



BLACK LIQUOR RECOVERY BOILER ADVISORY COMMITTEE

MINUTES OF MEETING Crowne Plaza Hotel/Atlanta Airport March-April 30, 31 & 1, 2015

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: **John Gray (NEW)**
Rayonier Advanced Materials
10 Gum Street
Fernandina Beach, FL 32034

Tel: 912-277-1388
Cell: 912-321-7582
john.p.gray@rayonieram.com

Vice-Chairman: **Dave Slagel (NEW)**
Weyerhaeuser
1 Bonnybridge Road
Port Wentworth, GA 31407

Tel: 912-966-4312
Cell: 912-247-6295
david.slagel@weyerhaeuser.com

Secretary: **Everett Hume (NEW)**
FM Global
1151 Boston-Providence Turnpike
Norwood, MA 02062

Tel: 781-255-4733
Cell: 413-323-6781
everett.hume@fmglobal.com

Treasurer: **Len Olavessen**
LENRO, Inc.
5303 Atascocita Road, #117
Humble, TX 77346

Cell: 901 573 8343
olavessen@aol.com

REGULAR MEMBERSHIP

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

ASSOCIATE MEMBERSHIP

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

CORRESPONDING MEMBERSHIP

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

Bylaws - 3.1

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

EXECUTIVE COMMITTEE

John Gray (NEW)
BLRBAC Chairman
Rayonier Advanced Materials
10 Gum Street
Fernandina Beach, FL 32034
Tel: 912-277-1388
Cell: 912-321-1388
john.p.gray@rayonieram.com

Dave Slagel (NEW)
BLRBAC Vice-Chairman
Weyerhaeuser
1 Bonnybridge Road
Port Wentworth, GA 31407
Tel: 912-9664312
Cell: 912-247-6295
david.slagel@weyerhaeuser.com

Everett Hume (NEW)
BLRBAC Secretary
FM Global
1151 Boston-Providence Turnpike
Norwood, MA 02062
Tel: 781-255-4733
Cell: 413.265.9562
everett.hume@fmglobal.com

Len Olavessen
BLRBAC Treasurer
LENRO, Inc.
5303 Atascocita Road, #117
Humble, TX 77346
Cell: 901-573-8343
olavessen@aol.com

David von Oepen (NEW)
Operator Representative
RockTenn
28270 U.S. Highway 80 West
Demopolis, AL 36732
Tel: 334-289-6315
dvonoepen@rocktenn.com

John Phillips (NEW)
Manufacturing Representative
Andritz
1115 Northmeadow Parkway
Roswell, GA 30076-3857
Tel: 770-640-2434
Cell: 678-427-6899
john.phillips@andritz.com

Jimmy Onstead
Insurance Representative
FM Global
5700 Granite Parkway, Suite 700
Plano, TX 75024
Tel: 972-731-1656
jimmy.onstead@fmglobal.com

Secretarial Services
Barbara Holich
5500 Irish Spring Street
Las Vegas, NV 89149

Frank's Cell: (630) 269-1005
Barbara's Cell: (630) 640-1805
E-Mail: fhholich@aol.com

BLRBAC SUBCOMMITTEES

<p>AUXILIARY FUEL Bruce Knowlen, Chairman Weyerhaeuser Company Mailstop: CH 3D29 PO Box 9777 Federal Way, WA 98063 Tel: 253-924-6434 bruce.knowlen@weverhaeuser.com</p>	<p>BLACK LIQUOR, SAFE FIRING OF Vernon Blackard, Chairman International Paper 2895 79 Trail Rd. (NEW) Roy MT 59471 (NEW) Cell: 251-284-3471 vernon.blackard@ipaper.com</p>
<p>EMERGENCY SHUTDOWN PROCEDURES John Andrews, Chairman MeadWestvaco Corporation 5255 Virginia Ave. North Charleston, SC 29406 Tel: 843-509-4926 john.andrews@mww.com</p>	<p>FIRE PROTECTION IN DIRECT CONTACT EVAPORATORS Craig Cooke, Chairman FM Global 815 Byron Drive Oconomowoc, WI 53066 Tel: 262-567-7370 craig.cooke@fmglobal.com</p>
<p>INSTRUMENTATION David Avery, Chairman Domtar Paper Company P. O. Box 678 Bennettsville, SC 29512 Tel: 843-454-8937 david.avery@domtar.com</p>	<p>MATERIALS & WELDING Dave Fuhrmann, Chairman International Paper 6285 TriRidge Blvd. Loveland, OH 45140 Tel: 513-248-6954 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 bob.zawistowski@psaengineering.com</p>	<p>PUBLICITY & NEWS RELEASE Matt Paine, Chairman (NEW) FM Global 1151 Boston-Providence Turnpike Norwood, MA 02062 Tel: 781-255-4733 matthew.paine@fmglobal.com</p>
<p>WASTE STREAMS Paul Seefeld, Chairman A.H. Lundberg Associates, Inc. 6174 Kissengen Springs Ct Jacksonville, FL 32258 Tel: 904-614-6492 paul.seefeld@lundberg-us.com</p>	<p>WATER TREATMENT Tom Przybylski, Chairman (NEW) Power Specialists Associates, Inc. 531 Main Street Somers, CT 06071 Tel: 860-763-3241 tom.przybylski@psaengineering.com</p>

BLRBAC MEETING SCHEDULE

Fall	October	5, 6 & 7	--	2015
Spring	April	4, 5 & 6	--	2016
Fall	October	3, 4 & 5	--	2016
Spring	April	3, 4 & 5	--	2017
Fall	October	2, 3 & 4	--	2017
Spring	April	2, 3 & 4	--	2018

"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

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
5500 Irish Spring Street
Las Vegas, NV 89149

Frank's Cell Phone: 630-512-0144
Barbara's Cell Phone: 630-640-1805
fhholich@aol.com

These are available at the **BLRBAC INTERNET ADDRESS:**

www.blrbac.org

BLRBAC Guidelines & Recommended Practices

LEGAL NOTICE

 *Waste Stream Incineration*

(Dated: April 2013)

 *Emergency Shutdown Procedure*

(Dated: October 2012)

 *Safe Firing of Black Liquor in Black Liquor Recovery Boilers*

(Dated: October 2012)

 *Materials & Welding Guidelines*

(Dated: April 2013)

 *Safe Firing of Auxiliary Fuel in Black Liquor Recovery Boilers*

(Dated: February 2012)

 *Fire Protection in Direct Contact Evaporators and Associated Equipment*

(Dated: February 2012)

 *Personnel Safety & Training*

(Dated: February 2012)

 *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: February 2012)

 *Post ESP Guidelines*

(Dated: October 2002)

 *Boiler Water Management Guidelines for Black Liquor Recovery Boiler*

(Dated: October 2014)

If you have any questions, contact:

Secretary: Everett Hume
FM Global
1151 Boston-Providence Turnpike
Norwood, MA 02062

Tel: 781-255-4733
Cell: 413-323-6781
everett.hume@fmglobal.com

AUXILIARY FUEL SUBCOMMITTEE

‡Bruce Knowlen – Chairman

Weyerhaeuser Company
P. O. Box 9777 / CH 3D29
Federal Way, WA 98063-9777
Tel: 253-924-6434
Fax: 253-924-4380

bruce.knowlen@weyerhaeuser.com

<p>Chad Harrod – Vice Chairman Georgia Pacific Brunswick Cellulose, Inc. PO Box 1438 Brunswick, GA 31520 Tel: 404-652-5815 chad.harrod@gapac.com</p>	<p>‡Allen L. Ray – Secretary Process Barron 105 19th Street South Birmingham, AL 35210 Tel: 205-956-3441 aray@processbarron.com</p>	<p>‡Tom DeBeer AIG 5001 Willow Creek Drive Woodstock, GA 30188 Tel: (678) 494-6026 Cell: (404) 218-8613 Thomas.DeBeer@aig.com</p>
<p>Lino DiLeonardo Zurich 400 University Ave., 16th Floor Toronto, ON M5G 1S7 Tel: 519-824-4548 lino.di.leonardo@zurich.com</p>	<p>‡Brook M. Holland George H. Bodman, Inc 228 Wild Rose Lane Canton, NC 28716 Cell: 828-421-0487 brookmholland@gmail.com</p>	<p>‡Kevin R. Huelsbeck FM Global Property Insurance Midwest- Chicago Ops W4893 Cliff View Dr. Sherwood, WI 54169 Cell: 920-205-5529 kevin.huelsbeck@fmglobal.com</p>
<p>Greg Kornaker Babcock & Wilcox Company P. O. Box 351 Barberton, OH 44203-0315 Tel: (330) 860-2009 gjkornaker@babcock.com</p>	<p>‡Nick Merriman Andritz Waagner-Biro-Platz 1 8074 Raaba/Graz, Austria Tel: +43-316-501-2810 Cell: +43-676-89-501-2810 nicholas.merriman@andritz.com</p>	<p>‡Nathan Schindler CCA Combustion Systems 884 Main St. Monroe, CT 06468 Tel: 203-268-3139 x 137 Cell: 203-362-7520 NSchindler@peerlessmfg.com</p>
<p>Ivan Semyanko Alstom Power, Inc. 200 Great Pond Dr., A157 PO Box 500 Windsor, CT 06095 Tel: 860-285-3953 ivan.semyanko@power.alstom.com</p>		

‡ Denotes attendance at meeting April 2015

EMERGENCY SHUTDOWN PROCEDURES SUBCOMMITTEE**‡John Andrews – Chairman**

MeadWestvaco
2347 MacLaura Hall Avenue
Charleston, SC 29414
Tel: 843-509-4926

E-mail: john.andrews@mww.com

<p>‡Dean Clay, Secretary BSI 935 Hidden Ridge Drive Milford, OH 45150-5588 Tel: (513) 576-0148 Cell: (513) 497-9070 dclay@fuse.net</p>	<p>‡Scott Crysel FM Global 5700 Granite Parkway, Suite 700 Plano, TX 75024 Tel: (972) 731-1658 scott.crysel@fmglobal.com</p>	<p>‡James Franks XL GAPS 855 Dogwood Road Somerville, TN 38068 Tel: (901) 465-0771 James.Franks@xlgroup.com</p>
<p>‡John Harmon Alstom Power Inc 200 Great Pond Drive Windsor, CT 06095 Tel: 860-285-4436 john.m.harmon@power.alstom.com</p>	<p>‡Chris Jackson Nautilus Loss Control 1362 11th Court, Fox Island, WA 98333 Tel: 253-303-0289 Cell: 503-840-5775 chris.jackson44@comcast.net</p>	<p>‡Rinus Jellema Nanaimo Forest Products' Harmac Pacific 1000 Wave Place Nanaimo, BC, Canada Tel: 250-701-1873 MJellema@harmacpacific.com</p>
<p>‡John A. Kulig Babcock & Wilcox Company P. O. Box 351, BVSW1A Barberton, OH 44203-0351 Tel: (330) 860-6438 Fax: (330) 860-9427 jakulig@babcock.com</p>	<p>‡Wayne MacIntire International Paper Co 6283 Tri-Ridge Blvd Loveland OH 45140-7810 Cell: (513) 543-0818 Fax: (901) 214-0894 wayne.macintire@ipaper.com</p>	<p>‡Karl Morency – Vice Chair Georgia-Pacific 133 Peachtree Street NE Atlanta, GA 30303 Tel: (404) 652-4629 Fax: (404) 654-4748 ktmorenc@gapac.com</p>
<p>‡John Phillips Andritz Pulp & Paper 5405 Windward Parkway, Suite 100W Alpharetta, GA 30004 Tel: 770-640-2434 john.phillips@andritz.com</p>	<p>‡David Slagel Weyerhaeuser Co. 1 Bonneybridge Road Port Wentworth, GA 31407 Tel: 912-966-4312 david.slagel@weyerhaeuser.com</p>	<p>‡John Weikmann Valmet Inc 3430 Toringdon Way, Suite 201 Charlotte, NC 28277 Tel: 704-414-3431 john.weikmann@valmet.com</p>

‡ Denotes attendance at meeting April 2015

**FIRE PROTECTION IN DIRECT CONTACT EVAPORATORS
AND ASSOCIATED EQUIPMENT SUBCOMMITTEE**

‡ Craig Cooke - Chairman
 FM Global
 815 Byron Drive
 Oconomowoc, WI 53066
 Tel: 262-567-7370
craig.cooke@fmglobal.com

<p>Phil Ramsey - Vice-Chairman Kapstone Paper P. O. Box 118005 Charleston, SC 29423-8005 Tel: 843-745-3480 phil.ramsey@kapstonepaper.com</p>	<p>Randy Baker Buckeye Technologies One Buckeye Drive Perry, FL 32348 Tel: 850-584-1380 randy_baker@bkitech.com</p>	<p>‡ Robert Goddard XL Group 129 Drive 1143 Tupelo, MS 38804 Tel: 662 844-5897 robert.goddard@xlgroup.com</p>
<p>Michael Hollern New Page Corporation 300 Pratt Street Luke, MD 21540 Tel: 301-359-3311, Ext. 3280 mfh3@newpagecorp.com</p>	<p>‡ Kevin Huelsbeck FM Global Property Insurance Midwest-Chicago Ops N8955 Willow Lane Menasha, WI 54952 Tel: 920-205-5529 kevin.huelsbeck@fmglobal.com</p>	<p>‡ Nick Merriman Austrian Energy & Environment Graz, Austria Tel: +43 316 501-2810 nicholas.merriman@ace-austria.at</p>
<p>Daniel Nesmith Kapstone P.O. Box 118005 Charleston, SC 29423-8003 Tel: daniel.nesmith@kapstonepaper.com</p>	<p>Christopher Skorton Kapstone P.O. Box 118005 Charleston, SC 29423-8003 Tel: 843-745-3242 christopher.skorton@kapstonepaper.com</p>	<p>Alarick Tavares Georgia-Pacific 133 Peachtree St. NE Atlanta, GA 30303 Tel 404-652-4606 najtavare@gapac.com</p>
<p>‡ Jim Taylor Graphic Packaging International P. O. Box 20700 1701 Jefferson Parkway Pine Bluff, AR 71612 jim.taylor@graphicpkg.com</p>		

‡ Denotes attendance at meeting April 2015

.PUBLICITY & NEWS RELEASE SUBCOMMITTEE

‡ Matt Paine – Chairman FM Global (NEW)
 1151 Boston-Providence Turnpike
 Norwood, MA 02062
 Tel: 781-255-4733
 Cell: 781-255-4733
matthew.paine@fmglobal.com

‡ Denotes attendance at meeting April 2015

INSTRUMENTATION SUBCOMMITTEE

‡David Avery – Chairman

Domtar Paper Company

P.O. Box 678

Bennettsville, SC 29512

Tel: 843-454-8937

david.avery@domtar.com

‡Rick Matarrese – Sec FM Gobal 655 Engineering Dr. #300 Norcross, GA 30092 Tele: 770-777-3684 rick.matarrese@fmglobal.com	‡David T. Boudreau SAPPI (S.D. Warren Company) 1329 Waterville Road Skowhegan, ME 04976 Tel: 207-238-7502 dave.boudreau@sappi.com	John Browning, Jr Alabama River Cellulose Georgia Pacific P.O. Box 100 Perdue Hill, AL 36470 Tel: 251-743-8336 john.browning@gapac.com
‡William Camp International Paper Company 100 Jensen Rd Prattville, AL 36067 Tel: 334-361-5620 bill.camp@ipaper.com	Clark Conely Metso Automation USA Inc. 8306 ruby Valley Rd Charlotte, NC 28277 Tel: 704-936-7408 clark.conley@metso.com	‡Michael Kiper International Paper Co. 6285 Tri-Ridge Blvd. Loveland, Ohio 45140 Tel: 513-248-6517 michael.kiper@ipaper.com
‡Bruce Knowlen Weyerhaeuser Company WTC1B22 P. O. Box 9777 Federal Way, WA 98063 Tel: 253-924-6434 bruce.knowlen@weyerhaeuser.com	Gregory J. Kornaker Babcock & Wilcox Power Generation Group, Inc. 20 South Van Buren Avenue P.O. Box 351 Barbenton, OH 44203-0351 gjkornaker@babcock.com	Alan LaFlamme Lincoln Paper & Tissue LLC 50 Katahdin Avenue P. O. Box 490 Lincoln, ME 04457 Tel: 207-794-0685 alaflamme@lpt.com
Eladio Ruiz de Molina CORR System, Inc. 3026 Overhill Road Birmingham, AL 35223 Tel: 205-879-4382 eladiordm@aol.com	‡Chris Dailey Georgia-Pacific 133 Peachtree St. NE 30303 Atlanta, GA 30348-5605 Tel: 404-652-2838 chris.dailey@gapac.com	‡Andy Smith Global Risk Consultants 203 Dunleith Drive Woodstock, GA 30188 Tel: 770-928-3890 andy.smith@globalriskconsultants.com

‡ Denotes attendance at meeting April 2015

INSTRUMENTATION SUBCOMMITTEE (Cont.)

<p>‡ Harri Soderlund Andritz 1115 Northmeadow Parkway Roswell, GA 30076 Tel: 770-640-2409 Cell: 678-644-9882 harri.soderlund@andritz.com</p>	<p>Jari Sopenan Jari Consultoria de Automacao Ltda Rua Rio Grande do Sul, 505 Agua Verde, Curitiba Brazil 80620-080 Tel:+55413244-7059 jari@jariautomation.com</p>	<p>‡ Gordon L. Vandenburg Liquid Solids Control, Inc. P.O.Box 259, Farm St. Upton, MA 01568 Tel: 508-529-3377 gardie@liquidsolidscontrol.com</p>
<p>‡ C.A. Vossberg Electron Machine Corp. P.O.Box 2349 Umatilla, FL 32784 Tel: 352-669-3101 ca@electronmachine.com</p>	<p>John Cover John E. Cover Engr., Inc. P.O. Box 35010 5425 Caldwell Mill Road Birmingham, AL 35236-6010 Tel: 205-991-7106 coverj@asme.org</p>	<p>Robert Putman Kapstone Paper 5600 Virginia Ave. North Charleston, SC 29406 Tel: 843-745-3313</p>
<p>Mikko Antikainen Andritz inc. 1115 Northmeadow Parkway Rosewell, Ga 30076-3857 Tel: 770-640-2454 Mikko.antikainen@andritz.com</p>		

‡ Denotes attendance at the meeting in April of 2015

Page - 11
MATERIALS & WELDING SUBCOMMITTEE

Dave Fuhrmann – Chairman
 International Paper
 6285 TriRidge Blvd.
 Loveland, OH 45140
 Tel: 513-248-6954
dave.fuhrmann@ipaper.com

<p>‡Jesse Worsham - Co Chair Domtar Paper Marlboro Mill P. O. Box 678 Bennettsville, SC 29512 Tel: 843-479-0200, Ext. 8879 jesse.worsham@domtar.com</p>	<p>Lynn Barrett Zampell Refractories 6801 Parke East Blvd. Tampa, FL 33610 Tel: 770-714-9125 lbarrett@zampell.com</p>	<p>Jennings Bird Metso Tel: 803-235-9091 jennings.bird@metso.com Req. Info. 4/14/15</p>
<p>‡George Bodman 13 Kingwood Villas Court Kingwood, TX 77339 Tel: 800-286-6069 or 281-359-4006 Cell: 713-557-2118 blrcldr@aol.com</p>	<p>Dan Chuchro FM Global P.O. Box 1567 Little Elm, TX 75068 Tel: 972-731-1882 dan.churchro@fmglobal.com</p>	<p>Yurij Duda Savcor yurij.duda@savcorinc.com Req. Info. 4/14/15</p>
<p>Dave Duplissey National Boiler Services 176 North Industrial Drive Trenton, GA 30752 Tel: 706-657-6200 dduplissey@nationalboiler.com</p>	<p>Steve Harville National Boiler Service, Inc. Trenton, GA Tel: 706-657-6200 Cell: 251-591-7850 sharville@nationalboiler.com</p>	<p>John Heffernan Zampell 262 Titus Avenue Warrington, PA 188976 Tel: 215-491-9300 jheffernan@zampell.com</p>
<p>‡Fabian Henriques Power Specialists Assoc. 531 Main Street Somers, CT 06071 Tel: 614-440-4284 fabian.henriques@psaengineering.com</p>	<p>‡Dennis Hollenbach Alstom Power 2000 Day Hill Road Windsor, CT 06095 Tel: 860-285-9140 dennis.hollenbach@power.alstom.com</p>	<p>Michael Hollern New Page Corporation 300 Pratt Street Luke, MD 21540 Tel: 301-359-3311, Ext. 3280 Cell: 301-802-2470 mfh3@newpagecorp.com</p>
<p>Mark Hovinga Babcock & Wilcox 20 S. VanBuren Avenue Barberton, OH 44203-0351 Tel: 330-860-6434 mnhovinga@babcock.com</p>	<p>‡Billy Jones Kapstone Paper P.O. Box 118005 Charleston, SC 29423-8005 Tel: 843-745-3507 Cell: 843-297-2001 william.jones@kapstonepaper.com</p>	<p>‡Terry Lane Georgia Pacific 4559 Lenora Drive Gardendale, AL 350072 Tel: 412-506-8168 terry.lane@gapc.com</p>

‡ Denotes attendance at meeting April 2015

MATERIALS & WELDING SUBCOMMITTEE (Cont.)

<p>Dave Lang FM Global P. O. Box 1567 Little Elm, TX 75068 Tel: 972-731-1882 david.lang@fmglobal.com</p>	<p>Ronald Lansing M&M Engineering 11020 W. 72nd Street Indiana Head Park, IL 60525 Tel: 708-784-3564 ron.lansing@mmengineering.com</p>	<p>‡Mark LeBel Andritz Pulp and Paper 1115 Northmeadow Parkway Roswell, GA 30076-3857 Tel: 770-640-2643 Cell: 678-577-8613 mark.lebel@andritz.com</p>
<p>‡Bingtao Li AZZ-WSI 2225 Skyland Court Norcross, GA 30071 Tel: 678-431-5163 bingtaoli@azz.com</p>	<p>Michael Lykins Packaging Corp. of America 1061 Woodcliff Drive South Elgin, IL 60177 Tel: 630-384-5272 Cell: 630-659-7115 mlykins@packagingcorp.com</p>	<p>‡Preston Morgan CTI Power P. O. Box 670 421 Browns Hill Road Locust, NC 28097 Tel: 704-781-2067 Cell: 704-533-4217 pmorgan@chicagotube.com</p>
<p>Max Moskal M&M Engineering 11020 W. 72nd Street Indiana Head Park, IL 60525 Tel: 708-74-3564 max.moskal@mmengineering.com</p>	<p>Joe Nelson . Georgia-Pacific 4559 Lenora Drive Gardendale, AL 35071-4067 Tel: 205-631-6457 Cell: 770-330-7924 jgnelson@gapac.com</p>	<p>Dan Phillips Wesco Welding Engineering Services Portland, OR 97062 Tel: 503-720-9270 phillipsdan@comcast.net</p>
<p>‡Stacy Power AZZ-SMA 1615 118th Avenue North St. Petersburg, FL 33716 Tel: 843-957-2111 stacy.power@azz.com</p>	<p>Ron Reed Valmet 992 Quality Drive Lancaster, South Carolina 29720 Tel: 803-289-4909 Cell: 704-281-3073 ron.reed@valmet.com</p>	<p>‡Bob Roy RMR Mechanical P. O. Box 170 Cumming, GA 30028 Tel: 770-205-9646 bob.roy@rmrmechanical.com</p>
<p>Douglas Singbeil FPInnovations - Paprican 3800 Wessbrook Mall Vancouver, BC V6S 2L9 Tel: 604-222-3254 Cell: 604-839-3254 douglas.singbeil@fpinnovations.com</p>	<p>Doug Keiley KB Engineering & Inspection</p>	<p>Steve Lukezich PSA, Inc. 531 Main Street Somers, CT 06071 Tel: 614-271-3040 steve.lukezich@psaengineering.com</p>
<p>Robinson, Phillip FM Global Alpharetta, GA Tel: 678-637-3266 phillip.robinson@fmglobal.com</p>	<p>Mike Mesamore National Boiler Services Tel: 706-657-6200 mmesamore@nationalboiler.com</p>	

‡ Denotes attendance at meeting April 2015

PERSONNEL SAFETY SUBCOMMITTEE

✚ Robert E. Zawistowski - Chairman

Power Specialists Assoc., Inc.
531 Main Street
Somers, CT 06071
(860) 763-3241, ext. 135

bob.zawistowski@psaengineering.com

<p>✚ Steve Bogart Weyerhaeuser 3401 Industrial Way P. O. Box 188 Longview, WA 98632 Tel: (360) 414-3337 steve.bogart@weyerhaeuser.com</p>	<p>Sam Dean – Vice Chairman Rayonier Advanced Materials 4470 Savannah Highway Jesup, GA 31545 Tel: (912) 427-5103 samuel.dean@rayonierAM.com</p>	<p>John Fredrickson Sappi Fine Paper NA 2201 Avenue B P.O. Box 511 Cloquet, MN 55720 Tel: (218) 878-4378 john.fredrickson@sappi.com</p>
<p>Robert Fry Northern Pulp P.O. Box 549, Station Main 260 Abercrombie Branch Road New Glasgow, NS B2H 5E8 Tel: (902) 752-8461, ext. 206 robert.fry@northernpulp.com</p>	<p>Ron Hess Global Risk Consultants 110 Cedar Cove Court Buckhead, GA 30625 Tel: (770) 490-4719 ronald.hess@globalriskconsultants.com</p>	<p>✚ Wes Hill Georgia-Pacific Corporation 410 NE Adams Street Camas, WA 98607 Tel: (360) 834-8434 wes.hill@gapac.com</p>
<p>✚ Daryl Hoffman FM Global Granite Park Two, 5700 Granite Parkway, Suite 700 Plano, TX 75024 Tel: (972) 731-1978 daryl.hoffman@fmglobal.com</p>	<p>✚ Jennifer Johnston Georgia-Pacific Corporation 133 Peachtree St., NE Atlanta, GA 30303 Tel: (404) 652-4632 jennifer.johnston@gapac.com</p>	<p>Louis Mangelli Diamond Power International, Inc. P.O. Box 40145 Baton Rouge, LA 70835-0145 Tel: (225) 907-8185 lmangelli@diamondpower.com</p>
<p>✚ Frank Navojosky International Paper Cincinnati Technology Cntr 6283 Tri-Ridge Blvd. Loveland OH 45140-7910 frank.navojosky@ipaper.com</p>	<p>✚ William Plappert, Jr Glatfelter 228 South Main Street Spring Grove, PA 17362 william.plappert@glatfelter.com</p>	<p>✚ Eric Schwartz Babcock & Wilcox Company 20 S. Van Buren Avenue Barberton, OH 44203-0351 Tel: (330) 860-1335 eschwartz@babcock.com</p>
<p>John Stelling Packaging Corporation of America N. 9090 County Road E. Tomahawk, WI 54487 Tel: (715) 453-2131, ext. 309 jstelling@packagingcorp.com</p>	<p>Brian Fiala - Alternate Packaging Corporation of America N. 9090 County Road E. Tomahawk, WI 54487 Tel: (715) 453-2131, ext. 551 bfiala@packagingcorp.com</p>	<p>Chris Suresh Domtar Paper Company, LLC 100 Clinchfield Street Kingsport, TN 37660 Tel: (423) 247-7111 Fax: (423) 247-2649 NEED UPDATED INFORMATION chris.suresh@domtar.com</p>
<p>Arthur G. Thomson Domtar Pulp & Paper Products, Inc. P.O. Box 800 2005 Mission Flats Road Kamloops, BC V2C 5M7 Tel: (250) 828-7372 art.thomson@domtar.com</p>	<p>David Von Oepen Rock-Tenn 28270 U.S. Highway 80 West Demopolis, AL 36732-5121 Tel: (334) 289-6315 dvonoepen@rocktenn.com</p>	

✚ Denotes attendance at meeting April 2015

SAFE FIRING OF BLACK LIQUOR SUBCOMMITTEE

‡Vernon Blackard - Chairman

International Paper
2895 79 Trail Rd.
Roy MT 59471
Cell: 251-284-3471

vernon.blackard@ipaper.com

<p>Clif Barreca Weyerhaeuser P. O. Box 1391 New Bern, NC 28563 Tel: 252-633-7696 clif.barreca@weyerhaeuser.com</p>	<p>‡Joe Bush Alstom Power 1119 Riverfront Parkway Chattanooga, TN 37402 Tel: 423-752-2931 Cell: 423-619-8123 joe.bush@power.alstom.com</p>	<p>Raul Das Buckeye Technologies One Buckeye Drive Perry, FL 32348 Tel: 850-584-1514 Cell: 850-672-2326 raul_das@bkitech.com raul_das@comcast.net</p>
<p>Mark Donahue Fossil Power Systems, Inc. 10 Mosher Drive Dartmouth, NS B3B 1N5, Canada Tel: 902-468-2743, Ext. 238 Cell: 902-468-2323 donahuem@fossil.ca</p>	<p>‡Len Erickson Power Specialist Assoc. 7744 West Paloma St. Boise, ID 83704-0701 Tel: 208-841-4246 len.erickson@PSAengineering.com</p>	<p>‡Daniel Franco Smurfit Kappa Columbia Calle 15 #18-109 Yumbo, Valle, Colombia Cel: +57 3113001079 Tel: (57-2) 6914 000 Ext. 2016 daniel.franco@smurfitkappa.com.cm</p>
<p>Tim Hicks Babcock & Wilcox 20 South Van Buren Avenue PO Box 351 Barberton, Ohio, 44203-0351 Tel: 330-860-2820 Cell: 330-730-7216 tehicks@babcock.com</p>	<p>Majed Ja'arah Verso Paper 6775 Lenox Center Court Suite 400 Memphis, TN 38115 Tel: 901-317-5589 majed.jaarah@versopaper.com</p>	<p>‡Guy Labonte FM Global 600 de la Gauchetiere Ouest, 14th Floor Montreal, Que H3B 4L8 Canada Tel: 514-876-7412 Cell: 514-942-3651 guy.labonte@fmglobal.com</p>
<p>‡Scott Moyer RockTenn 1660 Prudential Drive, Ste. 202 Jacksonville, FL 32207 Cell: 386-227-8991 smoyer@rocktenn.com</p>	<p>‡Doug Murch MeadWestvaco 501 South 5th Street Richmond VA 23219 Tel: 804-444-5245 Cell: 804-787-0781 douglas.murch@mwv.com</p>	<p>Bob Phelps Extra Hand, Plant Support Services 5440 Karma Road Chester, VA 23831 Ph. (804) 921-7374 Cell: 804-748-4391 robert.pheleps1@verison.net</p>
<p>‡Aaron Rose Georgia-Pacific 133 Peachtree St. NE P.O. Box 105605 Atlanta, GA 30348-5605 Tel: 404-652-2968 Cell: 770-596-7704 aaron.rose@gapac.com</p>	<p>Mark Sargent Consultant 857 Tall Trees Drive Cincinnati, OH 45245 Tel: 514-543-0480 msarge@yahoo.com</p>	<p>‡Alvaro Timotheo Andritz Pulp & Paper 5405 Windward Parkway, Ste.100W Alpharetta, GA 30004 Tel: 770-640-2642 Cell: 770-630-4577 alvaro.timotheo@andritz.com</p>
<p>Thomas Wranosky International Paper 568 Shore Airport Road Ticonderoga, NY 12883-9699 Tel: 518-585-5305 tom.wranosky@ipaper.com</p>		

‡ Denotes attendance at meeting April 2015

WASTE STREAMS SUBCOMMITTEE

‡Paul Seefeld

A.H. Lundberg Associates Inc.
6174 Kissengen Springs Ct.
Jacksonville, FL 32258
Tel: 904-614-6492

paul.seefeld@lundberg-us.com

<p>‡Mark E. Cooper FM Global 550Birmard St., Ste. 1788 Bentall 5 Vancouver, BC V6C2B5 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 Office: 334-963-2362 Cell: 541-285-1867 wendy.coyle@ipaper.com ‡Substitute: Richard Waters</p>	<p>‡David Frazier International Paper 3819 Blue Springs Trace Evans, GA 30809 Tel: 706-210-3470 Cell: 706-305-5321 david.frazier@ipaper.com</p>
<p>Michael Glasheen Expera Specialty Solutions prev. d/b/a Thilmany Kaukauna, WI michael.glasheen@experaspecialty.com</p>	<p>Meville Hedges Babcock & Wilcox 2302 Parklake Drive, NE Suite 300 Atlanta, GA 30345 Tel: 770-621-3907 mhedges@babcock.com</p>	<p>Olli Kujanpaa Andritz 10745 Westside Parkway Alpharetta, GA 30004 Tel: 770-640-2571 olli.kujanpaa@andritz.com</p>
<p>‡John Lewis Fluor Daniel Forest Products 100 Fluor Daniel Drive Greenville, SC 29607-2762 Tel: 864-517-1683 john.lewis@fluor.com</p>	<p>‡Steven L. Osborne Babcock & Wilcox 20 S. Van Buren Avenue Barberton, OH 44203 Tel: 330-860-1686 slosborne@babcock.com</p>	<p>John Rickard Jacobs Engineering P. O. Box 5456 Greenville, SC 29606 Tel: 864 676-6393 john.richard@jacobs.com</p>
<p>‡Bentley Sherlock Georgia Pacific Corp. Atlanta, GA Tel: 404-652-4608 Cell: 404-884-4872 bentley.sherlock@gapac.com</p>	<p>‡Michael D. Sides XL GAPS 1360 Olympia Park Circle Ocoee, FL 34761 Tel: 407-656-4275 Mobile: 407-462-4622 michael.sides@xlgroup.com</p>	<p>Thomas Gray Weyerhaeuser Address: City/State Zip Tel: ????????????@weyerhaeuser.com</p>
<p>John Veltre Chartis 2565 Mohawk Trail Acworth, GA 30102 Tel: 678-347-5406 john.veltre@chartis.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 arie.verloop@jansenboiler.com</p>	

‡ Denotes attendance at March 30, 2015 meeting.

WATER TREATMENT SUBCOMMITTEE**‡Tom Przybylski (NEW)**

Power Specialists Assoc., Inc.
 531 Main Street, Somers, CT 06071
 Tel: 860.763.3241
 Fax: 860.763.3608
tom.przybylski@psaengineering.com

‡Craig Aderman Sappi Fine Paper NA 89 Cumberland Street P.O. Box 5000 Westbrook, ME 04098-1597 Tel: 207-856-3517 Cell: 207-831-2472 craig.aderman@sappi.com	Robert Bartholomew, P.E. Sheppard T. Powell Associates, LLC 1915 Aliceanna Street Baltimore, MD 21231 Voice: 410-327-3500 rdb@stpa.com	‡Kelli Bastarache Power Specialists Assoc., Inc. 531 Main Street Somers, CT 06071 Tel: 860-763-3241 kelli.bastarache@psaengineering.com
‡Wayne Bucher NORAM Engineering Birmingham, AL Tel: 205-408-1874 Cell: 205-368-9396 wayne.bucher@gmail.com	‡Fred Call Buckman North America 1256 North McLean Blvd. Memphis, TN 38108-1241 Tel: 207-214-8357 fccall@buckman.com	‡Susan Childress IP Technology Power Mfg. Solutions 5870 Anderson Road Grovetown, GA 30813 Tel: 706-339-1631 susan.childress@ipaper.com
‡Frank DeStefano The Purolite Company 500 Locust Grove Spartanburg, SC 29303 Cell: 864-617-0881 fdestefano@puroliteusa.com	Buck Dunton ChemTreat, Inc. 4301 Dominion Blvd. Glen Allen, VA 23060 Tel: 804-935-2000 buckd@chemtreat.com	Don Flach Georgia-Pacific Corporation 133 Peachtree Street Atlanta, GA 30303 Tel: 386-336-5584 don.flach@gapac.com
Claude Gauthier, P.E. The Purolite Company P.O. Box 308, Paris, Ontario Canada N3L 3G2 Tel: 800-461-1500 Tel: 519-448-4512 cgauthier@puroliteUSA.com	‡John Gray Rayonier Advanced Materials 10 Gum Street Fernandina Beach, FL 32034 Tel: 912-277-1388 Cell: 912-321-7582 john.p.gray@rayonieram.com	‡Ken Hansen Babcock & Wilcox Company 20 South Van Buren Avenue Barberton, OH 44203 Tel: 330-860-6443 kehansen@babcock.com
Steve Hoefs Nalco Company 1601 W. Diehl Road Naperville, IL 60563-1198 Tel: 630-305-1461 Cell: 262-313-8036 shoefs@nalco.com	‡Norris Johnston Solenis LLC 37 Hough Road Lacey's Spring, AL 35754 Tel: 256-650-0049 Cell: 256-520-1011 njohnston@ashland.com	‡Dave Kittel Valmet, Inc. 3430 Toringdon Way, Ste. 201 Charlotte, NC 28277 Tel: 704-414-3434 Cell: 704-614-0492 dave.kittel@valmet.com

‡ Denotes attendance at meeting April 2015

WATER TREATMENT SUBCOMMITTEE - (Cont.)

<p>‡Sam Lewis Delta Training Partners, Inc. 4020 Oleander Drive Wilmington, NC 28403 Tel: 910-790-1988 slewis@deltatraining.com</p>	<p>Michael Lykins Packaging Corporation of America 1061 Woodcliff Drive South Elgin, IL 60177 Cell: 630-659-7115 mlykins@packagingcorp.com</p>	<p>Tom Madersky Power Specialists Assoc., Inc. 531 Main Street Somers, CT 06071 Tel: 860-763-3241 tom.madersky@psaengineering.com</p>
<p>‡Jason Miller Andritz Inc. 1115 Northmeadow Parkway Roswell, GA 30076-3857 Tel: 770-640-2528 Cell: 770-335-8529 jason.miller@andritz.com</p>	<p>‡Mitch Morgan Nalco Company 1601 W. Diehl Road Naperville, IL 60563-1198 Tel: 630-305-1000 jmorgan@nalco.com</p>	<p>Rick Morgan FM Global 5700 Granite Pkwy. Plano, TX 75024 Tel: 972-731-1869 rick.morgan@fmglobal.com</p>
<p>Kurt Parks Packaging Corporation of America 5495 Lake Park-Clyattville Road Valdosta, GA 31601 Tel: 229-559-2257 Cell: 229-415-8557 kparks@packagingcorp.com</p>	<p>Jim Robinson GE (Infra, Water) 4636 Somerton Rd. Trevose, PA 19053 Tel: 215-942-3381 james.robinson@ge.com</p>	<p>Alarick Tavares Georgia-Pacific Corporation 133 Peachtree Street Atlanta, GA 30303 Tel: 404-652-4000 ajtavare@gapac.com</p>

‡ Denotes attendance at meeting April 2015

Registered for the meeting were:

3S TEAM

Fudge, Joey, Skiatook, OK
Jones, Mickey, Skiatook, OK
Pyszynski, George, Skiatook, OK

A.H. Lundberg Associates

Seefeld, Paul, Jacksonville, FL
Wass, Greg, Bellevue, WA

Acuren

Anderson, Brian, La Porte, TX
Griffin, Timothy, Neenah, WI

AF&PA

Grant, Tom, Yonkers, NY

AIG

DeBeer, Thomas, Woodstock, GA
Laulumaa, Kimmo, Stockholm, Sweden

AirTek Construction

Baines, Troy, Troy, AL
Moore, Ronnie, Troy, AL

Alstom Power

Bush, Joe, Chattanooga, TN
Harmon, John, Windsor, CT
Hollenbach, Dennis, Windsor, CT
Kistka, Gerry, Jacksonville, FL
Rushing, Mike, Monticello, MS

AMEC Foster Wheeler

Wasson, Eric, Charlotte, NC

Andritz

Frykmo, Christer, Palmetto, FL
Gazsi, Andrew, Enfield, CT
Imig, Greg, Alpharetta, GA
LeBel, Mark, Alpharetta, GA
Merriman, Nick, Graz, Styria, Austria
Miikkulainen, Pasi, Kotka, Finland
Watson, David, Alpharetta, GA

Arcole Power, LLC

Vernes, Phil, Cheyenne, WY

Atlantic Combustion Tech.

Digdon, David, Amherst, NS, Canada

AZZ/SMS

Power, Stacy, St. Petersburg, SC

AZZ/WSI

Li, Bingtao, Norcross, GA

Babcock & Wilcox

Blazer, Phil, Charlotte, NC
Franks, Ralph, Atlanta, GA
Hansen, Kenneth, Barberton, OH
Hardman, Colin, Atlanta, GA
Kulig, John, Barberton, OH
LeClair, Amber, Barberton, OH
Leibel, Greg, Charlotte, NC
Nischt, Walter, Barberton, OH
Osborne, Steve, Barberton, OH
Phinney, Michael, Fordland, MO
Schwartz, Eric, Barberton, OH

Beecher Carlson

Eaves, Dennis, Berkeley Lake, GA

Boiler Island Air Systems

MacCallum, Colin, West Vancouver, BC,
Canada

Buckman Laboratories

Amsden, Bill, Pollock, LA
Call, Fred, Newry, ME
Hoelscher, Jerry, Memphis, TN
Wolfanger, David, Memphis, TN

Chalmers & Kubeck

Daniel, Earl, Watkinville, GA

Charles Higginbotham, PE, LLC

Higginbotham, Charles, Saint Simons Island,
GA

ChemTreat

Graham, Jim, Collierville, TN

Registered for the meeting were:

Chicago Tube & Iron

Morgan, Preston, Locust, NC

Clearwater Paper

Dinnell, Jesse, Lewiston, ID
Manyon, John, Lewiston, ID

Combustion Components Assoc.

Schindler, Nathan, Monroe, CT

Delta Training Partners

Lewis, Sam, Wilmington, NC

Diamond Power

Youssef, Simon, Lancaster, OH

Domtar

Avery, David, Bennettsville, SC
Dunn, Jonathan, Plymouth, NC
Sneed, Brandon, Kingsport, TN
Worsham, Jesse, Bennettsville, SC

Electron Machine Corp., The

Osborne, Brad, Umatilla, FL
Vossberg, C. A., Umatilla, FL

ESP Secretary

Clay, Dean, Milford, OH

Expera Specialty Solutions

Belongea, Jeff, Kaukauna, WI
Krupp, Brandon, Kaukauna, WI
Markrof, Scott, Mosinee, WI
McCarty, Matthew, Kaukauna, WI
Osterberg, Jeff, Mosinee, WI

Fluor

Lewis, John, Greenville, SC

FM Global

Baro, Joachim, Hagen, Germany
Chambers, Jeff, Fairhope, AL
Cooke, Craig, Oconomowoc, WI
Cooper, Mark, Woodinville, WA
Crysel, Scott, Plano, TX

FM Global (Cont.)

Hoffman, Daryl, Kirkland, WA
Huelsbeck, Kevin, Sherwood, WI
Hume, Everett, Norwood, MA
Labonté, Guy, Montreal, Que.
Matarrese, Rick, Alpharetta, GA
Morgan, Rick, Plano, TX
Onstead, Jimmy, Plano, TX
Paine, Matt, Norwood, MA
Robinson, Phillip, Alpharetta, GA

George H. Bodman, Inc.

Bayse, Michael, Kingwood, TX
Bodman, George, Kingwood, TX
Holland, Brook, Kingwood, TX

Georgia-Pacific

Daily, Christopher, Atlanta, GA
Guerrero, Alexander, Cedar Springs, GA
Hill, Wes, Camas, WA
Johnston, Jennifer, Atlanta, GA
Morency, Karl, Atlanta, GA
Pease, Bruce, Zachary, LA
Rose, Aaron, Cumming, GA
Sherlock, Bentley, Atlanta, GA

Glatfelter

Chaney, Kevin, Chillicothe, OH
Free, Roger, Chillicothe, OH
Plappert, William, Spring Grove, PA

Global Risk Consultants

Garfield, Michael, Lowell, ME
Smith, Andy, Woodstock, GA

GP Cellulose, LLC

Lane, Terry, Brunswick, GA
Lentz, Gregg, Brunswick, GA
Meadows, Tom, Brunswick, GA
Miller, Keith, Brunswick, GA

Greif

Godsey, Mike, Amherst, VA
Navarre, Terry, Amherst, VA
Schrock, Eric, Amherst, VA

Registered for the meeting were:

Harmac Pacific

Jellema, Marinus, Nanaimo, BC

Houghton Cascade

Leary, Ray, Auburn, WA

Hydrovac Industrial Services

Phillips, Tony, Columbus, MS

International Paper

Blackard, Vernon, Loveland, OH
Childress, Susan, Loveland, OH
Frazier, David, Loveland, OH
Fuhrmann, Dave, Loveland, OH
Kiper, Mike, Loveland, OH
MacIntire, Wayne, Loveland, OH
Navojosky, Frank, Loveland, OH
Wranosky, Tom, Ticonderoga, NY

Irving Pulp & Paper

Glenn, Matthew, Saint John, NB, Canada
Lyttle, Orry, Saint John, NB, Canada
Mott, Dennis, Saint John, NB, Canada

Jacobs Engineering

Hunter, Apryl, Greenville, SC

Jansen Combustion & Boiler Technologies

La Fond, John, Kirkland, WA
Verloop, Arie, Kirkland, WA

Kapstone

Hansford, Monte, Charleston, SC
Jones, William, Charleston, SC
Murray, Benjamin, Longview, WA
Sinsel, Brian, Longview, WA
Smith, Tim, Longview, WA

K-Patents

Betts, Herb, Naperville, IL
Hamalainen, Arto, Naperville, IL
Pyorala, Keijo, Naperville, IL

Lewis B. Bringman LLC

Bringman, Lewis, Baltimore, MD

Liquid Solids Control

Vandenburg, Gordon, Upton, MA

Marsh & McLennan

Weisenberg, Dale, Calgary, Alberta, Canada

MeadWestvaco

Andrews, John, Charleston, SC
Jones, Jesse, Covington, VA
Krepps, William, Richmond, VA
Murch, Douglas, Richmond, VA
Sanders, Doug, Phenix City, AL
Shirley, Wade, Phenix City, AL

Mondi Swiecie S.A.

Taylor, Jim, Pine Bluff, AR
Thein, Johnny, Pine Bluff, AR

MPW Industrial Services

Elam, Monty, Hebron, OH
Houseal, Bradford, Hebron, OH
Kaiser, Brent, Hebron, OH

Nalco

Morgan, J. Mitch, Naperville, IL

National Boiler Service

Harville, Steve, Trenton, GA
Mesamore, Mike, Trenton, GA

Nautilus Loss Control

Jackson, Christopher, Fox Island, WA

NORAM Engineering

Bucher, Wayne, Birmingham, AL

Northern Pulp Nova Scotia

Chiasson, Mike, Pictou, New Glasgow NS,
Canada
MacLeod, Kevin, New Glasgow, NS, Canada

Registered for the meeting were:

Phoenix Pulp & Paper

Chompoowisate, Putta, Bangkok, Thailand

Power Specialists

Bastarache, Kelli, Somers, CT
Erickson, Leonard, Somers, CT
Henriques, Fabian, Somers, CT
Lukezich, Steve, Somers, CT
Madersky, Lee Anne, Somers, CT
Madersky, Tom, Somers, CT
Przybylski, Tom, Somers, CT
Zawistowski, Bob, Somers, CT

Process Barron

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

Purolite

Destefano, Frank, Bala Cynwyd, PA
Downey, Don, Bala Cynwyd, PA
Klimek, Joe, Bala Cynwyd, PA

Rayonier

Gray, John, Fernandina Beach, FL
Porter, Daniel, Fernandina Beach, FL

Rick Spangler, Inc.

Spangler, Rick, St. Simons Island, GA

RMR Mechanical

Roy, Bob, Cumming, GA

Robins & Morton

Lawton, Roger, Alpharetta, GA

RockTenn

Campbell, Walter, West Point, VA
Martin, Bruce, Tacoma, WA
Mitchell, Ken, Fernandina Beach, FL
Morgan, Fred, Fernandina Beach, FL
Moyer, Scott, Jacksonville, FL
Walker, Sayed, Fernandina Beach, FL

Rocky Mountain Industrial Service

Cassel, Ray, Denver, CO
Kupka, Benjamin, Morrystown, PA

SAPPI

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

Siam Cellulose

Nanta, Jaturong, Bangkok, Thailand

Smurfit Kappa

Cruz, Cristian David, Calli, Columbia

Solenis

Baxter, Robert, Wilmington, DE
Durham, Virginia, Wilmington, DE
Hollimon, Lee, Pensacola, FL
Johnston, Norris, Lacey's Spring, AL
Matheson, Ken, Quispamsis, NB
Meredeth, Jim, Gulf Breeze, FL

Southern Environmental

Harris, Don, Pensacola, FL

Thompson Industrial Services

Gotberg, Doug, Sumter, SC
Jackson, Dwayne, Sumter, SC
Jackson, Jimmy, Sumter, SC
Wise, Carl, Sumter, SC

Valmet

Burelle, Raymond, Charlotte, NC
Conley, Clark, Charlotte, NC
Cross, Tom, Charlotte, NC
Farmer, Robert, Charlotte, NC
Kittel, David, Charlotte, NC
Martin, James, Charlotte, NC
Morrison, Dan, Charlotte, NC
Scruggs, Jeff, Charlotte, NC
Simms, James, Charlotte, NC
Ulrich, Jim, Charlotte, NC
Weikmann, John, Charlotte, NC

Registered for the meeting were:

Weyerhaeuser

- Bland, Ashley, Port Wentworth, GA
- Bogart, Steven, Longview, WA
- Drummond, Zermon, Columbus, MS
- Gary, Carl, Columbus, MS
- Knowlen, Bruce, Federal Way, WA
- Slagel, David, Port Wentworth, GA
- Wright, Chris, Port Wentworth, GA

XL GAPS

- Goddard, Robert, Tupelo, MS
- Franks, James, Somerville, TN
- Sides, Michael, Ocoee, FL

Zeeco

- Langstine, Bob, Lawrenceville, GA

MAIN COMMITTEE MEETING

INTRODUCTION – John Gray - Chairman (NEW): Welcome to the spring 2015 BLRBAC Main Committee Meeting. Thank you all for sticking around here through Wednesday morning. The Main Committee Meeting is now open.

This meeting, as are all of our BLRBAC meetings, is being held in strict compliance with BLRBAC's Anti-Trust Policy. Discussions involving price and pricing policy are prohibited. This session marks the beginning of a two year term for a new slate of Executive Committee Officers. I'm John Gray, Rayonier Advanced Materials, incoming Chairman; David Slagel, Weyerhaeuser, Vice Chairman; John Phillips, Andritz, Manufacturer Representative; Jimmy Onstead, FM Global, Insurance Representative and Everett Hume, FM Global, Secretary. Not with us today is the continuing Treasurer, Len Olavessen, LENRO, Inc. and David VonOepen of RockTenn, Operating Representative.

OLD BUSINESS

ACCEPTANCE OF THE FALL 2014 MEETING MINUTES – John Gray

The Meeting Minutes from the Fall 2014 meeting were posted on the BLRBAC WEB site for review. Does anyone have any comment or corrections? Can I get a motion to accept those Minutes? Can I get a second? All in favor? All opposed? Thank you. The Fall 2014 Meeting Minutes have been unanimously approved.

Do we have any other old business that anyone would like to discuss? Moving on.

NEW BUSINESS

1. NEW MEMBERS/REPRESENTATIVE CHANGES REPORT – Everett Hume

NEW REGULAR MEMBERSHIP - None Reported

NEW ASSOCIATE MEMBERSHIPS

Beecher Carlson - Atlanta, GA - Insurance Brokerage

Mark Mirek has been designated as the Associate Representative

Dennis Eaves has been designated as the Alternate Associate Representative

Enviro Vac - Savannah, GA - Industrial Cleaning Company

Fred Bishop has been designated as the Associate Representative

Tony Phillips has been designated as the Alternate Associate Representative

Harbison Walker International - Moon Township, PA - Refractory Supplier

Chris Hersh has been designated as the Associate Representative

John Bortner has been designated as the Alternate Associate Representative

1. **NEW MEMBERS/REPRESENTATIVE CHANGES REPORT – (Cont.)**
NEW ASSOCIATE MEMBERSHIPS - (Cont.)

MPW Industrial Services - Hebron, OH - Boiler Cleaning Services Company
Michael Sokol has been designated as the Associate Representative
Angela Rolfe has been designated as the Alternate Associate Representative

Robins & Morton - Birmingham, AL - Engineering and Construction Services
Roger Lawton has been designated as the Associate Representative
Arnold Farr has been designated as the Alternate Associate Representative

NEW CORRESPONDING MEMBERSHIPS – None Reported

REGULAR REPRESENTATIVE CHANGES – None Reported

ASSOCIATE REPRESENTATIVE CHANGES

Fuel Tech

Chris Smyrniotis remains the designated Associate Representative
Scott Bohlen replaced Zach Chapman as Alternate Associate Representative

Team Industrial Services

Glen Dragano replaced Mike Leonard as Associate Representative
Donell Davis replaced Shawn O'Connor as Alternate Associate Representative

CORRESPONDING MEMBERSHIP CHANGES - None Reported

MEMBERSHIP COMPANY NAME CHANGES

Rayonier Advance Materials

Rayonier has officially changed to Rayonier Advance Materials

MEMBERSHIP COMPANY STATUS CHANGES - None Reported

{Secretary's Note: The Company Membership List posted on the BLRBAC website may be out of date and 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 – John Gray**

The Executive Committee met Tuesday afternoon in closed session with five members present. We approved and accepted the above mentioned five companies as new Associate members. Additionally the proposed changes to the Personnel Safety Committee Guidelines were reviewed, including the changes suggested by membership during Bob Zawistowski's presentation yesterday afternoon.

3. **TREASURER'S REPORT** – John Gray for Len Olavessen

In the absence of Len Olavessen, I'll present the Treasurer's Report:

For the Spring 2015 Session we had:

- 193 Advance Registrations
- 31 At Door
- 20 Paper Companies
- 4 Insurance Companies
- 4 Boiler Manufacturers
- 27 Associate Member Companies
- 5 Guests of Member Companies

We had a total of eight individuals in attendance from outside North America. The countries represented were Colombia, Thailand, Austria, France, Germany and Sweden. Welcome to all of you! Thank you for attending.

Looking briefly at the 2015 budget we presented and approved during the 2014 Fall Session that was \$68,100.00. We are currently tracking essentially on that budget. The budget was developed assuming registration fees from an average of about 240 attendees per session. That was based on historical data over the last four years. For this session we had 224 paid attendees, but we expected attendance for the spring would be a little less than in the fall.

On January 1st we had a checking account surplus balance of \$66,202.00. After taking in the receipts from this meeting, the current balance stands at just over \$90,000.00. Looking at the projected expenses for the year which include primarily hotel costs, audio/visual and secretarial services, should bring the yearend account balance back down to the \$65,000.00 to \$66,000.00 range. So, all in all, it looks like we are tracking pretty much right along the budget outline. Len will give us more definite details when he gets back to us in the fall. Any questions on the budget?

4. **SECRETARY'S REPORT** – Everett Hume

As you know I'm new, so expect some issues that could come up. I do expect that there will be some changes from the previous way of getting things posted as when you will see them on line, time frames, etc. Just bear with me as I'm trying to become accustomed as to how the Website works and how the documents get fed through me and then get posted. Hopefully, you will enjoy the changes that you will see forthcoming in the next couple years.

Our Secretarial Services, Barbara, wanted me to make sure all of you know that when you send in your Advance Registration request that if you do not get an e-mail back from her confirming that you have indeed been registered, please check with her before the meeting (**write: fhholich@aol.com or call: 630-640-1805**). Also be sure to include the word "BLRBAC" in your subject line of any and all e-mail correspondence. Or else she will not open them up! She sends an e-mail out to the e-mail address listed on your registration forms indicating that she has received a check, that she has registered you and gives you a registration number.

SECRETARY'S REPORT – (Cont.)

There seems to be some confusion sometimes with people coming in and saying, "Well I registered". We say, "Did you get an e-mail confirming that?" "No!" So make sure you do that because it's two weeks prior to the meeting and you know you submitted something to Barbara for pre-registration and have not received confirmation, get in touch with her and say, "Did you get it?" Just so it can be checked into and cleared up.

Also there is a cut-off point as far as when the list of attendees is prepared. About two weeks before the meeting she cuts off that list because she has to prepare the documents, lunch tickets, badges and they are shipped to Atlanta one week prior to the meeting to guarantee arrival. That is why some of your advanced registered names may not show up on the Attendees List. That is because she has reached the cut-off date, but you do get recorded in the system and will appear in the published Meeting Minutes Attendee List.

Also she will often receive checks from a company for multiple people, but no Registration Form is enclosed. So make sure that you have a completed Registration Form enclosed with all company checks as she can't register somebody if she doesn't have their name. Conversely, she received completed Registration Forms, but no checks! With the Advance Registration cheaper than the At Door Registrations, sometimes that also causes some confusion. Legibly write out your Registration Form and see that it is included with the company/personal check covering who it is for. That will greatly help her out.

In some cases she gets names that are 28 characters long, supercalifragilisticexpialidocious, well they don't fit on the name tag. Sometimes she ends up putting something that looks like it should be right, so if there are questions on that, just make sure you check with Frank when you check-in and if it doesn't look like what you intended to have on your name tag, if possible he can get it corrected.

Any data you share with her regarding phone numbers or e-mail addresses don't go to anyone else except Barbara and the Executive Committee members. It will never get distributed anywhere and is not publically accessible. You don't have to worry about all of a sudden getting e-mails from Cabalas, Bass Pro Shop, or something like that.

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.

4. SECRETARY'S REPORT – (Cont.)

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.

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. Sometimes e-mails pop back as "undeliverable." This may be due to the fact that the e-mail box is full, incorrectly typed due to not being able to decipher attendee handwriting, etc. I will do my best to see that all e-mails are properly received at the posted e-mail address.

All Advance Registration attendees are recorded, given a registration number and sent a confirmation e-mail on the same day checks are received. This notification is sent to the e-mail address listed on the Registration Form. **If you have not received a confirmation notification from me, you are not registered for BLRBAC! 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.**

Finally, if you know from past experience that your Accounting Department takes weeks to issue a requested check for registration purposes, just send me your completed Registration Form and a personal check before the posted cut-off date. Then you can get reimbursed from your company at a later date. This will guarantee you are registered at the Advance registration fee. There are no exceptions when paying after the cut-off date, your organization will be required to pay the higher At Door fee.

5. SUBCOMMITTEE REPORTS

5.1 AUXILIARY FUEL REPORT – Bruce Knowlen

The subcommittee meeting opened at 1:10 PM on March 30, 2015. It began with a reminder of the BLRBAC Anti-Trust Policy. The minutes from the Fall 2014 meeting were also read and unanimously approved by all members present.

Introductions were then made of all in attendance. Two new members were voted in, Nathan Schindler, and Brook Holland. Attendance was: Seven of 11 members and 17 guests.

5. **SUBCOMMITTEE REPORTS – (Cont.)**

5.1 **AUXILIARY FUEL REPORT – (Cont.)**

A call for any new business was made. None was brought forward. The agenda resumed with existing business.

The term **Managed System** was discussed to draft a definition. The following was agreed upon by the subcommittee:

A documented procedure which includes a checklist of critical manual valves or devices that is completed by the operator prior to start-up and as needed throughout the operation. The checklist shall identify each valve or device and the proper position, condition, or state. Any deviation from the checklist shall be controlled and documented through a jumper policy.

Another item of old business was the continuing discussion on NFPA-85 regarding extent of furnace purge and precipitator de-energization. The subcommittee approved a revision to the text for Section 4.1 as follows:

During the boiler purge cycle, all air path components to the boiler enclosure (including, but not limited to, all air supply ducts and air heaters) and all flue gas path components from the boiler enclosure to the stack inlet (including, but not limited to, air heaters, flue gas ducts and precipitators) shall be purged. Direct fired air heaters shall not be fired during the purge cycle.

Noting that the precipitator can be an ignition source, the subcommittee approved the following:

An electrostatic precipitator should be de-energized if there is a **Loss of ID Fan(s)** – or – if Air Flow falls **below 30% MCR**. The precipitator power can be restored on completion of furnace purge.

The subcommittee determined a 2015 Fall Meeting of Aux Fuel will be planned.

That was the extent of the work within our group. It was a lively discussion. We do welcome more people to join our group. We have a fairly good discussion going on of significant topics. As I said before we welcome new topics and would like more people to join in. Are there any questions on this text?

Colin MacCallum - Boiler Island Air Systems: You mentioned something about the flow through the precipitator and you said 30% of the air flow. Did you mean 30% of the flue gas flow?

Bruce Knowlen: 30% of MCR air flow is what we have established as a base level. If you fall below that, that is a trip for the fuel system. The loss of air or the loss of flow below that level is what we would consider a need for de-energizing the precipitator.

5. **SUBCOMMITTEE REPORTS – (Cont.)**

5.1 **AUXILIARY FUEL REPORT – (Cont.)**

Colin MacCallum - Boiler Island Air Systems: So what you are saying is that the flu gas flow was related to the combustion gas flow; therefore, you were happy with that.

Bruce Knowlen: Correct.

5.2 **SAFE FIRING OF BLACK LIQUOR REPORT – Vernon Blackard**

Our revised document approved by voting members in Fall 2014 main committee meeting. Need to revise changes into document (remove red line changes and move changes to comments section).

Reviewed BLRBAC Anti Trust statement. Both closed and open meeting.

Introduced members and guests. Nine of 16 members present and 37 guests in open meeting.

Members present and address changes in Appendix 1.

Reviewed and approved the Fall 2014 meeting minutes.

Review any open items brought up to the Subcommittee before the Spring 2015 Meeting.

- Emulsion cooled liquor guns proposed language change and review of system if needed. Ch. 13 Item 9. Proposed language from Mark Sargent and Len Erickson.

Len to reword our document after discussion in closed meeting. Andritz provided presentation again in open meeting to show technology.

- David Slagel question answers:

Confirmed Sootblower spool piece for lower furnace water wash permissive is needed. Black liquor header recirculation valves should be part of the managed system. Valve position monitored in operation.

- Common definition discussion status.

Continue review with Subcommittees as needed. Obtained new “managed system” definition from Aux Fuel subcommittee that will be reviewed before next meeting.

- Refract wording proposal from Instrumentation Subcommittee.

5. **SUBCOMMITTEE REPORTS – (Cont.)**

5.2 **SAFE FIRING OF BLACK LIQUOR REPORT – (Cont.)**

Agree with wording changes proposed. We will introduce on next document revision for a vote by our committee.

- Discussion with Dave Bordeau on SFBL RGP document proposed changes.

Agree with additional alarms listed and figure updates. Will revise document for proposed changes and possible vote by our subcommittee.

- Open item discussion from members and guests.

Rick Spangler to provide Len Erickson information for smelt flow restrictors for spouts.

Reviewed Dissolving tank incident from RockTenn by Scott Moyer. Review with ESP Subcommittee to follow next BLRBAC meeting. Feb 24, 2015 incident date. Two dissolving tank CE unit at Panama City Mill. Several follow up items received from Scott for us to update our document.

Continue review to document as related to AFPA documents on Dissolving Tank Explosions. Mark Sargent status on items to consider from AFPA. DT sketch review. Possible revision to DT explosion relief – CH 10.2 item 8. W

We continued discussion on items working at AFPA and our possible ways to assist with our document.

5.3 **ESP SUBCOMMITTEE REPORT – John Andrews**

(Also see *Appendix A* – Incident List)

The ESP Subcommittee met in closed session on Monday March 30, 2015 with 13 of 13 members represented. Dean Clay assumed the duties as the ESP Subcommittee Secretary to replace Jules Gommi who retired after last meeting. Rinus Jellema was also welcomed as the Subcommittee representative from Western Canada BLRBAC. The Subcommittee met in open session on Tuesday morning October 7th, 2014 with 13 members represented and about 165 guests.

During the open session, the Subcommittee reviewed 31 incident reports from North America and no International Incidents. Of the 31 incidents, there were no Smelt Water Explosions reported. An incident report for a Dissolving Tank Explosion was received after the cut off for inclusion in the Spring Meeting. The report was reviewed during the Operating Problems Session and will be included in the official report at the Fall Meeting. Fifteen (15) of the reported leaks were classified as critical incidents and 17 were non-critical incidents. There were two Smelt Spout Leaks reported. An Emergency Shutdown Procedure (ESP) was performed in 7 of the incidents including 6 of the critical incidents representing 67% of the critical incidents that should have been ESP'd. There six leaks classified as critical that were found on a hydrostatic test or during an outage so an ESP was not necessary in those cases.

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

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

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

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

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 circles are the non-critical incidents and the red circles indicate the location of the critical incidents. The two green dots are for the Spout Leaks.

The leaks locations are summarized as follows:

- 7 – Economizer
- 3 – Superheater
- 2 – Screen
- 5 – Upper Furnace
- 4 – Boiler Bank
- 5 – Lower Furnace
- 5 – Penthouse
- 1 – Lower Vestibule
- 2 – Smelt Spout Leaks

5. **SUBCOMMITTEE REPORTS – (Cont.)**

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

Leaks by Boiler Type

The leaks by the number of drums and the back end arrangement were reviewed. There were 7 incidents reported in a single drum unit and 24 incidents reported in two drum units.

Three of the reported incidents were in boilers with Cascade Evaporators and 5 of the units had Cyclone Evaporators. Thirty one of the incidents involved units with extended economizers. This represents a smaller percentage of DCE units than prior meetings.

Leak Cause

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

- 4 – Thermal or Mechanical Fatigue
- 8 - Weld Failure
- 8 - Erosion or Corrosion Thinning
- 2 - Mechanical Damage
- 8 - Stress Assisted Corrosion or Stress Corrosion Cracking
- 2 - Overheat
- 2 –Unknown

How Discovered

Operator observations during boiler walkdowns continue to be the prevalent method of detecting leaks and accounted for identification of 21 of the leaks (62%) and shows that operators are continuing to be diligent in looking for leaks. One of the leaks (3%) was identified by indications in the control room and two leaks (6%) were indicated by a unit trip. Only one leak (3%) was initially indicated by the leak detection system installed. Nine leaks (26%) were found during a hydrostatic test during an outage.

Leak detection systems were reported to be installed on units in 19 of the incidents (61%). The leak detection systems were credited with providing the initial indication of 1 leak and confirmed 2 additional leaks.

One of the things the committee has been looking at is the time from initial indication of the leak to the time the ESP was initiated. The incidents that provided enough information showed that the time between initial indication of the leak and the initiation of the ESP ranged from less than 1 minute to 10:15 hours. The incident that took over 10 hours to initiate an ESP was for an overheat small rupture of a screen tube which has been shown to be the leak type most prone for a smelt water explosion so that was a close call! The median time to initiate the ESP was about 33 minutes which is about the same as previous years.

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

Incident Review

Figure 2 shows the critical incidents reported each year. The bar for 2015 just represents the leaks reported in the Spring Meeting. Figure 3 shows the history of Recovery Boiler Explosions showing the smelt water explosion reported last year and the one from 2012.

Figure 4 shows the effect of the smelt water explosions reported in the last couple of years on the five year rolling average which is up to 0.4 indicating two explosions in a five year period. Hopefully in another few years we can get back down to zero!

Figure 5 shows the history of reported dissolving tank explosions showing that we may be making some progress in reducing the incidents although it does not include the incident that came in after the cut off for this meeting. It will be included in the report next meeting. Following the recommendations from Section 10 of the Safe Firing of Black Liquor document would prevent many of the reported dissolving tank incidents that have occurred in the past.

Figure 6 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 has leveled off at 0.49 explosions per 100 boiler operating years due to the explosions in the last couple of years, but the total explosions, which includes all boiler explosions and dissolving tank explosions, remained under 0.9 explosions per 100 boiler years. 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 have accumulated over 18,000 total recovery boiler operating years in the BLRBAC data base for North America and have recorded 88 smelt water explosions. We all need to continue to get those trends going back down.

List of Operating Boilers

The BLRBAC Boilers in Service Database currently has 196 active recovery boilers listed, 153 in the US and 43 in Canada. In the US, the average age is 37.8 years and the oldest is 63 years. The average age in Canada is 38.6 years and the oldest boiler is 77 years which is a 1938 B&W unit at Cascades Paper.

The list is available on the BLRBAC web site. We urge you to look over the list and if there are any changes or corrections, contact Dean Clay.

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

Learnings

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

- Do not turn water back on to an isolated smelt spout! Once it has been isolated, it has most likely been further damaged and restoring water flow can result in a smelt water reaction.
- Review procedures for refractory removal with contractors to minimize potential damage to tubes. Consider hydroblasting rather than using air hammers.
- If you find issues with craftsman’s work such as bad welds or tube damage, inspect their previous work for similar damage.
- Consider orifice for sootblower condensate drains rather traps due to reliability concerns with traps. Need to get the condensate out to prevent erosion damage to the tubes!
- Several incidents showed the value and need for the Large Leak Logic the closes feedwater valve on trip w/ high furnace pressure and low drum level.
- Make sure Dissolving Tank emergency dilution is going to the correct tank at all times (for series dual tank systems). Need to confirm flow periodically rather than just testing valve.
- Install a scale or tram to check proper movement of header and hopper slip seals at ash hoppers during start up and shutdown.
- Check riser tubes between upper headers and the drum in penthouse for cracking. Especially short and straight tubes.
- Check installation details for ESP system in PLC or DCS to make sure it is set up for “energize to initiate” so that a loss of interrogation power or broken wire will not initiate an ESP.

ESP Guideline Changes under Consideration

The Subcommittee is working to combine the Post ESP Guidelines that covers the actions that should take place after the ESP has been initiated with the ESP Recommended Good Practice Document. We have maintained them as separate documents but have decided that it would be more useful as a single combined document. Chris Jackson has made a first draft of the combined document and the Subcommittee members will review and make further revisions before the next meeting.

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

Another proposed update will be to include the DCE Fire Suppression Medium as a specific exclusion to the “Stop All Water and Steam Supplies” in Section 3.8. We are also working on wording to clarify that all motor protection interlocks such as motor heater and overloads should be bypassed on the Rapid Drain Valves with the initiation of the ESP. Protection should be utilized in the close circuit to keep from burning up the motor unnecessarily. There is a guide on the BLRBAC web site for how Rotork Actuators should be set up for Rapid Drain Valves. We will also look at clarifying the intent of the provision for an “Alternate Means to Initiate ESP”

Incident Questionnaires

The Incident questionnaires are key to the operation of the ESP Subcommittee. We appreciate the good job that the mills have done in filling them out for their incidents. The current questionnaire has been updated with the contact information to send the file to Dean Clay at dclay@fuse.net. Anytime you have an incident that needs to be reported, I know it is very tempting to just go back in the file and pull out the report from a couple of years ago and just fill in the new information, but we really urge you to go and get the most recent version of that off the WEB site and use that for the report. I am sure Jules will be receiving some of the questionnaires for a while but he will forward them on to Dean.

Again, a reminder that when you are adding pictures into the questionnaire document, it is best that you import the picture as .JPG files rather than cut and paste.

Dean 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.

There were no questions or comments.

Spring 2015 Incident Locations

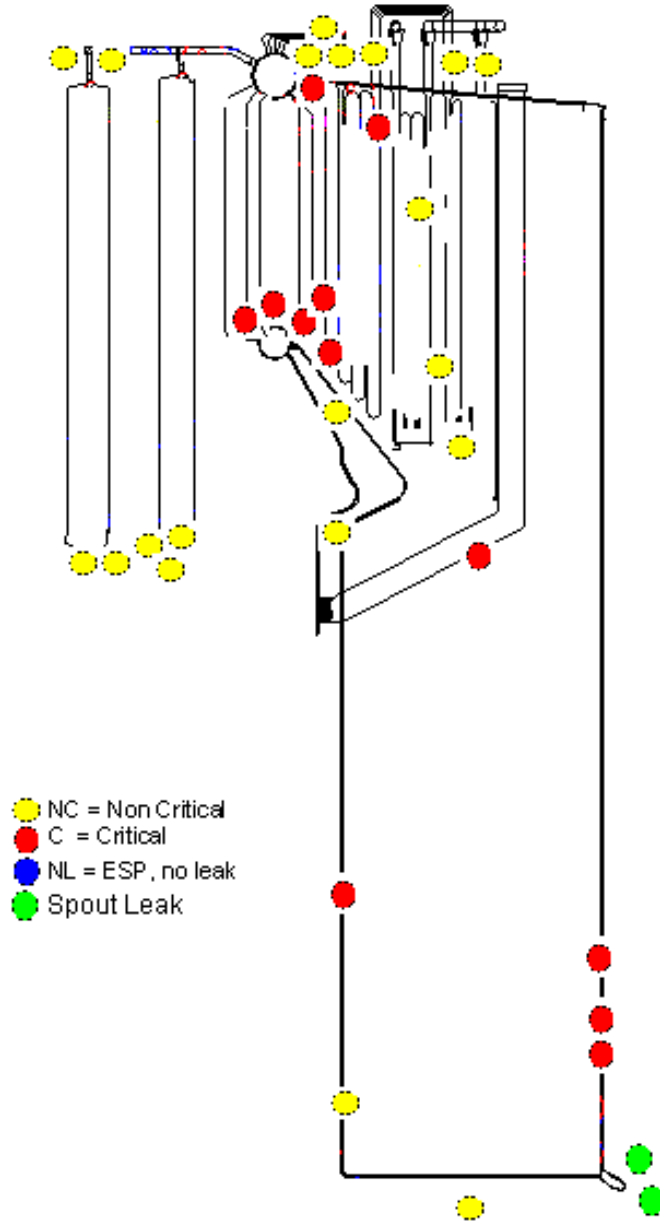


Figure 1

KRAFT RECOVERY BOILER CRITICAL INCIDENTS North America Pulp and Paper

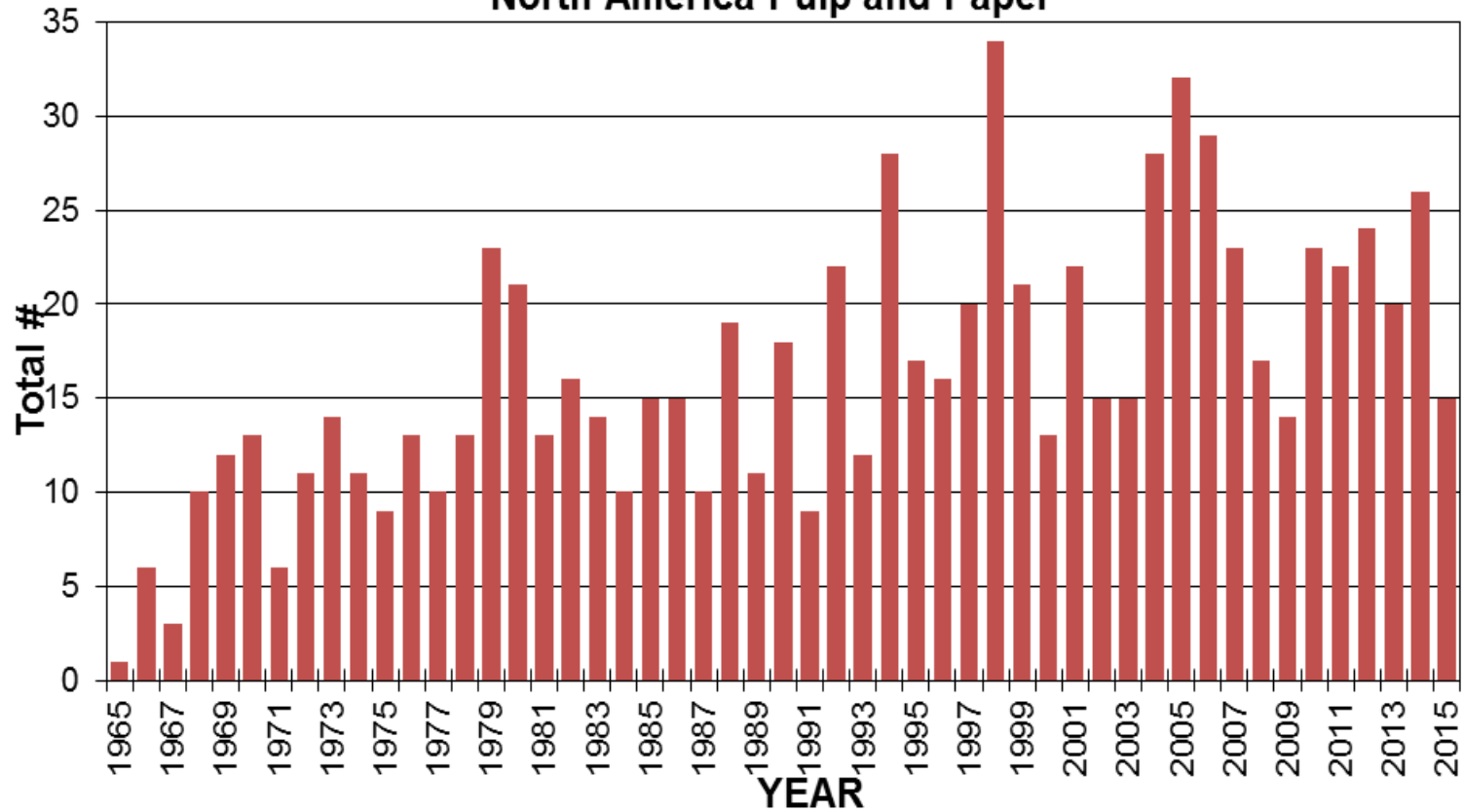


Figure 2

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

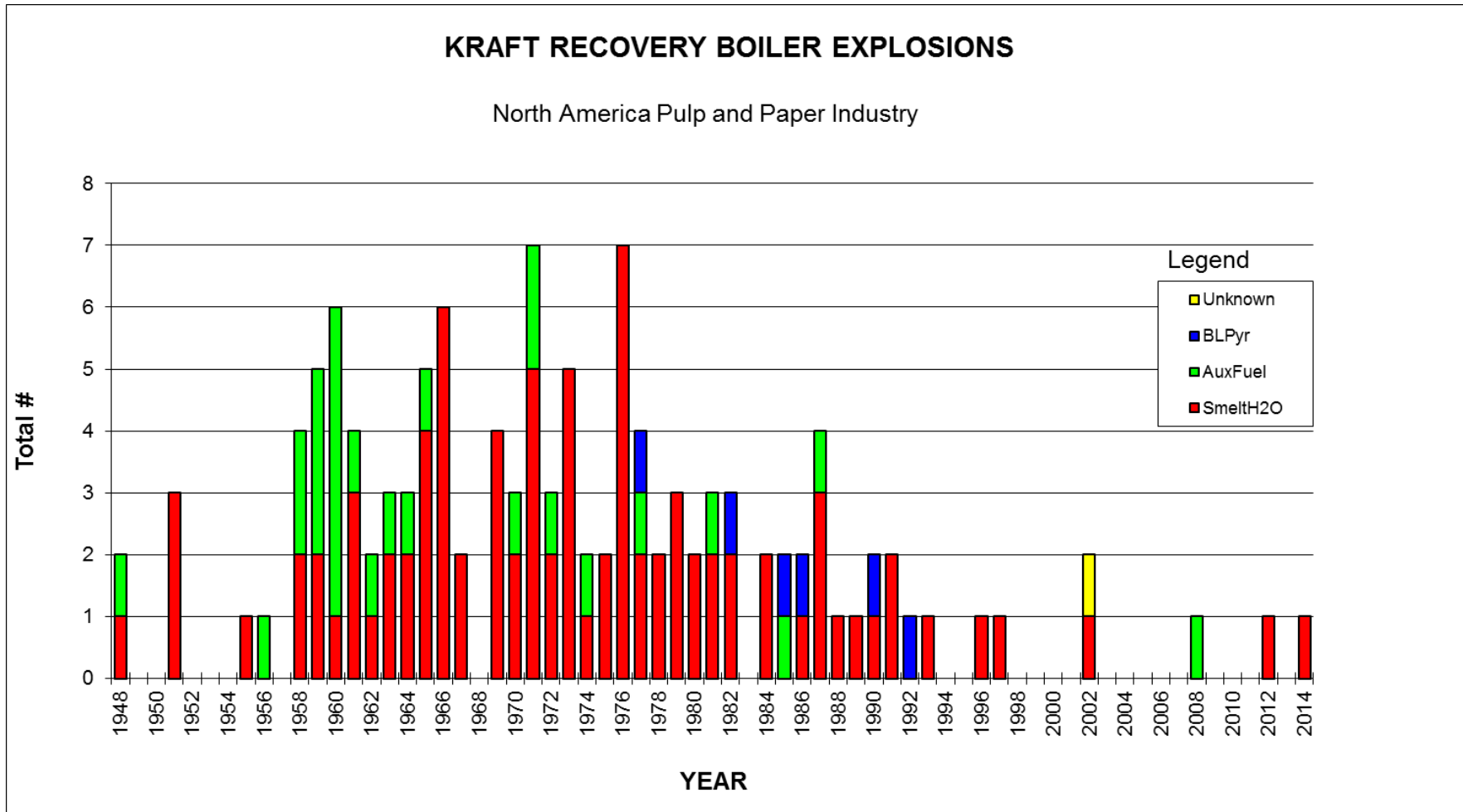


Figure 3

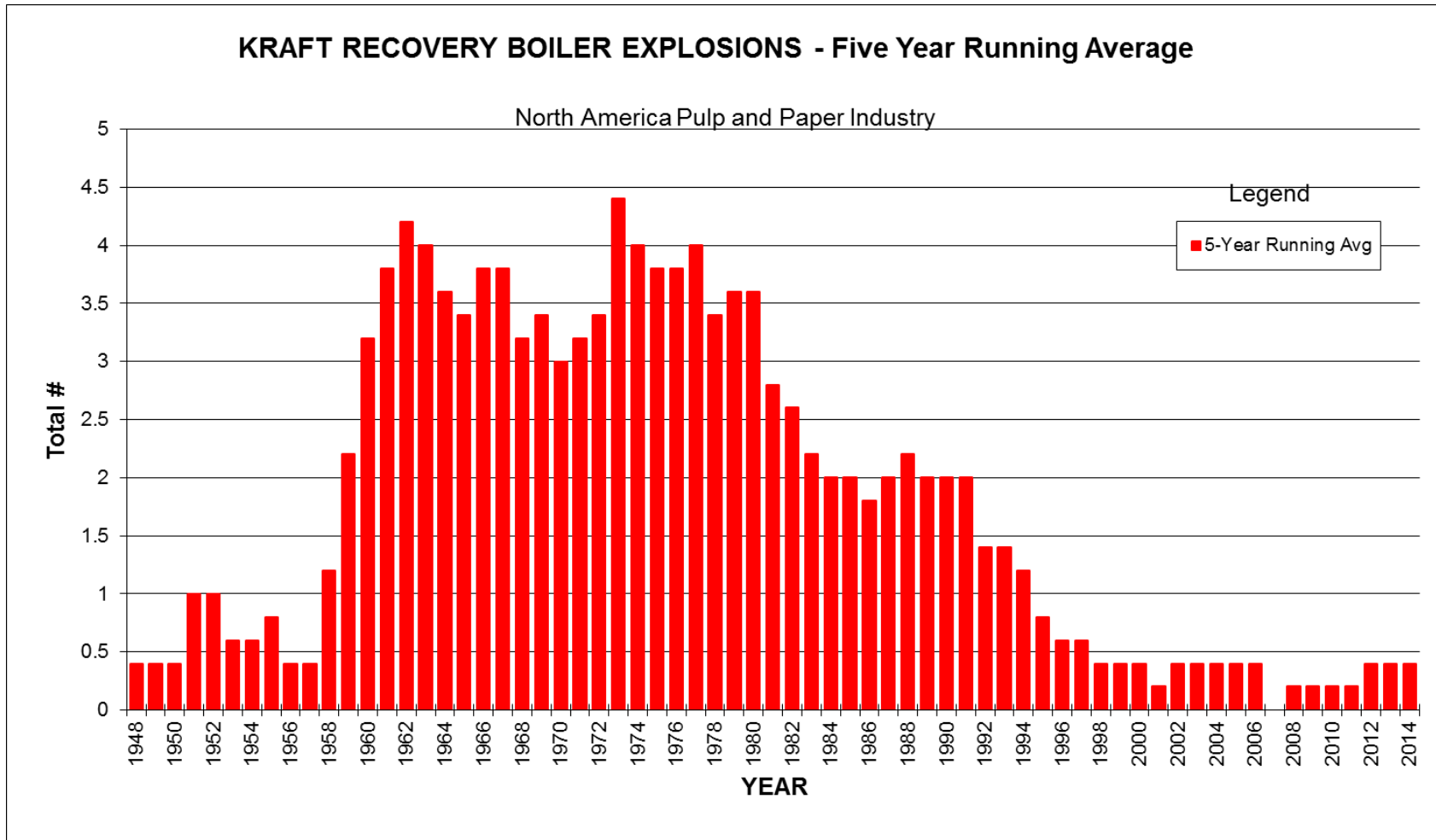


Figure 4

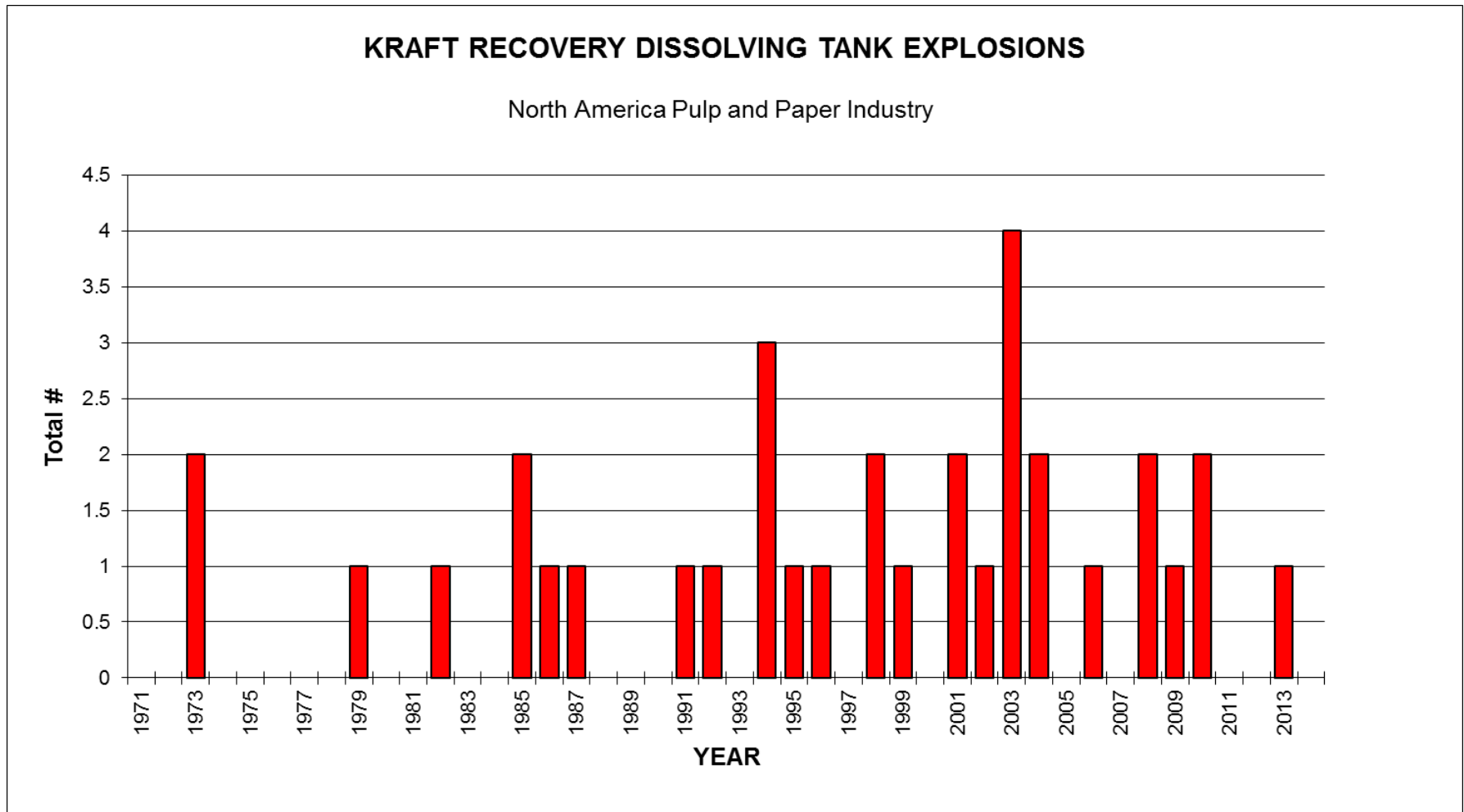


Figure 5

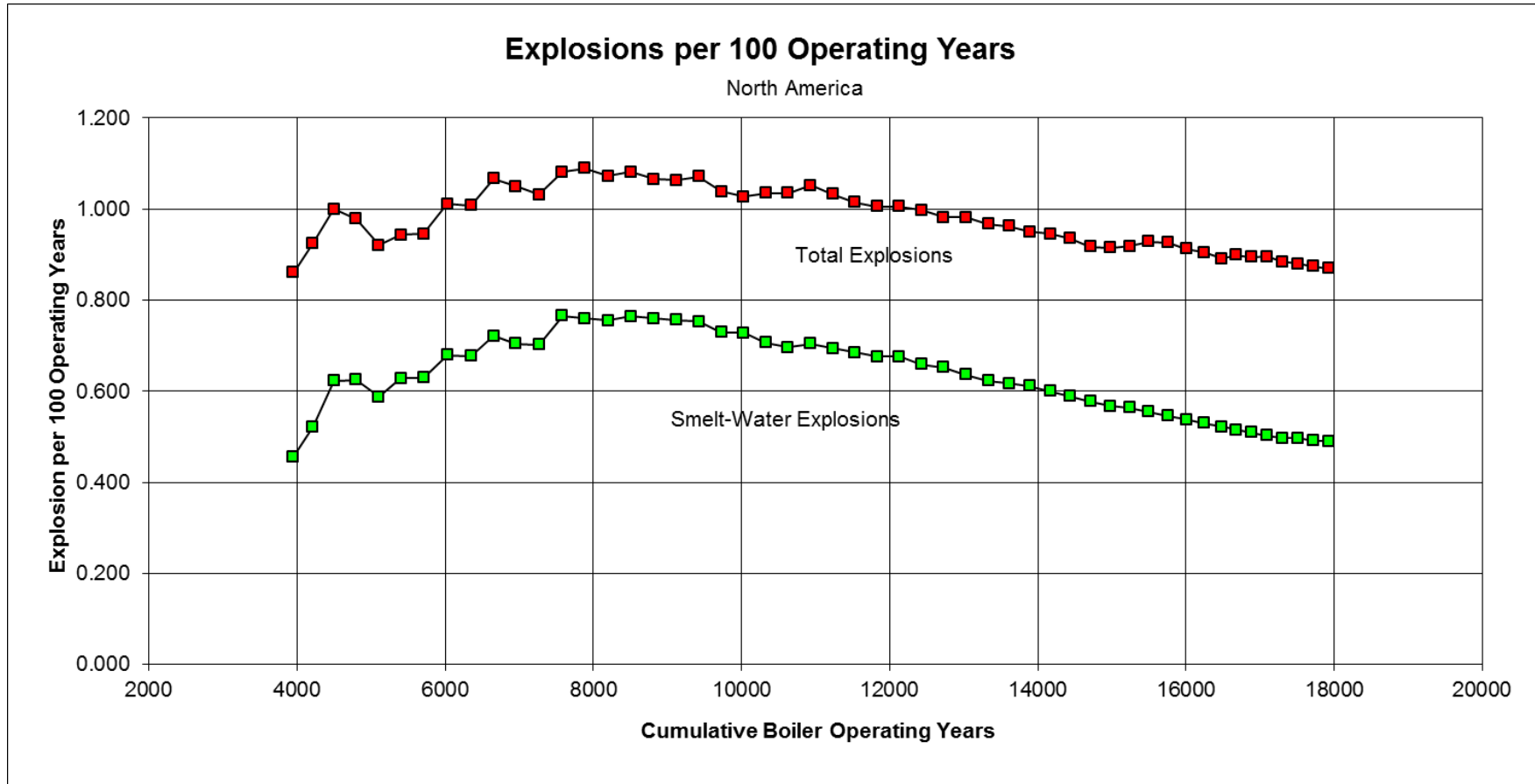


Figure 6

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

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

The Fire Protection in Direct Contact Evaporators Subcommittee met in Open session Monday morning. We had five members and one guest in attendance.

We reviewed the BLRBAC Anti-trust policy. We also reviewed and approved the April 2014 minutes. (We meet annually in the spring.)

There were no DCE fire incidents reported. This is Good News, but we urge reporting even the minor incidents as those can also provide valuable lessons.

After the April 2014 meeting we submitted a revision of our document for the Executive Committee review. They provided a number of comments, all good and helpful, but nothing that changed the overall message of the revision. Since that time our subcommittee reviewed the feedback and made changes. We voted on and approved the revised document Monday.

Our guideline was completely rewritten in 2002 and has served the membership well. Since that rewrite, there have been minimal revisions.

These more recent revisions focus on providing suggested reactions to upset conditions to help reduce the potential for a subsequent fire. Our review of fires in DCEs in 2011 and 2013 revealed the need for additional guidance.

The subcommittee approved revisions have already been submitted to the Executive Committee. We are assured the process will move forward quickly.

New members are always welcome!

5.5 **INSTRUMENTATION REPORT – Dave Avery**

The Instrumentation Subcommittee met in open session on Monday morning with ten members and five guests. Our session began with reading the antitrust statement continuing with introductions of members and guest.

We reviewed minutes from our October meeting and approved them as presented. During the review of the minutes we recognized that recently approved revision of the “Recommended Good Practice for Instruments and Control Systems used in the Operation of Black Liquor Recovery Boilers (Chapters 1 – 4)” were not posted on the web site. We found out with the recent transition of the BLRBAC Secretary Position we need to help assist in getting the correct file to the new Secretary. This will be done ASAP after this spring meeting.

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

Our work continued with committee members C.A. Vossberg and Gordie Vandenberg going scheduled presentation time Monday morning with SFBL Subcommittee to personally review our proposed changes to their section 4.10 Refractometer Calibration - the difference between an “on-line” standardization and an “off-line” calibration.

(Proposed wording)

4.10 Refractometer Standardization (Zero Offset) to Off-Line Test.

A Refractometer Standardization (“zero shifting” or “bias adjustment”) is an adjustment of the refractometer calibration curve to an off-line test to account for un-dissolved solids and/or changes in the black liquor chemistry. This is normally performed while the instrument is actively measuring black liquor solids.

4.11 Refractometer Calibration

A Refractometer Calibration involves placing two or more “samples” onto the sensor to generate a refractive index vs. dissolved solids curve. This is typically performed utilizing calibration oils or electronically (depending on supplier) in a controlled environment, while the sensing head is off of the process line.

Calibration procedures shall be done in a manner that does not affect the system’s ability to automatically perform a black liquor diversion utilizing the remaining (active) in-service refractometer. Improper procedures, or those that defeat the monitoring system described in Chapter 4, can result in the system failing in an unsafe condition. Refer to the manufacturer’s appropriate procedures

Having received feedback from Safe Firing of Black Liquor they have reviewed the proposed changes to document and will incorporate them in their next update.

The second item “our” collaboration with SFBL subcommittee continues.

Dave Boudreau has been working on update of section “G” and needed clarification/understanding properly our accuracy with the existing checklist. Dave attended a schedule appointment with SFBL in the morning to address the question Dave had about section ”G”.

As our task to update the checklists continues, we will need more interaction with the other subcommittees to clarify questions as they come up to insure our interpretations are correct.

We performed as self-assessment on our current approach to updating the checklist. The checklist uses every “Recommended Good Practice” BLRBAC has to consolidate information contained in the checklist. To audit and update the checklist most of the work will require each member reviewing each “Recommended Good Practice” to glean the info for the checklist. This work will have to be done in between the meeting for us to be efficient and accurate it cannot be done during the meeting.

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

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

The meeting will be used as assembly and review before presentation the Executive committee for posting. We have given ourselves five meetings to achieve a majority of the checklist updated. The committee has developed a procedure to use in our task.

The morning session concluded with an open discussion about “Drum Level Measurement” and “Drum Level Protection”. We have agreed to work with “Aux Fuels” to develop a clear definition and good recommendation to fill a void where the current references fall short.

The afternoon session had 5 members and 3 guests in attendance.

Reviewed our new requirements to add an additional column (or 1st out) to the checklist to make easier to follow.

We will continue work on the checklist based on our new procedure and modified checklist form.

Under Old Business:

- The group also in the fall discussed what a qualified I&E technician is and what is a calibration. These items will continued to be further explored over the next few meeting to help define this as it pertains to Recovery Boilers.
- In the fall we discussed how we can develop a concordance for our documents to make it easier to look up questions that the end user may have. John Browning has agreed work on the development of this idea

The selection of a vice chair is still in progress hopefully the fall will bring resolution to this issue. We ended the session with the charge to the subcommittee to do the best they can with the review/study of the existing practices and bring their progress to the next meeting.

Finally, our Instrumentation Subcommittee Meetings open collaborative/joint events that has all of us working together for a better product. Help us reach our goals and keep on the productive path with your help we all can get there!

5.6 **PERSONNEL SAFETY REPORT – Robert Zawistowski**

The Personnel Safety Sub-committee met in an "open" session on Monday, March 30, 2015. There were seven members (out of 18) plus 32 guests in attendance during the meeting.

Representation at our meeting by regular members and guests included original equipment manufacturer Babcock & Wilcox. Representation from insurance and insurance service companies included FM-Global.

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

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

Operating company representation was present at this meeting with representatives from, CLW Clearwater Paper, Expera Specialty Solutions, Georgia-Pacific, Glatfelter, Greif, International Paper, Irving Pulp & Paper, Kapstone, Northern Pulp NS, Rock-Tenn, Smurfit Kappa, Verso Paper and Weyerhaeuser. Contractor representation included Jacobs Engineering, MPW and 3S Team. Consultant representation included Power Specialists Assoc., Inc. and RSI.

The BLRBAC anti-trust statement was read.

The minutes of the last meeting were read and accepted.

Changes recommended for the main Personnel Safety document by the Executive Committee were reviewed this past winter and posted on the BLRBAC website for membership review. A presentation summarizing these changes was developed to be presented during the Tuesday afternoon Operating Problems Session. During the subcommittee meeting these changes were reviewed and explained. If acceptable, the plan is to vote on these seven changes during the main meeting on Wednesday.

The “Common Practices” document, now under development, was reviewed with a request for photos from the entire audience. A list of e-mail addresses was obtained. An e-mail will be sent out to those in attendance at the meeting who provided e-mails along with a list of photos needed for the document.

Also included in this e-mail will be a copy of the photo permission form so photos that are provided have been signed off at each location by the Mill Manager.

We discussed safety around hopper inspection and clearing. We will start developing language over the summer for review and editing by the Subcommittee during the October 2015 meeting.

Between the October 2014 and March 2015 meetings there were one request for clarification/interpretation of information in the Personnel Safety document.

Sam Dean of Rayonier AM has volunteered to accept the position of Vice-Chair of the Personnel Safety Subcommittee. We wish to welcome Sam aboard in his new role.

An on-line video of a smelt water explosion was reviewed.

A video of a 1959 Chevrolet being intentionally crashed into a 2009 Chevrolet in a 50/50 (driver-to-driver) situation was viewed. The purpose of this video was to illustrate how improvements in engineering and design offer superior protection in the newer compared to older automobile just as engineering and design innovations have improved safety in recovery boiler systems.

In closing, we are always welcome to new committee members who can participate in any capacity even if you can only attend meeting intermittently. Simply let me know via e-mail at the address below you are interested and provide me with your contact information.

5. SUBCOMMITTEE REPORTS - (Cont.)

5.6 PERSONNEL SAFETY REPORT – (Cont.)

Robert Zawistowski: (Slide Presentation - Subcommittee Minutes at the end of this document). Yesterday when we reviewed the changes to the Personnel Safety document, there were a total of seven changes and there were comments. I will read through this one because it is so important to us. We have changed it around a little bit. The note is now about pressure part ruptures. This was the discussion yesterday about explosion corners. This is how we've reworded it:

"In November of 2001 a report was issued to the American Forest & Paper Association by Thomas M. Grace and John Clement. The report is titled "Phase 2 Investigation of the Relationship between Recovery Boiler Furnace Design and Explosion Damage." We encourage owner operators to review this report and OEM recommendations as resources to assist in deciding what design elements, if any, relating to minimizing the potential for pressure part ruptures in the event of an explosion should be incorporated into the recovery boilers."

I had a little help from Karl on that yesterday in getting that language in there. That is the language as we are proposing it to go into the document. Are there any questions or comments? Like I said yesterday, I'm available if anyone feels there needs to be further discussion. We will take it back to committee or if you are satisfied with the wording, I'm happy to move it forward and to present it to the membership for vote and acceptance on the changes we are proposing.

Chairman: Any comments?

Robert Zawistowski: Speak now or forever hold your peace.

Chairman: These changes to the Personnel Safety document that were posted on the BLRBAC WEB site and reviewed in detail yesterday by Bobby. There was one point of contention and it was in this Section 2.245, which Bobby has addressed. Would all voting members, those with red ribbons, Can I get a motion to accept the changes as proposed to the Personnel Safety document? Seconded? All in favor? The vote on changes has been unanimously accepted.

Robert Zawistowski: I want to thanks all the committee who have been working on this with me over the past few years, as well as the numerous guests that have attended and provided input to help us get there and to make this document a little bit better. We will be working on new things as we move forward. As we get them developed, we will present them to you.

5.7 MATERIAL & WELDING REPORT - Jesse Worsham for David Fuhrmann

MORNING SESSION:

The Materials and Welding Subcommittee met in Open Session on Monday morning, March 30,2015.

The meeting was opened with a review of the BLRBAC Anti-Trust Statement.

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

5.7 **MATERIAL & WELDING REPORT - (Cont.)**

Attendance

11 members and 18 guest attended the morning session.

Old Business

The meeting minutes from the Fall 2014 Subcommittee meeting were reviewed and accepted.

New Business

Members

Mike Messamore will replace David Duplissey as the alternate for National Boiler Service.

Document Development

The subcommittee worked on the development of Section 2.5 Plugging Tubes in Drums and Headers.

AFTERNOON SESSION:

The afternoon session of the Materials and Welding Subcommittee was open and was attended by 10 members and 3 guest.

The meeting was opened with a review of the BLRBAC Anti-Trust Statement

Document Development

The subcommittee worked on the development of Section 2.5 Plugging Tubes in Drums and Headers..

Next Meeting Agenda

Continue development of the document Section covering Plugging Tubes in Drums and Headers.

5.8 **PUBLICITY & NEWS REPORT – Matt Paine (NEW)**

The Publicity Subcommittee has nothing new to report. The subcommittee of one continues to post meeting notices in four North American pulp and paper magazines and websites including Paper Age, Paper Industry, TAPPI, and Pulp and Paper Canada. Any suggestions on additional locations to post meeting notices would be appreciated.

5. SUBCOMMITTEE REPORTS - (Cont.)

5.9 WASTE STREAMS REPORT – Paul Seefeld

On March 30, 2015 the Waste Streams Subcommittee met in a closed session at 9:00 AM with five members, two alternates, and one user invitee present. There were nine of 14 members present and two guest operating company representatives. In the afternoon session, there were eight members and four guests present. At the start of both the morning and afternoon sessions the BLRBAC antitrust statement was reviewed. The October 2014 meeting's minutes were reviewed and unanimously.

Document Updates

The meeting was opened with discussion of resuming the editing of Chapters 4 and 5.

Chapter 4 changes:

Expand section 4.2.3 regarding the Dissolving Tank Vent Gasses (DTVGs). This section will likely end up as an entirely new chapter in the document. However, the first step is to modify the existing DTVG information and move all DTVG references in chapter 4 to the same section. The changes regarding DTVGs inserted into the document consisted of the following:

- Removal of the DTVGs from being routed to and combined with a DNCG system. Other *DNCG sources can be added to the DTVG system, but due to the amount of gas flow, it is not practical to add the DTVG source to a DNCG system.*
- The DTVG system will be engaged while the boiler is in operation, including start-up and shut down. If DNCG sources are added to the DTVG system, they would have to adhere to their existing interlocks and permissives per the BLRBAC document. DTVGs and DNCGs will have independent interlocks and permissives.
- The DTVG system will be designed with a mechanical fail safe to remove the condensate at the final low point drain by the use of rupture disks, rupture pins, or other devices.

Minor clarifications and corrections were also performed on this chapter.

Chapter 5 changes:

Page 37, 5.2.1.2: Elimination of the paragraphs comparing concentrator vent gasses with SOG and removing methanol from SOG. Neither of these have technical merit. A comment was added regarding residual DNCG collection when liquefying SOG.

Pages 38-39: Defining which equipment “should” be inside or outside of the boiler. The mist eliminator and automatic shut-off valve were placed in both categories

Page 39 and 42: Reference to seal pots. The paragraph in section 5.2.1.2 was removed. Reference in 5.2.3 was kept.

Pages 47-48: The explanation of vents and drains was reworded to disassociate them from each other.

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

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

Pages 44-45, 5.3.2 Clarification was made to the local inspection of the igniter before engagement. A statement was added to allow the disengagement of the igniter when the boiler is above 50% MCR. This will not affect existing interlocks or permissives when reintroducing the CNGC after a vent or gas transfer.

Minor clarifications and corrections were also performed on this chapter.

Chapter 5 changes will be submitted to the executive committee for review. This should be sent before the end of April after the summary sheet is written and reviewed by the subcommittee.

MISC:

A question regarding who is routing turpentine to the recovery boiler was answered. Currently, any 80% methanol liquefaction system either transfers red oil/turpentine to the continuous igniter as fuel (mixed with the methanol) or it is routed to the heavy liquor upstream of the refractometer. Either of these methods should follow the BLRBAC waste streams subcommittee guidelines.

The subcommittee still needs to obtain the translations of the most recent updates to the Finnish and Swedish operational guidelines.

A Vice-Chairman needs to be identified. The previous person, Meville Hedges, left B&W and is no longer on the committee.

In the afternoon (open) session, there were eight members, and eight guests present. We discussed the proposed updates to the document and the development of the chapter section dedicated to the dissolving tank vent gas collection.

The question of the turpentine routing was asked and answered during that session. There were no further questions.

5.10 **WATER TREATMENT REPORT – Tom Przybylski (NEW)**

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

Fourteen (14) subcommittee members and ten (10) guests attended the morning session. Fifteen (15) subcommittee members and seven (7) guests attended the afternoon session of the meeting. The subcommittee membership profile for those in attendance was as follows:

- Three (3) OEMs
- Two (2) mill representatives
- Ten (10) BLRBAC Associate Members (four of the ten in attendance represented water treatment companies).

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

The spring meeting activities were as follows:

- In the morning session, the BLRBAC Antitrust Policy was reviewed, the membership lists updated, and the fall meeting minutes accepted.
- The subcommittee had no further comments on the drum, tube and header circuitry sections, following some edits in the fall session. No more edits were brought forward and the group agreed that this section was ready to go to the executive committee. They will be submitted along with seven minor edits to the existing documents.
- The bulk of the morning was spent continuing production of the condensate section, which had been started last fall.
 - Topics included inspection of check valves in direct steam applications. Condensate sample system robustness, particularly in evaporator applications that are prone to plugging, was addressed. Sampling intervals for polisher resin was also addressed. Testing of condensate automatic dump systems was discussed, and test intervals were resolved. Test instrumentation was covered in depth. SOPs and ESOPs were agreed upon. The group agreed upon test intervals, as well as specific condensate tests to be performed.
- The afternoon session saw the completion of the condensate section.
 - Production included completion of the Monitoring portion and the Inspection/Documentation portion of the Condensate Section. Lag times and representative turbidity samples for paper machine condensate received significant discussion. A recommendation for a dedicated laboratory pH probe in high purity applications was accepted. Inspection protocols for condensers, evaporators, and liquor heaters were established.

We would like to thank all of the subcommittee members and guests for their participation and valued contributions. We also would encourage anybody to attend as guests. If they want to participate on the subcommittee, we certainly would welcome some new members

6. **AMERICAN FOREST & PAPER ASSOCIATION 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.

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

Membership

Currently, 26 companies (with the latest acquisitions) participate in the Program. We are still in contact with two other companies Evergreen [Pine Bluff AR mill] and Woodland Pulp 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. The present Program members represent over 98% of the total production of sulphate pulp in the U. S.

Operational Safety Seminars

We have two seminars (both in Atlanta) scheduled for this year. The first will be held April 7 – 8th and as of today we have 67 registered to attend. Our aim is to have 64, but sometimes some mills ask to accept a few extra due to their outage schedule. The second seminar will be held May 19 – 20th and we have 60 registered as of today. So we have few spots open for any mill that wants to send some people. I have received comments from a number of mills that with more experienced operators and supervisors moving on, they need to get the newer and less experienced people to these training sessions.

Study on Smelt Dissolving Tank Explosions

Both the Operations and Maintenance Subcommittee and the Research and Development Subcommittee are working to develop best practices around dissolving tank related issues. The Program is sponsoring further study into the dissolving tank area, originally completed by Dr. Grace in Phase I of the study. BLRBAC’s Safe Firing Subcommittee is looking into similar issues in this area. The R & D Subcommittee is working on proposals for additional research in smelt spouts and dissolving tank in conjunction with the University of Toronto. These involve research related to acoustic signature of the smelt shattering/dissolving process shatter jet interaction in the dissolving tanks and how to melt high sulfate slag that sheds from the upper furnace.

Work on Developing a Best Practice for Functional Testing of Interlocks and Trips on Recovery Boilers

The O & M Subcommittee is continuing its work on developing guidelines on functional testing of interlocks and trips procedures on recovery boilers. This will include how to conduct testing and proposed sequencing of testing interlocks. The Committee also will work on identifying best practices for clearing and preventing plugged/bridged ash hoppers, as well as external line maintenance, inspection and testing.

Updating “Kraft Recovery Boilers” Blue Book

The revision of the “Kraft Recovery Boilers” blue book is in the final stage is expected to be completed by June 30, 2015.

Proposal for Research of Protective Clothing and Equipment

The R & D Subcommittee is continuing to seek review of materials that are available for use for personnel protection around black liquor recovery boilers.

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

Other Research Projects Under Review

The Committee is discussing possible new research projects related to recovery boiler safety including: shatter jet design improvements; burning CNCG; ash hopper; develop procedures for safe inspection of boiler leaks (discuss with the BLRAC Safety Committee); boiler inspection protocols for SAC and FAC; combustible meters; and development of smelt spout burners.

The Committee is reviewing the four major studies (Furnace Design, Floor Tubes, Economizers and Superheaters) completed to see what recommendations were made for further study.

Annual Meetings and Conference

AF&PA's annual Recovery Boiler meetings and Conference was held in Atlanta in February 3 and 4th with good attendance. As usual, the Conference was open to all operating companies, insurers, vendors and manufacturers. The presentations include reports on the projects currently sponsored by the AF&PA Recovery Boiler Program and subcommittee reports on their accomplishments, reports from Sweden, Norway and Finland on their recovery boiler committees' activities, 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.

7. **EXECUTIVE COMMITTEE REPORT - John Gray**

The Executive Committee met Tuesday afternoon in closed session with 5 members present. The proposed changes to the Personnel Safety Guidelines were reviewed, including the changes suggested by membership during the presentation Bob Zawistowski gave yesterday afternoon. All changes were endorsed by the Executive Committee.

One of the administrative items we discussed included the acceptance of credit cards for at door registration fees. This option was originally slated to be in place for this 2015 Spring Session, but did not occur due to unforeseen circumstances. It is our intention to accept credit card payments for 'at door' registration for the Fall BLRBAC Session.

8. **TAPPI STEAM & POWER/ENERGY MANAGEMENT REPORT - Chris Jackson**

Steam & Power/Energy Management Committee with TAPPI help support the paper manufacturers by pulling together the accumulated knowledge of scientists, engineers, academics and people just like you. Just like you! I repeat that for a reason, who have years of experience wrestling with the problems of generating power, converting waste products and maximizing the efficiency of your pulp and paper operations. The committee does this by providing a forum for research papers presented at the annual PEERS conference and by publishing technical information papers or TIPS that offer guidance on how to overcome the obstacles; thus, specifying and maintaining the equipment you need to accomplish your goals.

8. **TAPPI STEAM & POWER/ENERGY MANAGEMENT REPORT - (Cont.)**

Although our work goes on throughout the year, we meet twice yearly. This afternoon at 12 o'clock we will hold our spring meeting downstairs. Everyone in this room has something to bring to the table that will further these goals and I invite you all to attend. As a small incentive, we offer free lunch, but there is a limited number. First come, first served.

We will meet together for the main meeting. We will break up into the three subcommittees which are Recovery & Power Boilers, Water Treatment and Energy Management. We will reconvene to consolidate whatever knowledge we have been able to accumulate. We will be discussing the active TIPS; those that are being written; those that are being reviewed; one that was withdrawn just because no one could find the time to review it and we might want to pull that back in. We are going to learn about the preparations for the PEERS conference and where we are with that with the sessions and the papers. That happens at the end of October by the way. We are also soliciting ideas for new TIPS and conference papers. You are crucial to that. They exist to serve you. If you have problems, this is one venue you can approach and say I need help with this issue. What can you do for me? You do not need to be a TAPPI member to come to this meeting and participate fully in the actions that we take on to accomplish your goals.

Any questions or comments? Thank you for your attention. I look forward to seeing you in a couple of hours.

9. **WESTERN CANADA BLRBAC REPORT – Rinus Jellema (NEW)**

No report given at this meeting.

10. **ACTIVITIES OUTSIDE NORTH AMERICA REPORTS**

No report given at this meeting.

11. **OPERATING PROBLEMS SESSION REPORT – Dave Slagel (NEW)**

The operating problem session was held Tuesday afternoon. There was good membership attendance at this session.

We started off the session with a presentation from Bob Zawistowski who provided an advance overview of the proposed changes to the Personnel Safety document that were voted on earlier this meeting.

After Bob's presentation, we reviewed the 12 questionnaires submitted by the membership. Covered topics ranged from general boiler equipment and operation to questions about various maintenance practices.

This concludes the operating problem session report.

11. **OPERATING PROBLEMS SESSION REPORT** – (Cont.)

I would like to remind everyone before we close the main committee meeting that we have two Technical presentations immediately following this meeting. The first is a presentation by Colin MacCallum of Boiler Island Air Systems entitled “First Maximize then Optimize the Reduction Efficiency in a Kraft Recovery Boiler” followed by a presentation by Brian Rethman of Acuren entitled “Boiler Tube Welds: Overview of NDT Techniques”.

Chairman: This concludes our Main Meeting. We have ended earlier than usual. We thank all of you for attending and taking the time away from your home and families. I'll entertain a motion for close the Main Meeting. Seconded? All in favor. Thank you.

NEXT MEETING – October 5, 6 & 7, 2015, Crowne Plaza Hotel, Atlanta, GA.

Appendix A - INCIDENT LIST

ECONOMIZER

SPRING 2015 – 01

Classification:

Location:

KPAQ Industries, St. Francisville, LA

Unit:

RB1, 1965, B&W, PR-85, 2-Drum, Large Economizer, Front-slope floor

Unit Size:

3.0 MM lb ds/day; 481,000 lb/hr steam at 600 psig, 750°F, 675 psig design (MAWP)

Incident Date:

December 15, 2014

Downtime hrs, leak/total:

24

ESP?

No

Leak/Incident Loc:

1/8" pinhole in primary economizer tube @ lower (inlet) header

How discovered:

Operator Rounds

Wash adjacent tube:

No

Root cause:

External pitting, corrosion

Leak detection:

No

Bed cooling enhance:

No

Last full inspection:

April 2014

Sequence of events:

December 15, 19:43 - I.D. Fan sped up from 615 rpm to 675 rpm and opacity increased (discovered post-mortem). 20:27 - Received call from P/U foreman about a possible leak in the upper economizer area. 21:10 - Checked ash hoppers. Water leaking down south east corner of west ash hopper; Opened door on the 8th floor west side RB at the bottom of the cross flow (Primary) economizer. We had to wash saltcake buildup in that area to see inside. Put a rod in about 5 feet between tubes and rod had water dripping off the end. With a strong flashlight we were able to verify the leak. 22:15 - Contacted Management about the leak.

22:35 - Reduced liquor firing to begin burning char bed out for repairs.

December 16- 01:00 - Pulled Liquor out of Recovery. 06:45 - Fire out of RB to begin cool down. 08:20 - We started had washing areas at and above area of leak. 12:20 - Welder identified leak on the tube. 17:00 - Hydro complete. 17:20 - UT reading: lowest 0.160". Surrounding tubes were 0.170" and up. 18:53 - Fire back in recovery. 23:10 - Boiler online

Repair procedure:

Weld Overlay

Future prevention:

Future Replacement of Components

ECONOMIZER

SPRING 2015 – 02

Classification:

Location: Georgia-Pacific, Palatka Mill, Palatka, FL

Unit: RB4, 1977, CE, Contract #22974, 2-drum, large economizer

Unit Size: 5.0 MM lb ds/day; 850,000 lb/hr steam at 1250 psig, 900°F, 1501 psig design

Incident Date: November 17, 2014

Downtime hrs, leak/total 44 hrs

ESP? No

Leak/Incident Loc: Economizer

How discovered: Operator

Wash adjacent tube: No

Root cause: Porosity in tube plug weld

Leak detection: Yes

Bed cooling enhanc No

Last full inspection: Oct. 2014

Sequence of events: The operator saw a wet area in the rear economizer ash hopper. The boiler was taken down in an orderly manner. One leak was found in the lower rear economizer.

Repair procedure: The plug weld was ground down and re-welded.

Future prevention: The mill is developing a plan for economizer replacement

ECONOMIZER

SPRING 2015 – 03

Classification:

Location: Georgia-Pacific, Palatka Mill, Palatka, FL

Unit: RB4, 1977, CE, Contract #22974, 2-drum, large economizer

Unit Size: 5.0 MM lb ds/day; 850,000 lb/hr steam at 1250 psig, 900°F, 1501 psig design

Incident Date: October 23, 2014

Downtime hrs, leak/total 42 hrs

ESP? No

Leak/Incident Loc: Economizer

How discovered: Operator

Wash adjacent tube: No

Root cause: Porosity in tube plug weld

Leak detection: Yes

Bed cooling enhanc No

Last full inspection: Oct. 2014

Sequence of events: The operator saw a wet area in the rear economizer ash hopper. The boiler was taken down in an orderly manner. One leak was found in the lower rear economizer.

Repair procedure: The plug weld was ground down and re-welded.

Future prevention:

ECONOMIZER

SPRING 2015 – 04

Classification:

Location: International Paper, Pensacola Mill, Cantonment, FL

Unit: RB1, 1975, B&W, PR-171A, 2 drum, large economizer

Unit Size: 3.06 MM lb ds/day; 450K lb/hr steam at 850 psig, 850°F, 1000 psig design (MAWP)

Incident Date: May 5, 2014

Downtime hrs, leak/total 22.73

ESP? No

Leak/Incident Loc: Economizer, 1/8" pinhole

How discovered: Operator found water in west hopper

Wash adjacent tube: No

Root cause: Weld defect

Leak detection: No

Bed cooling enhance: No

Last full inspection: April 2014

Sequence of events: RB1 tube leak was in the economizer and was found on boiler walk down. Operator noticed water in the west wet hopper before the liquor firing solids dropped.

Repair procedure: Cut out, reweld

Future prevention: Completed, addressed feedwater piping growth clearance at catwalk, replaced static feedwater piping hangers with engineered can hangers, corrected all priority 1 and priority 2 weld defects

ECONOMIZER

SPRING 2015 – 05	
Classification:	
Location:	International Paper, Pensacola Mill, Cantonment, FL
Unit:	RB1, 1975, B&W, PR-171A, 2 drum, large economizer
Unit Size:	3.06 MM lb ds/day; 450K lb/hr steam at 850 psig, 850°F, 1000 psig design (MAWP)
Incident Date:	April 18, 2014
Downtime hrs, leak/total ESP?	NA No
Leak/Incident Loc:	Economizer, 1/8" pinhole
How discovered:	Operator found water in west hopper
Wash adjacent tube:	No
Root cause:	Weld defect
Leak detection:	No
Bed cooling enhance:	No
Last full inspection:	April 2014
Sequence of events:	RB1 suspected tube leak in the economizer. Took liquor off and washed out hopper. Confirmed leak on bottom of economizer. This leak was monitored until repair made during annual outage that started on 4/21/2014.
Repair procedure:	Cut out, reweld
Future prevention:	Completed, addressed feedwater piping growth clearance at catwalk, replaced static feedwater piping hangers with engineered can hangers, corrected all priority 1 and priority 2 weld defects

ECONOMIZER INSPECTION STUB

SPRING 2015 – 06	
Classification:	
Location:	International Paper, Mansfield, LA
Unit:	RB2, 1981, B&W, PR-200, 2-Drum, Large Economizer, Rear-slope floor
Unit Size:	3.4 MM lb ds/day; 486,000 lb/hr steam at 1250 psig, 900°F, 1475 psig design (MAWP)
Incident Date:	October 26, 2013
Downtime hrs, leak/total ESP?	40 No
Leak/Incident Loc:	Small crack in weld that connects the pipe and cap assembly to the lower economizer header (#19). Crack was approximately 3/4". Another leak was found on the same type of assembly next to the first leak. The second leak was 1/4".(#13)inspection nozzle pipe to lower economizer header
How discovered:	Operator walkdown
Wash adjacent tube:	No
Root cause:	Weld procedure, crack in weld. Original handhole caps were removed and replaced with a pipe and cap inspection assembly in 2012 due to past handhole weld leaks.
Leak detection:	Yes
Bed cooling enhance:	No
Last full inspection:	2012
Sequence of events:	Outside Operator performing walkdown on the RB discovered water in the East economizer hopper at the inspection door. Due to leak location the boiler was kept on line with Aux Fuel and liquor removed for inspection. Once the location was visually verified the bed was burned out and the unit shut down in an orderly fashion. The leak detection had alarmed and cleared the night before. The Control Room Operator sent the outside operator to go do an inspection and nothing was found.
Repair procedure:	Defect ground out, PT, weld repaired, MT.
Future prevention:	

ECONOMIZER INSPECTION STUB

<p>SPRING 2015 – 07 Classification: Location: Unit: Unit Size: Incident Date: Downtime hrs, leak/total ESP? Leak/Incident Loc: How discovered: Wash adjacent tube: Root cause:</p> <p>Leak detection: Bed cooling enhanc Last full inspection: Sequence of events:</p> <p>Repair procedure: Future prevention:</p>	<p>International Paper, Texarkana Mill, Domino Texas RB2, 1976, B&W, PR-186, 2 drums, large economizer 4.55 MM lb ds/day; 763,000 lb/hr steam at 1050 psig, 825°F, 1200 psig design August 18, 2014 48 off line/57.58 off liquor No Upper economizer lower header inspection nipple Water was seen dripping from hopper door. No Imperfection in weld that allowed a crack to propagate. Similar failures on both recovery boilers since 2011 when all lower economizer hand hole caps were replaced with inspection nipples. Two on 1 RB and this is the 3rd for 2RB. Yes No October 2013 On August 18, operator reported that water was seen dripping off the center primary economizer hopper door and moisture was in the chute from the hopper. Investigation found no water in any of the upper economizer doors and there was no water in the generating bank hoppers. Unit taken down, locked out and repairs made. Indication ground out and repair made. Replaced all inspections nipples with better design and welding procedures in October 2014.</p>
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BOILER BANK**SPRING 2015 – 08****Classification:****Location****Georgia Pacific, Brewton, Al.****Unit**

RB1, 1956, PR-32 B&W, 2 drums, front-sloped hearth, cascade DCE

Unit Size:

1.2 MM lb ds/day; 184,000 lb/hr steam at 860 psig, 830°F, 970 psig design

Incident Date:

October 19, 2014

Downtime hrs, leak/total

37 hours 9 minutes / 39 hours 53 minutes

ESP?**Yes****Leak/Incident Loc:**5th floor, generating bank tubes, center row, at mud drum**How discovered:**

Operator observed low drum level, high feedwater flow, and furnace blowback

Wash adjacent tube:Yes, pinhole leak in 1st tube eroded 1" hole in adjacent tube; 3rd leak found on hydro.**Root cause:**

Near drum thinning

Leak detection:

No

Bed cooling enhanc

No

Last full inspection:

Nov. 2013

Sequence of events:

The #1 Recovery Boiler was ESP'd at 10:25 P.M. on 10-19-2014 after the drum level started falling, the feed water automatic valve went open and the boiler started blowing back. Prior to the event, the boiler was steaming at 145,200 lb./hr. with the feedwater flow at 161,000 lb./hr. which is a little higher than normal. The boiler was being fired on 100% black liquor at rate of 76,700 lb./hr., 66.5% liquor solids. When the 3rd Tender made rounds about two hours earlier no water was seen in the hoppers and no sign of a leak was seen. At 10:24 P.M. the boiler low drum level alarm went off, feed water flow went up, and the boiler started blowing back. The Operator ESP's the boiler at 10:25 P.M. There was no low drum level trip or high furnace pressure trip. The 8 hour ESP waiting period was observed.

At 6:30 a.m. on 10-20-2014, began to lockout the boiler and open doors to aid in cooling down the boiler. When the door on 3rd floor was opened, there was a bed of about 4 1/2 feet high that was still glowing in a few spots. When the door was opened on the right end of the mud drum, observed a washed area about 6 feet wide on top of the mud drum. Continued to run tertiary fan on boiler until contractor got there around 3:00 pm.

At 8:00 a.m. heat killers were installed in steam and mud drums to aid in cooling. Steam drum was 420 degrees at this time. At 2:00p.m. no fire was seen in the lower furnace and floor tubes were cooling off. Steam drum temperature was around 280 degrees F and mud drum was around 180 degrees F.

The contractor arrived at 3:00 p.m. and started looking for the leak. They found two tubes, one with a pin hole in it and one next to it with a 1" hole in it. At 8:00 p.m. the contractor was able to get into steam drum to start repairs. Two sections of pans were removed and two tubes were plugged. Pans were reinstalled before boiler was hydro'ed.

Repairs were finished around 7:00 a.m. on 10-21-2014 and the boiler was filled with warm demin water. Soon after the water reached the mud drum level, a third leak was observed next to the tube with the 1" hole. At 9:30 a.m. water was cut off and boiler drained below the mud drum. Doors were opened on the drums and the pans remove again to plug the tube that was still leaking. Started welding in the plugs at 12:00 p.m. and finished at 6:00 p.m.

Repair procedure:

Plugged three generating bank tubes

Future prevention:

BOILER BANK

SPRING 2015 – 09

Classification:

Location International Paper, Orange, TX

Unit RB2, 1967, PR-108-B,B&W, 2 drums, front-sloped hearth, cyclone DCE

Unit Size: 2.7 MM lb ds/day; 254,000 lb/hr steam at 850 psig, 835°F, 975 psig design

Incident Date: October 23, 2014

Downtime hrs, leak/total

ESP? Yes

Leak/Incident Loc: Generating bank tube at mud drum surface, hot side of drum

How discovered: DCS mass balance leak detection alarm

Wash adjacent tube: Yes

Root cause: Poor tube to drum socket fit

Leak detection: Yes, Nalco RBLI

Bed cooling enhanc No

Last full inspection: April 2014

Sequence of events: 10/23 - Boiler was at steady state burning 215 gpm of liquor and steaming 230,000 #/hr of steam. At 13:14 the DCS mass balance alarm sounded. The operators looked at steam and feedwater flows and saw where there was maybe a slight deviation, but not obvious. The Trasar leak detection system was reviewed and was not in alarm or showing noticeable trends in chemistry. The operators began a walk down of the boiler. The mass balance was reviewed again and the operators involved more personnel to assist walking down the boiler. When they got to the economizer area, they heard a sound that indicated a steam leak. At 14:11 the sootblowers were held to troubleshoot the location of the leak still thinking it was in economizer. Doors were opened in front of the economizer to look for the leak. Operators still diagnosed leak location as economizer. By this time the Trasar leak detection system was showing slow trends on chemistry which is not indicative of an economizer leak but is for a boiler circuit water leak. The operators still trying to diagnose the leak location were radioed approx 14:45 to get specifics on where the noise was heard and confirmed it potentially could be generating bank and that we were seeing chemistry changes and that they needed to evacuate and we were beginning an ESP procedure. The boiler was ESP'd at 14:47.

Repair procedure: Plugged three generating bank tubes. Leaking tubes and two adjacent tubes were plugged due to leaks or external erosion from the original leak. After 1st hydro 8 additional tubes were seal welded to correct for weepage that was of concern.

Future prevention: Considering sealwelding all tubes in the drum.

BOILER BANK

SPRING 2015 – 10

Classification:	
Location:	Appvion, Spring Mill, Roaring Spring Pa
Unit:	RB3, 1983, B&W, PR-204, 2 drums, large economizer
Unit Size:	0.81 MM lb ds/day; 117,800 lb/hr steam at 600 psig, 720°F, 725 psig design (MAWP)
Incident Date:	January 17, 2015
Downtime hrs, leak/total	139hrs
ESP?	Yes
Leak/Incident Loc:	Boiler Bank cold side near mud drum tube row 5 tube 2
How discovered:	Boiler trip
Wash adjacent tube:	No
Root cause:	Fatigue from the outside surface at the inside of the bend in the tube
Leak detection:	No
Bed cooling enhance:	No
Last full inspection:	May 2014
Sequence of events:	Boiler Trip, ESP. There were no indications of potential tube failure. The failure was immediate, steam drum went empty boiler tripped, ESP was initiated. Cool bed, find leak, water wash, NDT all boiler bank tubes, plug tube, hydro, fire boiler after all inspections completed.
Repair procedure:	Tube plugged, followed Babcock & Wilcox recommendations
Future prevention:	Retube boiler bank

BOILER BANK and ROOF

SPRING 2015 – 11

Classification:

Location: RockTenn, Fernandina Beach, FL

Unit: RB4, 1970, B&W, PR-126, 2 drum, Large economizer, Rear-slope floor.

Unit Size: 3MM lb ds/day; 492,000 lb/hr steam at 900 psig, 825°F, 875 psig design

Incident Date: February 6, 2014

Downtime hrs, leak/total 92 hrs liq to liq

ESP? No

Leak/Incident Loc: Gen. Bank – wall tube seal failure at mud drum

Penthouse – roof tube 180° x 2.5” crack inside steam drum

How discovered: Operator walkdown / Actual leak discovered at pressurizing boiler while off line

Wash adjacent tube: No

Root cause: Seal Failure / Rolling Process

Leak detection: Yes

Bed cooling enhance No

Last full inspection: March 2013 / December 2013

Sequence of events: While making his final boiler round (5:45am), the Recovery Boiler Operator noticed a slight intermittent puff of steam coming from between the top of the mud drum and boiler wall installation. After verifying that the boiler hoppers were dry, he proceeded back to the control room to check his boiler parameters and the Trasar Leak Detection System. Everything looked normal. He contacted the shift foreman and they went back to examine the mud drum. Process parameters remained normal. The decision was made to contact the department superintendent and prepare to burn the bed out for further inspection. Initially, no clear indication of leak, burned bed out, took boiler off line for further inspection, brought down on curve, took boiler off line, locked boiler out, removed installation, put a little pressure back on boiler (70 psi), discovered 2 leaks. Water washed gen. bank and superheater section of boiler, repaired leaks

Repair procedure: Wall Tube at Mud Drum - Four tubes were seal welded in the mud drum.

Roof Tube at Steam Drum - An approx. 21” dutchman was installed on one roof tube in the penthouse under the number 9 Supply Line. The dutchman was rolled and seal welded inside the steam drum and had one butt weld outside the drum.

Future prevention: Continue to inspect

SUPERHEATER

SPRING 2015 -12

Classification:

Location: RockTenn, West Point, VA

Unit: RB4, 1975, CE, 21975, 2 drum, decanting hearth, DCE Cascade

Unit Size: 2.7 MM lb ds/day; 427,000 lb/hr steam at 1225 psig, 900°F, 1360 psig design

Incident Date: August 21, 2014

Downtime hrs, leak/total 135.5/135.5 hrs

ESP? Yes

Leak/Incident Loc: 8 tubes had thru-wall cracks adjacent to attachment welds and buttwelds, Tertiary Superheat

How discovered: Hydro following ESP

Wash adjacent tube: No

Root cause: Tubes (SA213-TP347H) failed due to stress corrosion cracking (SCC) mechanism, likely related to steam contamination to the superheater. The mill had a significant carryover event due to some liquor intrusion in early April 2014. We were able to shutdown the entire mill within 3 hrs of the event but not until after we experienced carryover from the RB4 steam drum into the SH.

- Samples of failed tubes were sent to (3) independent labs for analysis.
- The failure mechanism consistent across all three labs is SCC.

Leak detection: No

Bed cooling enhance No

Last full inspection:

March, 2014

Sequence of events:

On August 21, 2014 at approximately 9:20 am the mill's 1200 psi steam header system became unstable following the unexpected shutdown of our #8 Power Boiler. At 9:22 am #4 Recovery Boiler experienced a low drum level MFT due to the swings in the 1200 lb header. The boiler was immediately purged, relit, and put back on line at 10:02 am. At 10:07 am an ESP of #4 Recovery Boiler was (auto) initiated when the boiler's BMS PLC experienced a large control power voltage drop. The backup power source (UPS) did not function properly. Sequence of events

1. Purge complete and fire back in boiler @ 9:51 am on August 21st.
2. Superheat drain open
3. Boiler came back on line @ 10:02 am at a superheat outlet pressure of 525 psig
4. @ 10:07 am superheat drain was still open
5. @ 10:07 am #12 Turbine, which due to the mill's upset condition was the only turbine on line, tripped causing a voltage drop on the bus feeding #4 Recovery's control power. This voltage drop caused the BMS to authorize an ESP.
6. @ 10:07 am an ESP started on #4 Recovery
7. All rapid drains opened as required
8. Boiler was cooled for 21 hours and then filled for hydro
9. First leak discovered @ 2:30 pm on August 22nd.
10. Boiler was water washed
11. Boiler was refilled for hydro and 6 leaks were discovered without pressure on boiler. One leak was large enough that decision was made not to apply hydro pressure.
12. 6 dutchmen were installed
13. Boiler was refilled and first hydro was completed – 2 additional leaks were found
14. 2 more dutchmen were installed (total 8 dutchmen installed)
15. Boiler was refilled and successful (dry) hydro was completed
16. Boiler was returned to service @ 1:40 am on August 27th for a total outage down time of 135.5 hours

Repair procedure:

All tube sections with leak indications were removed and dutchmen installed using WPS# GTSM 8-8, see attached weld maps

Future prevention:

1. ESP pushbuttons have been rewired so that ESP will not be initiated from a loss of control power.
2. Back up control power (UPS) will be added to routine shift inspection and also will have a PM performed once a year.
3. The SH tube cracking event is still under heavy investigation and we are now looking at replacing the superheat in the next 12-18 months.

SUPERHEATER

SPRING 2015 – 13

Classification:

Location: International Paper, Texarkana Mill, Domino Texas

Unit: RB2, 1976, Babcock & Wilcox, PR-186, 2 drums, large economizer

Unit Size: 4.55 MM lb ds/day; 763,000 lb/hr steam at 1050 psig, 825°F, 1200 psig design

Incident Date: August 20, 2014

Downtime hrs, leak/total 48 off line/57.58 off liquor

ESP? No

Leak/Incident Loc: Crack in tube at Secondary Superheater outlet header

How discovered: Found during a hydro after an inspection nipple repair

Wash adjacent tube: No

Root cause: Root cause TBD in fall annual outage

Leak detection: Yes

Bed cooling enhance No

Last full inspection: October 2013

Sequence of events: Entered penthouse, drained and re-locked boiler, made repairs

Repair procedure: Ground out defect and made weld repair

Future prevention: TBD

SCREEN**SPRING 2015 – 14****Classification:****Location:****NewPage Wickliffe, KY****Unit:**

RB1, 1970, CE, (S)17467, 2 drums, decanting hearth, cascade DCE

Unit Size:

3.2 MM lb ds/day; 473,000 lb/hr steam at 600 psig, 750°F, 760 psig design (MAWP)

Incident Date:

June 24, 2014

Downtime hrs, leak/total

81.5 hr

ESP?**Yes****Leak/Incident Loc:**

1" long rupture, screen tube platen #10, bottom tube

How discovered:

Steam / Feedwater differential & blow down conductivity

Wash adjacent tube:

No

Root cause:

Tube sample being investigated

Leak detection:

Mill DCS mass balance

Bed cooling enhanc

No

Last full inspection:

September 2013

Sequence of events:

June 23 - At 11:45pm there was a sudden change in the steam / feedwater differential and soon after the continuous blow down conductivity began to drop. The differential increased approximately 37 klb/hr but did not activate the alarm in the DCS because of a steam flow transmitter issue. The starting point on the differential was -22 klb/hr and it increased to 15 klb/hr. The alarm set point was 24 klb/hr. At 7:00am on 6-24-14 the Assistant Superintendent was scrolling through PI and noticed the steam / feedwater differential and drop in the blow down conductivity. He immediately went to the control room and began an investigation with the operating crew. Using EOP 31, the operator and Asst. Supt checked all the blow downs, boiler drains, and emergency drains for leakage. A boiler drain was leaking by and it was tightened. At 8:15am maintenance was called to check out the flow transmitters on the steam and feedwater flow. At 8:20am two experienced operators and the Asst. Supt. began a walk down of the boiler. During the walk down a noise could be heard so the main sootblower steam valve was closed. There was not a consensus that the noise was a leak so the decision was made to pull liquor. After liquor was pulled a second walk down is started at 9:30am. The second walk down started on the 4th floor because the noise seemed to be the loudest. A small inspection door was opened on the front wall and a plume of steam could be seen in the boiler. The decision was made to open a man door in the center of the front wall to confirm if it was a screen tube or a superheater leak. When the door was opened, it was obvious that it was a screen tube leak. The walk down team went straight back to the control room and the boiler ESP was activated at 10:00am. The RB EOP 22 was used to confirm all necessary safety precautions were taken.

Repair procedure:

The leaking tube was removed and a Dutchman was installed. All thinned area of tube was replaced.

Future prevention:

The leaking tube will be sent to a lab for testing and confirmation of the failure. NDT was performed on all accessible screen tubes during the ESP repairs. No thin tubes were found. Further NDT testing will be scheduled during the September 2014 outage. The steam / feedwater differential alarm was lowered to account for the steam flow transmitter issue.

SCREEN

SPRING 2015 – 15

Classification:

Location: RockTenn, West Point, VA

Unit: RB5, 1992, B&W, PR-219, Single drum, large economizer, Rear-slope floor

Unit Size: 3.0 MM lb ds/day; 497,000 lb/hr steam at 1225 psig, 900°F, 1450 psig design (MAWP)

Incident Date: December 2, 2014

Downtime hrs, leak/total 12.5/59.5

ESP? No

Leak/Incident Loc: Furnace front screen tube where tube rolls out-of-plane with nose arch. 1.5 in circumferential crack in the vicinity of a seal weld at a support lug attachment

How discovered: While filling for hydro following a water wash

Wash adjacent tube: no

Root cause: Mechanical fatigue initialing in the area of undercutting at the toe of the seal weld

Leak detection: no

Bed cooling enhance: no

Last full inspection: March 2014

Sequence of events: While bringing the boiler up to hydro pressure following the completion of a sootblower water wash, water was discovered running down from the nose arch and onto the rear wall. Further investigation revealed a leak at a tube to support attachment weld on the rear support tube (front screen)

Repair procedure: Damaged tube bend was removed and new bent tube section was installed. Weld procedure GTSM-P1 was used.

Future prevention: NDE will be performed on remaining 27 support lugs to tube bend welds during next outage

UPPER FURNACE

SPRING 2015 – 16

Classification:

Location: International Paper, Bogalusa, LA

Unit: RB21,1989, B&W, PR-211, Single Drum , Low Odor, Large Economizer, Rear-slope floor

Unit Size: 3.3 MM lb ds/day; 504,000 lb/hr steam at 850 psig, 825F, 1050 psig design

Incident Date: October 10, 2014

Downtime hrs, leak/total 68.3hrs Liquor to Liquor

ESP? No

Leak/Incident Loc: Lower Bullnose support attachment weld – external to boiler

How discovered: Operator Walk Down

Wash adjacent tube: No

Root cause: Evidence of corrosion fatigue was found on the inner diameter surface. Cracks also initiated at the toe of the weld region on the outer diameter surface of the tube. The support plate welded to the OD surface of the tube created a rigid region that locally constrained expansion of the tube. As a result a crack formed at the toe of the weld on the OD surface of the tube. Cracks also formed during thermal expansion on the ID surface of the tube on opposite sides of this constrained region.

Leak detection: No

Bed cooling enhanc No

Last full inspection: April 2014

Sequence of events: During operator walk down, the operator noticed water dripping onto a buckstay just below the bullnose cavity. Inspection from the cavity door revealed steam leaking from the furthest left lower bullnose hanger attachment location. Knowing the leak was external to the boiler, the area manager and department manger were called to look at the leak. Knowing this boiler was a fully membraned design, the decision was made not to ESP the boiler as there was no leak path into the furnace. The boiler was taken off liquor 30 minutes after the leak was originally discovered. Subsequent inspection from the front wall access doors while on auxiliary fuel confirmed no water was entering the furnace. The smelt bed was burned out and the furnace was shut down in an orderly fashion, The boiler was water washed and the insulation and lagging was removed from the leak area after all drum pressure was off the boiler and the drum vents were open. After the water wash, two independent inspections were completed on the superheater area to ensure no saltcake chunks were remaining that could fall on furnace entrants. Once the superheater was deemed clear, a scaffold was installed from the floor to the underside of the bullnose. The failed tube was replaced / x-ray inspected and the boiler was hydro tested. Since the boiler was not fired to dry it after the water wash, insulation and lagging needed to be removed in several areas on the exterior of the furnace to confirm there were not any additional leaks. Once the hydro was clear, the boiler was returned to service.

Repair procedure: Tube Replaced

Future prevention: Inspection of remaining hangers on annual outage 2015. Move hangers from tube OD to membrane between tubes

UPPER FURNACE

SPRING 2015 – 17

Classification:

Location: Georgia-Pacific, Cedar Springs, GA

Unit: RB2,1991, B&W, PR-214, Single Drum , Low Odor, Large Economizer, Front-slope floor

Unit Size: 2.5 MM lb ds/day; 497,500 lb/hr steam at 850 psig, 830F, 1050 psig design

Incident Date: June 8, 2013

Downtime hrs, leak/total

ESP? No

Leak/Incident Loc: Nose arch tube leak at top of cold side (external to furnace) where gen bank front wall casing attachment and filler bar come together. Crack was approximately 1”.

How discovered: Operator Walkdown

Wash adjacent tube: No

Root cause: Stress Assisted Corrosion (SAC). Sent the tube out for analysis and findings confirmed SAC.

Leak detection: Yes

Bed cooling enhanc No

Last full inspection: 2013

Sequence of events: Operator performing routine walkdown identified indications of water dripping under insulation and steam wisping out. Operator communicated observations and further inspections were performed by more senior operators and boiler was setup to listen for leaks and there were no indications/sounds of a leak in the boiler (routine practice of listening for leaks is performed every 8 hours; once/shift by operators). The RBLI data was quickly called up since there were no alarms on the DCS for the RBLI and there were no indications of a leak. Operator/Crew Leader reviewed the water test reports and no indications of a leak from that data, same thing for checking the steam/BFW flows diverging. Decision was made to perform controlled shutdown and therefore bed was burned out and boiler was shutdown, cooled down and locked out. Pulled insulation and performed hydrostatic pressure test to identify leak/crack. Contacted OEM for consultation prior

Repair procedure: Tube section replaced

Future prevention: For future boiler outages, plans included additional NDT/radiography in that same Nose Arch area across the top and purchased tubing for potential Dutchmen replacement based on findings and OEM recommendations. During the subsequent outage in the sister boiler of the same design and vintage (#1 Recovery Boiler), 71 dutchmen were installed. During the next planned outage for this boiler the same plans were in place and 70 tubes were replaced with Dutchmen (included straight and bent tube sections).

UPPER FURNACE

SPRING 2015 – 18

Classification:
Location: Georgia-Pacific, Port Hudson, Zachary, LA
Unit: RB1, 1967, B&W, PR-110, 1 drum boiler (Ahlstrom/Andritz modified to single drum in 2000), large economizer, front-slope floor.
Unit Size: 3.0 MM lb ds/day; 457,700 lb/hr steam at 850 psig, 825°F, 1025 psig design
Incident Date: April 12, 2014
Downtime hrs, leak/total ESP? 38 hours
Leak/Incident Loc: No
How discovered: Right Wall/ Upper Furnace under IK 20
Wash adjacent tube: Production Leader found during walk down
Root cause: Yes, washed tube on other side of crotch plate
Leak detection: Condensate from IK's dripping on crotch plate
Bed cooling enhance: Unit was operational but did not alert to the leak; Boiler was down for an inventory related outage with fire out of boiler.
Last full inspection: No
Sequence of events: November 2013
Future prevention: Production Leader noticed water dripping off of the nose arch while performing a hydro on a repair made in the lower furnace on 4-10-14. Found a pinhole leak in a water wall tube in the crotch of IK 20 wall penetration. The leak can be seen spraying towards the opposite side of the crotch plate.
 All sootblowers with similar crotch plate arrangements were weld overlayed with 309L during Oct/Nov 2014 Outage.

UPPER FURNACE

SPRING 2015 – 19

Classification:
Location: International Paper, Pensacola Mill, Cantonment, FL
Unit: RB1, 1975, B&W, PR-171A, 2 drum, large economizer, rear-slope floor
Unit Size: 3.06 MM lb ds/day; 450K lb/hr steam at 850 psig, 850°F, 1000 psig design (MAWP)
Incident Date: April 28, 2014
Downtime hrs, leak/total ESP? N/A – Hydro during outage
Leak/Incident Loc: No
How discovered: 2 pinholes, #23 IK Wall Box C3 Tube, 7th Floor
Wash adjacent tube: Hydro
Root cause: No
Leak detection: Mechanical damage to tube, air tool impact during refractory removal
Bed cooling enhance: No
Last full inspection: No
Sequence of events: April 2014
Repair procedure: Discovered on first hydro attempt near end of April 2014 annual outage.
 Cut out, replaced tube section. Checked other openings worked on, replaced 4 other damaged tubes.
Future prevention: Contractor communications, limits on tools being used, QA oversight; hydroblast removal of refractory may be preferred.

LOWER FURNACE

SPRING 2015 – 20

Classification:	
Location:	Tolko Manitoba Kraft Papers, The Pas, Manitoba, Canada
Unit:	RB, 1969, CE, CA-69108, 2 Drum, Cascade DCE, decanting hearth
Unit Size:	1.95 MM lb ds/day; 219,000 lb/hr steam at 750 psig, 825F, 800 psig design
Incident Date:	January 21, 2015
Downtime hrs, leak/total ESP?	/91 Yes
Leak/Incident Loc:	¼" X 1" oval section pulled from casing side of right wall tube, 2 nd from rear, just above secondary air level (2 level air system), 31'-10" above floor.
How discovered:	Operator saw water running down the side of the unit, while putting in a burner.
Wash adjacent tube:	No
Root cause:	Stress, attachment weld pulled an oval section from tube wall. No appearance of crack or fish mouth at the opening. This is the 4 th leak on tube attachments at buck stays over the years. When leaks occur it seems to be a short time after starting up and appears to be stress related.
Leak detection:	No
Bed cooling enhance	No
Last full inspection:	June 2014
Sequence of events:	Unit was coming on line from planned outage, firing oil, assistant went to put in another burner to push the boiler on line and noticed water running down side of unit. ESP was initiated immediately. Systems were checked to ensure everything was operational and area was evacuated.
Repair procedure:	Removed 4 foot section of tube and installed pup. Installed pad on tube weld and made attachment weld to pad.
Future prevention:	

LOWER FURNACE

SPRING 2015 – 21

Classification:	
Location:	Georgia-Pacific, Port Hudson, Zachary, LA
Unit:	RB1, 1967, B&W, PR-110, 1 drum boiler (Ahlstrom/Andritz modified to single drum in 2000), large economizer, front-slope floor.
Unit Size:	3.0 MM lb ds/day; 457,700 lb/hr steam at 850 psig, 825°F, 1025 psig design
Incident Date:	April 10, 2014
Downtime hrs, leak/total ESP?	80 hours No
Leak/Incident Loc:	Large circumferential crack on furnace-side of Front Wall/ Lower Furnace tube
How discovered:	Production Leader found during walk down
Wash adjacent tube:	No
Root cause:	Corrosion fatigue due to water side deposits (94 g/ft ²)
Leak detection:	Unit was operational but did not alert to the leak; Boiler was down for an inventory related outage with fire out of boiler.
Bed cooling enhance	No
Last full inspection:	November 2013
Sequence of events:	Production Leader noticed water coming out of center and left spout during a walk down prior to bringing the boiler back up from an outage. Leak location determined by looking thru the South liquor gun port. Since the boiler bed had been burned out and gas removed from furnace for 15 hours prior to the leak being found, no ESP was performed. Boiler was locked out for internal entry, leak was identified and boiler drained for repairs.
Repair procedure:	Removed the tube and installed dutchman during failure in April.
Future prevention:	In October, 2014 seven lower wall panels were removed and replaced with 2.875-inch O.D. SA210A1 carbon steel, with 360° coverage weld overlay of Inconel 625 material to a thickness

of 0.070-inch ± 0.010-inch (tube finished O.D. 3-inches after weld overlay). Remaining five lower wall panels to be replaced in November 2015. The dutchman installed during April failure was replaced during the wall panel installation on the front wall.

LOWER FURNACE

SPRING 2015 – 22

Classification:

Location: Georgia-Pacific, Port Hudson, Zachary, LA

Unit: RB1, 1967, B&W, PR-110, 1 drum boiler (Ahlstrom/Andritz modified to single drum in 2000), large economizer, front-slope floor.

Unit Size: 3.0 MM lb ds/day; 457,700 lb/hr steam at 850 psig, 825°F, 1025 psig design

Incident Date: September 13, 2014

Downtime hrs, leak/total 111/113 hours

ESP? Yes

Leak/Incident Loc: Two small 1/8" pinhole perforations next to the weld membrane on furnace-side of Front Wall/Lower Furnace tube

How discovered: Operations were in the process of installing gas burners when the leak was found by an operator.

Wash adjacent tube: No

Root cause: External thinning from preferential corrosion attack at a location that appeared to have been weld repaired, possibly during studding. Contributing factor was heavy waterside deposits (40 g/ft²)

Leak detection: Unit was operational but indication did not alert for Mass Balance or TRASAR. Leak estimated to be less than 5 gpm which is under detectable limit for RBLI. Boiler had been taken off liquor 1 hr prior to the ESP for an inventory related outage and had tripped on low drum level 48 minutes before ESP.

Bed cooling enhance No

Last full inspection: November 2013

Sequence of events: RB1 was taken off liquor at 9:45 AM on 9/13/14 for liquor management. At 10:05 AM the boiler tripped on low drum level. Operations were in the process of installing gas burners when the leak was found by an operator at 10:20 AM. The operator noticed water running out of the center spout and informed the control room. An ESP was initiated at 10:53 AM on 9/13/14. Leak was 4 feet below the liquor gun port on front wall in Tube #37. Repair required a dutchman replacement (44 inches).

Repair procedure: Removed the tube and installed dutchman. PT Test of prep and root made during repair and X-Ray performed after final weld completed. Hydro conducted after all welds were completed and verified to be satisfactory.

Future prevention: In October, 2014 seven lower wall panels were removed and replaced with 2.875-inch O.D. SA210A1 carbon steel, with 360° coverage weld overlay of Inconel 625 material to a thickness of 0.070-inch ± 0.010-inch (tube finished O.D. 3-inches after weld overlay). Remaining five lower wall panels to be replaced in October 2015. The dutchman installed during September failure was replaced with Inconel overlaid tube during the wall panel installation on the front wall.

LOWER FURNACE

SPRING 2015 – 23

Classification:

Location: International Paper, Bogalusa, LA

Unit: RB20, PR-66 (rebuilt as PR-202 in 1980), 1964, B&W, two cyclone DCE, front-slope floor

Unit Size: 2.8 MM lb ds/day; 388,000 lb/hr steam at 852 psig, 825°F, 1050 psig design

Incident Date: August 4, 2014

Downtime hrs, leak/total 101hrs 3 minutes – Liquor to Liquor

ESP? No

Leak/Incident Loc: Leak #1 – Cold Side Tube #73 Front Wall

Leak #2 – Hot Side Tube #10 Rear Wall

How discovered: Operator Walk down

Wash adjacent tube: No

Root cause: Failures of both tubes were in heat affected zones on the hot side of the tubes. Cracks initiated primarily at the outer diameter surface of the tubes and propagated through the wall in a method similar to thermal fatigue.

Leak detection: No

Bed cooling enhanc No

Last full inspection: April 2014

Sequence of events: 20 RB was operating normally after a trip 2 days earlier due to a PLC card failure. The field operator was cleaning the spouts and primary airports when he noticed steam vapor coming out of an obsolete secondary cleaning port. Further inspection of the air ducts indicated that water was not entering the boiler through the primary or secondary air ducts. No alarms were indicated on the duct leak detection system.

The Recovery Area Manager was called to inform him of the situation at which time he confirmed that the secondary airports on the front wall had been removed and replaced with fully welded straight tube sections. The original feeder ducts to the obsolete port from the secondary ductwork were still installed and that there should not be any water entering the furnace. The Recovery Area Manager went to the plant and completed a second inspection of the primary and secondary ductwork and no water could be seen in either the primary or secondary ductwork. The boiler was put on auxiliary fuel/ taken off liquor and a third inspection of the ductwork was completed. Once off liquor the inside of the furnace was inspected from the gun ports and no water could be seen. There were still no leak detection alarms present.

The bed was burned out and the boiler was shutdown in an orderly fashion. Once cooled down the Boiler was water washed as the leak was suspected to be at the attachment weld for the obsolete feeder duct which would require a Dutchmen be installed. The leak was identified on Tube #73 on the front wall – cold side inside the sealed feeder box to the obsolete secondary airport. An 18” long Dutchman was installed. On the Hydro test, August 6th at 9:42am, a second leak on tube #10 on the rear wall – hot side was found. Once scaffold was installed it appeared to be a leak at a location a pin stud was removed to install a Dutchmen below this location. This tube was cut out and a 24” Dutchmen was installed. A dry hydro was achieved on August 7th and 2:46am. The inside scaffolds were removed, the boiler was unlocked and put back in service.

Repair procedure: Replaced tube with Dutchmen

Future prevention: Plan a complete Lower Furnace replacement in April 2015

SPOUT

SPRING 2015 – 24

Classification:

Location: **Fortress Specialty Cellulose, Thurso, Quebec, Canada**

Unit: RB3, 1989, B&W, 141-7621, 2 drum, Large economizer, Rear-slope floor

Unit Size: 1.3 MM lb ds/day; 158,700 lb/hr steam at 510 psig, 710°F, 600 psig design (MAWP)

Incident Date: February 8, 2015

Downtime hrs, leak/total 16.5 hours

ESP? No

Leak/Incident Loc: Smelt spout melted. Andritz inserted spout

How discovered: Routine spout cleaning. Smelt was flowing differently in EAST spout. Operator then realized cooling water valve was closed. The boiler has 2 smelt spouts.

Wash adjacent tube: N/A

Root cause: Cooling water was not reopened after unlocking following shatter spray maintenance

Leak detection: N/A

Bed cooling enhance: N/A

Last full inspection: 2011 (thorough NDT)

Sequence of events: Boiler was burning black liquor for 21 hours before operator noticed cooling water was closed and inside of spout burnt. Bed was burnt down on auxiliary fuel w/o water on the failed spout.

Repair procedure: Replaced spout

Future prevention: Dry spout or flow meter on spout cooling water as permissive and interlock

SPOUT**SPRING 2015 – 25****Classification:****Location:(Mill, city, ST)****Unit:****Unit Size:****Incident Date:****Downtime hrs, leak/total****ESP?****Leak/Incident Loc:****How discovered:****Wash adjacent tube:****Root cause:****Leak detection:****Bed cooling enhance:****Last full inspection:****Sequence of events:****Expera Specialty Solutions, Mosinee Mill, Mosinee, WI**

RB14, 1976, B&W, PR-175, 2-drum, Large economizer, Rear-slope floor, 2 spouts.

0.90 MM lb ds/day; 151,900 lb/hr steam at 625 psig, 725°F, 700 psig design (MAWP)

July 23, 2014

48

No

Smelt Spout, B&W inserted. Piece of attachment weld between "O" tube and spout at the inserted end of the spout came out, resulting in a 1/8" x 2" long opening in the weld joint.

Operator heard leak while cleaning spouts.

No

Failed weld on spout. Third party analysis of the failed weld indicated that a crack developed in an undercut area at the toe of the weld on the water side, which propagated toward the smelt side of the weld until it failed, likely through normal thermal cycling of the spout and iron oxide forming a wedge in the undercut area.

No

No

October 2013

7/23/14 was a planned chill and blow. Starting on 3rd shift of 7/22/14 (mill time) liquor sprays were dropped in preparation for burnout of the smelt bed. The Soda Recovery Utility went up to the 1st floor to check out how the smelt was running. He noticed the east (LH) spout popping quite a bit. He went to the hood wash and observed that the flow was high and proceeded to cut it back, suspecting hood wash water may be splashing into the spout. Approximately 45 minutes later, the Utility went back to the 1st floor and observed the east spout continuing to pop. At that point he notified Recovery Mgr that the east spout was popping excessively and asked him to check it out, as he felt water may be getting into the furnace. He stated the hood washes were down to a trickle, so he didn't suspect that was the cause. The manager talked to the second Soda Recovery Utility operator, who was now tending the spouts, to get his input on what he was seeing. He stated the popping was coming from inside the furnace by the east spout. The manager proceeded to the primary air ports on the east side of the boiler, looked in the air port closest to the spout and observed what appeared to be water drops spraying up into the furnace bed. He called the Pulp Mill Supervisor over to verify what he was seeing. The supervisor confirmed that he also saw water drops/steam spraying back into the bed.

They decided that the east spout cooling water should be isolated to see if it would stop, so the spout cooling water valve to the east spout was closed. The popping was still occurring in the furnace and spout but appeared to have decreased. Water appeared to be still spraying into the furnace immediately after shutting the valve. The spout water outlet piping was reviewed and it was determined there were no valves after the spout, but most of the piping back to the spout surge tank was in a horizontal run and that any backflow should cease fairly quickly. Observations were made at the primary air port again and the water spray could not be seen going back into the furnace. The popping of the smelt at the east spout had ceased, so it was determined that the spout water was the most likely cause.

The cooling water valve to the east spout was then cracked open to see if the spray came back. It immediately appeared again and the popping started to increase. The valve was immediately shut again and left off. Burnout of the bed continued as planned (smelt was still running). A short time later the manager asked the Utility if the popping of the smelt had decreased or stopped. The Utility went to the east spout and rodded it out, with no popping occurring. Previously when the spout was rodded out the popping frequency increased and got more violent. The decision was made that no ESP was necessary as the flow of water into the boiler was stopped. The burnout of the bed would proceed and the spouts would have to be replaced.

The Utility operator that first found the issue stated that prior to the bed burnout that morning there was nothing unusual about the east spout as far as excessive popping. Several other

Soda Recovery Utility employees confirmed there was no indication that we may have had a leak at the spout prior to shutdown day.
Repair procedure: Replaced both spouts
Future prevention: Continue to change spouts every 12 months, visual inspection of welds on new spouts.

SUPPLY TUBE and SUPERHEATER

SPRING 2015 – 26
Classification:
Location: Georgia-Pacific, Foley Cellulose, Perry, FL
Unit: RB4, 1974, B&W, PR-167, 2 drum, large econ, rear-slope floor
Unit Size: 3.1 MM lb ds/day; 450,000 lb/hr steam at 600 psig, 750°F, 750 psig design (MAWP)
Incident Date: February 17, 2015
Downtime hrs, leak/total ESP? 71.8hrs/71.8hrs
Leak/Incident Loc: No
Leak/Incident Loc: Supply tube between downcomer and water wall header in lower vestibule
How discovered: Operator walkdown
Wash adjacent tube: No
Root cause: SAC (stress assisted corrosion) for supply tube and SH support tube, internal pitting for SH loop.
Leak detection: Mass balance
Bed cooling enhance: No
Last full inspection: May 2014
Sequence of events: Boiler was starting up from a water wash. Water was seen coming from lower vestibule during beginning of superheater steam-out period. Boiler shut down and cooled for repair. No liquor had been fired. After repair, first hydro test performed, two superheater leaks (high temp platen 3 row 1 loop 2, and low temp platen 4 support tube) and three handhole leaks in the lower vestibule were found.
Repair procedure: Supply tube was sectioned and replaced. The loop was replaced and the support tube was sectioned and replaced.
Future prevention: X-ray of all remaining supply tubes in lower vestibule is planned for next IMO. Several superheater loops are changed annually during inspection outages. Changing out both superheaters is on the 5-yr plan.

RISER TUBE

SPRING 2015 – 27
Classification:
Location:(Mill, city, ST) Georgia-Pacific, Foley Cellulose, Perry, FL
Unit: RB2, 1957, B&W, PR-40, 2 drum, large economizer, front-slope floor
Unit Size: 2.3 MM lb ds/day; 380,000 lb/hr steam at 600 psig, 750°F, 686 psig design (MAWP)
Incident Date: January 25, 2015
Downtime hrs, leak/total ESP? 66hrs/66hrs
Leak/Incident Loc: No
Leak/Incident Loc: Longitudinal crack on return tube between upper furnace screen header and steam drum, outside boiler; leak was very close to the drum.
How discovered: Routine operator walkdown
Wash adjacent tube: No
Root cause: Cold side corrosion
Leak detection: Mass balance
Bed cooling enhance: No
Last full inspection: December 2013
Sequence of events: Boiler was operating at 80% load. During routine operator tour, water was seen coming out of shroud near left end of steam drum. Boiler was pulled off liquor to begin repair outage.
Repair procedure: Return tube was sectioned out
Future prevention: The entire return tube on both the east and west sides will be replaced in the March 2015 outage. The steam drum shroud will be pulled off both ends of the steam drum to allow the drum level sensing legs to be checked for cold side corrosion next year.

RISER TUBE

SPRING 2015 – 28

Classification:
Location: International Paper, Georgetown, South Carolina
Unit: RB2, 1967, B&W, PR-114, 2 Drums, Cyclone Evaporators
Unit Size: 4.5 MM lb ds/day; 500,000 lb/hr steam at 1020 psig, 950°F, 1175 psig design
Incident Date: March 19, 2013
Downtime hrs, leak/total ESP? 0 / Down for 10 day annual outage
Leak/Incident Loc: No
 Penthouse. RHS of boiler. 2" riser (equalizer) tube connecting sidewall headers to steam drum cracked.
How discovered: Hydrostatic testing
Wash adjacent tube: No
Root cause: Stress Assisted Corrosion determined by lab analysis
Leak detection: No
Bed cooling enhanc N/A
Last full inspection: March 2012
Sequence of events: Leak discovered on hydro during annual outage.
Repair procedure: SA- 178A tube weld repaired in 2013 for this leak; section replaced in 2014 due availability of new tube and nozzle from B & W.
Future prevention: Visual inspection; All similar equalization tubes were replaced on both boilers.

RISER TUBE

SPRING 2015 – 29

Classification:
Location: International Paper, Georgetown, South Carolina
Unit: RB1, 1964, B&W, PR-81, 2 Drums, Cyclone Evaporators
Unit Size: 3.4 MM lb ds/day; 425,000 lb/hr steam at 1020 psig, 950°F, 1175 psig design
Incident Date: March 10, 2014
Downtime hrs, leak/total ESP? 0 / Down for 10 day annual outage
Leak/Incident Loc: No
 Penthouse. 2" riser (equalizer) tube connecting sidewall headers to steam drum cracked.
How discovered: During visual inspection of the penthouse for the annual outage
Wash adjacent tube: No
Root cause: Stress Assisted Corrosion determined by lab analysis
Leak detection: No
Bed cooling enhanc N/A
Last full inspection: March 2013
Sequence of events: Leak discovered during annual outage.
Repair procedure: As planned, tube was replaced during this 2014 outage.
Future prevention: Visual inspection; All similar equalization tubes were replaced on both boilers.

RISER TUBE

SPRING 2015 – 30

Classification:

Location: International Paper, Orange Mill, TX

Unit: RB2, 1967, B&W, PR-108B, 2 drum, direct contact cyclone evaporator, front-slope floor

Unit Size: 2.7 MM lb ds/day; 254,000 lb/hr steam at 850 psig, 830°F, 975 psig design

Incident Date: July 17, 2014

Downtime hrs, leak/total 50:45 /

ESP? No

Leak/Incident Loc: Crack in weld on 2" riser (equalizer) tube from rear sidewall upper header to the drum.

How discovered: Boiler walkdown during the pressurization curve

Wash adjacent tube: no

Root cause: SAC

Leak detection: Yes

Bed cooling enhanc No

Last full inspection: April 2014

Sequence of events: Boiler had been down due to loss of mill water to the plant. The boiler was restarted and during walkdown of unit a drip was noticed on the boiler casing and investigation ruled out rain, sootblower, and water hose. Inspection in the upper penthouse could see a small weeping leak from the door. The decision was made to shut and repair. Pressure in the drum was 32 psi when leak was noticed and with no bed, the boiler was taken down in orderly shut.

Repair procedure: Burring out of crack and welding

Future prevention: Replacement of failed tube and opposite wall tube on next planned outage. Will also replace the similar tubes on sister boiler.

DESUPERHEATER WATER LINE

SPRING 2015 – 31

Classification:

Location: RockTenn, Stevenson, AL

Unit: RB4, 1997, Ahlstrom, 6208, 1 drum, Large economizer, Decanting hearth

Unit Size: 1.36 MM lb ds/day; 197,000 lb/hr steam at 600 psig, 720°F, 725 psig design (MAWP)

Incident Date: November 28, 2014

Downtime hrs, leak/total 31 hrs

ESP? No

Leak/Incident Loc: 1/8" pinhole in socket weld on desuperheater water line in penthouse.

How discovered: Operator Walkdown

Wash adjacent tube: No

Root cause: Porosity in construction socket weld.

Leak detection: No

Bed cooling enhance: No

Last full inspection: June 2014

Sequence of events: Boiler operator notified the recovery assistant superintendent that he noticed vapor coming from the top of the boiler penthouse and the penthouse inspection door on the 9th floor. The inspection door was removed and a leak on the primary desuperheater water piping was observed. The boiler was taken down two days later. Penthouse was cooled and repairs were made.

Repair procedure: Replacement of component parts: included one 1 ½" schedule 80 45 degree elbow, one 1 ½" schedule 80- 90 degree elbow, one 1 ½" schedule 80 pipe coupling

Future prevention:

**Appendix B - PERSONNEL SAFETY
(Slide Presentation)**



Advisory
Committee

2015 April BLRBAC Personnel Safety Document Revisions

Bob Zawistowski

Personnel Safety Subcommittee - Chairman

Changes from October 2013 – *Draft*

1. Added a sentence to paragraph 1.1.6 to reference Appendix B containing a generic letter for obtaining a variance to allow exit doors to open into the Recovery Area
2. Added to the last sentence of 1.3.2 to include “local building codes” and a reference to paragraph 1.1.6
3. Added a new paragraph to 2.2.3 regarding structural and pressure part integrity
4. Added a new section 2.2.5 on Explosion Relief Corners
5. Added a new paragraph 2.10.6 on Management of Change
6. Added a new paragraph, 2.10.7 on Boiler Blowdown Line
7. Added a new section 4.4 providing guidance for mills to use/consider when establishing a set of Recovery Boiler Safety Guidelines

For a summary of prior changes to this document refer to Appendix A, Document Revision History

Changes from October 2013 – *Draft*

1. Added a sentence to paragraph 1.1.6 to reference Appendix B containing a generic letter for obtaining a variance to allow exit doors to open into the Recovery Area

1.1.6 Doors leading to and from protected areas should be pressure resistant and open into the recovery boiler area. This arrangement is necessary to prevent the doors from being blown open during an explosion. This may be different from some local building codes, but is necessary to ensure a safe protected area. They must be normally closed in order to prevent the propagation of pressure, flame, projectiles and hot gases into the protected areas. These doors should be selfclosing, but not lockable. (See Appendix B for a generic letter requesting a variance for these doors from the requirements in NFPA 101, *Life Safety Code* and/or local building codes. Also see paragraph 1.3.2.)

APPENDIX B – GENERIC STAIRWAY AND RECOVERY AREA EXIT DOOR VARIANCE LETTER

The purpose of this letter is to request a variance regarding the direction of door opening in enclosed stairwells in the mill's (such and such) boilers. Please note that this request refers only to doors providing access from the recovery boiler area to enclosed stairwells in recovery boiler buildings. This request does not refer to the bottom door going out of the building from a stairwell to the world or other building. NFPA 101, *Life Safety Code*, 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 pulp and/or paper mill recovery boiler, however, the situation is likely to be very different. In the event of a recovery boiler explosion, the viability of the enclosed stairwell as an emergency exit is more likely if the door frames prevent the doors 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 of recovery boilers and evacuation of the recovery boiler area. 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, an enclosed stairwell is the primary exit. The smelt-water interaction can cause the release of high pressure steam and/or high temperature water and noxious fumes into the building due to the failure of tubes and/or piping. For these reasons the Black Liquor Recovery Boiler Advisory Committee (BLRBAC) *Recommended Guidelines for Personnel Safety*, Sections 1.16 and 1.32 recommends that the doors to the enclosed stairwell in a recovery boiler building open from the stairwell into the boiler area. It further requires these doors to be pressure resistant and self-closing, but not lockable. Based on this information, we are requesting a variance from NFPA 101, *Life Safety Code*, for the enclosed stairwells in (such and such) recovery boilers. This variance will apply only to these specific stairwells.

Changes from October 2013 – *Draft*

2. Added to the last sentence of 1.3.2 to include “local building codes” and a reference to paragraph 1.1.6

1.3.2 Doors leading to the protected stairwell should open out into the boiler building so in the event of pressurization the doors would not be forced open. They should be pressure resistant and be self-closing, but not lockable. (See Appendix B for a generic letter requesting a variance for these doors from the requirements in NFPA 101, *Life Safety Code* and/or local building codes. Also see paragraph 1.1.6.)

Changes from October 2013 – *Draft*

3. Added a new paragraph to 2.2.3 regarding structural and pressure part integrity

2.2.3 Studies have shown that there are a number of areas that may rupture in addition to explosion corners. These areas include all remaining corners of the furnace (for example, the junction of the floor and sidewalls, the junction of the nose arch and side walls and junction of the roof and sidewalls). Operator and/or maintenance workstations should not be exposed to these locations.

Owner/operators of recovery boilers should consult with OEMs about potential upgrade recommendations for older design recovery boilers to improve structural/pressure part integrity.

Changes from October 2013 – *Draft*

4. Added a new paragraph 2.2.5 on Explosion Relief Corners

2.2.5 Explosion relief corners have reduced the amount of damage that occurs to boilers in some explosion situations. In November 2001 a report was issued to the American Forest & Paper Association by Thomas M. Grace and John L. Clement. The report is titled “Phase II, Investigation of the Relationship Between Recovery Boiler Furnace Design and Explosion Damage.” We encourage owner operators to review this report and OEM recommendations as resources to assist in deciding what design elements, if any, relating to explosion protection should be incorporated in their Recovery Boilers.

Changes from October 2013 – *Draft*

5. Added a new paragraph 2.10.6 on Management of Change

2.10.6 Management of Change – A “Management of Change” policy is recommended. Management of Change should be communicated to all involved parties in the mill and the changes should be documented in hard copy or electronically. How a management of change is structured, implemented and revised is up to the individual mills and those person(s) responsible for recovery boiler operation.

Changes from October 2013 – *Draft*

6. Added a new paragraph, 2.10.7 on Boiler Blowdown Line

2.10.7 Boiler Blowdown Lines – Boiler blowdown lines including header, drum, water column, etc. drains are subject to external corrosion. Often these lines are covered with insulation and lagging. The lines generally have little to no pressure on the lines until they are in use. Lines that have corroded and lost significant wall thickness have leaked or burst when blowdown valves are opened pressurizing these lines. Generally the corrosion process is slow and occurs over extended periods of time. Mills should periodically evaluate the lines. The interval at which evaluations are performed will be determined by the mill as corrosion rates vary due to numerous variables.

Changes from October 2013 – *Draft*

7. Added a new section 4.4 providing guidance for mills to use/consider when establishing a set of Recovery Boiler Safety Guidelines

4.4.1 A set of Recovery Boiler Safety Guidelines should be developed with the objective of improving safety and establishing a more formalized guideline process. These guidelines may exist in several different locations as opposed to under common cover, and their content is up to the mill and person(s) responsible for the operation of the recovery boiler. Topics to consider in the development of recovery boiler safety guidelines are listed below. This is by no means an all-inclusive list, and it is up to the individual mills to determine specific elements to include along with governing protocols. Many of these suggested topics are addressed in more detail in other BLRBAC documents but are listed here as they relate specifically to personnel safety.

Personnel Protection

Develop a recovery boiler area PPE matrix with minimum PPE for specific tasks or activities based upon the hazard assessment.

Evaluation criteria to determine suitability of protective equipment and clothing for specific tasks.

Establishment of “restricted or limited access areas” such as smelt spout decks and other areas of elevated risk.

Establish safe and accepted behaviors, possibly using Job Hazard Analysis, for working around the recovery boiler.

Ergonomics and heat stress should be considered in selection and/or design for PPE and tools.

Smelt Deck

Facilities should consider engineered solutions where practical to minimize employee exposure to smelt splashes such as mini-hoods, doghouses, enclosed hoods, hinged access doors, chainmail shields, automatic spout rodders.

Layout and design should facilitate an unrestricted egress route from the smelt deck.

Consider remote monitoring of the spout deck such as a camera displayed in the control room.

Use of a properly designed spout rod, such as one with a blunted end or properly capped hollow rod.

How to deal with plugged spouts such as using a properly designed gas torch and/or use of rods.

Specify items that are considered unsafe and should not be used such as hollow uncapped rods.

Hoppers

Specify precautions/procedures/checklists when working around ash hoppers such as use of chain restrictors on doors. Early detection systems should be employed such as use of thermocouples, level indicators, etc.

Ports

Specify precautions/procedures when working around or inspecting the furnace through the ports.

Restricted Areas

Access to the smelt deck, areas under the floor vestibule and other areas deemed to have elevated risk should be identified and restricted to only those personnel needing to enter these areas.

Signage and barriers (chain or other method) should indicate these areas are restricted. Develop guidelines so information about the restricted areas is clearly communicated to operation and visiting personnel. Incorporate minimum training standards into orientation programs.

Management of Change

Changes to processes, equipment, procedures or facilities that could affect the risk assessment, and any additional tasks/activities that should be evaluated and should be managed using a defined/established form of “Management of Change” process.



Advisory
Committee

2015 April BLRBAC Personnel Safety Document Revisions

Questions ?????