welds dye penetrant checked. Added boiler tubes ID'd with problem, and repaired. |
| Future prevention: | More ndt planned for 2011 outage. |

BOILER

SPRING 2011 - 19

| | |
|----------------------------------|---|
| Classification: | Critical Incident 746 |
| Location: | Georgia Pacific Naheola Mill, Pennington, AL |
| Unit: | #4 RU, 1993 B&W #PR-220, 1-drum Large Economizer |
| Unit Size: | 5.92 MM lb ds/day; 883,400 lb/hr steam at 1250 psig, 905°F, 1625 psig design |
| Incident Date: | August 14, 2010 |
| Downtime hrs, leak/total: | 46.18 |
| ESP? | No |
| Leak/Incident Loc: | 1-3/16" long & 5/16" wide failure, in straight tube 7" below right side soot blower sleeve RS-24 in boiler section (1-drum unit) 11' below roof. |
| How discovered: | Leak detection system alarm. Then operator identified the location. |
| Wash adjacent tube: | No |
| Root cause: | Sootblower erosion due to a poppet valve leaking at the at rest position |
| Leak detection: | Yes. Trasar (alarmed leak & allowed early detection) and Mass balance |
| Bed cooling enhanc | No |
| Last full inspection: | March 2010 |
| Sequence of events: | 14Aug 18:35 Leak detection alarm identified leak. 18:55 Operator located the leak. Since spray toward rear and BELIEVED to be below nose arch], did orderly shut down 18:57 Reduced liquor. 19:42 Liquor out. 20:15 Visually confirm no spray towards furnace 20:54 Char bed burned out. [Ed. Note: At some point, found leak to be above arch.] 15Aug 06:31 All fuel out. 10:00 Began exterior repairs. 20:00 Began scaffold. 16Aug 04:00 Scaffold complete. 10:15 Repairs complete. 14:00 Xray complete. 16:00 Began repair of membrane crack found. 22:58 Began fill unit 17Aug 04:45 Hydro: Repair OK, but found unrelated leak at a sootblower, (see separate report.) |
| Repair procedure: | A tube section was removed & replaced |
| Future prevention: | Outage NDT scope will be expanded to include UT scans of all sootblower tube openings. A poppet valve PM will be developed. The ESP SOP has been revised to identify sootblowers above the furnace arch. This would have been ESP'd if location were defined. The top of the furnace arch will be delineated in the field. A poppet valve leakage alarm will be evaluated. Operator walk down to note sootblower steam flow with system down. |

Appendix A – Summary of Incidents (Continued)

BOILER**SPRING 2011 - 20**

| | |
|----------------------------------|--|
| Classification: | Non-Critical |
| Location: | Georgia Pacific Naheola Mill, Pennington, AL |
| Unit: | #4 RU, 1993 B&W #PR-220, 1-drum Large Economizer |
| Unit Size: | 5.92 MM lb ds/day; 883,400 lb/hr steam at 1250 psig, 905°F, 1625 psig design |
| Incident Date: | August 17, 2010 |
| Downtime hrs, leak/total: | 28.4 |
| ESP? | No |
| Leak/Incident Loc: | Hair line crack extending from sootblower RS-64 crotch plate into bent tube membrane weld |
| How discovered: | During hydro |
| Wash adjacent tube: | No |
| Root cause: | Bad weld. Crack propagation from a faulty crotch plate to membrane weld |
| Leak detection: | Yes. Trasar and Mass balance (Boiler off line) |
| Bed cooling enhanc | No |
| Last full inspection: | March 2010 |
| Sequence of events: | 17Aug 04:45 Hydro: Found leak at sootblower. Made repairs. Hydro OK 18 August 10: 03:10- First burner in. 09:09- Unit on-line. |
| Repair procedure: | Ground out the crack. Verified by dye penetrant. Replaced the removed material by welding. |
| Future prevention: | Appeared to be a result of faulty welds made during sootblower sleeve modifications made in October 1996. February 2011 outage NDT scope will be expanded to include dye penetrant testing of all modified soot blower crotch plate-to-membrane welds & nearby membrane traversing welds. Additionally, the tube failure will be removed & replaced. |

Appendix A – Summary of Incidents (Continued)

BOILER

| | |
|----------------------------------|---|
| SPRING 2011 - 21 | |
| Classification: | Critical Incident 747 |
| Location: | NewPage, Wickliffe, KY |
| Unit: | #1 RB, 1969 CE # (S)17467, 2 drum, DCE cascade; 1993 B&W Boiler |
| Unit Size: | 3.2 MM lb ds/day; 450,000 lb/hr steam at 600 psig, 800°F, 760 psig design |
| Incident Date: | February 4, 2011 |
| Downtime hrs, leak/total: | 61 hours |
| ESP? | Yes |
| Leak/Incident Loc: | Two cold side generating bank tubes sheared, one at mud and steam drum, one at mud drum. |
| How discovered: | Unit tripped on high furnace pressure; Drum level dropped; Heard unusual noise. |
| Wash adjacent tube: | Yes – from leaking tube? |
| Root cause: | Salt cake build-up on SB proximity switch. Stuck soot-blower in boiler bank vibrated two boiler tubes to fatigue failure rupture. Logic alarm for SB timer off due to SB maintenance. |
| Leak detection: | No |
| Bed cooling enhanc | No |
| Last full inspection: | August 2010 |
| Sequence of events: | 3Feb IK 36 (mid-boiler) had been run into boiler and failed to retract because of salt cake build-up on proximity switch. Its motor tripped on overload. Unit was down for cascade wash and repacking of soot blower isolation valve. 4Feb When blower system was reenergized, IK 36 blew on and vibrated neighboring boiler tubes to rupture failure. 05:08 Unit tripped on high furnace pressure. Drum lost level below -10". Tried to adjust feed water. Noise heard. 05:20 ESP'd unit. |
| Repair procedure: | A third cold side gen bank tube had a leak indication inside the rolled area of the tube in the drum. A fourth tube was thinned from the leak. The four tubes were plugged in drums and sheared tube material removed. |
| Future prevention: | The soot blower steam flow scale was set too low, and the soot blower flow maxed out with two IKs blowing. The scale was corrected, and an alarm was added for high steam flow. The mill runs single blows on the soot blower system, and the flow drops to zero after each soot blower activates. An alarm was added to indicate if the steam flow does not reset to zero after a set time. Follow-up operator training and communication to follow existing start-up procedures that include walking down and checking the soot blowers before starting the soot blower system. Procedure updated to include verifying the soot blower home position and the position of maintenance switch. Develop SOP and train maintenance and operators on checking and verifying soot blower status during normal operations and maintenance of soot blowers. |

Appendix A – Summary of Incidents (Continued)

BOILER SCREEN

| | |
|----------------------------------|---|
| SPRING 2011 - 22 | |
| Classification: | Critical Incident 748 |
| Location: | Domtar, Kamloops, BC Canada |
| Unit: | #2 RU, 1972 B&W #68100, 2-drum ; 2010 Andritz |
| Unit Size: | 5.5 MM lb ds/day; 740,000 lb/hr steam at 740 psig, 700°F, 850 psig design |
| Incident Date: | December 14, 2010 |
| Downtime hrs, leak/total: | 124 hrs |
| ESP? | Yes |
| Leak/Incident Loc: | Sheared 1-1/2 " tube weld attachment at lower boiler screen miniheader (just above rear wall arch) |
| How discovered: | Low drum level trip; Panel critical trends |
| Wash adjacent tube: | No |
| Root cause: | Vibration fatigue |
| Leak detection: | No |
| Bed cooling enhanc | No |
| Last full inspection: | June 2010 |
| Sequence of events: | When tube sheared, lost drum level (low drum trip) and panel indicators showed leak. ESP'd unit. |
| Repair procedure: | Repair made. 67 of 76 tubes had crack indications. 50% of them were less than 50% deep. All cracks were ground out, weld repaired and MP and LP tested. Vibration bars installed. |
| Future prevention: | Re-inspect at Spring 2011 outage |

UPPER FURNACE

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|----------------------------------|--|
| SPRING 2011 - 23 | |
| Classification: | Non-Critical |
| Location: | Smurfit-Stone Container Corp, West Point, VA |
| Unit: | #5 RB, 1992 B&W, PR-219, 1-drum Large econ |
| Unit Size: | 3.0 MM lb ds/day; 493,000 lb/hr steam at 1200 psig, 900°F, 1250 psig design |
| Incident Date: | November 28, 2010 |
| Downtime hrs, leak/total: | 30 |
| ESP? | No |
| Leak/Incident Loc: | 1/4" crack at toe of inboard fillet weld of support gusset on 8 th rear wall tube, at lower bend of nose arch, upper furnace, external to furnace. |
| How discovered: | Walk down. Saw steam at rear wall coming through insulation. |
| Wash adjacent tube: | No |
| Root cause: | Stress at toe of superfluous (unauthorized) inboard fillet weld on support gusset to rear wall tube. |
| Leak detection: | No |
| Bed cooling enhanc | No |
| Last full inspection: | April 2010 |
| Sequence of events: | 28Nov , 14:30 during walk down saw steam coming from insulation by nose arch corner, 6 th floor. Extensive checks. No other indications. Pulled liquor. No leak visible in furnace. Did orderly shut down. 21:30 Bed burned out. Unit off line. At 500 psig, removed insulation. Located leak. |
| Repair procedure: | Ground out crack and repaired weld. |
| Future prevention: | Will replace repaired tube with Dutchman. Will inspect remaining 27 support gussets for inboard fillet weld on gusset. If found, will schedule to replace with Dutchmen. |

Appendix A – Summary of Incidents (Continued)

UPPER FURNACE

SPRING 2011 - 24

| | |
|----------------------------------|--|
| Classification: | Non-Critical |
| Location: | Georgia Pacific Naheola Mill, Pennington, AL |
| Unit: | #4 RU, 1993 B&W #PR-220, 1-drum Large Economizer |
| Unit Size: | 5.92 MM lb ds/day; 883,400 lb/hr steam at 1250 psig, 905°F, 1625 psig design |
| Incident Date: | July 10, 2010 |
| Downtime hrs, leak/total: | 38.12 hr |
| ESP? | No |
| Leak/Incident Loc: | 1/32" "drill" hole, external (cold side) in mid left side wall, upper furnace 3' below nose arch. |
| How discovered: | Walk down. Saw steam coming from lagging |
| Wash adjacent tube: | No |
| Root cause: | Either tube flaw or corrosion pit |
| Leak detection: | Yes. Mass balance (leak too small to see) and Trasar (alarmed leak but lost among cooling water high temp alarms). |
| Bed cooling enhanc | No |
| Last full inspection: | March 2010 |
| Sequence of events: | 9Jul 22:32 Walk down saw steam coming from lagging. No panel signs. 22:45 Orderly shut down. 10Jul 00:06 Start pull liquor 01:40 Liquor out. 11:34 All fuel out. 11Jul 00:04 began repairs. 03:30 Tube repairs complete. 09:05 Hydro OK. Returned to service. 16:12 1 st fire. 22:27 Unit on line. |
| Repair procedure: | Pad welded |
| Future prevention: | Outage NDT scope will be expanded to include adjacent tube UT scans. Additionally, the tube failure will be removed & replaced. Failed tube to be removed & examined in detail. |

UPPER FURNACE

SPRING 2011 - 25

| | |
|----------------------------------|---|
| Classification: | Non-Critical |
| Location: | International Paper, Eastover, SC |
| Unit: | #1 RB, 1984 CE, #31381, 2-drum Large economizer, decanting hearth |
| Unit Size: | 2.3 MM lb ds/day; 370,000 lb/hr steam at 1500 psig, 900°F, 1670 psig design |
| Incident Date: | November 13, 2010 |
| Downtime hrs, leak/total: | 37 |
| ESP? | No |
| Leak/Incident Loc: | Attachment weld; pinhole leak at channel attachment weld to side wall tube external to boiler in nose arch cavity where maintenance beam are inserted. |
| How discovered: | Walk down. Saw steam vapor coming from under the insulation lagging at the area of the maintenance beams |
| Wash adjacent tube: | No |
| Root cause: | Attachment weld failure |
| Leak detection: | Yes. |
| Bed cooling enhanc | No |
| Last full inspection: | 2010 |
| Sequence of events: | During walk down, saw steam vapor coming from under the insulation lagging at the area of the maintenance beams. Stopped soot blowers. No noise. No leak detection indication. Did controlled shut down. Removed insulation. Found pinhole leak at an attachment weld between a channel and a tube. The channel is part of the beam system that supported the buckstay and maintenance beam penetration. The leak was on an external attachment weld |
| Repair procedure: | Ground out crack, PT'd area, beveled back and rewelded |
| Future prevention: | Check opposite side attachment welds and get information from CE on other common attachment weld failure points to inspect during the next outage. |

Appendix A – Summary of Incidents (Continued)

SPOUT

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|----------------------------------|--|
| SPRING 2011 - 26 | |
| Classification: | Non-Critical |
| Location: | Georgia-Pacific, Brewton AL |
| Unit: | #2 RB, 1963 B&W, PR-79, 2-drum w/ Cascade Evaporator, 2010 B&W Spout |
| Unit Size: | 1.1 MM lb ds/day; 186,000 lb/hr steam at 860 psig, 830°F, 975 psig design |
| Incident Date: | Sept 12, 2010 |
| Downtime hrs, leak/total: | 25 hr |
| ESP? | YES |
| Leak/Incident Loc: | Smelt spout leak. 1/8" pinhole in factory inlet nozzle weld |
| How discovered: | Walk down. Saw water spraying in dog house |
| Wash adjacent tube: | No |
| Root cause: | Weld defect in factory inlet nozzle weld |
| Leak detection: | No |
| Bed cooling enhanc | No |
| Last full inspection: | 28Feb2010 |
| Sequence of events: | 12Sep: 14:10 Walk down saw water spraying in dog house. 14:22 Couldn't confirm source, so ESP'd unit. 8-hour wait. 23:00 began lockout. Replaced spout. 13Sep 05:30 Good spout and unit hydro. 10:15 Fired unit. 14:55 On line. 15:40 On liquor. |
| Repair procedure: | Replaced spout (Only 7 mo old) |
| Future prevention: | Follow up with B&W on manufacturing QA/QC |

LOWER FURNACE

| | |
|----------------------------------|---|
| SPRING 2011 - 1118 | Intl 1118 |
| Classification: | Unclassified (Smelt Water Reaction) |
| Location: | International Paper, Luiz Antonio, SP, Brazil |
| Unit: | 1992 CBC-Mitsubishi/Andritz, 2-drum Large econ, decanting hearth |
| Unit Size: | 3.747 MM lb ds/day; 540,000 lb/hr steam at 1060 psig, 842°F, 1131 psig design |
| Incident Date: | October 5, 2010 |
| Downtime hrs, leak/total: | 110/110 |
| ESP? | YES |
| Leak/Incident Loc: | 3 tubes by unused gun opening, rear wall; 16mm, 16mm, 1mm |
| How discovered: | Panel: Steam-water differential |
| Wash adjacent tube: | YES. Likely 1 tube leak washed the other 2. |
| Root cause: | Fireside corrosion thinning. In 2005, process changes led to higher temps in lower furnace reducing zone, with more smelt runoff on walls. |
| Leak detection: | No |
| Bed cooling enhanc | Yes. CO2 lance. |
| Last full inspection: | August 2010 |
| Sequence of events: | Previously, steam-water differentials uncovered minor peripheral leaks. Oct 5, 2010 12:00 Abnormal noise by superheater for 15 min. 13:36 ID fan increase. No leak found. 13:40 Draft increased at boiler exit. No leak found. 13:45 Steam flow down .75% with plugged boiler bank. No leak found. 15:00 Shut SB's to listen. No leak found. 15:58 water-steam differential grew & conductivity fell. 16:00 Started controlled shut down. 16:35 Liquor out 16:39 Boiler tripped on low drum. 16:44 Saw small explosions in hearth and furnace puffs. ESP'd unit. 18:20 Unit P=0. 20:45 Cleared unit for inspection. 21:40 Put 4 TC's in remaining bed. Did 10 hours CO2 lancing of hot spots. Oct 6 Made repairs to 3 tube leaks and 3 thinned tubes. |
| Repair procedure: | Replaced 3 leaking tubes plus 3 additional thinned tubes at the liquor gun elevation. |
| Future prevention: | Added inspection & UT in Jan 2011. Plan replace lower furnace with composite in Fall 2011. |

Appendix A – Summary of Incidents (Continued)

UPPER FURNACE

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|----------------------------------|---|
| SPRING 2011 - 1119 | Intl 1119 |
| Classification: | Fatality Accident |
| Location: | NPI, Yatsushiro, Japan |
| Unit: | #7 RB |
| Unit Size: | 00 MM lb ds/day; ,000 lb/hr steam at 00 psig, 00°F, 00 psig design |
| Incident Date: | September 4, 2010 |
| Downtime hrs, leak/total: | |
| ESP? | no |
| Leak/Incident Loc: | Upper furnace fatality |
| How discovered: | Workers fell |
| Wash adjacent tube: | n/a |
| Root cause: | Improper positioning of workers during upper furnace ash removal |
| Leak detection: | n/a |
| Bed cooling enhanc | n/a |
| Last full inspection: | - |
| Sequence of events: | During shutdown unit needed ash buildup removed in upper furnace. Workers in the furnace used a 3-meter vibrating iron pole to vibrate a tube in the built-up region. A large lump of ash was dislodged and fell on the workers, knocking two of the three down to the hearth. The supervisor died in the hospital. A contractor broke his shoulder blade and was treated in the hospital. |
| Repair procedure: | |
| Future prevention: | Sticking with plan. Stay out from under ash buildup. |

**TAPPI Power and Recovery
Boiler Sub-Committee Update**

1

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

2

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

3

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)

4

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

5

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)

6

Appendix B – TAPPI Update – Power and Recovery Boiler Subcommittee (Continued)

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

7

Meetings:

- Meetings are held twice per year
 - Next Meeting
 - Spring, Following BLRBAC Meeting
 - Wednesday April 6, 2011; 1:00 pm – 4:00 pm

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