



# BLACK LIQUOR RECOVERY BOILER

## ADVISORY COMMITTEE

### MINUTES OF MEETING

#### Crowne Plaza Hotel/Atlanta Airport

#### Atlanta, Georgia

#### October 10, 11 & 12, 2011

#### OBJECTIVE

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

*Bylaws - 2.1*

#### OFFICERS

**Chairman:** **Scott Moyer** Tel:  
Georgia-Pacific Corporation  
Florida County Road 216-S (shipping)  
P. O. Box 919 (mail)  
Palatka, FL 32178-0919

386-329-5609  
Mobile: 386-227-8991  
[scott.moyer@GAPAC.com](mailto:scott.moyer@GAPAC.com)

**Vice-Chairman:** W  
CH **Jim Hinman**  
eyerhaeuser NR  
3D29  
33663 Weyerhaeuser Way S.  
Federal Way, WA 98003

Tel: 253-924-6757  
[jim.hinman@weyerhaeuser.com](mailto:jim.hinman@weyerhaeuser.com)

**Secretary:** **Mike Polagye**  
FM Global  
P. O. Box 9102  
Norwood, MA 02062

Tel: 781-255-4730  
[michael.polagye@fmglobal.com](mailto:michael.polagye@fmglobal.com)

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

Cell: 901 573 8343  
[olavessen@aol.com](mailto: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](http://www.blrbac.org)**  
**IRS Employer ID/Tax ID (IRS E.I.N.T./T.I.N) ---- #13-366-5137**

## EXECUTIVE COMMITTEE

**Scott Moyer**  
**BLRBAC Chairman**  
Georgia Pacific Corporation  
P. O. Box 919  
Palatka, FL 32178-0919  
Tel: 386-329-5609  
Mobile: 386-227-8991  
[scott.moyer@GAPAC.com](mailto:scott.moyer@GAPAC.com)

**Jim Hinman**  
**BLRBAC Vice-Chairman**  
Weyerhaeuser  
CH 3D29  
33663 Weyerhaeuser Way S.  
Federal Way, WA 98003  
Tel: 253-924-6757  
[jim.hinman@weyerhaeuser.com](mailto:jim.hinman@weyerhaeuser.com)

**Mike Polagye**  
**BLRBAC Secretary**  
FM Global  
P. O. Box 9102  
Norwood, MA 02062  
Tel: 781-255-4730  
[michael.polagye@fmglobal.com](mailto:michael.polagye@fmglobal.com)

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

**Dave Fuhrmann**  
**Operator Representative**  
International Paper  
6283 Tri-Ridge Blvd.  
Loveland, OH 45140  
Tel: 513-248-6954  
[dave.fuhrmann@ipaper.com](mailto:dave.fuhrmann@ipaper.com)

**John Weikmann**  
**Manufacturing Representative**  
Metso Power  
3430 Toringdon Way, Ste. 201  
Charlotte, NC 28277  
Tel: 704-414-3431  
[john.weikmann@metso.com](mailto:john.weikmann@metso.com)

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

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**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](mailto:fhholich@aol.com)

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## BLRBAC SUBCOMMITTEES

<p><b>AUXILIARY FUEL</b>  <b>Bruce Knowlen, Chairman</b>  Weyerhaeuser Company  WTC 1B22  PO Box 9777  Federal Way, WA 98063  Tel: 253-924-6434  <a href="mailto:bruce.knowlen@weyerhaeuser.com">bruce.knowlen@weyerhaeuser.com</a></p>	<p><b>BLACK LIQUOR</b>  <b>Mark Sargent, Chairman</b>  International Paper  6283 Tri-Ridge Boulevard  Loveland, OH 45140-7910  Tel: 513-248-6086  <a href="mailto:mark.sargent@ipaper.com">mark.sargent@ipaper.com</a></p>
<p><b>EMERGENCY SHUTDOWN PROCEDURES</b>  <b>John Andrews, Chairman</b>  MeadWestvaco Corporation  5255 Virginia Ave.  North Charleston, SC 29406  Tel: 843-746-8214  <a href="mailto:john.andrews@mww.com">john.andrews@mww.com</a></p>	<p><b>FIRE PROTECTION IN DIRECT CONTACT EVAPORATORS</b>  <b>Craig Cooke, Vice Chairman</b>  FM Global  815 Byron Drive  Oconomowoc, WI 53066  Tel: 262-567-7370  <a href="mailto:craig.cooke@fmglobal.com">craig.cooke@fmglobal.com</a></p>
<p><b>INSTRUMENTATION</b>  <b>David Avery, Chairman</b>  Domtar Paper Company  P. O. Box 678  Bennettsville, SC 29512  Tel: 843-454-8937  <a href="mailto:david.avery@domtar.com">david.avery@domtar.com</a></p>	<p><b>MATERIALS &amp; WELDING</b>  <b>Dave Fuhrmann, Chairman</b>  International Paper  6285 TriRidge Blvd.  Loveland, OH 45140  Tel: 513-248-6954  <a href="mailto:dave.fuhrmann@ipaper.com">dave.fuhrmann@ipaper.com</a></p>
<p><b>PERSONNEL SAFETY</b>  <b>Robert Zawistowski, Chairman</b>  Power Specialists Associates, Inc.  531 Main Street  Somers, CT 06071  Tel: 860-763-3241, Ext. 135  <a href="mailto:bob.zawistowski@psaengineering.com">bob.zawistowski@psaengineering.com</a></p>	<p><b>PUBLICITY &amp; NEWS RELEASE</b>  <b>Dave Parrish, Chairman</b>  FM Global  1151 Boston-Providence Turnpike  Norwood, MA 02062  Tel: 781-255-4734  <a href="mailto:david.parrish@fmglobal.com">david.parrish@fmglobal.com</a></p>
<p><b>WASTE STREAMS</b>  <b>John Rickard, Chairman</b>  Jacobs Engineering  P. O. Box 5456  Greenville, SC 29606  Tel: 864-676-6393  <a href="mailto:john.rickard@jacobs.com">john.rickard@jacobs.com</a></p>	<p><b>WATER TREATMENT</b>  <b>Tom Madersky, Chairman</b>  Power Specialists Assoc. Inc.  531 Main Street  Somers, CT 06071  Tel: 860-763-3241  <a href="mailto:tom.madersky@psaengineering.com">tom.madersky@psaengineering.com</a></p>

BLRBAC MEETING SCHEDULE

<b>Spring</b>	<b>April</b>	<b>2, 3 &amp; 4</b>	<b>--</b>	<b>2012</b>
<b>Fall</b>	<b>*October</b>	<b>1, 2 &amp; 3</b>	<b>--</b>	<b>2012</b>
<b>Spring</b>	<b>April</b>	<b>8, 9 &amp; 10</b>	<b>--</b>	<b>2013</b>
<b>Fall</b>	<b>October</b>	<b>7, 8 &amp; 9</b>	<b>--</b>	<b>2013</b>
<b>Spring</b>	<b>April</b>	<b>7, 8 &amp; 9</b>	<b>--</b>	<b>2014</b>
<b>Fall</b>	<b>October</b>	<b>6, 7 &amp; 8</b>	<b>--</b>	<b>2014</b>

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

■ Past Chairman Lon Schroeder

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**\*50<sup>th</sup> Anniversary Meeting** – Dates changed by Executive Committee from previously posted dates due to hotel availability.

BLRBAC has established its own Website which is: [www.blrbac.org](http://www.blrbac.org)

At this website you will find a copy of past MeetingMinutes and the next Meeting Notice. Therefore, each Representative and Associate Representative is asked to inform their people of this website. 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**                      Mail/e-mail completed questionnaires to Barbara Holich. These

**QUESTIONNAIRE**                              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](mailto:fhholich@aol.com)

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

**[www.blrbac.org](http://www.blrbac.org)**

## **BLRBAC Guidelines & Recommended Practices**

 *Waste Stream Incineration*

(Dated: October 2010)

 *Emergency Shutdown Procedure*

(Dated: October 2009)

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

(Dated: April 2010)

 *Materials & Welding Guidelines*

(Dated: October 2010)

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

(Dated: October 2010)

 *Fire Protection in Direct Contact Evaporators and Associated Equipment*

(Dated: April 2008)

 *Personnel Safety & Training*

(Dated: October 2007)

 *Application of Rotork Actuators on Black Liquor Recovery Boilers*

(Dated: October 2005)

 *Post ESP Water Level*

(Dated: January 2005)

 *Checklist and Classification Guide for Instruments and Control Systems*

(Dated: October 2004)

 *Post ESP Guidelines*

(Dated: October 2002)

If you have any questions, contact:

Mike Polagye

BLRBAC Secretary

FM Global

P. O. Box 9102

Norwood, MA 02062

Phone: 781-255-4730

[michael.polagye@fmglobal.com](mailto:michael.polagye@fmglobal.com)

**AUXILIARY FUEL SUBCOMMITTEE**

**‡ Bruce Knowlen – Chairman**

Weyerhaeuser Company  
 P.O. Box 9777 / WTC-1B22  
 Federal Way, WA 98063-9777  
 Tel: 253-924-6434

[bruce.knowlen@weyerhaeuser.com](mailto:bruce.knowlen@weyerhaeuser.com)

<p><b>‡ Allen L. Ray – Sec.</b>                  Barron Industries, Inc.                  105 19th Street South                  Birmingham, AL 35210                  Tel: 205-956-3441  <a href="mailto:aray@processbarron.com">aray@processbarron.com</a></p>	<p><b>‡ Tom DeBeer</b>                  Chartis Insurance                  5001 Willow Creek Drive                  Woodstock, GA 30188                  Tel: (678) 494-6026                  Cell: (404) 218-8613  <a href="mailto:thomas.debeer@chartisinsurancer.com">thomas.debeer@chartisinsurancer.com</a></p>	<p><b>Lino DiLeonardo</b>                  Zurich                  400 University Ave., 16th Floor                  Toronto, ON M5G 1S7                  Tel: 519-824-4548  <a href="mailto:lino.di.leonardo@zurich.com">lino.di.leonardo@zurich.com</a></p>
<p><b>Chad Harrod</b>                  Georgia Pacific Cellulose                  Brunswick Cellulose, Inc.                  PO Box 1438                  Brunswick, GA 31520                  Tel: 912-265-5780 x7757  <a href="mailto:chad.harrod@gapac.com">chad.harrod@gapac.com</a></p>	<p><b>Kevin R. Huelsbeck</b>                  FM Global Property Insurance                  Midwest- Chicago Ops                  N8955 Willow Lane                  Menasha, WI 54952.                  920.205.5529 (cell)  <a href="mailto:kevin.huelsbeck@fmglobal.com">kevin.huelsbeck@fmglobal.com</a></p>	<p><b>‡ Greg Kornaker</b>                  Babcock &amp; Wilcox Company                  P. O. Box 351                  Barberton, OH 44203-0315                  Tel: (330) 860-2009  <a href="mailto:gjkornaker@babcock.com">gjkornaker@babcock.com</a></p>
<p><b>Nick Merriman</b>                  AE&amp;E Austria GmbH &amp; Co KG                  Wagner-Biro-Platz 1                  8074 Raaba/Graz, Austria                  Tel: +43-316-501-2810                  Cell: +43-676-89-501-2810  <a href="mailto:nicholas.merriman@aee-austria.at">nicholas.merriman@aee-austria.at</a></p>	<p><b>Joe Proterra</b>                  Proterra-Power, LLC                  3382 Harbour Point Pkwy.                  Gainesville, GA 30206                  Tel: (home) 770-297-7688                  Cell: 678-296-1805  <a href="mailto:jproterra@yahoo.com">jproterra@yahoo.com</a></p>	<p><b>‡ Ivan Semyanko</b>                  Alstom Power, Inc.                  200 Day Hill Road                  Windsor, CT 06095                  Tel: 860-285-3953  <a href="mailto:ivan.semyanko@power.alstom.com">ivan.semyanko@power.alstom.com</a></p>
<p><b>‡ Dave Streit</b>                  Buckeye Florida                  One Buckeye Drive                  Perry, FL 32348                  Tel: 850-584-1402  <a href="mailto:dave_streit@bkitech.com">dave_streit@bkitech.com</a></p>		

‡ Denotes attendance at meeting in October of 2011

**EMERGENCY SHUTDOWN PROCEDURES SUBCOMMITTEE**

**‡ John Andrews – Chairman**

MeadWestvaco  
5255 Virginia Avenue  
North Charleston, SC 29406  
Tel: 843-509-4926

E-mail: [john.andrews@mwv.com](mailto:john.andrews@mwv.com)

<p><b>‡ Shawn Casey</b> Howe Sound Pulp &amp; Paper 3838 Port Mellon Highway Port Mellon, BC V0N 2S0 Tel: (604) 884-2712 <a href="mailto:shawn.casey@hspp.ca">shawn.casey@hspp.ca</a></p>	<p><b>‡ Scott Crysel</b> FM Global 5700 Granit Parkway, Suite 700 Plano, TX 75024 Tel: (972) 731-1658 <a href="mailto:scott.crysel@fmglobal.com">scott.crysel@fmglobal.com</a></p>	<p><b>James Franks</b> XL GAPS 855 Dogwood Road Somerville, TN 38068 Tel: (901) 465-0771 <a href="mailto:James.Franks@xlgroup.com">James.Franks@xlgroup.com</a></p>
<p><b>‡ Julius (Jules) Gommi</b> GommiTech 25804 214 Avenue SE Maple Valley, WA 98038 Tel: (425) 432-0867 Cell: (206) 930-1195 <a href="mailto:j.gommi@comcast.net">j.gommi@comcast.net</a></p>	<p><b>‡ John Harmon</b> Alstom Power Inc 200 Great Pond Drive Windsor, CT 06095 Tel: (860) 285-4436 <a href="mailto:john.m.harmon@power.alstom.com">john.m.harmon@power.alstom.com</a></p>	<p><b>‡ Chris Jackson</b> Global Risk Consultants 1362 11<sup>th</sup> Court, Fox Island, WA 98333 Tel (253) 303-0289 Cell (503) 840-5775 <a href="mailto:chris.jackson44@comcast.net">chris.jackson44@comcast.net</a></p>
<p><b>‡ John A. Kulig</b> Babcock &amp; Wilcox Company P. O. Box 351, BTAD2A Barberton, OH 44203-0351 Tel: (330) 860-6438 <a href="mailto:jakulig@babcock.com">jakulig@babcock.com</a></p>	<p><b>‡ Wayne MacIntire</b> International Paper Co 6283 Tri-Ridge Blvd Loveland OH 45140-7810 Tel: (513) 248-6834 <a href="mailto:wayne.macintire@ipaper.com">wayne.macintire@ipaper.com</a></p>	<p><b>‡ Karl Morency</b> Georgia-Pacific 133 Peachtree Street NE Atlanta, GA 30303 Tel: (404) 652-4629 <a href="mailto:ktmorenc@gapac.com">ktmorenc@gapac.com</a></p>
<p><b>‡ John Phillips</b> Andritz Inc. 1115 Northmeadow Parkway Roswell, GA 30076 Tel: (770) 640-2434 <a href="mailto:john.phillips@andritz.com">john.phillips@andritz.com</a></p>	<p><b>‡ David Slagel</b> Weyerhaeuser Co. 1 Bonneybridge Road Port Wentworth, GA 31407 Tel: (912) 966-4312 <a href="mailto:david.slagel@weyerhaeuser.com">david.slagel@weyerhaeuser.com</a></p>	<p><b>‡ John Weikmann</b> Metso Power 3430 Toringdon Way, Suite 201 Charlotte, NC 28277 Tel: (704) 414-3431 <a href="mailto:john.weikmann@metso.com">john.weikmann@metso.com</a></p>

‡ Denotes attendance at meeting in October of 2011



Andrews    Casey    Crysel    Franks    Gommi    Harmon    Jackson  
Kulig    MacIntire    Morency    Phillips    Slagel    Weikman

**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](mailto:craig.cooke@fmglobal.com)

<p><b>Randy Baker</b> Buckeye Technologies One Buckeye Drive Perry, FL 32348 Tel: 850-584-1380 <a href="mailto:randy_baker@bkitech.com">randy_baker@bkitech.com</a></p>	<p><b>Joe Goss</b> Delta Natural Kraft P. O. Box 20700 1701 Jefferson Parkway Pine Bluff, AR 71612 Tel: 870-541-5052 <a href="mailto:jgoss@pbmill.com">jgoss@pbmill.com</a></p>	<p><b>Michael Hollern</b> New Page Corporation 300 Pratt Street Luke, MD 21540 Tel: 301-359-3311, Ext. 3280 <a href="mailto:mfh3@newpagecorp.com">mfh3@newpagecorp.com</a></p>
<p><b>Kevin Huelsbeck</b> FM Global Property Insurance Midwest-Chicago Ops N8955 Willow Lane Menasha, WI 54952 Tel: 920-205-5529 <a href="mailto:kevin.huelsbeck@fmglobal.com">kevin.huelsbeck@fmglobal.com</a></p>	<p><b>Nick Merriman</b> Austrian Energy &amp; Environment Graz, Austria Tel: +43 316 501-2810 <a href="mailto:nicholas.merriman@ace-austria.at">nicholas.merriman@ace-austria.at</a></p>	<p><b>Phil Ramsey</b> Kapstone Paper P. O. Box 118005 Charleston, SC 29423-8005 Tel: 843-745-3480 <a href="mailto:phil.ramsey@kapstonepaper.com">phil.ramsey@kapstonepaper.com</a></p>
<p><b>Jim Taylor</b> Delta Natural Kraft P. O. Box 20700 1701 Jefferson Parkway Pine Bluff, AR 71612 <a href="mailto:jataylor@pbmill.com">jataylor@pbmill.com</a></p>	<p><b>John Yash</b> Babcock &amp; Wilcox Company 2302 Parklake Drive, NE Suite 300 Atlanta, GA 30345 Tel: 770-621-3920 <a href="mailto:jlyash@babcock.com">jlyash@babcock.com</a></p>	

‡ Denotes attendance at meeting in October of 2011 - Note DCE did not meet in the fall of 2011

**PUBLICITY & NEWS RELEASE SUBCOMMITTEE**

‡**Dave Parrish – Chairman**  
FM Global  
1151 Boston-Providence Turnpike  
Norwood, MA 02062  
Tel: 781-255-4734  
[david.parrish@fmglobal.com](mailto:david.parrish@fmglobal.com)

‡ Denotes attendance at meeting in October of 2011



## INSTRUMENTATION SUBCOMMITTEE

## ‡David Avery – Chairman

Domtar Paper Company  
P. O. Box 678; Bennettsville, SC 29512  
Tel: 843-454-8937

[david.avery@domtar.com](mailto:david.avery@domtar.com)

<p>‡Rick Matarrese – Sec. FM Global 655 Engineering Dr. #300 Norcross, GA 30092 Tel: 770-777-3684 <a href="mailto:rick.matarrese@fmglobal.com">rick.matarrese@fmglobal.com</a></p>	<p>‡J. C. Browning- Vice Chair Alabama River Pulp Co., Inc. P. O. Box 100 Perdue Hill, AL 36470 Tel: 334-743-8336 <a href="mailto:johnb@ariver.com">johnb@ariver.com</a></p>	<p>‡David T. Boudreau SAPPI (S.D. Warren Company) 1329 Waterville Road Skowhegan, ME 04976 Tel: 207-238-7502 <a href="mailto:david.boudreau@sappi.com">david.boudreau@sappi.com</a></p>
<p>William Camp International Paper Company 100 Jensen Road Prattville, AL 36067 Tel: 334-361-5620 <a href="mailto:bill.camp@ipaper.com">bill.camp@ipaper.com</a></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 <a href="mailto:coverj@asme.org">coverj@asme.org</a></p>	<p>Michael Fay Simpson Tacoma Kraft Co. P. O. Box 2133 Tacoma, WA 98421 Tel: 253-596-0250 <a href="mailto:mfay@simpson.com">mfay@simpson.com</a></p>
<p>Michael Kiper International Paper Co. 6285 Tri-Ridge Blvd. Loveland, Ohio 45140 Tel: 513-248-6517 <a href="mailto:michael.kiper@ipaper.com">michael.kiper@ipaper.com</a></p>	<p>‡Bruce Knowlen Weyerhaeuser Company WTC1B22 P. O. Box 9777 Federal Way, WA 98063 Tel: 253-924-6434 <a href="mailto:bruce.knowlen@weyerhaeuser.com">bruce.knowlen@weyerhaeuser.com</a></p>	<p>‡Alan Laflamme Lincoln Paper &amp; Tissue LLC 50 Katahdin Avenue P. O. Box 490 Lincoln, ME 04457 Tel: 207-794-0685 <a href="mailto:alaflamme@lpandt.com">alaflamme@lpandt.com</a></p>
<p>Gail Lance Babcock &amp; Wilcox P. O. Box 351 Barberton, OH 44203 Tel: 330-860-2628 <a href="mailto:gilance@babcock.com">gilance@babcock.com</a></p>	<p>Dan Mott Irving Pulp &amp; Paper Ltd. P. O. Box 3007, Station B Saint John, NB, E2M 3H1 Canada Tel: 506-632-4149 <a href="mailto:mott.dan@irvingpulp.com">mott.dan@irvingpulp.com</a></p>	<p>‡Eladio Ruiz de Molina CORR System, Inc. 3026 Overhill Road Birmingham, AL 35223 Tel: 205-879-4382 <a href="mailto:eladiordm@aol.com">eladiordm@aol.com</a></p>
<p>‡Andy Smith Global Risk Consultants 2971 Flowers Road. South Atlanta, GA 30341 Tel: 770-451-8056, Ext. 308 <a href="mailto:andysmith@globalriskconsultants.com">andysmith@globalriskconsultants.com</a></p>	<p>Roger Smith Georgia-Pacific Corp. P. O. Box 105605 Atlanta, GA 30303 Tel: 404-915-0141 <a href="mailto:resmith@gapac.com">resmith@gapac.com</a></p>	<p>‡Harri Soderlund Andritz Rosewell, GA Tel: 770-640-2451 <a href="mailto:harri.soderlund@andritz.com">harri.soderlund@andritz.com</a></p>
<p>Jari Sopenan Jari Consultoria de Automacao Ltda. Rua Rio Grande do Sul, 505 Agua Verde, Curitiba Brazil 80620-080 Tel: +55 41 3244-7059 <a href="mailto:jari@jariautomation.com">jari@jariautomation.com</a></p>		

‡ = Denotes attendance at meeting in October of 2011

**MATERIALS & WELDING SUBCOMMITTEE****‡ Dave Fuhrmann – Chairman**

International Paper  
6285 TriRidge Blvd.  
Loveland, OH 45140  
Tel: 513-248-6954

[dave.fuhrmann@ipaper.com](mailto:dave.fuhrmann@ipaper.com)

<p><b>‡ Jesse Worsham - Co Chair</b> Domtar Paper Marlboro Mill P. O. Box 678 Bennettsville, SC 29512 Tel: 843-479-0200, Ext. 8879 <a href="mailto:jesse.worsham@domtar.com">jesse.worsham@domtar.com</a></p>	<p><b>Lynn Barrett</b> Zampell Refractories 6801 Parke East Blvd. Tampa, FL 33610 Tel: 770-714-9125 <a href="mailto:lbarrett@zampell.com">lbarrett@zampell.com</a></p>	<p><b>‡ George Bodman</b> 13 Kingwood Villas Court Kingwood, TX 77339 Tel: 800-286-6069 or 281-359-4006 Cell: 713-557-2118 <a href="mailto:blrcldr@aol.com">blrcldr@aol.com</a></p>
<p><b>Dave Crowe</b> David N French Metallurgists 2681 Coral Ridge Road Brooks, KY 40109-5207 Tel: 502-955-9847 Cell: 502-262-8968 <a href="mailto:dcrowe@davidn french.com">dcrowe@davidn french.com</a></p>	<p><b>John Hefferman</b> Zampell Refractories 262 Titus Avenue Warrington, PA 18976 Tel: 215-491-9300 <a href="mailto:jhefferman@zampell.com">jhefferman@zampell.com</a></p>	<p><b>Fabian Henriques</b> PSA Inc. 531 Main Street Somers, CT 06071 Tel: 614-440-4284 <a href="mailto:fabian.henriques@psaengineering.com">fabian.henriques@psaengineering.com</a></p>
<p><b>‡ Dennis Hollenbach</b> Alstom Power 2000 Day Hill Road Windsor, CT 06095 Tel: 860-285-9140 <a href="mailto:dennis.hollenbach@power.alstom.com">dennis.hollenbach@power.alstom.com</a></p>	<p><b>‡ Michael Hollern</b> New Page Corporation 300 Pratt Street Luke, MD 21540 Tel: 301-359-3311, Ext. 3280 Cell: 301-802-2470 <a href="mailto:mfh3@newpagecorp.com">mfh3@newpagecorp.com</a></p>	<p><b>‡ Mark Hovinga</b> Babcock &amp; Wilcox 20 S. VanBuren Avenue Barberton, OH 44203-0351 Tel: 330-860-6434 <a href="mailto:mnhovinga@babcock.com">mnhovinga@babcock.com</a></p>
<p><b>Terry Lane</b> Georgia-Pacific Corporation 1400 West Ninth Street Brunswick, Georgia 31520 Tel: 912-265-5780, Ext. 6636 Cell: 912-506-8168 <a href="mailto:terry.lane@gapac.com">terry.lane@gapac.com</a></p>	<p><b>‡ Dave Lang</b> FM Global P. O. Box 1567 Little Elm, TX 75068 Tel: 972-731-1882 <a href="mailto:david.lang@fmglobal.com">david.lang@fmglobal.com</a></p>	<p><b>‡ Michael Lykins</b> Smurfit-Stone Containerboard Corp. 450 E. North Avenue Carol Stream, IL 60188 Tel: 630-384-5272 Cell: 630-414-0145 <a href="mailto:mlvkins@smurfit.com">mlvkins@smurfit.com</a></p>
<p><b>Max Moskal</b> M&amp;M Engineering 11020 W. 72<sup>nd</sup> Street Indiana Head Park, IL 60525 Tel: 708-784-3564 <a href="mailto:max_moskal@mmengineering.com">max_moskal@mmengineering.com</a></p>	<p><b>Joe Nelson</b> Georgia-Pacific Corporation P. O. Box 61270 Phoenix, AZ 85082 Tel: 205-631-6457 Cell: 770-330-7924 <a href="mailto:joe.nelson@gapac.com">joe.nelson@gapac.com</a></p>	<p><b>‡ Terry Parks</b> National Board 1055 Crupper Avenue Columbus, OH 43229 Tel: 614-431-3221 (desk) <a href="mailto:tparks@nationalboard.org">tparks@nationalboard.org</a></p>
<p><b>Dan Phillips</b> Wesco Welding Engineering Services Portland, Oregon 97062 Tel: 503-720-9270 <a href="mailto:phillipsdan@comcast.net">phillipsdan@comcast.net</a></p>	<p><b>‡ Bob Roy</b> RMR Mechanical PO Box 170 Cumming, GA 30028 Tel: 770-205-9646 <a href="mailto:bob.roy@rmmmechanical.com">bob.roy@rmmmechanical.com</a></p>	<p><b>‡ Douglas Singbeil</b> FPInnovatons - Paprican 3800 Wesbrook Mall Vancouver, BC V6S 2L9 Tel: 604-222-3254 Cell: 604-839-3254 <a href="mailto:douglas.singbeil@fpinnovaions.ca">douglas.singbeil@fpinnovaions.ca</a></p>
<p><b>Henry R. Tessier Jr.</b> Hartford Steam Boiler 1 State Street P. O. Box 5024 Hartford, CT 06102-5024 Tel: 860-722-5406 <a href="mailto:henry_tessier@hsb.com">henry_tessier@hsb.com</a></p>	<p><b>‡ Billy Walker</b> CNA Risk Control 4701 Porchaven Lane Apex, NC 27539 Tel: 919-773-8001 <a href="mailto:billy.walker@cna.com">billy.walker@cna.com</a></p>	<p><b>Luis Yopez</b> <b>WSI Aquilex</b> <a href="mailto:luis.vepez@wsi.aquilex.com">luis.vepez@wsi.aquilex.com</a></p> <hr/> <p><b>Yurij Duda</b> <b>Savcor</b> <a href="mailto:yurij.duda@savcorinc.com">yurij.duda@savcorinc.com</a></p>

‡ Denotes attendance at meeting in October of 2011

**PERSONNEL SAFETY SUBCOMMITTEE****‡Robert E. Zawistowski – Chairman**

Power Specialists Associates, Inc.  
531 Main Street  
Somers, CT 06071  
Tel: 860-763-3241, Ext. 135

[bob.zawistowski@psaengineering.com](mailto:bob.zawistowski@psaengineering.com)

<p><b>‡Fred Abel</b> AXA Matrix Risk Consultants Rhone-Alpes 235, cours Lafayette 69006 Lyons France Tel: +33 4 72 83 29 41 <a href="mailto:frederic.abel@axa-atrirc.com">frederic.abel@axa-atrirc.com</a></p>	<p><b>‡Ken Baker</b> RockTenn Company P. O. Box 100544 Florence, SC 29501-0544 Tel: 843-269-0179 <a href="mailto:kbaker@smurfit.com">kbaker@smurfit.com</a></p>	<p><b>‡John Frederickson</b> Sappi Fine Paper NA 2201 Avenue B P. O. Box 511 Cloquet, MN 55720 Tel: 218-878-4378 <a href="mailto:john.frederickson@sappi.com">john.frederickson@sappi.com</a></p>
<p><b>Robert Fry</b> Northern Pulp P.O. Box 549, Station Main 260 Albercrombie Branch Road New Glasgow, NS B2H 5E8 Canada Tel: 902-752-8461, Ext. 206 <a href="mailto:robert.fry@northernpulp.com">robert.fry@northernpulp.com</a></p>	<p><b>‡Wes Hill</b> Georgia-Pacific 401 NE Adams Street Camas, WA 98607 Tel: 360-834-8434 <a href="mailto:wes.hill@gapac.com">wes.hill@gapac.com</a></p>	<p><b>‡Jim Hinman</b> Weyerhaeuser Company CH 3D29 33663 Weyerhaeuser Way S. Federal Way, WA 98003 Tel: 253-924-6757 <a href="mailto:jim.hinman@weyerhaeuser.com">jim.hinman@weyerhaeuser.com</a></p>
<p><b>‡Daryl Hoffman</b> FM Global Granite Park Two 5700 Granite Parkway, Ste. 700 Plano, TX 75024 Tel: 972-731-1978 <a href="mailto:daryl.hoffman@fmglobal.com">daryl.hoffman@fmglobal.com</a></p>	<p><b>‡Jennifer Johnston</b> Georgia-Pacific Corporation 133 Peachtree St. NE Atlanta, GA 30303 Tel: 404-652-4632 <a href="mailto:jennifer.johnston@gapac.com">jennifer.johnston@gapac.com</a></p>	<p><b>‡Michael Kaiser</b> International Paper Company 275 Muscogee Road Contonment, FL 32533 Tel: 850-968-3014 <a href="mailto:michael.kaiser@ipaper.com">michael.kaiser@ipaper.com</a></p>
<p><b>‡Randy Lombardi</b> Babcock &amp; Wilcox Company 20 S. Van Buren Avenue Barberton, OH 44203-0351 Tel: 330-860-2028 <a href="mailto:rlombadi@babcock.com">rlombadi@babcock.com</a></p>	<p><b>Louis Mangelli</b> Diamond Power International, Inc. P.O. Box 40145 Baton Rouge, LA 70835-0145 Tel: 225-907-8185 <a href="mailto:lmangelli@diamondpower.com">lmangelli@diamondpower.com</a></p>	<p><b>‡Preston Morgan</b> Metso Power 2430 Toringdon Drive, Ste. 201 Charlotte, NC 28277 Tel: 704-414-3402 <a href="mailto:preston.morgan@metso.com">preston.morgan@metso.com</a></p>
<p><b>Frank Navojosky</b> Verso Paper. Riley Street Jay, ME 04239 Tel: 207-897-1444 <a href="mailto:frank.navojosky@versopaper.com">frank.navojosky@versopaper.com</a></p>	<p><b>Lynn Rawls</b> XL GAPS 206 Rawls Road Perkinston, MS 39573 Tel: 601-928-9420 <a href="mailto:lynn.rawls@xlgroup.com">lynn.rawls@xlgroup.com</a></p>	<p><b>John Stelling</b> Packaging Corp. of America N. 9090 County Road E. Tomahawk, WI 54487 Tel: 715-453-2131, Ext. 309 <a href="mailto:jstelling@packagingcorp.com">jstelling@packagingcorp.com</a></p>
<p><b>‡Chris Suresh</b> Domtar Paper Company, LLC 100 Clinchfield Street Kingsport, TN 37660 Tel: 423-247-7111 <a href="mailto:chris.suresh@domtar.com">chris.suresh@domtar.com</a></p>	<p><b>Arthur Thomson</b> Domtar Pulp &amp; Paper Products, Inc. P. O. Box 800 2005 Mission Flats Road Kamloops, BC V2C 5M7 Tel: 250-828-7372 <a href="mailto:art.thomson@n.domtar.com">art.thomson@n.domtar.com</a></p>	

‡Denotes attendance at meeting in October of 2011

**SAFE FIRING OF BLACK LIQUOR SUBCOMMITTEE**

**Mark Sargent – Chairman**  
 International Paper  
 6283 Tri-Ridge Blvd.  
 Loveland, OH 45140-7910  
 Tel: 513-248-6086  
[mark.sargent@ipaper.com](mailto:mark.sargent@ipaper.com)

<p>‡ <b>Clif Barreca</b>                  Weyerhaeuser                  P. O. Box 1391                  New Bern, NC 28563                  Tel: 252-633-7696  <a href="mailto:clif.barreca@weyerhaeuser.com">clif.barreca@weyerhaeuser.com</a></p>	<p>‡ <b>Joe Bush</b>                  Alstom Power                  1119 Riverfront Parkway                  Chattanooga, TN 37402                  Tel: 423-752-2931                  Cell: 423-619-8123  <a href="mailto:joe.bush@power.alstom.com">joe.bush@power.alstom.com</a></p>	<p>‡ <b>Raul Das</b>                  Buckeye Technologies                  One Buckeye Drive                  Perry, FL 32348                  Tel: 850-584-1514                  Cell: 850-672-2326  <a href="mailto:raul_das@bkitech.com">raul_das@bkitech.com</a></p>
<p>‡ <b>Mark Donahue</b>                  Fossil Power Systems, Inc.                  10 Mosher Drive                  Dartmouth, NS                  Canada B3B 1N5                  Tel: 902-468-2743, Ext. 238                  Cell: 902-468-2323  <a href="mailto:donahuem@fossil.ca">donahuem@fossil.ca</a></p>	<p>‡ <b>Len Erickson</b>                  Boise, Inc.                  P. O. Box 50                  Boise, ID 83728-0001                  Tel: 208-384-4933  <a href="mailto:lenerickson@boiseinc.com">lenerickson@boiseinc.com</a></p>	<p><b>Larry Hiner</b>                  Babcock &amp; Wilcox                  P. O. Box 351                  Barberton, OH 44203-0351                  Tel: 330-860-6525  <a href="mailto:lahiner@babcock.com">lahiner@babcock.com</a></p>
<p>‡ <b>Guy Labonte</b>                  FM Global                  600 de la Guachetiere Ouest                  Montreal, Que H3B 4Lb                  Canada                  Tel: 514-876-7412  <a href="mailto:guy.labonte@fmglobal.com">guy.labonte@fmglobal.com</a></p>	<p>‡ <b>Scott Moyer</b>                  Georgia Pacific                  P. O. Box 919                  Palatka, FL 32178-0919                  Tel: 386-312-1190  <a href="mailto:scott.moyer@gapac.com">scott.moyer@gapac.com</a></p>	<p>‡ <b>Doug Murch</b>                  MeadWestvaco                  11013 West Broad Street                  Glen Allen, VA 23060-5937                  Tel: 804-327-5245                  Cell: 513-288-5750  <a href="mailto:douglas.murch@meadwestvaco.com">douglas.murch@meadwestvaco.com</a></p>
<p>‡ <b>Bob Phelps</b>                  Extra Hand, Plant Support Services                  5440 Karma Road                  Chester, VA 23831                  Ph. (804) 921-7374                  Cell: 804-748-4391  <a href="mailto:robert.pheleps1@verison.net">robert.pheleps1@verison.net</a></p>		

‡ Denotes attendance at meeting in October of 2011

**WASTE STREAMS SUBCOMMITTEE****‡John Rickard – Chairman**

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

[john.rickard@jacobs.com](mailto:john.rickard@jacobs.com)

<p><b>‡Henry Beder</b> 14150 NE 32nd Pl. Bellevue, WA 98007 Tel: 425-861-6801 Cell: 425-516-8225 <a href="mailto:hbeder@comcast.net">hbeder@comcast.net</a></p>	<p><b>Mark E. Cooper</b> FM Global Key Center 601 108th Ave, N.E, Suite 1400 Bellevue WA 98004 Tel: 425-709-5084 <a href="mailto:mark.cooper@fmglobal.com">mark.cooper@fmglobal.com</a></p>	<p><b>Wendy Coyle</b> International Paper 7600 Highway 10 West Pine Hill, AL 36769 Office: 334-963-2362 Cell: 541-285-1867 <a href="mailto:wendy.coyle@ipaper.com">wendy.coyle@ipaper.com</a></p>
<p><b>‡Meville Hedges</b> Babcock &amp; Wilcox 2302 Parklake Drive, NE Suite 300 Atlanta, GA 30345 Tel: 770 621 3907 <a href="mailto:mhedges@babcock.com">mhedges@babcock.com</a></p>	<p><b>Arnie Iwanick</b> Harris Group Inc 1750 NW Naito Parkway Portland, OR 97209-2530 Tel: 503 345-4516 Fax: 503 228-0422 <a href="mailto:arnie.iwanick@harrisgroup.com">arnie.iwanick@harrisgroup.com</a></p>	<p><b>‡Olie Kujanpaa</b> Andritz 10745 Westside Parkway Alpharetta, GA 30004 Tel: 770-640-2571 <a href="mailto:olli.kujanpaa@andritz.com">olli.kujanpaa@andritz.com</a></p>
<p><b>‡John Lewis</b> Fluor Daniel Forest Products 100 Fluor Daniel Drive Greenville, SC 29607-2762 Tel: 864 517-1683 <a href="mailto:john.lewis@fluor.com">john.lewis@fluor.com</a></p>	<p><b>‡Steven L. Osborne</b> Babcock &amp; Wilcox 20 S. Van Buren Avenue Barberton, OH 44203 Tel: 330.860.1686 <a href="mailto:slosborne@babcock.com">slosborne@babcock.com</a></p>	<p><b>‡Ann Plank</b> A. H. Lundberg Associates Inc P. O. Box 597 Bellevue WA 98009 Tel: 425 283 5070 <a href="mailto:ann.plank@lundbergassociats.com">ann.plank@lundbergassociats.com</a></p>
<p><b>‡Paul Seefeld</b> A.H. Lundberg Associates Inc. 6174 Kissengen Springs Ct. Jacksonville, FL 32258 Tel: 904-614-6492 <a href="mailto:paul.seefeld@lundbergassociates.com">paul.seefeld@lundbergassociates.com</a></p>	<p><b>‡Michael D. Sides</b> GE GAP Services 1360 Olympia Park Circle Ocoee, FL 34761 Tel: 407-656-4275 Mobile: 407-462-4622 <a href="mailto:michael.sides@xlgroup.com">michael.sides@xlgroup.com</a></p>	<p><b>‡Arie Verloop</b> Jansen Combustion and Boiler Technologies 12025 115<sup>th</sup> Avenue N.E., Ste 250 Kirkland, WA 98034-6935 Tel: 425-952-2825 <a href="mailto:arie.verloop@jansenboiler.com">arie.verloop@jansenboiler.com</a></p>
<p><b>Marla Weinberg</b> International Paper Corporate Technology Center 6285 Tri-Ridge Blvd. Loveland, OH 45140 Tel: 513-248-6789 <a href="mailto:marla.weinberg@ipaper.com">marla.weinberg@ipaper.com</a></p>		

‡ Denotes attendance at meeting in October of 2011

## WATER TREATMENT SUBCOMMITTEE

## ‡Tom Madersky

Power Specialists Assoc. Inc.  
531 Main Street  
Somers, CT 06071  
Tel: 860-763-3241

[tom.madersky@psaengineering.com](mailto:tom.madersky@psaengineering.com)

<p>‡Craig Aderman Sappi Fine Paper NA 89 Cumberland St. P.O. Box 5000 Westbrook, ME 04098-1597 Office: 207-856-3517 Cell: 207-831-2472 <a href="mailto:craig.aderman@sappi.com">craig.aderman@sappi.com</a></p>	<p>‡Kelli Bastarahe Power Specialists Assoc. Inc. 531 Main Street Somers, CT 06071 Tel: 860-763-3241 <a href="mailto:kelli.bastaraache@psaengineering.com">kelli.bastaraache@psaengineering.com</a></p>	<p>Susan Childress IP Technology Power Mfg. Solutions 5870 Anderson Road Grovetown, GA 30813 Tel: 706-339-1631 <a href="mailto:susan.childress@ipaper.com">susan.childress@ipaper.com</a></p>
<p>‡Clark Conley Metso Power 3430 Toringdon Way, Ste. 201 Charlotte, NC 28277 Tel: 704-414-3468 Cell: 704-936-7408 <a href="mailto:clark.conley@metso.com">clark.conley@metso.com</a></p>	<p>Frank DeStefano The Purolite Company 500 Locust Grove Spartanburg, SC 0881 Cell: 864-617-0881 <a href="mailto:fdestefano@puroliteusa.com">fdestefano@puroliteusa.com</a></p>	<p>‡Buck Dunton ChemTreat 4301 Dominion Blvd. Glen Allen, VA 23060 Tel: 804-935-2000 <a href="mailto:buckd@chemtreat.com">buckd@chemtreat.com</a></p>
<p>Virginia Durham Ashland</p>	<p>‡Don Flach Georgia-Pacific Corp. 133 Peachtree St. Atlanta, GA 30303 Tel: 386-336-5584 <a href="mailto:don.flach@gapac.com">don.flach@gapac.com</a></p>	<p>Frank Gabrielli Alstom Power 2000 Day Hill Road Windsor, CT 06095 Tel: 860-285-5646 <a href="mailto:frank.gabrielli@power.alstom.com">frank.gabrielli@power.alstom.com</a></p>
<p>‡Claude Gauthier The Purolite Company</p>	<p>‡John Gray Rayonier Performance Fibers, LLC 4470 Savannah Highway Jesup, GA 31545 Tel: 912-588-8213 Cell: 912-432-2921 <a href="mailto:john.p.grav@rayonier.com">john.p.grav@rayonier.com</a></p>	<p>‡Ken Hansen Babcock &amp; Wilcox 20 South Van Buren Avenue Barberton, OH 44203 Tel: 330-860-6443 <a href="mailto:kehansen@babcock.com">kehansen@babcock.com</a></p>
<p>‡Brandon Hastings Boise White Paper 400 Second Street Int'l Falls, MN 56649-2327 Tel: 218-285-5011 <a href="mailto:brandonhastings@boisepaper.com">brandonhastings@boisepaper.com</a></p>	<p>‡Norris Johnston Ashland Hercules Water Tech. 37 Hough Road Lacey's Spring, AL 35754 Tel: 256-650-0049 Cell: 256-520-1011 <a href="mailto:njohnston@ashland.com">njohnston@ashland.com</a></p>	<p>‡Dave Kittel Rayonier Performance Fibers, LLC 1 Gum Street Fernandina Beach, FL 32034 Tel: 904-27701486 <a href="mailto:david.kittel@rayonier.com">david.kittel@rayonier.com</a></p>

‡ Denotes attendance at meeting in October of 2011

## WATER TREATMENT SUBCOMMITTEE (Cont.)

<p>‡<b>Sam Lewis</b> Delta Training Partners, Inc. 4020 Oleander Drive Wilmington, NC 28403 Tel: 910-790-1988 <a href="mailto:slewis@deltatraining.com">slewis@deltatraining.com</a></p>	<p>‡<b>Mitch Morgan</b> Nalco 1601 W. Diehl Road Naperville, IL 60563-1198 Tel: 630-305-1000 <a href="mailto:jmorgan@nalco.com">jmorgan@nalco.com</a></p>	<p>‡<b>Rick Morgan</b> FM Global Granite Parkway Plano, TX 75024 Tel: 972-731-1869 <a href="mailto:rick.morgan@fmglobal.com">rick.morgan@fmglobal.com</a></p>
<p><b>Richard Morris</b> Metso Power 3430 Toringdon Way, Suite 101 Charlotte, NC 28277 Tel: 704-281-4703 <a href="mailto:richard.morris@metso.com">richard.morris@metso.com</a></p>	<p>‡<b>Fred Neubauer</b> Ashland Hercules Water Tech. 1600 Sugar Creek Drive East Mobile, AL 36695 Tel: 251-633-5566 Cell: 251-591-2297 <a href="mailto:richard.morris@metso.com">richard.morris@metso.com</a></p>	<p><b>Kurt Parks</b> Packaging Corp. of America 5495 Lake Park-Clyattville Road Valdosta, GA 31601 Office: 229-559-2257 Cell: 229-415-8557 <a href="mailto:kparks@packagingcorp.com">kparks@packagingcorp.com</a></p>
<p>‡<b>Tom Przybylski</b> Boise, Inc. 400 Second Street Int'l. Falls, MN 56649-2327 Tel: 218-285-5011 <a href="mailto:tomprzybylski@boisepaper.com">tomprzybylski@boisepaper.com</a></p>	<p><b>Jim Robinson</b> GE (Infra, Water) 4636 Somerton Road Trevose, PA 19053 Tel: 215-942-3381 <a href="mailto:james.robinson@ge.com">james.robinson@ge.com</a></p>	<p>‡<b>Alarick Tavares</b> Georgia Pacific 133 Peachtree Street Atlanta, GA 30303 Tel: 404-652-4000 <a href="mailto:ajtavare@gapac.com">ajtavare@gapac.com</a></p>
<p>‡<b>Alvaro Timotheo</b> Andritz 1115 N. Meadow Parkway Roswell, GA 30076-3857 Tel: 770-640-2500 <a href="mailto:alvaro.timotheo@andritz.com">alvaro.timotheo@andritz.com</a></p>		

‡ Denotes attendance at meeting in October of 2011

Registered for the meeting were:

**A.H. Lundberg Associates**

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

**AbitibiBowater**

Andrijeski, Greg, Sylacauga, AL  
Paterson, James (Sargo), Alexander City, AL

**Acuren Inspection**

Pajaro, Vernon, Augusta, GA  
Spires, L. P., Augusta, GA

**AirTek Construction**

Bringman, Lewis, Linthicum, MD  
Moore, Ronnie, Troy, AL

**Alabama River Cellulose**

Browning, John, Perdue Hill, AL

**Alstom Power**

Bush, Joe, Chattanooga, TN  
Harmon, John, Windsor, CT  
Hollenbach, Dennis, Windsor, CT  
Kistka, Gerry, Jacksonville, FL  
Semyanko, Ivan, Windsor, CT

**American Forest & Paper Assoc.**

Grant, Tom, Yonkers, NY

**Andritz**

Frykmo, Christer, Roswell, GA  
Kujanpaa, Olli, Roswell, GA  
LeBel, Mark, Roswell, GA  
Phillips, John, Roswell, GA  
Timotheo, Alvaro, Roswell, GA

**Aquilex WSI**

Power, Stacy, Norcross, GA

**Armstrong International**

Shelley, John, Three River, MI

**Ashland Hercules Water**

Johnston, Norris, Lacey Spring, AL  
Neubauer, Fred, Mobile, AL

**AXA Matrix Risk Consultants**

Abel, Fred, Lyon, France  
Hayes, Michael, Miamisburg, OH

**Babcock & Wilcox**

Blazer, Phil, Charlotte, NC  
Busselman, Tandy, Barberton, OH  
Hansen, Kenneth, Barberton, OH  
Hedges, Meville, Atlanta, GA  
Hicks, Timothy, Barberton, OH  
Hovinga, Mark, Barberton, OH  
Kornaker, Greg, Barberton, OH  
Kulig, John, Barberton, OH  
Lombardi, Randy, Barberton, OH  
Osborne, Steve, Barberton, OH  
Sherlock, H. Bentley, Atlanta, GA  
Siebe, Greg, Atlanta, GA

**Boise Inc.**

Erickson, Leonard, Boise, ID  
Hastings, Brandon, International Falls, MN  
Miller, Jason, Deridder, LA  
Przybylski, Tom, International Falls, MN

**Brunswick Cellulose**

Brandino, Lindsay, Brunswick, GA  
Lane, Terry, Brunswick, GA

**Buckeye Technologies**

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

**Buckman Laboratories**

McCool, Craig, Brandon, MS.



Registered for the meeting were:

**Carter Holt Harvey**

Dennis, Gavin, Kawerau, New Zealand  
Jones, Michael, Tokoroa, New Zealand  
Lamont, Trevor, Kawerau, New Zealand

**CB Anthony Ross**

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

**Chalmers & Kubeck**

Gattis, Clayton, Watkinsville, GA  
Hobgood, Larry, Watkinsville, GA

**Chartis**

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

**Chemstone**

Hollis, Tommy, Greenville, SC

**ChemTreat**

Graham, Jim, Collierville, TN

**Clearwater Paper**

Bliss, John D. (Dave), McGehee, AR  
Cox, Gary, Lewiston, ID  
Milgos, Marty, Lewiston, ID

**CNA Risk Control**

Walker, Billy, Apex, NC

**CORR System**

Ruiz de Molina, Eladio, Birmingham, AL

**Delta National Kraft**

Spencer, Daryl, Pine Bluff, AR

**Delta Training Partners**

Lewis, Sam, Wilmington, NC

**Diamond Power**

Mangelli, Lou, Lancaster, OH

**Domtar**

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

**Electron Machine**

Vossberg, Carl III, Umatilla, FL

**Entech Products**

Mathis, David, Alabaster, AL  
Mathis, Steven, Alabaster, AL

**Evergreen Packaging**

Jorstad, Jeremy, Canton, NC  
West, Gregory, Canton, NC

**Extra Hand Plant Support Services**

Phelps, Bob, Chester, VA

**Fluor**

Lewis, John, Greenville, SC

**FM Global**

Beaulieu, Andre, Montreal, Que.  
Cole, Phillip, Cumberland, RI  
Cooke, Craig, Oconomowoc, WI  
Crysel, Scott, Plano, TX  
Dondona, Jasbir, Vancouver, BC  
Hoffman, Daryl, Kirkland, WA  
Judge, Chris, Manchester, UK  
Labonté, Guy, Montreal, Que.  
Matarrese, Rick, Alpharetta, GA  
Moberg, Eric, Plano, TX  
Morgan, Rick, Plano, TX  
Onstead, Jimmy, Plano, TX  
Parrish, David, Norwood, MA  
Polagye, Mike, Norwood, MA

Registered for the meeting were:

**Fossil Power Systems**

Donahue, Mark, Dartmouth, NS  
Siteman, Trevor, Dartmouth, NS

**George H. Bodman, Inc.**

Bodman, George, Kingwood, TX  
Dhanjal, Sanjiv, Kingwood, TX

**Georgia-Pacific**

Flach, Don, Palatka, FL  
Hill, Wes, Camas, WA  
Johnston, Jennifer, Atlanta, GA  
Morency, Karl, Atlanta, GA  
Moyer, Scott, Palatka, FL  
Presley, Stefanie, Atlanta, GA  
Rose, Aaron, Atlanta, GA  
Taveres, Alarick, Atlanta, GA

**Glatfelter**

Gentzler, William (Bill), Spring Grove, PA  
Murren, John, Spring Grove, PA  
Young, Dan, Chillicothe, OH

**Global Risk Consultants**

Jackson, Christopher, Fox Island, WA  
Smith, Andy, Woodstock, GA

**GommiTech**

Gommi, Julius, Maple Valley, WA

**Graphic Packaging International**

Barnes, Marcus, Macon, GA

**Howe Sound Pulp & Paper**

Casey, Shawn, Port Mellon, BC

**International Paper**

Blackard, Vernon, Loveland, OH  
Childress, Susan, Loveland, OH  
Fuhrmann, Dave, Loveland, OH  
Kaiser, Michael, Loveland, OH  
MacIntire, Wayne, Loveland, OH

**Interstate Paper**

Burns, Stanley, Selma, AL  
Howard, Roy, Riceboro, GA  
MacMillan, Randy, Riceboro, GA  
Stapleton, David, Riceboro, GA

**Jansen Combustion**

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

**John E. Cover Engr.**

Cover, John, Birmingham, AL

**Kapstone Paper**

Lipata, Kathleen, North Charleston, SC  
Ramsey, Phil, Charleston, SC

**KGRA Energy**

Capilouto, Christine, New York, NY

**K-Patents**

Miller, Adam, Naperville, IL  
Pyorala, Keijo, Naperville, IL

**LENRO, Inc.**

Olavessen, Len, Millington, TN

**Lincoln Paper & Tissue**

LaFlamme, Alan, Lincoln, ME

**Liquid Solids Control**

Sweeney, Michael, Upton, MA

**M&M Engineering Assoc.**

Moskal, Max, Indian Head Pk., IL

**Madison Industrial Services**

Moseley, Donny, Conway, AR

**Madison Industrial Services**

Sherrod, Hank, Irving TX

Registered for the meeting were:

**Matrix Risk Consultants**

Garfield, Michael, Lowell, ME

**MeadWestvaco**

Andrews, John, N. Charleston, SC  
McManiols, Jeffrey, Phenix City, AL  
Murch, Doug, Richmond, VA  
Sanders, Doug, Phenix City, AL

**Metso Power**

Burelle, Raymond, Charlotte, NC  
Conley, Clark, Charlotte, NC  
Gantt, Melissa, Charlotte, NC  
Geedey, Jim, Charlotte, NC  
Hughes, Riley, Charlotte, NC  
McCoy, Bill, Charlotte, NC  
Morgan, Preston, Charlotte, NC  
Nichols, Jody, Charlotte, NC  
Ries, Nancy, Charlotte, NC  
Sechrist, Dick, Charlotte, NC  
Swayne, Greg, Charlotte, NC  
Tanguay, Eric, Charlotte, NC  
Weikmann, John, Charlotte, NC

**Mondi Swiecie S.A.**

Graczyk, Robert, Swiecie, Poland  
Pieniazek, Dariusz, Swiecie, Poland

**Nalco**

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

**National Board of BPVI**

Parks, Terry, Columbus, OH

**National Boiler Service**

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

**NKSJ Risk Management**

Funaguchi, Akira, Shinjyuku-ku, Tokyo

**NORAM Engineering**

Bucher, Wayne, Birmingham, AL

**North American Industries**

Tinnell, Chris, Helena, AL

**Old Town Fuel & Fiber**

Spencer, Ian, Old Town, ME

**Packaging Corp. of America**

Lykins, Michael, South Elgin, IL  
Ridley, Bruce, Lake Forest, IL

**Power Specialists Assoc.**

Bastarache, Kelli, Somers, CT  
Haraga, Rudy, Somers, CT  
Lee Anne, Somers, CT  
Madersky, Tom, Somers, CT  
Zawistowski, Bob, Somers, CT

**Process Equip/Barron Ind.**

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

**Purolite**

Gauthier, Claude, Kitchener, Ont.  
Tonsor, Melissa, Bala Cynwyd, PA

**Rayonier**

Gray, John, Jesup, GA  
Johnson, Charley, Jessup, GA  
Kittel, Dave, Fernandina Beach, FL

**RMR Mechanical**

Roy, Bob, Cumming, GA

**RockTenn**

Baker, Ken, Florence, SC  
Campbell, Bob, West Point, VA  
Chambless, Tony, Demopolis, AL  
Etheridge, Chris, Demopolis, AL

Registered for the meeting were:

**RockTenn (Cont.)**

Groome, Matt, Panama City, FL  
Hagins, Hank, Fernandina Beach, FL  
Holtzclaw, Jimmy, Demopolis, AL  
Parten, Greg, Demopolis, AL  
Smith, Dan, Hodge, LA  
Von Oepen, David, Demopolis, AL

**SAPPI**

Aderman, Craig, Westbrook, ME  
Fredrickson, John, Cloquet, MN

**Sheppard T. Powell Associates**

Bartholomew, Robert, Baltimore, MD

**Smurfit Kappa Carton de Colombia**

Franco, Daniel, Cali, Colombia

**Southern Environmental**

Harris, Don, Pensacola, FL

**Thompson Industrial Services**

Carter, Roman, Blackshear, GA  
Jackson, Dwayne, Sumter, SC  
Nochowicz, Georgi, Sumter, SC

**Verso Paper**

Holden, Rich, Jay, ME  
Ja'arah, Majed, Memphis, TN  
LeBlanc, John, Jay, ME

**Weyerhaeuser**

Bloodworth, Billy, Oglethorpe, GA  
Burnette, Richard, Oglethorpe, GA  
Doyer, Roch, Grande Prairie, Alberta  
Ellison, Kevin, Grande Prairie, Alberta  
Harrison, Michael, Port Wentworth, GA  
Haynes, Randy, Columbus, MS  
Hinman, James (Jim), Federal Way, WA  
Johnston, Bob, Columbus, MS  
Knowlen, Bruce, Federal Way, WA  
McCarty, Doug, Columbus, MS  
Parsch, Mike, Granne Prairie, AB  
Sharp, Melissa, Columbus, MS  
Slagel, David, Port Wentworth, GA  
Standridge, Tim, Columbus, MS  
Vandermeer, Robert, Granne Prairie, AB  
Watt, Graylin, Columbus, MS  
Wilson, Ken, Columbus, MS

**XL GAPS**

Sides, Michael, Ocoee, FL

**MAIN COMMITTEE MEETING**

**INTRODUCTION:** BLRBAC Chairman, Scott Moyer, called the meeting to order at 8:00 a.m on Wednesday, October 12, 2011.

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

**OLD BUSINESS**

**ACCEPTANCE OF THE SPRING 2011 MEETING MINUTES – Scott Moyer**

Minutes were posted for the spring 2011 meeting. Are there any corrections? Do I have a motion to accept? So moved. Second? Are the voting members all in favor? Opposed? The spring 2011 Meeting Minutes have been accepted as written.

**NEW BUSINESS**

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

**NEW REGULAR MEMBERSHIP - None**

**NEW ASSOCIATE MEMBERSHIPS**

**Aquilex** - They are a service company who, under a different name, have actually been involved with recovery boilers for many years

Jim Tipperreiter is the designated Associate Representative

Stacy Power is the designated Alternate Associate Representative

**Chalmers & Kubeck Inc.** -- This is an OEM distributor and an authorized repair company for safety valves and control valves. They have a DR stamp and an OEM distributor for Flowserve Limitorque electric actuators.

Clayton Gattis is the designated Associate Representative

Larry Hobgood is the designated Alternate Associate Representative

**Wall Colmonoy Corporation** - They manufacture alloy products to protect boiler tubes and panels and other components in boilers.

Bert Breer is the designated Associate Representative

Steve Miller is the designated Alternate Associate Representative

**NEW CORRESPONDING MEMBERSHIPS – None Reported**

**REGULAR REPRESENTATIVE CHANGES**

**Alabama River Cellulose**

John Browning replaced Brad Larrimore as designated Representative  
Phil Joyner replaced Tim Standridge as designated Alternate Representative

**Buckeye Technologies**

Randy Baker replaced Dave Streit as designated Representative  
Raul Das remains as the designated Alternate Representative

**Glatfelter**

William Gentzler replaced Hugh Muller as designated Representative  
William Plappert replaced William Gentzler as designated Alternate Representative

**Packaging Corporation of America**

John Stelling replaced Lester Pedron as the designated Representative  
Kirk Thomas remains as the designated Alternate Representative

**RockTenn - previously d/b/a Smurfit-Stone**

David Von Oepen - replaced Marty Duckworth as the designated Representative  
Donn Tarpley - designated Alternate Representative

**ASSOCIATE REPRESENTATIVE CHANGES**

**Savcor Forest, Inc.**

Martti Huttunen remains the designated Associate Representative  
Pasi Niemelainen replaced Jurij Duda as the designated Alternate Associate Representative

**CORRESPONDING MEMBERSHIP CHANGES - None Reported**

**MEMBERSHIP COMPANY NAME CHANGES**

**NKSJ Risk Management - previously d/b/a SOMPO Japan Risk Management**

Kenichi Muramatsu - designated Representative  
Akira Funaguchi - designated Alternate Representative

**RockTenn - previously d/b/a Smurfit-Stone**

David Von Oepen - designated Representative  
Donn Tarpley - designated Alternate Representative

**Savcor Forest, Inc. - previously d/b/a Savcor Consulting, Inc.**

Martti Huttunen - designated Associate Representative  
Pasi Niemelainen - designated Alternate Associate Representative

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

2. **EXECUTIVE COMMITTEE REPORT** – Scott Moyer

We met in closed session yesterday afternoon. First order of business, we met with an attorney from a local firm in Atlanta, who has offered to provide BLRBAC legal guidance and counsel on a pro bono basis. This meeting went very well and he will be helping us get our house in order and move forward on some matters that are in need of attention. We look forward to working with him going forward. He is very knowledgeable in the area of industrial safety and he has already brought some good things to the table. This will help us going forward as an organization.

A couple of the items that we discussed on the legal front. The Executive Committee voted to pursue incorporation of BLRBAC. This will provide protection to the membership as well as the officers and committee chairs if there is any legal issue that arises. The "corporation" of BLRBAC would be the entity as opposed to all of us as individuals.

The other legal item the executive committee acted on was a disclaimer statement with assistance from our attorney. This will be placed into our recommended practices and on the website. The purpose of this is to emphasize the need for the operating companies to evaluate the risks of their equipment and facility in addition to the materials included in the recommended practices.

Another item we have been working on for several meetings is consolidating Policies and Procedures that have been enacted by the Executive Committee over the years. They will be posted as Appendices to the Operating Procedures posted on the website.

Lastly we continued to discuss the 50th Anniversary celebration, which will be next fall. Len Erickson and Len Olavessen are going to lead this effort. They will start evaluating funding needs and developing plans for the celebration which will be held during the fall 2012 BLRBAC meeting. Look forward to more communication on this and if you have an interest in participating in the planning for this event, please let one of these gentlemen know.

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

We had 186 Advance registrations for this meeting and 37 At Door, which included nine off-shore corresponding members -- two from Poland; one from France; one from Great Britain; one from Colombia; one from Japan; and three from New Zealand. We have 30 paper companies represented, four boiler manufacturers, and six insurance companies.

Our checking balance as of this morning is \$55,167.22

Before you get euphoric, we still have a lot of bills to pay. I expect that by the end of the year we will be having a balance somewhere around \$35,000.00 or something like that.

3. **TREASURER'S REPORT** – (Cont.)

The CD that we have is valued at \$15,046.58.

As mentioned, we are really getting seriously into the 50th Anniversary planning and funding. One of the things we will be doing is sending out requests to companies to help sponsor that anniversary celebration. We will be writing a letter and asking for money. Once we have some ideas of what we have available, we can do some more detailed planning based on exactly what it is we can afford to do.

If you have any suggestions, Len Erickson, Dean Clay and I will be more than happy to hear from you. We will try to take into account everybody's suggestions.

**CHAIRMAN:** Len, do you want to just mention the 2012 budget and that we on the Executive Committee have approved it? That is required by our By-laws.

**OLAVESSEN:** We will have a balanced budget next year with the provision that for the 50th Anniversary, we don't know yet, but we may have to put a surcharge onto the normal registration fee of the \$125 Advance/\$200 At Door. This would help cover the additional costs with the extra dinner and celebrations that will be going on. It will all depend on how generous your companies are as to just how big or how little that surcharge will be.

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

I will just highlight a couple things this morning. One is that with the registration process, 99.44% of you do it the way Barbara would like it done and that is to include the completed Registration Form with your check in the same envelope so that both are received together. The other small percentage makes her life interesting! Also, it is important that your e-mail address be kept up-to-date and should be legibly included on the Registration Form because Barbara does send an acknowledgement to everyone that the Registration Form and check have been received. She will tell you that it has been processed and she will assign you a registration number. There have always been a couple of people who come to the meeting and say, "Oh, I registered," but we have no record of it here. It's possible that the check was lost. We are not going to say that that can't happen. It's unlikely that it happened, but the biggest check and balance against that that you have is that you should get the acknowledgement from Barbara that she has received and recorded your registration. If you don't get that acknowledgement from Barbara, you can figure that you are not yet registered. That will help smooth things out when you arrive at BLRBAC if you can verify that you received that response from her.



4. **SECRETARY'S REPORT** – (Cont.)

The other item regards our website and a couple things relating to that. One is that we are looking for a volunteer to help us maintain it. I've been using a gentleman within FM Global, but he is running out of time to devote to it. We have cobbled together the Website we have now because we had been using Microsoft Office Front Page and that is not supported under the Windows 7 environment. So the Website doesn't have the look that it used to have and we would like to get that back if we can find a Webmaster who can volunteer and devote some time to it. If you are interested or know of someone who may be interested, please let me know and I will be happy to work with you or them to get things going. *{Secretary's Note: A person has come forward in December and has started work. The web address of [www.blrbac.org](http://www.blrbac.org) will once again take you directly to the current website.}*

Along with that, on that Website, there is a tab called "Documents for Review & Comment." There are no documents that will be brought to the membership today for a vote, but there will be a number of them that will be voted on at the spring meeting in April. You will receive a notice when those documents are out there. Take the time to look at them so that if you have concerns you can get your comments in to the subcommittee chairman and have those comments addressed rather than waiting for the floor vote at the April meeting. We would like to give everybody that opportunity to look at the documents before they are "published". When they are posted for review and comment, that is the best time for people who are not on the subcommittee to get their comments in and make their opinions known.

That concludes my report. Are there any questions? Thank you.

**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](mailto:fhholich@aol.com)) your intentions. Include your name, company and your e-mail address.

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

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

4. **SECRETARY'S REPORT – (Cont.)**

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](mailto: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.

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 meeting was called to order and introductions were made of members and guests present – six members and one alternate, 11 visitors (18 total in attendance).

The BLRBAC Antitrust Policy was read.

The minutes from the Oct 2010 meeting were read by the Secretary and accepted by members.

The agenda included old and new business –

Old Business:

- The subcommittee reviewed the change in the posted document removing the statement regarding BLRBAC not encouraging incineration of waste streams. The posted document date has been changed but this is the only change.

5. **SUBCOMMITTEE REPORTS - (Cont.)**  
5.1 **AUXILIARY FUEL REPORT – (Cont.)**

New business:

- Request was received to consider removing fan tripping from common logic in favor of just removing fuel. This would align with other boiler references such as NFPA. A discussion covered instances of high and low pressure in the furnace and effects. The consensus of the members was to leave the SFAF document as-is for fan tripping protocol.
- Request from SFBL to coordinate a change to Common Permissive Starting Logic: Add a dashed box “Confirm DCE conditions satisfactory prior to starting fans”. It is intended to prevent a fire in the direct contact evaporator system. Discussion ensued. This is an operator determination that is also part of the pre-startup checklist. One concern in the group was that adding this could lead to adding many other items. Instead of adding the suggested change, the SFAF committee recommended that we add a statement in the logic to “**Verify pre-startup check list has been completed**”. The members all agreed to this suggested change and would pass this on for consideration with the SFBL subcommittee.
- Review of SFAF Chapter 5, AUDIBLE ALARMS AND VISUAL INDICATORS: Work began to revise content so that items listed that should be in another subcommittee’s document be removed from the SFAF document and placed in the appropriate document for management and supporting explanation. The thought is to eliminate the overlap. Discussion ensued. The subcommittee agreed to develop and propose a list of items to extract from this chapter during the coming year. The items being removed will be passed to the appropriate subcommittee and included in their document so that no items will be lost.
- General topics of discussion requested from attendees: 1) Flame scanner reliability – scanners not able to discriminate between flame and background. 2) Burner air register reliability – position setting and sensing problems.

The main action item is for the group to review Chapter 5 and develop a list; chairman to coordinate communication by email and be ready to present list by October 2012.

The subcommittee meeting schedule was discussed and re-affirmed to be once per year in the fall. The next meeting is scheduled for October 1, 2012.

Acknowledgement and thanks are offered to Dave Streit for his service and leadership of the SFAF subcommittee. This may be his last meeting as he is planning retirement.

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

5.2 **BLACK LIQUOR REPORT** – Len Erickson for Mark Sargent

Reviewed BLRBAC Anti Trust statement.

Reviewed and approved the spring 2011 meeting minutes.

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

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

These changes will be an operator action just after the black liquor header purge and prior to initiating black liquor firing. We are proposing to also add language to Chapter 15, 15.6, “Stable Firing Established” and 15.7 “Superheaters cleared”, describing the suggested requirements prior to initiating black liquor firing. These changes are being recommended as a means to try and prevent short term overheat failures of superheater tubes.

We have received a suggestion to include some permissives for DCE’s in Figure 1, common starting logic for Safe Firing of Auxiliary Fuel and Safe Firing of Black Liquor. We proposed the changes to the Safe Firing of Auxiliary Fuel Subcommittee for their thoughts, the Aux Fuel Subcommittee countered with slightly different wording. SFBL will review and if the committee is in agreement accept the revised wording.

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

Proposed changes to section 10.2 “Design”, bullet 10 adding remote shutoff capability to allow operators to shut off all dissolving tank dilution sources from a safe location.

The committee reviewed and discussed the diverting of very high solids (>70%) black liquor. The issue is personnel safety if diverting to an atmospheric dump tank or mix tank. The subject was discussed in committee and at the operating problems session. There was very little input regarding problems associated with taking liquor samples or with circulating liquor in systems at solids of 75% or greater. The subject will be referred to the Personnel safety subcommittee.

5.3 **ESP SUBCOMMITTEE REPORT** – John Andrews

The ESP Subcommittee met in closed session on Monday October 12<sup>th</sup> with 12 of 13 members represented. The Subcommittee met in open session on Tuesday morning October 13<sup>th</sup> with 13 members represented and about 180 guests.

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

During the open session, the Subcommittee reviewed 26 incident reports from North America. Of the 26 incidents, 17 leaks were classified as critical incidents and 13 were non-critical incidents. In four of the incident reports, multiple leaks were reported so the leaks were classified individually. Two of the reported incidents were for spout failure and both of those were classified as critical due to water entering the furnace from the leaking spout. There were no boiler explosions or smelt dissolving tank explosions reported this session. An Emergency Shutdown Procedure (ESP) was performed in 10 of the incidents including 8 of the critical incidents representing 67% of the critical incidents that should have been ESP'd. Since several of the critical leaks were found after the boiler was down, it would not be expected to perform an ESP.

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

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

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

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

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

**Incident Locations**

The general locations of the leaks for boilers in North America are shown in Figure 1, which displays a typical boiler, not representing any particular style or model. The yellow marks are the non-critical incidents and the red marks indicate the location of the critical incidents. Since the two spout leaks were both classified as critical, they are indicated by red dots at the spout level. One incident reported a Feedwater Air Heater Leak and that is represented by the yellow dot below the furnace.

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

The leaks locations are summarized as follows:

- 12 – Economizer
- 2 – Superheater
- 2 – Boiler Bank / Steam Drum
- 6 – Upper Furnace
- 3 – Lower Furnace
- 2 – Screen
- 1 – Feedwater Coil Air Heater
- 2 – Smelt Spout Failure

**Leaks by Boiler Type**

The leaks by the number of drums and the back end arrangement were reviewed. There were two leaks reported in single drum units and one leak reported in a unit that had three drums. The 27 remaining leaks were all in two drum units. The predominance of leaks in two drum units is probably more an indication of the age of the boiler than for some other issue with two drums.

Half of the leaks were in boilers with Direct Contact Evaporators and the other half was from units with extended economizers.

**Root Cause**

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

- 11 – Weld Failure
- 9 – Thermal or Mechanical Fatigue
- 5 - Erosion or Corrosion Thinning
- 2 – Mechanical Damage
- 2 - Stress Assisted Corrosion or Corrosion Fatigue
- 1 – Overheat

There were no superheater leaks that were caused by overheat so hopefully the mills are gaining a better appreciation and understanding of proper procedures for clearing superheater tubes of condensate during startup.

**How Discovered**

Operator observations during boiler walkdowns continue to be the prevalent method of detecting leaks and accounted for identification of nineteen (19) of the leaks (63%) and indicates that operators are continuing to be diligent in looking for leaks. Four (4) of the leaks were identified by the control room and two (2) leaks were initially indicated by the leak detection system installed. Five (5) leaks were discovered by a hydrostatic test during an outage.

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

Leak detection systems were reported to be installed on units in 10 of the incidents (63%). This represents an increase over prior years. The leak detection systems were credited with providing the initial indication of 2 leaks and confirmed two additional leaks. An indication that leak detection systems are becoming more effective is that they provided indication for 3 economizer leaks which have traditionally been difficult to detect with the leak detection systems.

The Subcommittee has been looking at the time between the initial indication of the leak and the initiation of the ESP. The incidents reviewed showed that for those incidents that provided detailed information on timing, the time between initial indication of the leak and the initiation of the ESP ranged from about one minute to 24+ hours. One incident reported running over two hours with definite indications of a leak. The median time to initiate the ESP was about 1 hour. There were a couple of reports that did not ESP until water was seen in the furnace or on the bed, again indicating that mills were requiring too much confirmation that a leak was present before initiating an ESP.

**Incident Review**

We are receiving most of the reports electronically and the Subcommittee has initiated a procedure to acknowledge the receipt of all Incident Reports that are received in order to make sure no reports are lost in “cyberspace”. Often the reports become large files when pictures and diagrams are attached so there have been some issues with getting through the e-mail system. Whenever you submit an Incident Report, you should receive a confirmation within a week. If not, please contact the Secretary, Jules Gommi, to see what happened to the report. The current file size limit for Jules to receive the reports is 10 megabytes. If you are preparing a report and it gets to be greater than 10 MB, please send it in two separate emails. Please use .doc files rather than .pdf and use .jpg file format for photos and illustrations.

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

Figure 2 shows the critical incidents reported each year. One reason for the recent increase is we are including leaks in critical areas that were discovered during a shutdown because they were probably leaking while the boiler was in operation.

Figure 3 shows the history of Recovery Boiler Explosions showing the string of years without an explosion was broken with the Aux Fuel explosion at Vicksburg in 2008. The good news is that we have accumulated several years since then without an explosion.

Figure 4 shows the five year rolling average of reported boiler explosions is at 0.2 after finally getting to zero before the Vicksburg explosion. If we avoid a boiler explosion for the next couple of years, it will be back to zero. Keep up the good work!

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

Figure 5 shows the history of dissolving tank explosions and there were none reported this year. But recent history indicates that dissolving tank explosions continue to be a problem. Following the recommendations from Section 10 of the Safe Firing of Black Liquor would prevent many of the reported dissolving tank incidents 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 steam water explosion experience is continuing to trend down over time and is down to just under 0.5 explosions per 100 boiler operating years, but the total explosions, which includes all boiler explosions and dissolving tank explosions, decreased to just under 0.9 explosions per 100 boiler years since no dissolving tank explosions were reported this year. The factor is calculated by a summation of all reported explosions since 1948 divided by a summation of the number of boilers reported in service each year during the same period. We all need to continue to keep that trending down. Effort should be focused on developing better procedures to handle heavy steam runs and plugged spouts.

**Learnings**

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

There were only two superheater incidents reported this time and neither of them were due to short term overheating. Maybe mills are learning about proper procedures for clearing superheater tubes.

Better investigation of the true root cause mechanisms causing leaks is needed to work toward future prevention. It can be a challenge to take the time to remove a tube sample when repairing a tube leak but if there is not a good understanding of the cause, it is likely that a similar leak may occur later. In any event, it would be good to let other mills know what to look for to prevent a similar problem.

Copper tubing or coils in heat exchangers can be a source of copper contamination in the boiler feedwater. Copper can result in localized heavy deposits that build up over a relatively short period of time and result in tube thinning or overheating failure.

Mills should check for tube thinning above the composite tube line. There have been reports of localized deposits in this area as well as the potential for higher corrosion rates due to gas phase reactions.

Recognition of leaks and operator authority to initiate an ESP should be emphasized in training. There have been too many cases that operators either did not recognize the tell tale signs of a leak or too easily explained them away for other causes. When a leak is discovered, the operator should not feel like he has to notify management before pushing the buttons.



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

Any changes in the recovery boiler either component changes, material changes or control system changes should be thoroughly reviewed before implementation or installation to make sure that they will perform adequately and no unintended consequences will result.

**Clarification of “Dedicated Stand –Alone”**

The Subcommittee is continuing to work on the appropriate language for a clarification of “Dedicated Stand-Alone” as it refers to the ESP system architecture. Recommended language changes to the ESP Document were recently posted to the BLRBAC website for review and comment. We have recommended an additional minor additional change as shown in the bold text below:

Recommended Change to second sentence of Chapter 1:

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

Add paragraph to the after bulleted items on Page 4

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

Delete “Dedicated Stand Alone” definition from Section 3.24

If anyone has any comments or questions concerning the proposed language changes, please contact John Andrews or Jules Gomi. Depending on comments received, this proposed language should be up for approval in the Spring 2012 meeting.

**Direct Contact Evaporators and ESP**

During the meetings there was some continued discussion of an incident that was reported in the Spring concerning a boiler that initiated an ESP and subsequently had a cascade fire. We will be having additional discussions with SafeFiring of Black Liquor and Fire Protection in DCE Subcommittees to if clarification to the guidelines is needed.

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

Some points that we would like to stress are that mills need to be able to maintain dilution to the DCE after and ESP. Dilution water is not one of the water sources that are intended to be shut off with an ESP. Another area that will be reviewed is the proper operation of fans and dampers if a DCE fire is detected following an ESP.

The Subcommittee will be looking at the Post ESP Guidelines as well to provide additional guidance on considerations for units with a DCE.

**List of Operating Boilers**

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

**Incident Questionnaires**

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

The ESP Questionnaire continues to be updated and mills are requested to obtain the current version from the BLRBAC website if an incident needs to be reported. The completed form should be submitted to Jules Gommi at the e-mail address listed on the form. Please note that Jules' mail box is limited to a file size of 10 megabytes so please consider this limit when submitting the report. When submitting the report please use the MS Word format .doc rather than in PDF format and use .jpg format for illustrations and photos. If the report is over 10 meg, send illustrations in a separate e-mail.

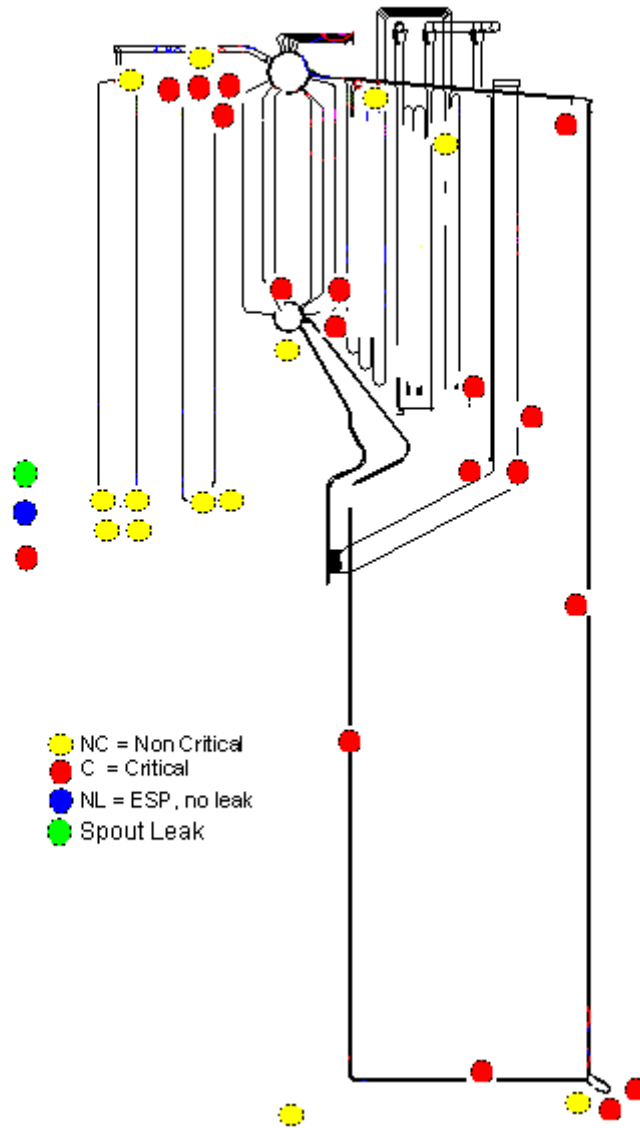
Jules will send out an e-mail confirmation to the mill any time he receives a questionnaire. If the mill does not receive that confirmation within a couple of weeks of submitting the form, please contact Jules to see if there is a problem.

**WAYNE MacINTYRE** - International Paper - Would the ESP Subcommittee consider tracking the time of day the ESP is initiated? It is my observation that many of them seem to occur after 7:00 a.m. and this could be a factor in the length of time between when a leak is suspected and when an ESP is conducted.

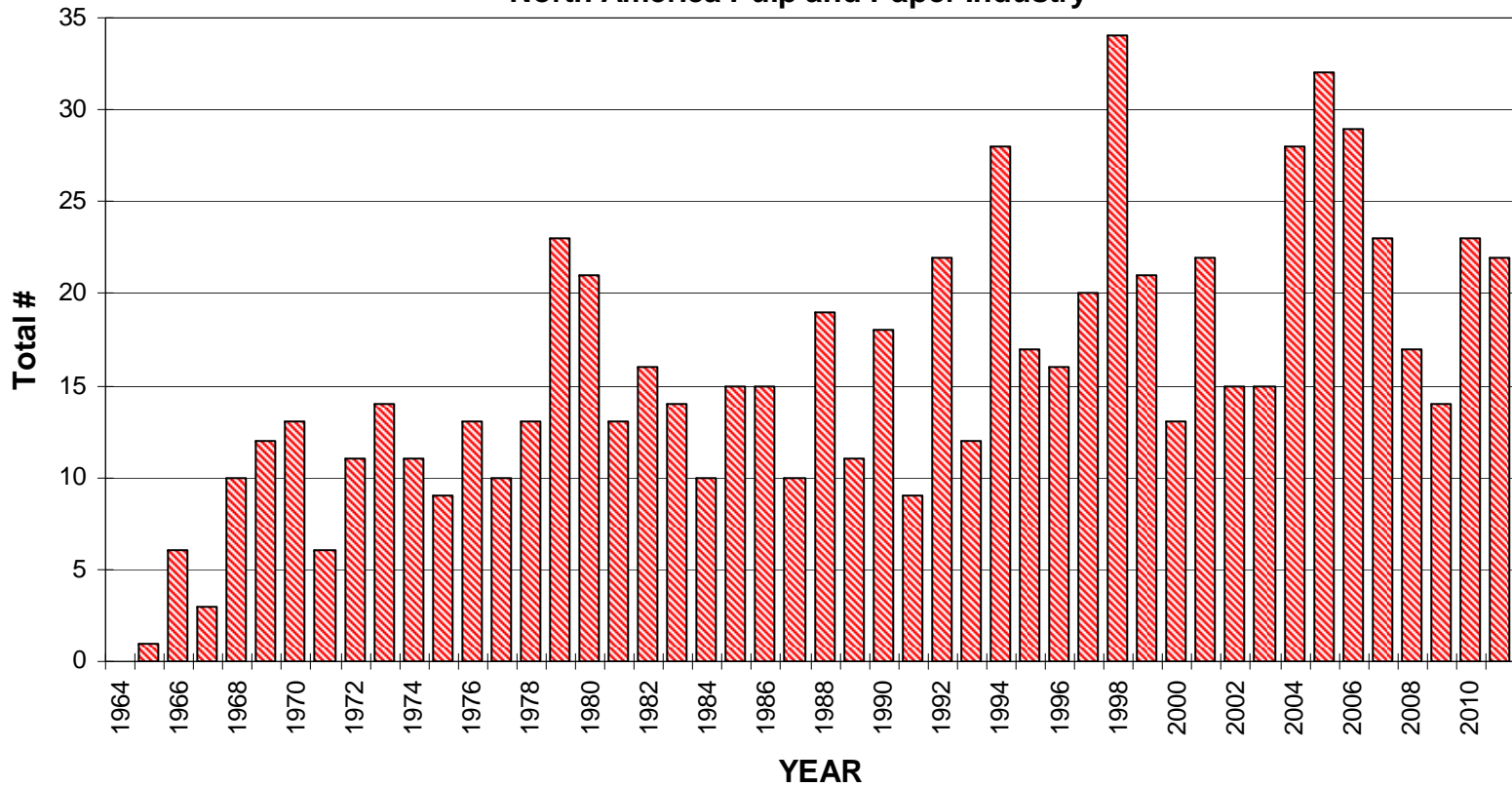
**JOHN ANDREWS:** This is something that maybe ESP should start tracking.

Figure 1

Fall 2011 Leak Locations



### KRAFT RECOVERY BOILER CRITICAL INCIDENTS North America Pulp and Paper Industry



**Figure 2**  
**(Critical Exposure Classification Began in 1965, Changed to Critical Incident in 1999)**

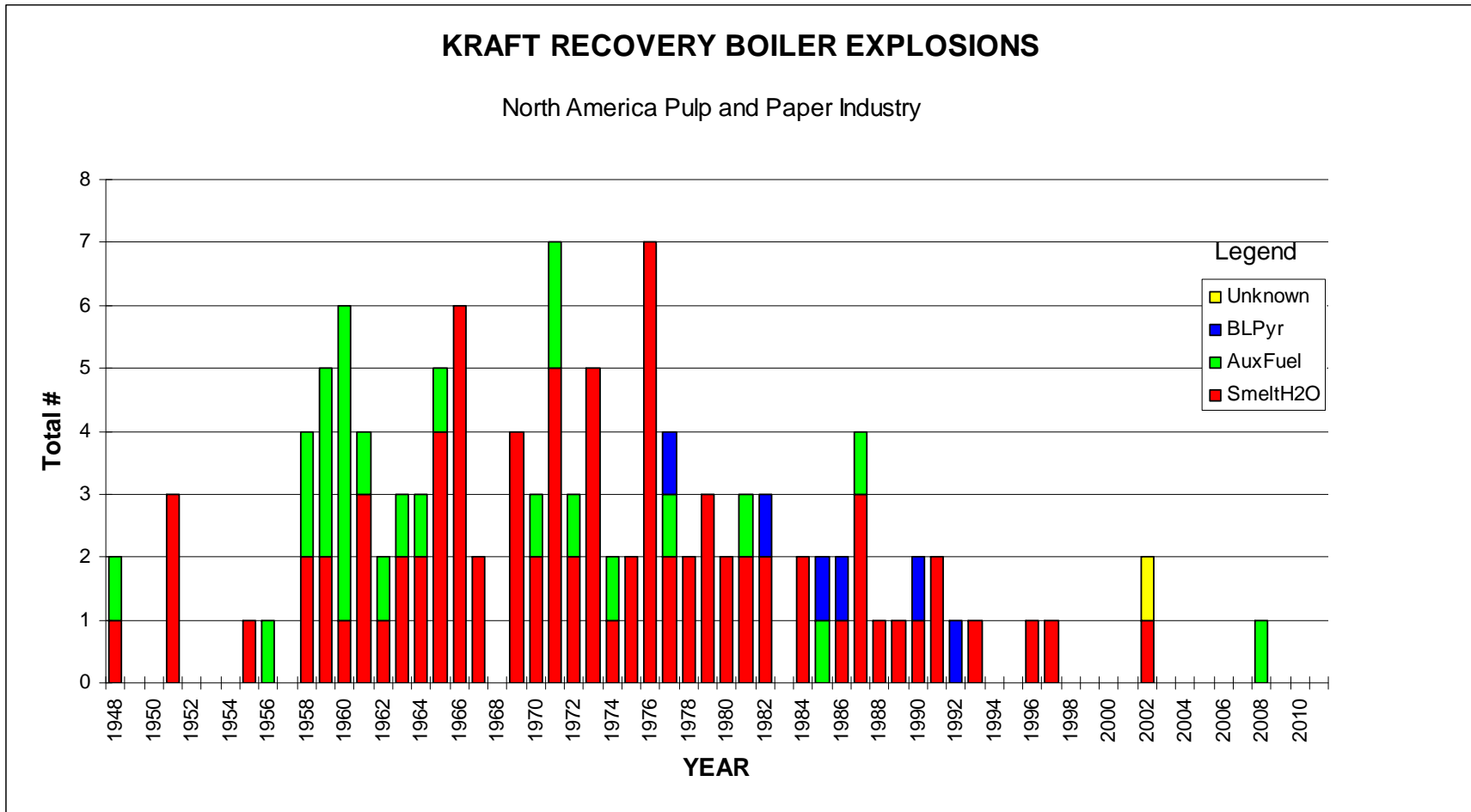


Figure 3

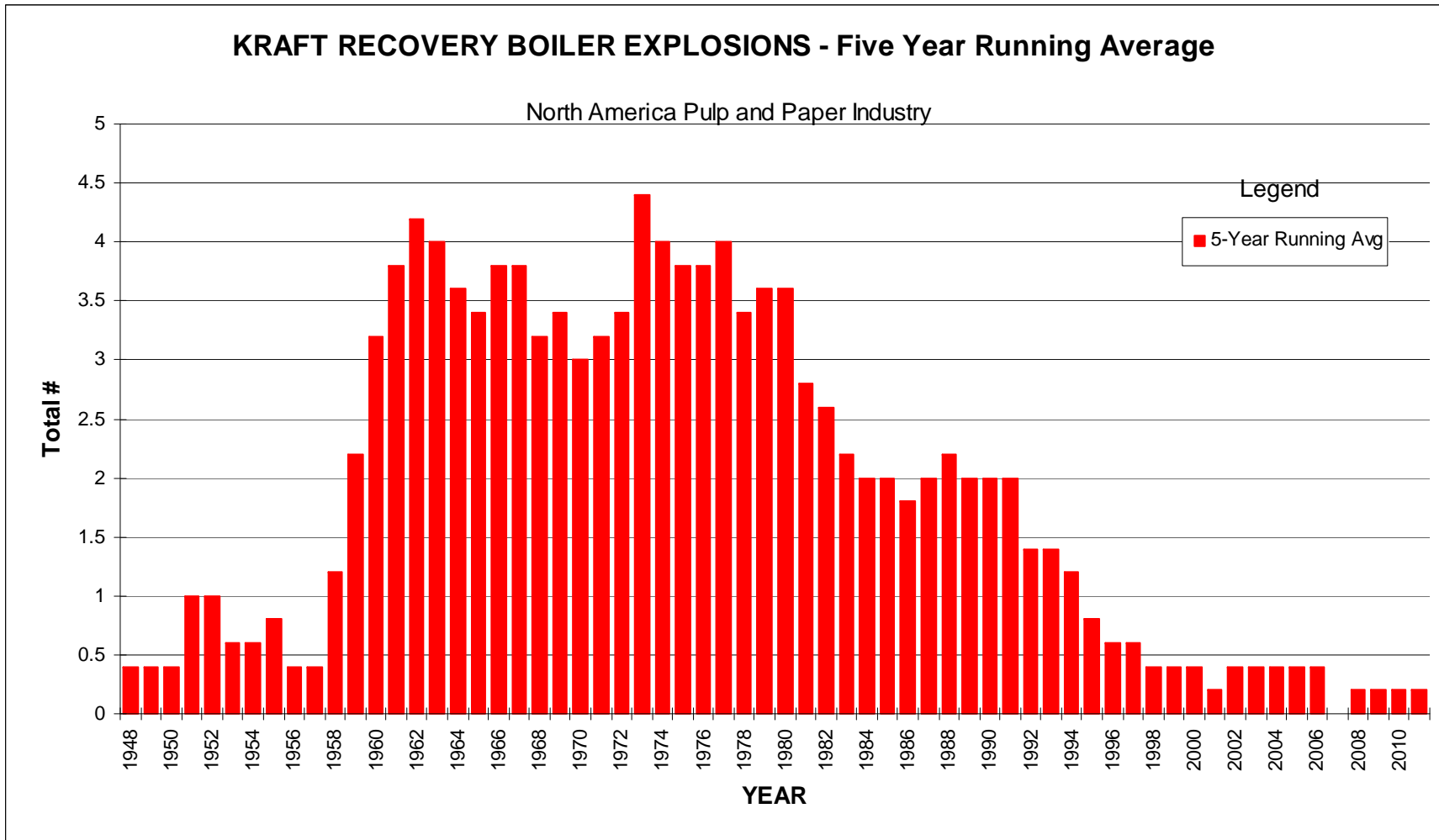


Figure 4

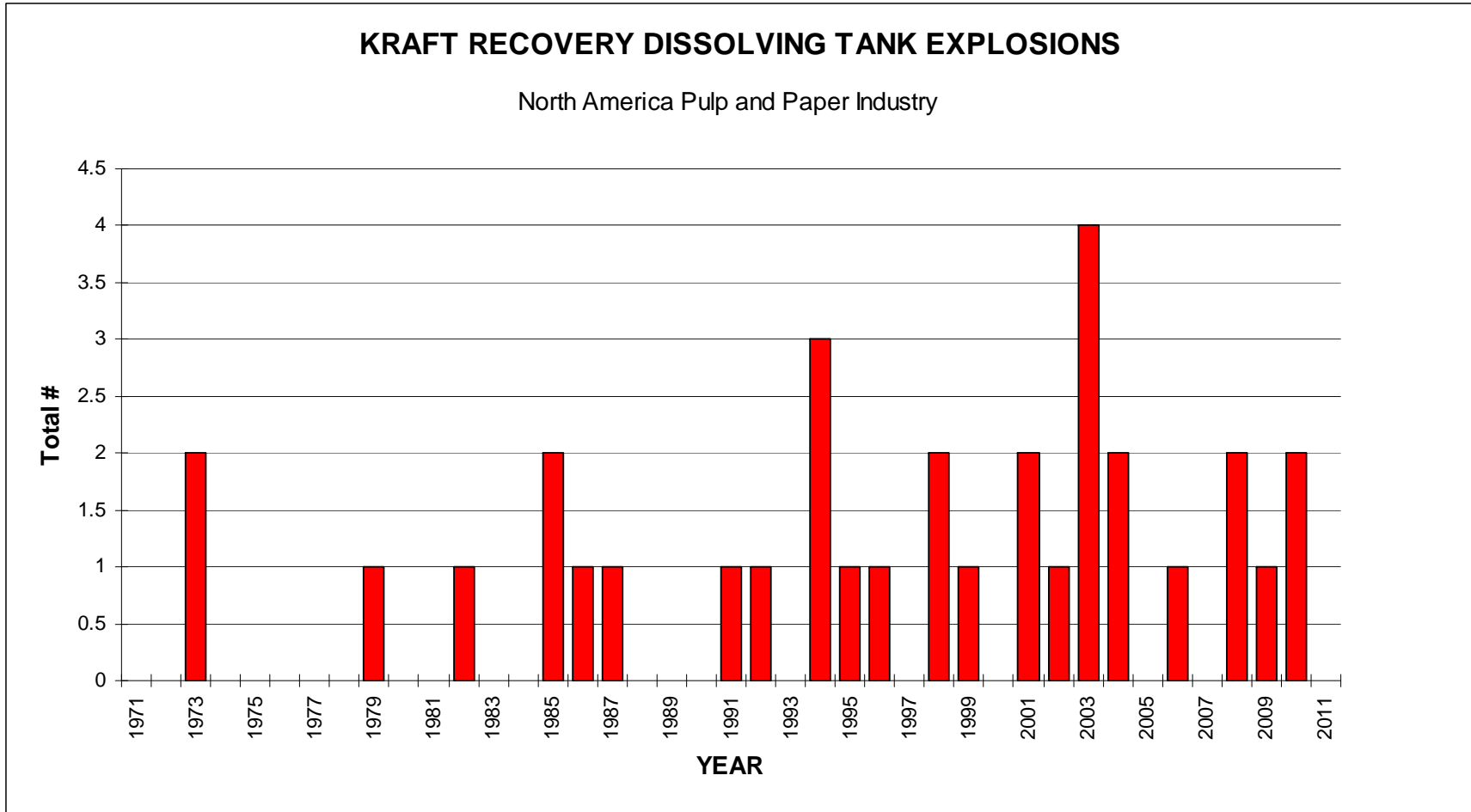


Figure 5

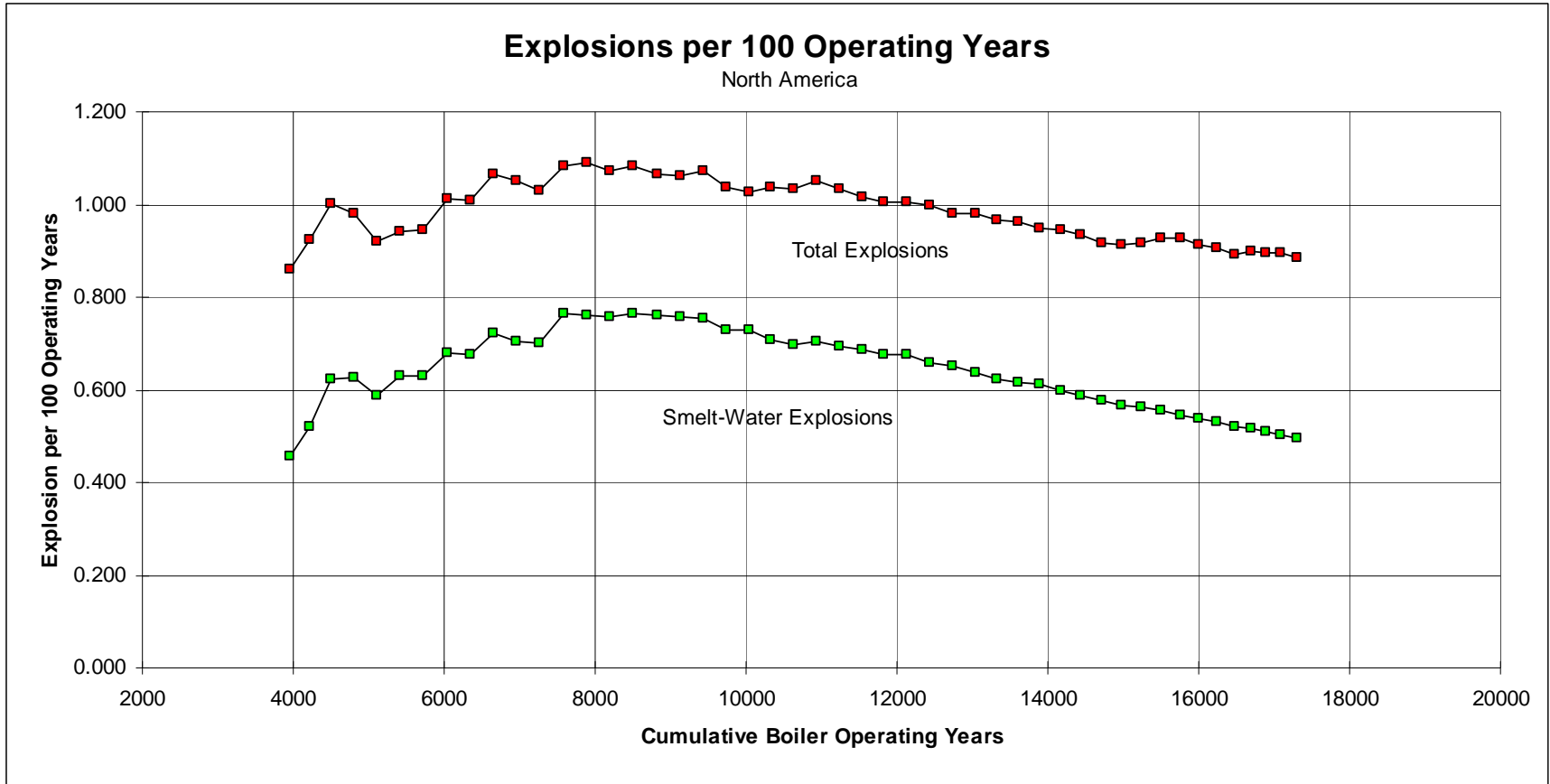


Figure 6



5. SUBCOMMITTEE REPORTS – (Cont.)

5.4 FIRE PROTECTION IN DIRECT CONTACT EVAPORATORS REPORT – Craig Cooke

Since this subcommittee did not meet, there was no report given. This subcommittee will meet in the spring of 2012.

5.5 INSTRUMENTATION REPORT – Dave Avery

The instrumentation subcommittee met in closed session on Sunday afternoon with 5 out of seventeen members. The BLRBAC Anti-Trust Statement was read before the team started commencing with the task at hand. The group reviewed Chapters one through three of the “Instrumentation Checklist and Classification Guide”. The members made updates and changes required to keep the document current with the other practices and account for current technologies. The goal in this exercise is to “UCSMOI” which means to “Update, Clarify, Simplify, while maintaining original intent”. The meeting produced a scope that was adopted for our document update.

The instrumentation subcommittee met in open session on Monday morning with 8 out of seventeen members and 12 guests. Our session began with reading the BLRBAC Anti-Trust Statement and introductions of members and guest. We continued on with a review of last April’s minutes and they were accepted. Our work continued with reviewing the draft changes from April 2011 that are on the web page for membership review.

They are:

- Deleted references to Safety Instrumented System (SIS) and replaced with new term Recovery Boiler Safety System (RBSS).
- Added definitions for Emergency Shutdown Procedure (ESP) System, Process Control System (PCS), and Recovery Boiler Safety System (RBSS).
- Deleted definitions for Basic Process Control, PC, and Safety Instrumented System (SIS)
- Additional word changes for consistency with the ESP System recommendations in the ESP Recommended Good Practice.

The draft changes for Chapter three we are next beginning with the header: **CHAPTER 3 GUIDELINES FOR RECOVERY BOILER CONTROL SYSTEMS** – chapter heading suggest changing to:

*“CHAPTER 3 GUIDELINES FOR RECOVERY BOILER PROCESS CONTROL SYSTEMS”*

**3.2 Power Sources**

Firm power feed is required to the controls, primary elements and operator interface. Firm power is any uninterruptible AC power supply or two independently supplied AC sources not susceptible to the same interruption. Also, each operator’s CRT station electronics should have a firm power supply. As a minimum each system should have one (1) redundant power supply per DC bus. The power supplies shall be properly grounded and conditioned in accordance with the manufacturer’s specifications and applicable codes. – Suggested changes.....

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

*3.2 Electrical Power Sources*

*Firm power feed is required to the control system components, including primary elements and human machine interface (HMI). Firm power is any uninterruptible AC power supply or two independently supplied AC sources not susceptible to the same interruption.*

**3.3 Automatic Back-up or Hard Wired**

Fail safe design is the first level of protection in preventing critical failures. The next level of protection is the degree of reliability of the process control system. Reliability is the probability that a device will function without failure over a specific time period. Safe instrumentation practices ensure that the operator can retain control of boiler processes during all operating conditions, including the ability to safely shut down the boiler during control system failures. The advent of the state-of-the-art control system has resulted in the consolidation of process control loops and motors under the direction of one control system. A failure of the control system could render many control elements inoperable to the operator. The recognition of failures in the state-of-the-art control system has pointed to the necessity of transfer of control from the faulted unit to a back-up system. Manual control is an operable mode. The transfer to the back-up control may be automatic or initiated by the operator. The intent of the back up controls is to enhance the reliability of control systems to the extent that failure of one control system component will not render more than one instrument loop or motor control inoperable. This requirement prevents dilution of the present state of reliability inherent in the single loop, single motor controls. This higher level of reliability in instrumentation applies to those identified control systems as outlined in the applicable BLRBAC publications for promoting safety and the prevention of furnace explosions. ***Suggested changes>>>>***

*3.3 Automatic Back-up or Hard Wired Control System Reliability*

*Fail safe design is the first level of protection in preventing critical failures. The next level of protection is the degree of reliability of the process control system. Reliability is the probability that a device will function without failure over a specific time period.*

*Safe control system design practices should be utilized to ensure the operator can retain control of boiler processes during all operating conditions, including the ability to safely shut down the boiler during control system failures. Manual control is an acceptable mode of operation.*

*Control system architecture which consolidates multiple control functions could render many control elements inoperable with a common failure. In recognition of common failure points in consolidated control systems, transfer of control from the faulted unit to an alternate unit or method should be considered, so that failure of one control system component will not render more than one instrument loop or motor control inoperable. The transfer to the back-up control may be automatic or initiated by the operator.*

*An alternate unit or method maintains the reliability inherent in the single loop, single motor controls. This would apply to control loops identified in the applicable BLRBAC publications*

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

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

Additional work is needed to complete Chapter three

Homework assignments are:

- 3.4 Critical Processes Loops (John Cover & Eladi Ruiz de Molina are to review and provide and suggest Update)
- 3.6 Man *Human* Machine Interface (John Browning is to review and provided suggested updating)
- 3.7 Hardware Jumps and Software Forces (BYP ASSES) (Rick Matarrese is to review and suggest update)
- 3.8 System Security (Dave Avery is to review and suggest changes)

At the spring '12 meeting another Sunday closed session will be scheduled for continuation of the Update.

Finally, the subcommittee invites you to participate with us; you never know what we may learn.

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

**Review BLRBAC Anti Trust Statement**

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

**Attendance**

The morning meeting of the Materials and Welding Subcommittee met in open session on April 4, 2011, with 12 of 20 members represented and 12 guests.

**Old Business**

Minutes of last meeting reviewed and approved.

No new changes posted for member review.

Work with the ESP subcommittee resulted in changes to the ESP Incident Questionnaire. A new area for Handhole cap failure was provided and a question on whether the BLRBAC procedure was followed.

**New Business:**

Yurij Durda, Savcor, was considered for committee membership, but was tabled until he is present at a meeting.

A bulletin for Thermal Spray Coatings for Boiler Fire Side Waterwall Tubes was reviewed, modified and approved for submittal to the Executive Committee.

- Discussion on experiences with waterside deposits above the coated zone possibly as a result of heat flux differences.
- Discussion on papers that indicate coatings that hold water under pressure

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

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

Incidents from the spring 2011 ESP open meeting were reviewed to look at weld failures that could potentially lead to review by our committee. Weld defects such as porosity and slag inclusion lead to discussion on inspection. Discussion generated on the number of continued failures reported on weld in handhole cap failures.

- Proper preheat of the header is essential
- Use of a machining tool for cap removal requires less header repair
- Weld starts and stops should be cleaned and staggered on subsequent welds

**Communications:**

Jon Wilson, Power & Recovery Superintendent & Chief Power Engineer, Hinton Pulp, West Fraser Mills Ltd. asked for direction on proper hydrostatic test pressure. Personnel Safety is in agreement with Materials and Welding, 2.3.6 Final Inspection. The hydrostatic test pressure shall be adequate to verify the integrity of the repair. Added comments on AI, jurisdictional authority and scope of repairs. Pressures may be as high as 1.5 X MAWP. Safety valve set pressure should also be considered as some pressure tests may require temporarily rendering safety valves inoperative.

Randy Baker, Buckeye Technologies, asked what type hoses (if any) are being used to supply steam shatter jets? A photo was supplied of a typical hose. This hose has a metal sheath to protect from smelt spatters yet is corrosion resistant. It also is flexible, and typically gives good service life. I believe there are several vendors that can supply these. You may ask a boiler supplier like B&W, Alstom, Metso or Andritz. The response was also copied to Mark Sargent, Chairman of BL Safe Firing.

**Afternoon Session:**

The open afternoon session met in an open meeting with 12 members present and 22 guests. Call to order and review of the BLRBAC Anti Trust statement. Review of Morning Meeting Activities

A presentation was provided by Pedro Amador, Aquilex on ***Unifuse®* Spiral Overlay Tubing in Black Liquor Recovery Boilers- Technology and Experience**

Plans for the next meeting may include:

- Development of documents for economizer tube plugs and for SH ties
- Development of procedures for closure plate repairs.
- Continue work on Technical Bulletins for Materials –
  - The format for Materials Bulletins must be developed as the welding bulletin format does not apply

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

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

- Presentations of experiences that may be of interest to this group.
  - Welding Research Council
  - Repairs of cracks in the tube to header weld of economizer miniheaders
  - Inspection methodologies

5.7 **PERSONNEL SAFETY REPORT – Robert Zawistowski**

The Personnel Safety Subcommittee met in an "open" session on Monday, October 10, 2011. There were 12 members (out of 18) plus 35 guests in attendance during the meeting.

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

Representation at our meeting by regular members and guests included original equipment manufacturers Babcock & Wilcox, Diamond Power, and Metso. Representation from insurance and insurance service companies included Axa-Matrix Risk Consolidated, FM-Global, and NKSJ Risk Management. Operating company representation was present at this meeting with representatives from Blue Ridge Paper, CHH-Kirch, CHH-Thisman, Delta Natural Kraft, Domtar, Georgia-Pacific, Glatfelter, International Paper, Kapstone, Mead Westvaco, Mondi Swiecie S.A., Old Town Fuel & Fiber, Rayonier, Rock-Tenn, Sappi, and Weyerhaeuser. Repair company representation included Chalmers & Kubeck. Consultant representation included Power Specialists Associates, Inc.

The emergency stairwell "door opening letter" that was approved and voted on by the membership at the Spring 2011 meeting was submitted to our Subcommittee with grammatical corrections. This latest draft was reviewed and approved by the Subcommittee. The edited draft was presented to the Executive Committee on Monday afternoon. Because the changes were only grammatical and no content was modified, we were told this would not require another membership vote. The corrections will be made and posted as an appendix to the existing personnel safety document.

An introduction/disclaimer was reviewed for the draft of our new document, "Common Practice Guidelines". Some additional language was added since the initial draft was reviewed during the spring 2011 meeting.

Discussions were held relating to our development of "Common Practice Guidelines." We reviewed drafts of the following topics, "Smelt Spout Rodding," "Air Port Rodding" and "Chill and Blow." In past meetings we had agreed on general format and basic content. During this meeting we reviewed information gathered to date in preparation for review by the Executive Committee. At this point we felt our document was ready for a first round review by the Executive Committee. On Monday afternoon the Executive Committee was advised the first draft will be forthcoming following the Fall 2011 BLRBAC meeting.

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

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

We are always looking for new materials to add to this new document. A list of photographs needed for our document is listed below. Any photographs you are willing to share can be e-mailed to [bob.zawistowski@psaengineering.com](mailto:bob.zawistowski@psaengineering.com)

We would like to obtain photos of the following examples:

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

A section on liquor gun changing, liquor streamtesting, and a section on sootblowers will be added to the document during future meetings.

A presentation on safety was presented by Bob Zawistowski at the end of the meeting, “The Cost of Accidents.” After a short introduction on safety and “unsafe acts” a 12 minute British safety video from the SGB scaffolding company was shown and subsequently discussed. This safety video can be found on “You Tube” and is available for purchase in multiple languages at the following link:

<http://www.cip-books.com/product-details.aspx?categoryID=5&productid=1944>

We welcome new subcommittee member Michael Kaiser of International Paper, Cantonment, FL and John Fredrickson of Sappi Fine Paper, Cloquet, MN.

Between the April 2011 and October 2011 meetings there were no requests for clarification or document interpretation.

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

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

Requests for posting of fall meeting announcement were sent to Paper Age (magazine and website), Paper Industry (magazine) and RISI (website). TAPPI is, and already had in this case, automatically posted the meeting announcement in magazines and on their website.

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

5.9 **WASTE STREAMS REPORT** – Arie Verloop for John Rickard (Chaired by Paul Seefeld)

On October 10, 2011 the Waste Streams Subcommittee met in closed session at 9:00 AM with eight members present and three excused absences.

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

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

The committee's additional miscellaneous revisions to four sections in the guidelines from the spring 2011 meeting were partially incorporated into the document and will be finished before the spring 2012 meeting. We are also editing this section to include the other aforementioned changes.

The subcommittee has again targeted the spring 2012 meeting to present the above revisions (and future revisions) to the Executive Committee in hope of having them presented to the full membership for voting during the fall 2012 meeting. The changes and additions made during this session were minor and unanimous in acceptance.

We worked on comments to the revised guidelines, including some that were identified during our previous meetings in the fall and spring. The *Chapter 6* changes, voted in during the spring 2011 meeting were incorporated into the document and minor changes were made. We then, agreed to and voted in these final changes. We will incorporate these changes in the document to be reviewed by the Executive Committee in the spring of 2012

Since the spring meeting, we received two questions regarding the committee guidelines.

- What is the reasoning behind the 50% MCR as a prerequisite before adding NCGs to the recovery boiler? We decided that the 50% was a safe point to start and that individual mills can determine the minimum % MCR by working with their boiler manufacturer. This position is supported by the boiler manufacturers on the committee as well as the documentation from our European counterparts. As we have several references to 50% MCR, we plan on addressing this in the definition section of the document.
- During stable operation, is a continuous igniter really necessary? In the past, we had discussed this topic. In a batch mill, between blows, the bulk of the flow to the recovery is steam from the ejector. This is due to the minimum propagation speed required at the low flow condition between blows.

Ventless transfer was discussed at length. It was determined that even with a continuous igniter, steam tracing, and purge steam running continuously in a "standby mode", there is no ability to route NCGs to a recovery boiler (as a backup) without venting. This is due to the rule requiring local control, by an operator, to engage the NCG system into the recovery boiler.

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

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

There are two statements that we are investigating. They are in regard to the mixing of soap and tall oil into the liquor stream. We state that an agitator is required to keep the soap or tall oil in solution when there is full or partial recirculation of liquor. The committee looked for feedback as to if soap or tall oil will actually separate from 62%(+) liquor and received feedback during the afternoon session that several mills had significant separation in heavy liquor tanks and pumped a high percentage of soap to the recovery boiler when the tank level was low.

The afternoon open session began at 1PM. Eight subcommittee members and 7 visitors were present.

We had to postpone the presentation on NCG constituents, due to scheduling conflicts with the presenter. This presentation has been scheduled for the April 2012 meeting and we will establish a back-up presentation on the same subject.

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

The 50% MCR minimum to burn NCG clarification was discussed and there were no issues with the direction that the committee was planning.

The new guidelines regarding recirculation to a closed and vented system were discussed and, again, there were no issues with the direction that the committee was planning.

The ventless transfer limitation to the recovery boiler was discussed and clarified. This will be a continuing issue in the industry as the practice of burning NCGs in the recovery boiler is becoming more common.

5.10 **WATER TREATMENT REPORT – Tom Madersky**

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

Twenty (20) subcommittee members attended both sessions of the meeting; the subcommittee membership profile for those in attendance was as follows:

- Three (3) OEMs
- Ten (10) mill representatives
- One (1) insurance representative
- Six (6) BLRBAC Associate Members (4 of the 6 in attendance represented water treatment companies).



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

Susan Childress (IP), Claude Gauthier (Purolite) and Kelli Bastarache (PSA) were welcomed as new subcommittee team members.

We would, again, like to thank all of the subcommittee members for their participation and valued contributions.

**The fall meeting activities were as follows:**

- The BLRBAC Antitrust Policy was reviewed; the membership lists updated and key line items from the spring 2011 subcommittee meeting minutes were discussed.
- We performed final edits on the text and illustrations of the first four water system documents the subcommittee produced.
- We forwarded those documents to Mike Polagye for submittal to the Executive Committee.
- Pending the Executive Committee's final approval, we have requested that all four documents be posted for membership review and comments.
- We will have an open session in the afternoon of the spring 2012 subcommittee meeting to address membership input specific to the four resources that have been posted

In addition to the aforementioned edits we:

- Performed a partial edit of the drum, tube, and header circuitry section;
- Reviewed team assignments and objectives in preparation for production of the chemical cleaning section . . . the first development objective will be to provide the end user with guidelines and parameters to help establish a chemical cleaning timeline;
- And, we will add another section to the master outline that will address sampling and testing protocols.

In the spring 2012 morning session (a closed session), the plan is to have two of the three production teams complete the 1<sup>st</sup> edit of the boiler drum, tube and header section. The maintenance team will work on the chemical cleaning guidelines.

We closed our meeting at 3:45 p.m. and provided the Executive Committee with a summary of the subcommittee activities.

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.

**Membership**

Currently, 31 companies (pending what changes have taken place) participate in the Program including 6 non-AF&PA member companies. KPAQ joined the Program this year. The Program members represent nearly 95% of the total production of sulphate pulp in the U. S. There are a few other companies (Clearwater Paper [formerly Potlatch], Evergreen [Pine Bluff AR mill], Temple Inland and Woodland Pulp [formerly Domtar's mill] operating recovery boilers that are not in the Program. We continue to encourage them to join with the current members in the cooperative efforts for the safe operation and research to improve the reliability of the recovery boilers. All companies operating recovery boilers benefit directly from the Program's activities, including the research.

Currently, there are 102 mills operating 171 recovery boilers in the U. S. They produce about 40% of the total energy used in the U. S. pulp and paper industry. The average age of the boilers is about 30 years. Over 67% of the boilers were installed prior to 1979.

**Recovery Boiler Explosions**

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

**Operational Safety Seminars**

Last year we had a total of 93 attendees for the two seminars in Atlanta. They represented 13 companies from 24 mills. This year we had 73 attendees from 13 companies and 21 mills. We plan to have two seminars again next year. We ask that all companies seriously consider sending people to these valuable seminars.

The Committee felt that having the two half day sessions instead of the day and one-half day sessions, at the request of a number of companies, avoids additional time away from the mill. The seminars have also been reformatted to further improve the discussions and "preaching and teaching" the information available.

**Recovery Boiler Reference Manuals**

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

**Review of the AF&PA Recovery Boiler Audit Guidelines**

The Operation and Maintenance Subcommittee is reviewing the AF&PA Recovery Boiler Audit Guidelines which was last revised in 2004. We expect that the revised document will be approved at the February meeting and be available on the AF&PA Website.

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

**Recommendations and Guidelines in AF&PA Guidelines and Checklist Document**

The Operation and Maintenance Subcommittee finalized the recommendations and guidelines developed from the Economizer Tube Failure Study. These have been processed and included in the revised AF&PA Guidelines and Checklist document which was distributed to all member companies in May. It was also added to the AF&PA website. It may be downloaded by going to the AF&PA website.

**Study on Smelt Dissolving Tank Explosions**

The Research & Development Subcommittee completed two studies concerning Smelt Dissolving Tank Explosions, including the study of green liquor density versus TTA as a function of green liquor composition. The Committee is now looking at a proposal to sponsor a study for “Mitigating the Risk of Smelt-Water Explosions in Dissolving Tanks.” The committee is also considering a possible future study of heavy smelt runoffs.

**Evaluation of Drying Out Recovery Boilers after a Water Wash**

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

**Updating “Kraft Recovery Boilers” Blue Book**

The Committee is continuing to update the 15 chapters for the “Kraft Recovery Boilers” text book. There have been enough commercial advances and research activities documented to warrant a new edition. Dr. Tran and other known recovery boiler researchers are reviewing the final drafts and to have the book ready for publication by the middle of next year. Copies of the current edition are available for purchase from TAPPI.

**Other Research Projects Under Review**

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

**Annual Meetings and Conference**

AF&PA’s annual Recovery Boiler meetings and Conference is planned to be held in Atlanta February 7<sup>th</sup> and 8<sup>th</sup>. As usual, the Conference is 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, as well as other research being done outside of AF&PA related to recovery boilers. The object of the Conference is to keep not only the members advised, but also the remainder of the recovery boiler community, as well. We hope that many of you will plan to attend next year’s Conference which will be held in Atlanta in February.

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

No report was made.

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

No written report was received for the meeting minutes. See Appendix B for the Slide Presentation used during the meeting.

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

No report was made.

10. **ACTIVITIES OUTSIDE NORTH AMERICA REPORTS**

No reports were made.

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

Yesterday afternoon we had an Operating Problems discussion which started with a quiz. Nearly 230 attendees participated and I hope that everybody enjoyed the quiz and session and took away learnings from it. I think we ended up with about 55 questions that were discussed plus a few additions to those as we had the discussions associated with them. I want to continue to encourage people to submit those questions both at the meeting and at any time prior using the Operating Problems form posted on the BLRBAC website with the meeting registration materials. I think some of the discussions that take place really are valuable to the operating facilities in both the information they gain from each other and also the information we gain from our suppliers. I encourage everybody to continue to participate in Operating Problems discussions and I think it is helpful and certainly interesting to all of us.

12. **ADJOURNMENT**

**CHAIRMAN:**

**NEXT MEETING**

Crowne Plaza Atlanta Airport Hotel  
Atlanta GA  
April 2, 3 & 4, 2012

Are there any other questions or comments? If not, can I have a motion to adjourn the meeting? Second? All in favor? Opposed? The business meeting of fall 2011 BLRBAC is concluded. I encourage you to stay for the technical presentations that will begin after a short break. Thank you very much for your participation.

Everyone have a safe trip home!

13. **TECHNICAL PRESENTATIONS**

- *Clean Power Generation from Low Grade Heat in Pulp and Paper Mills*, Christine Capilouto, KGRA Energy
- *Refractory Selection in High Alkali Environments*, Tom Gencarelli, Harbison-Walker Refractories Company

**ECONOMIZER HAND HOLE CAP**

<b>FALL 2011 - 01</b>	
<b>Classification:</b>	<b>Non-Critical</b>
<b>Location:</b>	<b>Georgia Pacific, Camas, WA</b>
<b>Unit:</b>	#4 RB, 1974 CE #22673, 2-drum Large economizer, decanting hearth
<b>Unit Size:</b>	2.5 MM lb ds/day; 400,000 lb/hr steam at 650 psig, 750°F, 680 psig design
<b>Incident Date:</b>	June 24, 2011
<b>Downtime hrs, leak/total:</b>	16
<b>ESP?</b>	<b>No</b>
<b>Leak/Incident Loc:</b>	1/8" pin hole leak in weld on hand hole cap, top position, about 3' from left end, economizer second pass main header, 9th floor. Covered by upper furnace insulation and lagging of header. External to duct work and located in a dead air space
<b>How discovered:</b>	Walk down. Heard leak.
<b>Wash adjacent tube:</b>	No
<b>Root cause:</b>	Internal pocket erosion from feedwater turbulence flow at point of weld where hand hole and pipe fit; due to lack of weld penetration between inside diameter of header and seal surface of hand hole plug
<b>Leak detection:</b>	Yes.
<b>Bed cooling enhanc</b>	No
<b>Last full inspection:</b>	April 2011
<b>Sequence of events:</b>	<b>24Jun:</b> During walk down, heard leak noise. Located leak. Reduced liquor flow. Controlled shut down on natural gas. Lock out. Drained economizer. Made repair. Unit put back in service.
<b>Repair procedure:</b>	Weld ground out. Inspected carefully to evaluate any sort of cracking No cracks found. Repaired as per ASME Section 1. Verified via NDE with dye penetrant and the hand hold was re welded then verified with dye penetrant.
<b>Future prevention:</b>	Failure was a one time event with no prior history. The fact that there was no cracking in the weld means that the failure was not due to fatigue and would not be likely found in other areas

**ECONOMIZER HAND HOLE CAP; and UPPER REAR WALL**

<b>FALL 2011 02a&amp;b</b>	<b>2a Econ Hand Hole</b>	<b>2b Upper Rear Wall</b>
<b>Classification:</b>	<b>2a Non-Critical</b>	<b>2b CRITICAL INCIDENT 749</b>
<b>Location:</b>	<b>International Paper Co, Texarkana, Texas</b>	
<b>Unit:</b>	1976 B&W, PR-186, 2-drum Large economizer, Sloped hearth	
<b>Unit Size:</b>	4.55 MM lb ds/day; 763,000 lb/hr steam at 1050 psig, 813°F, 1200 psig design	
<b>Incident Date:</b>	April 18, 2011	
<b>Downtime hrs, leak/total:</b>	42.75 hr	
<b>ESP?</b>	No	
<b>Leak/Incident Loc:</b>	1. Econ lower header hand hole cap weld, upper (hot)econ, elev 122'; <b>2. Upper rear wall</b> loose tube crack at old attachment weld repair, elev 140'-5"	
<b>How discovered:</b>	1. Walk down Saw water and slush in conveyors; 2. Hydro after repair	
<b>Wash adjacent tube:</b>	No	
<b>Root cause:</b>	- [Econ: Noted at meeting: Likely porosity]	
<b>Leak detection:</b>	No	
<b>Bed cooling enhanc</b>	No	
<b>Last full inspection:</b>	October 2010	
<b>Sequence of events:</b>	Water and slush were found in economizer conveyor and leg line. An orderly shutdown was completed and the leaking hand hole cap was repaired. During hydro, leak found in upper wall, and weld repaired.	
<b>Repair procedure:</b>	Cap was weld repaired in place. Wall crack was weld repaired.	
<b>Future prevention:</b>	Hand hole caps have had leaks in past. Will replace wall tube in Fall 2011 outage. Will test other tubes then.	

**ECONOMIZER**

**FALL 2011 - 03**  
**Classification:** Critical Incident 750  
**Location:** Georgia-Pacific, Toledo, OR  
**Unit:** #1 RB, 1957 CE #15656, 2-drum, DCE cascade, decanting hearth  
**Unit Size:** 1.44 MM lb ds/day; 170,000 lb/hr steam at 600 psig, 700°F, 700 psig design  
**Incident Date:** Dec 24, 2010  
**Downtime hrs, leak/total:** 24 hr  
**ESP?** No  
**Leak/Incident Loc:** Economizer tube, 1" from upper header  
**How discovered:** Walk down, saw puddle on a buckstay and weeping from casing  
**Wash adjacent tube:** No  
**Root cause:** Fatigue failure due to tube to header bottoming, crack in previous repair  
**Leak detection:** No  
**Bed cooling enhanc** No  
**Last full inspection:** 7Dec2010  
**Sequence of events:** During walk down, saw puddle on a buckstay and weeping from casing. Reported. Inspection determined was in economizer.  
**Repair procedure:** Remove leak by grinding, PT insp, Welded repair  
**Future prevention:** Annual Inspection, Replace Economizer based on project approval

**ECONOMIZER**

<b>FALL 2011 04a&amp;b</b>	<b>4a Econ</b>	<b>4b Econ</b>
<b>Classification:</b>	<b>Critical Incident 751</b>	<b>Critical Incident 752</b>
<b>Location:</b>	<b>Georgia Pacific, Toledo, OR</b>	
<b>Unit:</b>	#1 RB, 1957 CE, #15656, 2-drum DCE cascade, decanting hearth	
<b>Unit Size:</b>	1.44 MM lb ds/day; 170,000 lb/hr steam at 600 psig, 700°F, 700 psig design	
<b>Incident Date:</b>	April 4 <b>AND</b> April 7, 2011	
<b>Downtime hrs, leak/total:</b>	24 Hr; 24 hr	
<b>ESP?</b>	<b>No</b>	
<b>Leak/Incident Loc:</b>	<b>4Apr:</b> 1/8" crack, crossover [feeder] tube, near the header to tube weld 1" from upper economizer header caused from age and stress. ; <b>7Apr:</b> Pinhole Leak 2 <sup>nd</sup> tube from north	
<b>How discovered:</b>	Walk down. Saw water dripping from economizer	
<b>Wash adjacent tube:</b>	No	
<b>Root cause:</b>	Fatigue stress cracking near the header to tube weld due to corrosion of economizer and feeder tubes being bottomed out in upper header.	
<b>Leak detection:</b>	Yes Nalco Trasar	
<b>Bed cooling enhanc</b>	No	
<b>Last full inspection:</b>	December 2010	
<b>Sequence of events:</b>	4Apr: During walk down, saw water dripping from upper economizer header.	
<b>Repair procedure:</b>	Tube had been previously repaired. Crack was ground out and pad welded (and pinhole)	
<b>Future prevention:</b>	Many similar leaks due to 1958 age & cycling. Plan to replace economizer in Jan. 2012.	

**ECONOMIZER**

<b>FALL 2011 - 05</b>	
<b>Classification:</b>	<b>Non-Critical</b>
<b>Location:</b>	<b>Domtar, Hawesville, KY</b>
<b>Unit:</b>	#4 RU, 1997 Ahlstrom 59072, 1-drum large econ
<b>Unit Size:</b>	2.7 MM lb ds/day; 415,880 lb/hr steam at 1250 psig, 860°F, 1550 psig design
<b>Incident Date:</b>	26Jan2011
<b>Downtime hrs, leak/total:</b>	26
<b>ESP?</b>	<b>Yes</b>
<b>Leak/Incident Loc:</b>	¼" long circumferential crack in weld, Lower econ 2" feeder tube-to-feed distribution header
<b>How discovered:</b>	Walk down. Saw moisture in discharge end of #1 econ ash conveyer
<b>Wash adjacent tube:</b>	Yes: thinned only
<b>Root cause:</b>	Stress induced during initial weld, suspected slag or porosity, thermal cycles
<b>Leak detection:</b>	Yes. Did not detect.
<b>Bed cooling enhanc</b>	No
<b>Last full inspection:</b>	Oct 2010
<b>Sequence of events:</b>	<b>26Jan:</b> Saw moisture in discharge end of #1 econ ash conveyer. Too small to locate. Leak monitored 6 days. Ready to shut down if worsened. <b>31Jan:</b> 23:00 pulled liquor. <b>1Feb:</b> 01:00 pulled fuel. Drained econ hot water. Refilled with cool water to locate leak. Repair made. 17:15 Fired unit <b>2Feb:</b> 03:00 Liquor fired.
<b>Repair procedure:</b>	Crack ground out and rewelded. Thin tube pad welded.
<b>Future prevention:</b>	Plan added visual and mag particle testing inspection, during the next shut

**ECONOMIZER**

<b>FALL 2011 - 06</b>	
<b>Classification:</b>	<b>Non-Critical</b>
<b>Location:</b>	<b>Domtar, Johnsonburg, PA</b>
<b>Unit:</b>	1993 Tampella #90132, 1-drum Large economizer
<b>Unit Size:</b>	2.8 MM lb ds/day; 400,000 lb/hr steam at 1250 psig, 900°F, 1600 psig design
<b>Incident Date:</b>	May 8, 2011
<b>Downtime hrs, leak/total:</b>	27 / 32.7
<b>ESP?</b>	<b>No</b>
<b>Leak/Incident Loc:</b>	Crack in weld between the tube (row 60, #8) and the header,
<b>How discovered:</b>	Walk down. Saw wet ash.
<b>Wash adjacent tube:</b>	No
<b>Root cause:</b>	Historically stress-assisted corrosion (SAC); stress corrosion fatigue cracking caused by a combination of thermal expansion of the tube length, and the cantilever effect of the sloped portion of the tube
<b>Leak detection:</b>	No
<b>Bed cooling enhanc</b>	No
<b>Last full inspection:</b>	April 2010
<b>Sequence of events:</b>	<b>8May:</b> 16:50 During walk down, saw damp ash in economizer conveyer. Orderly shutdown. 20:10 Liquor out. Burned out bed. Lock-out. <b>9May:</b> 04:50 began water wash of economizer. Inspected site. Drained water. Began repair. 13:35 Completed repair. 16:25 Hydro OK. 22:20 Unit on line (gas) Added work on mix tank bearing change-out. <b>10May:</b> 04:50 On liquor
<b>Repair procedure:</b>	Grind out defect, and weld repair
<b>Future prevention:</b>	During the past 7 years there have been numerous leaks in the #1 Economizer section

**ECONOMIZER**

<b>FALL 2011 - 07</b>	
<b>Classification:</b>	<b>Non-Critical</b>
<b>Location:</b>	<b>Longview Fibre, Longview WA</b>
<b>Unit:</b>	#18 RU, 1965 CE, #2964, 2-drum DCE cascade, decanting hearth
<b>Unit Size:</b>	2.1 MM lb ds/day; 367,000 lb/hr steam at 800 psig, 750°F, 975 psig design
<b>Incident Date:</b>	March 22, 2011
<b>Downtime hrs, leak/total:</b>	48
<b>ESP?</b>	<b>No</b>
<b>Leak/Incident Loc:</b>	½" Crack at base of RT plug weld, bottom economizer distribution header
<b>How discovered:</b>	Walk down. Saw water dripping from cascade upper side inspection door
<b>Wash adjacent tube:</b>	No
<b>Root cause:</b>	-
<b>Leak detection:</b>	No
<b>Bed cooling enhanc</b>	No
<b>Last full inspection:</b>	Oct 2010
<b>Sequence of events:</b>	<b>22Mar:</b> Coming up after cascade wash. 18:00 Solids were slow coming up, so checked dilution header piping. Saw water dripping from upper side inspection door of cascade. Inside saw water running down duct. Diverted all fuel. No bed yet. No glow in hearth. No signs of water in clear view of lower furnace. Unit cooled, drained and isolated for repair
<b>Repair procedure:</b>	Ground crack out and welded. Performed dye pen. test and 800# hydro followed
<b>Future prevention:</b>	Inspect lower econ header in future annual hydro tests

**ECONOMIZER**

<b>FALL 2011 - 08</b>	
<b>Classification:</b>	<b>Non-Critical</b>
<b>Location:</b>	<b>Rayonier Performance Fibers, Jesup, GA</b>
<b>Unit:</b>	#6 RB, 1982 CE #24579, 2-drum Large econ, decanting hearth
<b>Unit Size:</b>	4.9 MM lb ds/day; 1,000,000 lb/hr steam at 1325 psig, 900°F, 1590 psig design
<b>Incident Date:</b>	May 4, 2011 <b>AND</b> May 8, 2011
<b>Downtime hrs, leak/total:</b>	May 4:28 hr; May 8: 34 hr
<b>ESP?</b>	<b>No</b>
<b>Leak/Incident Loc:</b>	<b>May 4:</b> Small pinhole leak in tube plug weld in upper cold, rear economizer header, tube #13 between 10th & 11th floors, roughly 130' elevation. <b>May 8:</b> :Small pinhole leak in tube plug weld in LOWER economizer header
<b>How discovered:</b>	Walk down
<b>Wash adjacent tube:</b>	Yes, adjacent tube #12 washed to thinning
<b>Root cause:</b>	Incorrect plug material supplied by the vendor and installed by the contractor (not known until 2nd leak on 5/8/2011. Used shaft material in lieu of SA-105 called for in specs. Contributing factors: poor contractor QC and weld quality (lack of penetration due to using a 110v portable welding machine in lieu of a "4 pack", no pre or post-weld heat treat).
<b>Leak detection:</b>	No
<b>Bed cooling enhanc</b>	No
<b>Last full inspection:</b>	April 2011
<b>Sequence of events:</b>	In <b>April, 2011</b> annual outage, contractor installed upper and lower econ header tube plugs <b>4May:</b> Walk down saw economizer leak. Orderly shut down. Small leak discovered in a plug weld in top econ. hdr. Adjacent tube had been washed. Weld repair made on plug, adjacent washed tube plugged. <b>8May:</b> Walk down saw economizer leak. Orderly shut down. Small leak discovered in plug weld in bottom econ. header. Weld repairs made on all 4 plugs.
<b>Repair procedure:</b>	5/4 leak – weld repair of existing plug, installation of 2 additional plugs for adjacent washed tube. 5/8 leak – removal of all 4 plugs and replacement with correct material using preheat
<b>Future prevention:</b>	Both mill and contractor procedures governing material verification are under review. Current preferred supplier list is also under review



**ECONOMIZER**

<b>FALL 2011 - 09</b>	
<b>Classification:</b>	<b>Critical Incident 753</b>
<b>Location:</b>	<b>International Paper, Riverdale, Selma, AL</b>
<b>Unit:</b>	#2 RB, 1981 CE, #28679, 2-drum Large econ, Decanting hearth, New B&W economizer
<b>Unit Size:</b>	2.7MM lb ds/day; 425,000 lb/hr steam at 1425 psig, 860°F, 1720 psig design
<b>Incident Date:</b>	May 22, 2011
<b>Downtime hrs, leak/total:</b>	43
<b>ESP?</b>	<b>No</b>
<b>Leak/Incident Loc:</b>	5/8" linear indication, pit, or small hole, on header-side of toe of tube-to-header weld, Tube 77, row 5, upper header of new 1-week-old B&W 2nd pass economizer.
<b>How discovered:</b>	Walk down. Saw steam coming from 11th floor RH access door into the 2nd pass economizer.
<b>Wash adjacent tube:</b>	No
<b>Root cause:</b>	Slag inclusion or porosity in shop weld.
<b>Leak detection:</b>	YES
<b>Bed cooling enhanc</b>	No
<b>Last full inspection:</b>	May 2011
<b>Sequence of events:</b>	22May: During walk down, saw steam coming from 11th floor RH access door into the 2nd pass economizer. Investigation showed it at upper header, 2nd pass new B&W economizer. Believed there was no baffle between leak and generating bank. Crew proceeded to pull liquor. 16:10 While pulling liquor the boiler diverted. Re-established fire, burned out bed. 22:25 23:10 fire out. 23May: Found leak following morning. Economizer drained. 11:00 LOTO complete. Repairs made. Backfilled superheater for hydro. 23:30 Boiler was full. Did hydro tested to 1375 psi, OK 24May: 02:30 Boiler fired..09:00 Boiler was on line..11:15 Boiler on liquor.
<b>Repair procedure:</b>	Burred out defect. Revealed 5/8" linear indication. PT'd site to find extent of indication. Linear indication removed and PT'd again to verify complete removal. Inspection inconclusive as to which occurred first, linear or pit. Pit appears to be result of slag inclusion or porosity, though no additional porosity was evident during defect removal. Header was preheated to 300oF by contractor prior to repair. Contractor repaired defect using TIG. Repair PT'd and accepted. Additional UT performed in adjacent, but no washing-thinning found.
<b>Future prevention:</b>	B&W investigated shop fab of this unit. Determined exact tube to header welds made by this boiler maker and reviewed shop QC reports. UT adjacent tubes for possible washing (none discovered). PT / MT all welds made by this boiler maker as well as spot checked other tube to header welds on this unit and no indications found.

**ECONOMIZER**

<b>FALL 2011 - 10</b>	
<b>Classification:</b>	<b>Non-Critical</b>
<b>Location:</b>	<b>Nanaimo Forest Products, Harmac Pulp, Nanaimo B C Canada</b>
<b>Unit:</b>	#5RU, 1951 CE, #CA51126, 3-drum DCE cascade, Decanting Hearth
<b>Unit Size:</b>	1.1 MM lb ds/day; 210,000 lb/hr steam at 600 psig, 750°F, 775 psig design
<b>Incident Date:</b>	June 26, 2011
<b>Downtime hrs, leak/total:</b>	2 days
<b>ESP?</b>	<b>No</b>
<b>Leak/Incident Loc:</b>	Crack in lower economizer tube near inlet (bottom) header
<b>How discovered:</b>	Walk down prompted by low solids liquor test
<b>Wash adjacent tube:</b>	Initial crack washed 2 adjacent tubes
<b>Root cause:</b>	Likely SAC
<b>Leak detection:</b>	No
<b>Bed cooling enhanc</b>	No
<b>Last full inspection:</b>	October 2010
<b>Sequence of events:</b>	<b>26 June:</b> Solids dropped in liquor test. Operator did walk down with soot blowers off. Heard noise. Confirmed it. Did orderly shut down. Liquor pulled and bed burned out boiler cooled and a hydro performed. Scaffold installed and leak located. Did repair.
<b>Repair procedure:</b>	Grind and repair
<b>Future prevention:</b>	Inspect the other inlets for weld quality issues

**FWAH**

<b>FALL 2011 - 11</b>	
<b>Classification:</b>	<b>Non-Critical</b>
<b>Location:</b>	<b>Georgia Pacific, Camas, WA</b>
<b>Unit:</b>	#4 RB, 1974 CE #22673, 2-drum Large economizer, decanting hearth
<b>Unit Size:</b>	2.5 MM lb ds/day; 400,000 lb/hr steam at 650 psig, 750°F, 680 psig design
<b>Incident Date:</b>	December 25, 2010
<b>Downtime hrs, leak/total:</b>	19
<b>ESP?</b>	No
<b>Leak/Incident Loc:</b>	1/8" pin hole leak, First pass air preheater piping, third weld off supply header 1.5' off ground floor. Located outside casing of air passage
<b>How discovered:</b>	Walk down. Heard leak, then found moisture under the dead air space, basement floor.
<b>Wash adjacent tube:</b>	No
<b>Root cause:</b>	Poor weld quality due to lack of penetration and embedded porosity, allowing internal pocket erosion from turbulence around chill rings and embedded weld porosity
<b>Leak detection:</b>	Yes. Nalco Trasar
<b>Bed cooling enhanc</b>	No
<b>Last full inspection:</b>	April 2011
<b>Sequence of events:</b>	25Dec: During walk down, heard noise, found moisture on floor under FWAH dead air space. Checked that air heater sump level was OK. Orderly shut down, drained and repaired.
<b>Repair procedure:</b>	Weld repair performed where both root and final passed test
<b>Future prevention:</b>	Conducted ultrasonic thickness testing on all eight bottom row "S-bends" which connect inlet headers to air heater. Large flaws found resulting in expanding the scope to include phased array ultrasonic testing on all eight bottom S-bends along with random testing on first & second rows off opposite side of header. The largest S-Bend ultrasonic indication was sectioned for analysis. Two replacement S-Bends were fabricated. One was installed. (Other saved as template for future. Since so many weld quality issues observed, plan to replace headers and try to eliminate number of welds by getting majority of the piping bent. The erosion issues in the S-Bends appear to be more of an issue due to the use of chill rings at welds where scalloping was observed on the upstream side of the rings.

**SCREEN** (and SUPERHEATER)

<b>FALL 2011 - 12</b>	
<b>Classification:</b>	<b>Critical Incident 754</b>
<b>Location:</b>	<b>Smurfit-Stone Container (now RockTenn as of May 2011), Panama City, Florida</b>
<b>Unit:</b>	#2 RB, 1971 CE, #27070, 2-drum, DCE cascade, Decanting hearth
<b>Unit Size:</b>	2.97 MM lb ds/day; 398,000 lb/hr steam at 450 psig, 750°F, 570 psig design
<b>Incident Date:</b>	February 6, 2011
<b>Downtime hrs, leak/total:</b>	74.4 hr
<b>ESP?</b>	<b>Yes</b>
<b>Leak/Incident Loc:</b>	Screen: 3" circumferential crack in top screen tube, 6 <sup>th</sup> platen, 79" above hearth 2 <sup>nd</sup> tube down also crushed 70%. (Superheater: small cracks)
<b>How discovered:</b>	Panel: DCS showed steam-water differential; ID Fan increase; Nalco leak detection
<b>Wash adjacent tube:</b>	No
<b>Root cause:</b>	Mechanical damage from slag fall
<b>Leak detection:</b>	Yes Nalco RBLI, confirmed leak
<b>Bed cooling enhanc</b>	No
<b>Last full inspection:</b>	January Annually
<b>Sequence of events:</b>	<b>6Feb:</b> 14:30 panel showed steam-water differential (S-WD) 15:22 S-WD alarm, ID fan increase, Nalco leak detection showing increase, feedwater chemicals down. 15:44 Nalco alarm. 16:28 Start to reduce load and liquor to better observe for leak. 16:58 ESP'd unit. No evidence of water entering bed. After repairs, hydro found superheater leaks: all at tie welds, primary SH (2) and secondary SH (1).
<b>Repair procedure:</b>	Top screen tube removed and headers plugged. 2 <sup>nd</sup> tube headers plugged (tube left in unit). Superheater tie welds were pad welded. During Feb 21 outage, screen tubes replaced. Also replaced 10 more damaged upper screen tubes.
<b>Future prevention:</b>	Previously, soot blowing had been cut back to save steam, perhaps allowing too great a slag build-up. Soot blower sequence and amounts being increased. Note of interest: This was 1 <sup>st</sup> ESP in over 15 years, and will be used for training guide.

**SUPERHEATER**

<b>FALL 2011 - 13</b>	
<b>Classification:</b>	<b>Non-Critical</b>
<b>Location:</b>	<b>International Paper, Ticonderoga, NY</b>
<b>Unit:</b>	#1 RB, 1969 B&W # PR-131, 2-drum Large economizer, Sloped hearth
<b>Unit Size:</b>	2.01 MM lb ds/day; 300,000 lb/hr steam at 850 psig, 825°F, 975 psig design
<b>Incident Date:</b>	July 26, 2011
<b>Downtime hrs, leak/total:</b>	63 hrs
<b>ESP?</b>	<b>Yes</b>
<b>Leak/Incident Loc:</b>	Sheared-off secondary superheater tubes just below roof, 292' elev; one left side, one right side.
<b>How discovered:</b>	Furnace pressurized
<b>Wash adjacent tube:</b>	No
<b>Root cause:</b>	High sootblower steam pressure; high-intensity nozzles; poor superheater tube support, allowing unrestrained swinging
<b>Leak detection:</b>	No
<b>Bed cooling enhanc</b>	Yes. Austin Fire Sodium bicarbonate
<b>Last full inspection:</b>	August 2010
<b>Sequence of events:</b>	<b>26Jul</b> 11:26 Furnace went positive. Couldn't control pressure or drum level. ESP'd unit. 4-hour wait. Visual confirmation of sheared tube. Cooled bed with sodium bicarbonate to <800oF. Verified with TC's on probes, and IR camera
<b>Repair procedure:</b>	Capped superheater tubes at headers; secured platens for removal at next outage one week later
<b>Future prevention:</b>	Change soot blower nozzle type and soot blower steam pressure settings

**SCREEN**

<b>FALL 2011 - 14</b>	
<b>Classification:</b>	<b>Critical Incident 755</b>
<b>Location:</b>	<b>Georgia Pacific, Toledo, OR</b>
<b>Unit:</b>	#2 RB, 1959 CE, #5959, 2-drum DCE cascade, decanting hearth
<b>Unit Size:</b>	1.4 MM lb ds/day; 170,000 lb/hr steam at 600 psig, 800°F, 700 psig design
<b>Incident Date:</b>	July 31, 2011
<b>Downtime hrs, leak/total:</b>	6.7 days
<b>ESP?</b>	<b>Yes</b>
<b>Leak/Incident Loc:</b>	1" tear in weld attachment of screen tube, right side furnace screen. Also 1" crack next tube down
<b>How discovered:</b>	Leak detection Nalco Trasar alarm (earlier: major slag fall felt in control room; feedwater flow jump)
<b>Wash adjacent tube:</b>	No
<b>Root cause:</b>	Major slag fall broke screen tubes attachment welds
<b>Leak detection:</b>	Yes. Nalco Trasar alarmed leak.
<b>Bed cooling enhanc</b>	No
<b>Last full inspection:</b>	March 2011
<b>Sequence of events:</b>	<b>31Jul:</b> 15:43 Felt major slag fall in control room. 15,000 lb/hr jump in feed water flow. Found liquor gun sheared off. Replaced gun. 17:54 Nalco Trasar mass water balance alarm. Saw earlier feed water jump. High CO, low O2. Shut soot blowers. Heard roaring sound. ESP'd unit. Upon inspection, found two screen tubes with cracks in weld attachments and 4 screen tubes bent out of plane. Repairs made. Hydro found 1 added screen tube weld attachment leak. Area where chunk hit the floor of the furnace was cleared of all smelt and inspected for damage. No damage was found and unit was put back into service.
<b>Repair procedure:</b>	Sectioned and replaced all 6 screen tubes, then 7 <sup>th</sup> tube after hydro.
<b>Future prevention:</b>	- -

**DRUM**

<b>FALL 2011 - 15</b>	
<b>Classification:</b>	<b>Non-Critical</b>
<b>Location:</b>	<b>International Paper Co, Texarkana, Texas</b>
<b>Unit:</b>	1972 B&W, PR-144, 2-drum Large economizer, Sloped hearth
<b>Unit Size:</b>	2.6 MM lb ds/day; 408,000 lb/hr steam at 650 psig, 750°F, 775 psig design
<b>Incident Date:</b>	March 2, 2011
<b>Downtime hrs, leak/total:</b>	29
<b>ESP?</b>	<b>No</b>
<b>Leak/Incident Loc:</b>	<u>Leaking crack in RHSW mud drum blow down piping at forging off mud drum, elev 99'-6"</u>
<b>How discovered:</b>	Walk down Saw water blowing out of crack in boiler bank hopper below the mud drum
<b>Wash adjacent tube:</b>	No
<b>Root cause:</b>	-
<b>Leak detection:</b>	No
<b>Bed cooling enhanc</b>	No
<b>Last full inspection:</b>	April 2010
<b>Sequence of events:</b>	<b>2Mar:</b> 07:30 Saw water coming out of a crack in RHSW generating bank hopper wall just below mud drum. 08:00 First liquor gun removed. 08:20 All liquor out. Found leak was below mud drum. All water was going to boiler bank hoppers. Did orderly shutdown.
<b>Repair procedure:</b>	Pad weld leak in 1-1/2" leg line at the 4" diameter drain forging.
<b>Future prevention:</b>	-

**BOILER****FALL 2011 - 16****Classification:****Critical Incident 756****Location:****International Paper, Courtland, AL****Unit:**

#2 RB, 1979 B&amp;W, PR-180, 2-drum DCE cyclone, Sloped hearth

**Unit Size:**

4.2 MM lb ds/day; 500,000 lb/hr steam at 450 psig, 550°F, 550 psig design

**Incident Date:**August 11, **2010****Downtime hrs, leak/total:**

46.7

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

2" fish-mouth leak, lower rear (cold-side) boiler row 81, tube 21

**How discovered:**Leak Detection System (confirmed by walk down saw water on 7<sup>th</sup> floor at mud drum)**Wash adjacent tube:**

No

**Root cause:**

Sootblower erosion caused thinning to failure

**Leak detection:**

Yes. IP mass balance

**Bed cooling enhanc**

Yes. Southland Fire Sodium bicarbonate and nitrogen

**Last full inspection:**

October 2010

**Sequence of events:**

**11Aug:** 10:15 Level 3 Leak Detection alarm. Walk down found water going into ash hopper; dump tank level rising. ID fan increase. Steam-water leak alarm. Did ESP. 4-hour wait. Cooled bed. Hydro to find leak. Night: Lockout. Begin repair **12Aug:** 04:00 start staging and bed cooling. 15:10 Repairs complete. Start fill for hydro. 21:40 Fire in boiler. **13Aug:** 09:30 On liquor Noon On load.

**Repair procedure:**

Cut out tube; plugged steam &amp; mud drums (tube 21, row 81)

**Future prevention:**

9 leaks since 2000. Included corrosion pitting, under deposit corrosion and stress assisted corrosion, near drum corrosion, sootblower erosion and vibration bar fatigue. IRIS and video scope NDE testing generating tubes during October outage. Rebuild or re-tube boiler in 2013

**UPPER FURNACE****FALL 2011 - 17****Classification:****Critical Incident 757****Location:****Tolko Manitoba Kraft Papers, The Pas Manitoba, Canada****Unit:**

1969 CESL, CA-69108 2-drum DCE Cascade

**Unit Size:**

1.75 MM lb ds/day; 219,000 lb/hr steam at 750 psig, 825°F, 800 psig design

**Incident Date:**

15Feb2011

**Downtime hrs, leak/total:**

78

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

½ inch crack at attachment weld to buckstay; Front right corner approx. 54 ft above floor.

**How discovered:**

Walk down during meter replacement outage; visual inspection saw water running out spout.

**Wash adjacent tube:**

No

**Root cause:**

Buckstay attachment weld failure

**Leak detection:**

No

**Bed cooling enhanc**

No (no bed)

**Last full inspection:**

Oct 2010

**Sequence of events:**

15Feb: Took unit down to replace south spout flow meter. 05:00 pulled liquor. 08:30 Bed burned out and aux fuel pulled. Operator saw undue drum level shrinking. Saw liquid coming from south spout. From manway, saw water running down right wall. Activated ESP. 8-hour evacuation. Removed skin casing and portion of buckstay channel for access. Tube 129 to buckstay weld cracked and leaking. Tube 128 to buckstay weld cracked off.

**Repair procedure:**

Tube 129 crack area excavated and MT examined to determine extent of cracking and ensure complete removal. Groove welded with ER70S-2, weld MT examined and weld metal build up performed, with MT examination of final. Tube 128 ground clean and MT examined, no cracks found. Repads installed on both tubes and welded to buckstay.

**Future prevention:**

Review incident and questionnaire with all operators paying extra attention to the ESP and the events previous to the ESP to learn from what went well and what needs to be worked on..

**UPPER FURNACE**

<b>FALL 2011 - 18</b>	
<b>Classification:</b>	<b>Critical Incident 758</b>
<b>Location:</b>	<b>International Paper, Riegelwood, NC</b>
<b>Unit:</b>	#4 RB, 1974 CE, 23771, 2-drum DCE Cascade, Decanting hearth, 1991 Tampella rebuild
<b>Unit Size:</b>	2.4 MM lb ds/day; 326,000 lb/hr steam at 600 psig, 725°F, 1000 psig design
<b>Incident Date:</b>	March 2, 2011
<b>Downtime hrs, leak/total:</b>	83 hr
<b>ESP?</b>	<b>Yes</b>
<b>Leak/Incident Loc:</b>	Small crack approximately ¼" in at membrane weld straight tube, original side wall soot blower opening IK 14, over arch, in front of mud drum. Sprayed onto opposite tube in bent opening.
<b>How discovered:</b>	Instruments: Boiler water chemistry showed loss of chemical and conductivity; led to walk down, when leaks were heard
<b>Wash adjacent tube:</b>	Yes. 1 <sup>st</sup> leak washed 1/2x1/4" bent tube
<b>Root cause:</b>	Being analyzed
<b>Leak detection:</b>	Yes Mass balance uses steam flow, blowdown flow, and feed water flow to calculate a difference value. Looking back leak detection log shows separation in steam and feedwater flows.
<b>Bed cooling enhanc</b>	Yes Southland Fire Protection N2 Blown through tubes into bed
<b>Last full inspection:</b>	May 2010
<b>Sequence of events:</b>	2Mar Early am: Demineralizer operator reported losses in chemicals and conductivity. ~8am: #4RB Fireman and Area Manager did walk down. Heard noise on the 6th floor near IK14. Did immediate ESP. After successful ESP and 4 hours wait period, area declared safe. Boiler doors removed to help cool the furnace.
<b>Repair procedure:</b>	Both opening tubes replaced with Dutchmen and then welds were X-rayed. The flat studs at the opening were PT'd prior to the hydrostatic test.
<b>Future prevention:</b>	Will UT inside the wall box. Believe these were original tubes installed in 1974.

**UPPER FURNACE**

<b>FALL 2011 - 19</b>	
<b>Classification:</b>	<b>Critical Incident 759</b>
<b>Location:</b>	<b>International Paper, Ticonderoga, NY</b>
<b>Unit:</b>	#1 RB, 1969 B&W # PR-131, 2-drum Large economizer, Sloped hearth. 1980 rebuild
<b>Unit Size:</b>	2.01 MM lb ds/day; 300,000 lb/hr steam at 850 psig, 825°F, 975 psig design
<b>Incident Date:</b>	February 13, 2011
<b>Downtime hrs, leak/total:</b>	22/96
<b>ESP?</b>	No
<b>Leak/Incident Loc:</b>	Pitting in previously repaired membrane attachment weld HAZ. In plugs from 1980 rebuild cable slots. Left upper furnace wall tube, 289' elev, 7th from front wall
<b>How discovered:</b>	Hydrostatic Pressure test while down for other repair
<b>Wash adjacent tube:</b>	No
<b>Root cause:</b>	Poor craftsmanship during a previous repair- overheating the membrane to tube weld, resulting in internal pitting in the heat affected zone
<b>Leak detection:</b>	No
<b>Bed cooling enhanc</b>	No
<b>Last full inspection:</b>	August 2010
<b>Sequence of events:</b>	Identified leaking tube during pressure test, took pressure off and repaired.
<b>Repair procedure:</b>	Installed Dutchman
<b>Future prevention:</b>	Better quality assurance during repair welds Replace panels in future

**UPPER FURNACE****FALL 2011 - 20**

**Classification:** Critical Incident 760  
**Location:** International Paper, Vicksburg, MS  
**Unit:** 1967 B&W, PR-105, 2-drum DCE cyclone, sloped hearth, 2008 B&W wall rebuild  
**Unit Size:** 3.5 MM lb ds/day; 495,000 lb/hr steam at 1020 psig, 825°F, 1200 psig design  
**Incident Date:** June 18, 2011  
**Downtime hrs, leak/total:** During hydro  
**ESP?** No  
**Leak/Incident Loc:** Crack on the bottom bend of lower IK opening, #601, left side wall, 110' above hearth, new in 2008  
**How discovered:** During hydro  
**Wash adjacent tube:** Yes. Areas of adjacent tube of opening washed out and leaked  
**Root cause:** Likely stress related crack from installation  
**Leak detection:** Yes. (n/a-during hydro outage)  
**Bed cooling enhanc:** No. (n/a-during hydro outage)  
**Last full inspection:** April 2010  
**Sequence of events:** 18Jun: During hydro prior to startup, found leak after fill even before any pressure applied. Found moisture in lower furnace. Found source. Stopped hydro. Made repairs  
**Repair procedure:** Replaced wall opening. All 4 welds x-rayed. Checked adjacent wall openings & found OK  
**Future prevention:** Will inspect all IK openings during the next plant outage.

**UPPER FURNACE****FALL 2011 - 21**

**Classification:** Critical Incident 761  
**Location:** Georgia Pacific, Brewton, AL  
**Unit:** #2 RU, 1963 B&W, # PR-79, 2-drum DCE cyclone, sloped hearth  
**Unit Size:** 1.1 MM lb ds/day; 186,000 lb/hr steam at 860 psig, 830°F, 975 psig design  
**Incident Date:** July 9, 2011  
**Downtime hrs, leak/total:** 38/42.5  
**ESP?** No  
**Leak/Incident Loc:** Crack in attachment weld line at #1 sootblower box, 5th floor left side  
**How discovered:** Walk down  
**Wash adjacent tube:** No  
**Root cause:** Cold side corrosion thinning leading to cracked weld; non-membrane unit  
**Leak detection:** No  
**Bed cooling enhanc:** No  
**Last full inspection:** March 2011  
**Sequence of events:** 9Jul: 13:00 Saw water dripping from the 5th floor buck stay under the #1 Soot-blower. Thought was soot blower leak. Shut IK steam. 14:35 Leak still there. Began orderly shut down. Pulled liquor Started to burn bed 15:02 Started #1 power boiler ID Fan, which tripped #3 power boiler which tripped entire mill. (Not recovery related – was due to breaker setting, #1 bus.) No leaks found in furnace cavity. 10Jul: 06:30 Restarted unit to burn down bed. 12:00 Noon Shut down unit to cool and make repairs. 17:35 Lock out done. Repairs made. 23:15 Hydro OK. 11Jul: 00:55 fired boiler. 04:55 Boiler on line. 09:30 liquor in boiler.  
**Repair procedure:** Weld build up in the area of leak  
**Future prevention:** - -

**LOWER FURNACE**

FALL 2011 - 22

<b>Classification:</b>	<b>Critical Incident 762</b>
<b>Location:</b>	<b>Northern Pulp Nova Scotia, New Glasgow Nova Scotia Canada</b>
<b>Unit:</b>	1967 B&W-Can, #5940, 2-drum, DCE Cyclone, Decanting Hearth
<b>Unit Size:</b>	3.25 MM lb ds/day; 477,000 lb/hr steam at 900 psig, 850°F, 1050 psig design
<b>Incident Date:</b>	May 6, 2011
<b>Downtime hrs, leak/total:</b>	156/270
<b>ESP?</b>	<b>Yes</b>
<b>Leak/Incident Loc:</b>	Two tubes with leaks - 1/8 inch rupture on in blisters, Front water wall 36 feet above west spout, at buckstay level just above tertiary air duct belt
<b>How discovered:</b>	Instruments: Loss of PO 4, Steam-water differential, noise in furnace 24 hours later
<b>Wash adjacent tube:</b>	No
<b>Root cause:</b>	Long term overheating due to heavy water side scale deposit
<b>Leak detection:</b>	No
<b>Bed cooling enhanc</b>	No
<b>Last full inspection:</b>	May 2010
<b>Sequence of events:</b>	<b>4May:</b> 21:45 Steam-water differential started; <b>5May:</b> Loss of PO4 in boiler water. Steam-Water diff at 7-8000. Reduced liquor firing, isolated soot blower steam walked boiler down several time on both day and shifts. <b>6May</b> 07:00 started orderly shutdown at, 08:30 liquor off, 09:20 Saw water spraying into the lower furnace.. ESP'd unit.
<b>Repair procedure:</b>	5 tubes removed and replaced with pup pieces, three had blisters(2 had holes) and the other two showed signs of overheating
<b>Future prevention:</b>	Copper coil floatation dryers (like Flakt) give random heavy indiscriminate deposits <b>any</b> place, <b>not</b> just high heat zones. Reviewed total ESP package with operators; Acid clean boiler; Commission study on boiler circulation; Review alternate treatment program. Same location as previous leak.

**LOWER FURNACE**

FALL 2011 - 23

<b>Classification:</b>	<b>Critical Incident 763</b>
<b>Location:</b>	<b>Temple-Inland Corp, Bogalusa, LA</b>
<b>Unit:</b>	#20 RB, 1980 B&W PR-202, 2-drum DCE cyclone, sloped hearth
<b>Unit Size:</b>	2.8 MM lb ds/day; 380,000 lb/hr steam at 850 psig, 825°F, 1050 psig design
<b>Incident Date:</b>	May 8, 2011
<b>Downtime hrs, leak/total:</b>	91 hrs
<b>ESP?</b>	Yes
<b>Leak/Incident Loc:</b>	1/16" Pinhole in water wall tube 47, RSW, 1" above floor seal
<b>How discovered:</b>	Walk down. Saw small puddle lying in the bottom in right side middle primary wind box
<b>Wash adjacent tube:</b>	Yes. Adjacent tube 46 and 1st floor tube in front of RSW had thinning.
<b>Root cause:</b>	Internal blister from improper stud installation heat stress
<b>Leak detection:</b>	No
<b>Bed cooling enhanc</b>	Yes. Southland Fire & Safety Sodium Bicarbonate
<b>Last full inspection:</b>	March 2010
<b>Sequence of events:</b>	8May: Saw small puddle lying in the bottom in wind box, Also saw water dripping from north side of casing. In lower vestibule saw water dripping north side of lagging against north wall. Indications were an external leak. Started orderly shut down. Then saw area on smelt bed that was built up slightly higher then the bed around it. Saw small water pool in the center of the build-up on the smelt bed. 12:57 ESP'd. Contractor called to cool remaining smelt bed.. 8-hour wait.
<b>Repair procedure:</b>	Installed 4' Dutchmen in 2 waterwall tubes and 3/4" X 3/4" weld overlay in adjacent floor tube
<b>Future prevention:</b>	Continue annual inspections



**LOWER FURNACE**

<b>FALL 2011 - 24</b>	
<b>Classification:</b>	<b>Non-Critical</b>
<b>Location:</b>	<b>Lincoln Paper and Tissue, Lincoln, ME</b>
<b>Unit:</b>	#2 RB, 1972 B&W, PR-151, 2-drum, Large economizer, sloped hearth
<b>Unit Size:</b>	1.7 MM lb ds/day; 250,000 lb/hr steam at 600 psig, 650°F, 750 psig design
<b>Incident Date:</b>	July 6, 2011
<b>Downtime hrs, leak/total:</b>	39
<b>ESP?</b>	<b>No</b>
<b>Leak/Incident Loc:</b>	1/8" tube leak in front wall under east smelt spout, cold side of tube
<b>How discovered:</b>	Walk down. While checking smelt tank agitator, saw water spraying down from under spouts
<b>Wash adjacent tube:</b>	No
<b>Root cause:</b>	Corrosion on cold side of tube created from weak wash spraying on the area over a period of time
<b>Leak detection:</b>	No
<b>Bed cooling enhanc</b>	No
<b>Last full inspection:</b>	Sept 2010
<b>Sequence of events:</b>	<b>6Jul:</b> 15:30 While checking smelt tank agitator, saw water spraying down from under front protective cladding under east spout. Investigation determined it to be a tube leak, on the cold side of the tube. No danger of getting in smelt. Orderly shutdown. <b>7Jul:</b> 01:00 Liquor out. 06:50 Bed burned out. Unit off line. 10:00 Removed outer skin. 17:00 Started maintenance. 21:00 Repairs complete. <b>8Jul:</b> 00:10 Hydro OK. 03:00 Outer skin replaced. 03:53 Oil fire in unit. 14:20 Unit on line. 15:55 Liquor fired.
<b>Repair procedure:</b>	Leaking tube ground out and Liquid Penetrant (LP) used. No indications. Put on root pass, with LP check. Final weld added with LP check. Two other tubes had similar corrosion thinning. Both ground down and pad welded. Three areas on header had corrosion. All three ground down and pad welded with LP check.
<b>Future prevention:</b>	Cladding installed 10 years ago to protect furnace tubes from weak wash spraying. Recently cladding has deteriorated. Cladding beefed up and more improvements next outage.

**SMELT SPOUT**

<b>FALL 2011 - 25</b>	
<b>Classification:</b>	<b>Critical Incident 764</b>
<b>Location:</b>	<b>Lincoln Paper &amp; Tissue, Lincoln, ME</b>
<b>Unit:</b>	#2 RB, 1972 B&W, PR-151, 2-drum Large econ, sloped hearth
<b>Unit Size:</b>	1.7 MM lb ds/day; 250,000 lb/hr steam at 600 psig, 650°F, 750 psig design
<b>Incident Date:</b>	March 14, 2011
<b>Downtime hrs, leak/total:</b>	31 hrs
<b>ESP?</b>	<b>No</b>
<b>Leak/Incident Loc:</b>	Smelt spout, at junction of Inconel 690 partial trough overlay, after 6 mo service
<b>How discovered:</b>	Walk down. At smelt spout, saw water squirting into air along with smelt, with snapping and cracking
<b>Wash adjacent tube:</b>	No
<b>Root cause:</b>	Corrosion/erosion of spout material from doghouse wall wash system splatter
<b>Leak detection:</b>	-
<b>Bed cooling enhanc</b>	No
<b>Last full inspection:</b>	-
<b>Sequence of events:</b>	<b>14Mar11</b> 19:20 At smelt spout, saw water squirting into air along with smelt, with snapping and cracking. Plugged spout. Reduced firing 8%. Then started shut down. Reduced liquor to ~50%, added oil <b>15Mar</b> 03:00 Pulled liquor. 07:20 bed burned down, unit off line. Began lockout. 09:00 began work on spout replacement. 19:30 Spout replaced. 22:30 Oil fire in. High water trip chafed wire caused delays. <b>16Mar</b> 08:45 Unit on line. Spouts checked. 10:03 Liquor in.
<b>Repair procedure:</b>	2 <sup>nd</sup> spout also had thinning. Spouts replaced with previously removed, refurbished spouts
<b>Future prevention:</b>	In past, worked on reducing wash splatter – angle of spray, tank vent draft, lowered wash header, added ceramic coating over 50/50 Ni-Chrome metal spray (no help). Also Inconel 625 overlay on tip; Solid Inconel 625 plating in many areas – No help. Next will try: Solid Inconel 625 plate; entire Inconel 625 trough overlay; complete new chromized spouts.

**SMELT SPOUT****FALL 2011 - 26****Classification:****Critical Incident 765****Location:****AbitibiBowater, Coosa Pines, AL****Unit:**

#3 RB, 1976 CE, #31174, 2-drum Large econ, decanting hearth, 2011Metso Rebuild

**Unit Size:**

3.85 MM lb ds/day; 550,000 lb/hr steam at 575 psig, 750°F, 600 design (Orig 1080 psig design pressure was derated]

**Incident Date:**

May 24, 2011

**Downtime hrs, leak/total:**

56.66 hr

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

#4 Smelt spout, middle of spout, middle of trough

**How discovered:**

Walk down. Water was seen coming out of the smelt spout door on the #4 smelt spout

**Wash adjacent tube:**

No

**Root cause:**

Faulty smelt spout head tank level transmitter allowed for loss of proper cooling water to the smelt spouts for an unknown period of time. Combined with the cooling water supply to the spouts being piped up top to bottom (instead of bottom to top), the spouts had little to no cooling water in the spout for an unknown period of time.

**Leak detection:**

No

**Bed cooling enhanc**

No

**Last full inspection:**

May 2011

**Sequence of events:**

**May 2011:** Andritz smelt spouts replaced with Metso spouts during outage, along with new Metso mini hoods, all shatter spray, spout, and shower water piping. Spouts were shop hydro-ed and field hydro-ed before installation.

- All systems were checked out for proper flows and functionality on start-up including the smelt spout cooling water, shatter jets and wall box water sprays.

- No changes were made to the existing smelt spout cooling water system during the outage. The existing low flow setpoint per spout was 15 gpm, and the existing outlet high temperature setpoint per spout was 180oF.

- Boiler fired and brought on-line with diesel fuel on Sunday, **May 22**. Fired liquor in the boiler Sunday afternoon. Burned between 50 -215 gpm of liquor and steamed up to 400 kpph between Sunday and Tuesday. . Started up boiler with spout cooling water flow rates similar to old spouts.

Operator received a high temperature alarm Tuesday morning. Operator observed good flows through all spouts (+25 gpm according to the local flow devices), but the #4 spout was popping smelt out of the spout. Flows to all spouts had been increased to +25 gpm over the past 36 hour period to help cool the spout cooling water temperature below 180oF.

Added additional cooling water flow to the spouts as outlet temperatures rose. Spout cooling water supply out-ran the cooling water return to the head tank and a faulty head tank level transmitter did not allow for adequate make-up to the head tank level. Ran the spout(s) with limited cooling water supply for an unknown period of time before failure.

- At the time, only had one liquor gun in the boiler, so pulled liquor out of the boiler. The operator closed the smelt spout hood (door) then turned off the wall box water and shatter spray steam to the #4 spout. When the operator attempted to open the spout hood, water could be seen flowing out of the spout over the spout hood.

- The boiler was ESP'ed at 9:54 a.m. Tuesday morning, **May 24**. All ESP functions operated correctly. - 12-hour wait period.

**Repair procedure:**

Replaced all 4 spouts

**Future prevention:**

Upgrade the smelt cooling water system to support new spout design requirements. Be sure all auxiliary systems are reviewed when new equipment is installed

## APPENDIX B –SLIDES FROM TAPPI POWER AND RECOVERY BOILER SUB-COMMITTEE REPORT

### Objectives:

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

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

### Activities:

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

1

### Recovery Boiler – Released TIP's

- Specification for Procurement of Recovery Boiler Economizer (2009)

Developed from AF&PA Economizer Study

- Recommended Test Procedures for Black Liquor Evaporators (2008) – Review 2012

Documents test procedures for evaporators

- Recovery Boiler Sootblowers (2009)

Two TIP's – "The Basics" and "Practical Guidelines"

- Recovery Boiler Performance Calculation Forms

Long Form/in publication form - Short Form/includes spreadsheet

2

### Recovery Boiler – Released TIP's

- Stripping of Kraft Pulping Process Condensates—Regulations, Design & Operations (2008) – Review 2012
- Collection and Burning of Concentrated NCG's – Regulations, Design, Operation (2008) – Review 2012
- Recovery Boiler Energy Efficiency Improvements (2008)
- Estimating the First Melting Temperature of Fireside Deposits in Recovery Boilers (2004)

3

### Recovery Boiler – Released TIP's:

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

4

### Water Treatment Activities

- Keys to Successful Cleaning of Boilers
- Water Quality and Monitoring Requirements for Paper Mill Boilers Operating on High Purity Feedwater
- Water Quality Guidelines and Monitoring Requirements for Paper Mill Boilers Operating with Softened Make-up Water
- Design Engineer Decisions Tree – Paper Mill Boiler Feedwater
- Response to Contamination of High Purity Boiler Feedwater
- Evaluating Reverse Osmosis for Treating Make-up to the Boiler Feedwater in a Pulp and Paper Mill
- Water Treatment Related Opportunities for Energy Conservation in a Paper Mill Powerhouse
  - TIP is currently under 5 year review

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### Meetings:

- Meetings are held twice per year
  - Next Meeting, Following BLRBAC Spring Meeting
  - Wednesday April 4, 2012; 1:00 pm – 4:00 pm
- TAPPI PEERS Conference; Savannah, Ga
- Monday, October 15, 2012

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