BLACK LIQUOR RECOVERY BOILER
ADVISORY COMMITTEE

MINUTES OF MEETING
Crowne Plaza Hotel/Atlanta Airport
Atlanta, Georgia
October 1, 2 & 3, 2007

OBJECTIVE

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

Bylaws - 2.1

OFFICERS

Chairman:	**Len Erickson** Boise Paper Solutions P. O. Box 50 Boise, ID 83728-0001	Tel: 208-384-4933 Fax: 208-384-7637 **lenerickson@boisepaper.com**
Vice-Chairman:	**Scott Moyer** Alabama River Pulp P. O. Box 100 Perdue Hill, AL 36470	Tel: 251-743-8476 Fax: 251-743-8529 **scott.moyer@ariver.com**
Secretary:	**Mike Polagye** FM Global P. O. Box 9102 Norwood, MA 02062	Tel: 781-255-4730 Fax: 781-762-9375 **michael.polagye@fmglobal.com**
Treasurer:	**Ron Hess** HSB Forest Products Group 110 Cedar Cove Court Buckhead, GA 30625-3300	Tel: 706-484-1723 Fax: 706-485-5267 **ronald_hess@hsb.com**

REGULAR MEMBERSHIP

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

ASSOCIATE MEMBERSHIP

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

CORRESPONDING MEMBERSHIP

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

Bylaws - 3.1

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

EXECUTIVE COMMITTEE

Len Erickson
BLRBAC Chairman
Boise Paper Solutions
P. O. Box 50
Boise, ID 83728-0001
Tel: 208-384-4933
Fax: 208-384-7637
lenerickson@boisepaper.com

Scott Moyer
BLRBAC Vice-Chairman
Alabama River Pulp
P. O. Box 100
Perdue Hill, AL 36470
Tel: 251-743-8476
Fax: 251-743-8529
scott.moyer@ariver.com

Mike Polagye
BLRBAC Secretary
FM Global
P. O. Box 9102
Norwood. MA 02062
Tel: 781-255-4730
Fax: 781-762-9375
michael.polagye@fmglobal.com

Ron Hess
BLRBAC Treasurer
HSB Forest Products Group
110 Cedar Cove Court
Buckhead, GA 30625
Tel: 706-484-1723
Fax: 706-485-5267
ronald_hess@hsb.com

Dave Fuhrmann
Operator Representative
International Paper
6285 TriRidge Blvd.
Loveland, OH 45140
Tel: 513-248-6954
Fax: 513-248-6679
dave.fuhrmann@ipaper.com

Jim Dickinson
Manufacturing Representative
Babcock & Wilcox Company
20 S. Van Buren Avenue
Barberton, OH 44203-0351
Tel: 330-860-1229
Fax: 330-860-9319
jadickinson@babcock.com

Jimmy Onstead
Insurance Representative
FM Global
Granite Park One
5800 Granite Parkway, Ste. 600
Plano, TX 75024
Tel: 972-731-1656
Fax: 972-731-1820
jimmy.onstead@fmglobal.com

****

Secretarial Services
Barbara Holich
1005 59th Street
Lisle, IL 60532
Tel: (630) 512-0144
Fax: (630) 512-0155
E-Mail: **fhholich@aol.com**

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BLRBAC SUBCOMMITTEES

AUXILIARY FUEL **Dave Streit, Chairman** Buckeye Florida One Buckeye Drive Perry, FL 32348 Tel: 850-584-1402 Fax: 850-584-1717 **dave_streit@bkitech.com**	**BLACK LIQUOR** **Mark Sargent, Chairman** International Paper 6285 Tri-Ridge Boulevard Loveland, OH 45140-7910 Tel: 513-248-6086 Fax: 513-248-6679 **mark.sergeant@ipaper.com**
EMERGENCY SHUTDOWN PROCEDURES **John Andrews, Chairman** MeadWestvaco Corporation P. O. Box 118005 Charleston, SC 29423-8005 Tel: 843-745-3212 Fax: 843-745-3229 **jda6@meadwestvaco.com**	**FIRE PROTECTION IN DIRECT CONTACT EVAPORATORS** **Chris Jackson, Chairman** Global Risk Consultants Corp. c/o 12848 SW Thunderhead Way Beaverton, OR 97008 Tel/Fax: 503-671-9829 Fax: 901-763-6900 **chris-jackson @globalriskconsuiltants.com**
INSTRUMENTATION **David Avery, Chairman** Weyerhaeuser P.O. Box 678 Bennettsville, SC 29512 Tel: 843-479-0200, Ext. 458 or 335 Fax: 843-479-6603 **dave.avery@weyerhaeuser.com**	**MATERIALS & WELDING** **Dave Fuhrmann, Chairman** International Paper 6285 TriRidge Blvd. Loveland, OH 45140 Tel: 513-248-6954; Fax: 513-248-6679 **dave.fuhrmann@ipaper.com**
PERSONNEL SAFETY **Robert Zawistowski, Chairman** Power Specialists Associates, Inc. 531 Main Street Somers, CT 06071 Tel: 860-763-3241, Ext. 126 Fax: 860-763-3608 **bob.zawistowski@psaengineering.com**	**PUBLICITY & NEWS RELEASE** **Craig Cooke, Chairman** FM Global 815 Byron Drive Oconomowoc, WI 53066 Tel: 262-567-7370 Fax: 972-731-1820 **craig.cooke@fmglobal.com**
WASTE STREAMS **John Rickard, Chairman** Jacobs-Sirrine P. O. Box 5456 Greenville, SC 29606 Tel: 864-676-6393 Fax: 864-676-6005 **john.rickard@jacobs.com**	

BLRBAC MEETING SCHEDULE

Spring	**2008**	**April**	**7, 8 & 9**
Fall	**2008**	**October**	**6, 7 & 8**
Spring	**2009**	**April**	**6, 7 & 8**
Fall	**2009**	**October**	**5, 6 & 7**
Spring	**2010 ***	**April**	**12, 13 & 14**

*** Second week in April to avoid conflict with Passover and Easter**

"Bring Operator(s). Give them a chance to hear first hand!"
■ Past Chairman Lon Schroeder

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

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

BLRBAC MEETING NOTICE

COVER LETTER — General Information

REGISTRATION FORM — Print and mail to Said & Done with appropriate fees

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

SCHEDULE — List of Subcommittee activities on Monday & Tuesday

AGENDA — Reports given to Main BLRBAC Meeting on Wednesday

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

Mrs. Barbara Holich
BLRBAC Secretarial Services
1005 59th Street
Lisle, IL 60532

Phone: 630-512-0144
Fax: 630-512-0155
fhholich@aol.com

BLRBAC Publications

Below is the current status of the BLRBAC publications. They are available at the **BLRBAC INTERNET ADDRESS**: **www.blrbac.org**

Fire Protection in Direct Contact Evaporators and Associated Equipment
(April 2007)

Safe Firing of Auxiliary Fuel in Black Liquor Recovery Boilers
(April 2007)

Safe Firing of Black Liquor in Black Liquor Recovery Boilers
(October 2007)

Waste Stream Incineration
(October 2006)

Emergency Shutdown Procedure (ESP)
(October 2006)

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

Post ESP Water Level
(January 2005)

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

Personnel Safety & Training
(October 2007)

Post ESP Guidelines
(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
Fax: 781-762-9375
michael.polagye@fmglobal.com

AUXILIARY FUEL SUBCOMMITTEE

Dave Streit – Chairman
Buckeye Florida
One Buckeye Drive
Perry, FL 32348
Tel: 850-584-1402
Fax: 850-584-1717
dave_streit@bkitech.com

Allen L. Ray – Sec. Barron Industries, Inc. 105 19th Street South Birmingham, AL 35210 Tel: 205-956-3441 Fax: 205-956-2265 **allen_ray@barronind.com**	**John Alesandrini** Babcock & Wilcox Co. P. O. Box 351 Barberton, OH 44203-0315 Tel: 330-860-6001 Fax: 330-860-2220 **jmalesandrini@babcock.com**	**Robert DeCarrera** Georgia-Pacific Corp. 133 Peachtree Street N.E. Atlanta, GA 30303 Tel: 404-652-4686 Fax: 404-654-4746 **rdecarre@gapac.com**
Lino DiLeonardo Zurich 400 University Ave., 16th Floor Toronto, ON M5G 1S7 Tel: 519-824-4548 Fax: 519-824-0916 **lino.di.Leonardo@zurich.com**	**Bruce Knowlen** Weyerhaeuser Company WTC 1B22 P. O. Box 9777 Federal Way, WA 98063 Tel: 253-924-6434 Fax: 253-924-4380 **bruce.knowlen@weyerhaeuser.com**	**Guy Labonte** FM Global 600 De La Gauchetiere St W. 14th Floor Montreal, Quebec Canada H3B 4L8 Tel: 514-876-7412 Fax: 514-876-7495 **guy.labonte@fmglobal.com**
Nick Merriman sappi Forest Products sappi Management Services P. O. Box 31560 2017 Braamfontein South Africa Tel: +27 (0)32 456 1433 Fax: +27 (0)32 456 1484 **nick.merriman@sappi.com**	**Jim Quandt (Alt.)** Weyerhaeuser Company P. O. Box 275 Springfield, OR 97477 Tel: 541-741-5428 Fax: 541-741-5895 **jim.quandt@weyerhaeuser.com**	**Ivan Semyanko, PE** ABB Alstom Power, Inc. CEP Code 1017-2406 200 Day Hill Road Windsor, CT 06095 Tel: 860-285-3953 Fax: 860-285-4020 **ivan.semyanko@us.abb.com**

‡ = Subcommittee did not meet.

NOTE: This Subcommittee's next meeting is scheduled for the spring of 2008 at 1:00 PM as an "open" meeting.

EMERGENCY SHUTDOWN PROCEDURES SUBCOMMITTEE

‡ **John Andrews – Chairman**
MeadWestvaco Corporation
P.O. Box 118005
Charleston, SC 29423-8005
Tel. 843-745-3212
Fax. 843-745-3229
jda6@meadwestvaco.com

‡ **Dean Clay** International Paper 6285 Tri-Ridge Blvd Loveland, OH 45140-7910 Tel: (513) 248-6564 Fax: (513) 248-6683 **dean.clay@ipaper.com**	‡ **Jack Clement** Clement Consulting, Inc. 4161 Meadowcreek Lane Copley, OH 44321-3088 Tel: (330) 666-7647 Fax: (330) 666-7647 **jack@clementconsulting.com**	‡ **James Franks** Swiss Re GAP Services 855 Dogwood Road Somerville, TN 38068 Tel: (901) 465-0771 Fax: (888) 964-7348 **James_franks@swissre.com**
‡ **Julius (Jules) Gommi** GommiTech 25804 214 Avenue SE Maple Valley, WA 98038 Tel: (425) 432-0867 Cell: (206) 930-1195 (no Fax) **j.gommi@comcast.net**	‡ **Chris Gore** Domtar Paper Company P.O. Box 678 Bennettsville, SC 29512 Tel: (843) 479-0200 x430 Fax: (843) 479-9481 **chris.gore@n.domtar.com**	‡ **John A. Kulig** Babcock & Wilcox Companies P. O. Box 351, BVS02B Barberton, OH 44203-0351 Tel: (330) 860-6438 Fax: (330) 860-9427 **jakulig@babcock.com**
‡ **Mark LeBel** Alstom Power P. O. Box 500, 1112-2406 Windsor, CT 06095-0500 Tel: (860) 285-2238 Fax: (860) 285-5078 **mark.lebel@power.alstom.com**	‡ **Greg Manzulenko** Alberta Pacific Forest Ind. P.O. Box 8000 Boyle, Alberta, Canada T0A-0M0 Tel: (780) 525-8457 Fax: (780) 5225-8092 **Greg.Manzulenko@alpac.ca**	‡ **Karl Morency** Georgia-Pacific P. O. Box 105605 Atlanta, GA 30348-5605 Tel: (404) 652-4629 Fax: (404) 654-4748 **ktmorenc@gapac.com**
‡ **David Parrish** FM Global P. O. Box 9102 Norwood, MA 02062 Tel: (781) 255-4734 Fax: (781) 762-9375 **david.parrish@fmglobal.com**	‡ **John Phillips** Andritz Inc. 1115 Northmeadow Parkway Roswell, GA 30076 Tel: (770) 640-2434 Fax: (770) 640-2521 **john.phillips@andritz.com**	‡ **John Weikmann** Metso Power 3430 Toringdon Way, Suite 201 Charlotte, NC 28277 Tel: (704) 414-3431 Fax: (704) 541-7128 **john.weikmann@metso.com**

‡ Denotes attendance at meeting October 1, 2007

FIRE PROTECTION IN DIRECT CONTACT EVAPORATORS AND ASSOCIATED EQUIPMENT SUBCOMMITTEE

‡**Chris Jackson – Chairman**
Global Risk Consultants Corporation
12848 SW Thunderhead Way
Beaverton, OR 97008
Tel/Fax: 503-671-9829
chris.jackson@globalriskconsultants.com

‡**Randy Baker** Buckeye Technologies One Buckeye Drive Perry, FL 32348 Tel: 850-584-1380 Fax: 850-584-1738 **randy_baker@bkitech.com**	‡**Craig Cooke**-Vice Chairman FM Global 815 Byron Drive Oconomowoc, WI 53066 Tel: 262-567-7370 Fax: 972-731-1820 **craig.cooke@fmglobal.com**	‡**Joe Goss** Delta Natural Kraft P. O. Box 20700 1701 Jefferson Parkway Pine Bluff, AR 71612 Tel: 870-541-5052 Fax: 870-541-5089 **jgoss@pbmill.com**
Joseph Lynch Swiss Reinsurance Company Global Asset Protection Services 1105 Lakewood Parkway Suite 200 Alpharetta, GA 30004-4741 Tel: 770-569-7091 Fax: 770-569-7090 **joe_lynch@swissre.com**	**Nick Merriman** SAPPI SMS Johannesburg, Republic of South Africa Tel: +27 (0) 32 456 1433 Fax: +27 (0) 83 661 8165 **nick.merriman@sappi.com**	**John Yash** Babcock & Wilcox Company 2302 Parklake Drive, NE Suite 300 Atlanta, GA 30345 Tel: 770-621-3920 Fax: 770-621-3922 **jlyash@babcock.com**

‡ Denotes attendance at meeting October 1, 2007

Note: Next Fire Prot. For Dir. Contact Evaporators Meeting will be in the fall of 2008.

INSTRUMENTATION SUBCOMMITTEE

‡**David Avery – Chairman**
Weyerhaeuser Company
P. O. Box 678; Bennettsville, SC 29512
Tel: 843-479-0200, Ext. 458 or 335
Fax: 843-479-6603
david.avery@weyerhaeuser.com

‡**Richard Pothier – Sec.** RiNan, Inc. 44 Glen Drive Peabody, MA 01960 Tel: 978-535-2520 Fax: 978-535-3502 rinan-44@aol.com	‡**J. C. Browning, Jr. - Vice Chair** Alabama River Pulp Co., Inc. P. O. Box 100 Perdue Hill, AL 36470 Tel: 334-743-8336 Fax: 334-743-8332 johnb@ariver.com	David T. Boudreau SAPPI (S.D. Warren Company) 1329 Waterville Road Skowhegan, ME 04976 Tel: 207-238-3219 Fax: 207-238-3479 david.boudreau@na.sappi.com
William Camp International Paper Company 100 Jensen Road Prattville, AL 36067 Tel: 334-361-5620 Fax: 334-361-5619 bill.camp@ipaper.com	‡**John Cover** John E. Cover Engr., Inc. P. O. Box 35010 5425 Caldwell Mill Road Birmingham, AL 35236-6010 Tel: 205-991-7106 Fax: 205-991-6109 coverj@asme.org	‡**Michael Fay** Simpson Tacoma Kraft Co. P. O. Box 2133 Tacoma, WA 98421 Tel: 253-596-0250 Fax: 253-596-0160 mfay@simpson.com
‡**Alan Laflamme** Lincoln Paper & Tissue LLC 50 Katahdin Avenue Lincoln, ME 04457 Tel: 207-794-0685 Fax: 207-794-3964 alaflamme@lpandt.com	‡**Gail Lance** Babcock & Wilcox P. O. Box 351 Barberton, OH 44203 Tel: 330-860-2628 Fax: 330-860-2220 gjlance@babcock.com	‡**Rick Matarrese** FM Global 655 Engineering Dr. #300 Norcross, GA 30092 Tel: 770-777-3684 Fax: 770-777-0414 rick.matarrese@fmglobal.com
‡**Dan Mott** Irving Pulp & Paper Ltd. P. O. Box 3007, Station B Saint John, NB, E2M 3H1 Canada Tel: 506-632-4149 Fax: 506-633-5598 mott.dan@irvingpulp.com	‡**Roger Smith** Georgia-Pacific Corp. P. O. Box 105605 Atlanta, GA 30303 Tel: 404-652-4264 Fax: 404-584-1466 resmith@gapac.com	‡**Jari Sopanen** Andritz Brasil Ltda. Rua Presidente Faria, 248-10ˆandra 80020-290 Cuitiba – PR Brazil Tel: +55 41 304-7682 Fax: +55 41 224-0014 jari-sopanen@andritz.com
‡**Michael Kiper** International Paper Co. 6285 Tri-Ridge Blvd. Loveland, Ohio 45140 Tel: 513-248-6517 Fax: 513-248-6679 michael.kiper@ipaper.com		

‡ Denotes attendance at meeting October 1, 2007

MATERIALS & WELDING SUBCOMMITTEE

‡Dave Fuhrmann – Chairman
International Paper
6285 TriRidge Blvd.
Loveland, OH 45140
Tel: 513-248-6954
Fax: 513-248-6679
dave.fuhrmann@ipaper.com

‡Jesse Worsham - Co Chair Weyerhaeuser Company Marlboro Mill P. O. Box 678 Bennettsville, SC 29512 Tel: 843-479-0200, Ext. 380 Fax: 843-479-6603 **jesse.worsham @n.domtar.com**	‡Lynn Barrett Zampell Refractories 6801 Parke East Blvd. Tampa, FL 33610 Tel: Fax: **lbarrett@zampell.com**	‡George Bodman 13 Kingwood Villas Court Kingwood. TX 77339 Tel: 800 286 6069 or 281-359-4006 Fax: 281-359-4225 Cell: 713-557-2118 **blrclgdr@aol.com**
George Bynog National Board 1055 Crupper Avenue Columbus, OH 43229 Tel: 614-431-3201 - desk 614-888-8320 (ext 250) Fax: 624-847-1828 **gbynog@nationalboard.org**	Dave Crowe David N French Metallurgists 2681 Coral Ridge Road Brooks, KY 40109-5207 Tel: (502) 955-9847 Cell: (502) 262-8968 FAX: N/A **dcrowe@acuren.com**	‡ John Hefferman Zampell Refractories 262 Titus Avenue Warrington, PA 18976 Tel: 215-491-9300 Fax: 215-491-9931 **jheffernan@zampell.com**
‡Fabian Henriques PSA Inc. 531 Main Street Somers, CT 06071 Tel: 614-440-4284 Fax: 860-760-3608 **fabian.henriques@psaengineering.com**	Dennis Hollenbach Alstom Power 2000 Day Hill Road Windsor, CT 06095 Tel: 860-285-9140 Fax: 860-285-5078 **dennis.hollenbach@power.alstom.com**	‡Dave Lang FM Global Box 1567 Little Elm, TX 75068 Tel: 972-731-1882 Fax: 973-402-1070 **david.lang@fmglobal.com**
Michael Lykins Smurfit-Stone 450 E. North Avenue Carol Stream, IL 60188 Tel: 630-384-5272 Fax: 630-414-0145 **mlykins@ssmurfit.com**	Max Moskal M&M Engineering 11020 W. 72nd Street Indiana Head Park, IL 60525 Tel: 708-784-3564 Fax: 708-784-3612 **max_moskal@mmengineering.com**	‡Steve Osborne Babcock & Wilcox 20 S. VanBuren Avenue Barberton, OH 44203-0351 Tel: 330-860-1686 Fax: 330-860-9023 **slosborne@babcock.com**

‡ Denotes attendance at meeting October 1, 2007

MATERIAL & WELDING SUBCOMMITTEE (Cont.)

Dan Phillips Industra Service Corporation Portland, Oregon Tel: 503-624-9100 Fax: 503-624-9994 **dphillips @industrainc.com**	‡Bob Roy RMR Mechanical PO Box 170 Cumming, GA 30028 Tel: 770-205-9646 Fax: 770-205-9580 **bob.roy@rmrmechanical.com**	Mary Russ Aker Kvaerner 3430 Toringdon Way, Suite 201 Charlotte, NC 28277 Tel: 704-414-3458 Fax: 704-541-1128 **mary.russ@ipaper.com**
‡Jimmy Sherouse Southeastern Mechanical Services 1615 118th Ave St. Petersburg, FL 33716 Tel: 850-492-9175 **jsherouse@semsi.com**	‡Henry Tessier Jr. Hartford Steam Boiler One State Street P. O. Box 5024 Hartford, CT 06102-5024 Tel: Fax: n/a/ **henry_tessier@hsb.com**	Billy Walker* CNA Risk Control 4701 Porchaven Lane Apex, NC 27539 Tel: 919-773-8001 Fax: n/a **billy.walker@cna.com**
Luis Yepez WSI 2225 Skyland Court Norcross, GA 30071 Tel: 678-728-9279 Fax: n/a **lyepez@wsi.aquilex.com**		

‡ Denotes attendance at meeting October 1, 2007

PUBLICITY & NEWS RELEASE SUBCOMMITTEE

‡**Craig Cooke – Chairman**
FM Global
815 Byron Drive
Oconomowoc, WI 53066
Tel: 262-567-7370
Fax: 972-731-1820
craig.cooke@fmglobal.com

‡ Denotes attendance at meeting October 3, 2007

PERSONNEL SAFETY SUBCOMMITTEE

‡**Robert E. Zawistowski – Chairman**
Power Specialists Associates, Inc.
531 Main Street
Somers, CT 06071
Tel: 860-763-3241, Ext. 135
Fax: 860-763-3608
bob.zawistowski@psaengineering.com

‡**Fred Abel** AXA Corporate Solutions Assurance Rhone-Alpes 235, cours Lafayette 69006 Lyons France Tel: +33 4 72 83 29 41 Fax: +33 4 72 83 29 40 **frederic.abel@axa-corporatesolutions.com**	**Ken Baker** Smurfit-Stone Container Corporation P. O. Box 100544 Florence, SC 29501-0544 Tel: 843-269-0179 Fax: 843-269-0167 **kbaker@smurfit.com**	‡**Jim Dickinson** Babcock & Wilcox Company 20 S. Van Buren Avenue Barberton, OH 44203-0351 Tel: 330-860-1229 Fax: 330-860-9319 **jadickinson@babcock.com**
‡**Phil English** Smurfit-Stone Container Corporation 9469-1 Eastport Road (32218) P. O. Box 26009 Jacksonville, FL 32226-6009 Tel: 904-714-7112 Fax: 904-714-7178 **penglish@smurfit.com**	‡**Robert Fry** Neenah Paper P.O. Box 549, Station Main New Glasgow, NS B2H 5E8 Tel: 902-752-8461, Ext. 206 Fax: 902-752-9173 **robert.d.fry@neenahpaper.com**	**David Fuhrmann** International Paper Company 6285 Tri-Ridge Road Loveland, OH 45140-7910 Tel: 513-248-6954 Fax: 513-248-6679 **dave.fuhrmann@ipaper.com**
Lory Hammer (on Leave of Absence) MeadWestvaco 104 East Riverside Street Covington, VA 24426-1238 Tel: 540-969-5410 Fax: 540-969-5756 **lyhl@meadwestvaco.com**	‡**Ronald Hess** HSB Forest Products Group 110 Cedar Cove Court Buckhead, GA 30625 Tel: 706-484-1723 Fax: 706-485-5267 **ronald_hess@hsb.com**	‡**Wes Hill** Boise Cascade 1300 Kaster Road St. Helens, OR 97051 Tel: 503-397-9447 Fax: 503-397-9351 **weshill@boisepaper.com**

‡ Denotes attendance at meeting October 1, 2007

PERSONNEL SAFETY SUBCOMMITTEE (Cont.)

‡**Daryl Hoffman** FM Global Granite Park Two 5700 Granite Parkway, Ste. 700 Plano, TX 75024 Tel: 972-731-1978 Fax: 972-731-1820 **daryl.hoffman@fmglobal.com**	**Jamie Manion** MeadWestvaco 11013 West Broad Street Glen Ellen, VA 2306-5937 Tel: 804-327-6497 Fax: 804-327-8159 **JJM11@meadwestvaco.com**	‡**Preston Morgan** Metso Power 3430 Toringdon Drive, Suite 201 Charlotte, NC 28277 Tel: 704-414-3402 Fax: 704-541-3683 **preston.morgan@metso.com**
‡**Len Olavessen** Buckman Laboratories International, Inc. 1256 North McLean Blvd. Memphis, TN 38108-1241 Tel: 901-573-8343 Fax: 901-272-6541 **lrolavessen@buckman.com**	‡**Lynn Rawls** Swiss Re 206 Rawls Road Perkinston, MS 39573 Tel: 601-928-9420 Fax: 601-928-9420 **lynn_rawls@swissre.com**	‡**John Stelling** Packaging Corp. of America N. 9090 County Road E. Tomahawk, WI 54487 Tel: 715-453-2131, Ext. 309 Fax: 715-453-0470 **jstelling@packagingcorp.com**
‡**Alarick Tavares** Georgia Pacific Corp. 133 Peachtree St. NE (30303) P. O. Box 105605 Atlanta, GA 30348-5605 Tel: 404-652-4606 Fax: 404-584-1466 **ajtavare@gapac.com**	**Arthur Thomson** Domtar Pulp & Paper Products, Inc. P.O. Box 800 2005 Mission Flats Road Kamloops, BC V2C 5M7 Tel: 250-828-7372 Fax: 250-828-7745 **art.thomson@n.domtar.com**	

‡ Denotes attendance at meeting October 1, 2007

SAFE FIRING OF BLACK LIQUOR SUBCOMMITTEE

‡**Mark Sargent – Chairman**
International Paper
6285 Tri-Ridge Blvd.
Loveland, OH 45140-7910
Tel: 513-248-6086
Fax: 901-214-0894
mark.sargent@ipaper.com

‡**Clif Barreca** Weyerhaeuser P. O. Box 1391 New Bern, NC 28563 Tel: 252-633-7696 Fax: 252-633-7657 **clif.barreca@weyerhaeuser.com**	‡**Scott Crysel** FM Global Granite Park Two 5700 Granite Pkwy, Ste. 700 Plano, TX 75024 Tel: 972-731-1658 Fax: 972-731-1820 **scott.crysel@fmglobal.com**	‡**Len Erickson** Boise Paper Solutions P. O. Box 50 Boise, ID 83728-0001 Tel: 208-384-4933 Fax: 208-384-7637 **lenerickson@boisepaper.com**
‡**Larry Hiner** Babcock & Wilcox P. O. Box 351 Barberton, OH 44203-0351 Tel: 330-860-6525 Fax: 330-860-9295 **lahiner@babcock.com**	**Majed Ja'arah** Temple Inland, Inc. 1750 Inland Road Orange, TX 77632 Tel: 409-746-7315 Fax: 409-746-7249 **majedjaarah@templeinland.com**	‡**Scott Moyer** Alabama River Pulp P. O. Box 100 Perdue Hill, AL 36470 Tel: 251-743-8476 Fax: 251-743-8529 **scottm@ariver.com**
‡**Doug Murch** MeadWestvaco 11013 West Broad Street Glen Allen, VA 23060-5937 Tel: 804-327-5245 Cell: 513-288-5750 Fax: 804-201-2192 **douglas.murch@meadwestvaco.com**	‡**Rick Young** Alstom Power Inc. 1119 Riverfront Parkway Chattanooga, TN 37402 Tel: 423-752-2603 Fax: 423-752-2660 **frederick.young@power.alstom.com**	

‡ Denotes attendance at meeting October 1, 2007

WASTE STREAMS SUBCOMMITTEE

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

‡Craig J. Aderman SAPPI P. O. Box 5000 Westbrook, ME 04098-1597 Tel: 207-238-3177 Fax: 207-856-3675 craig-aderman@sappi.com	**‡Henry Beder** Weyerhaeuser WTC 2G25 P. O. Box 9777 Federal Way, WA 98003 Tel: 253-924-4242 Fax: 253-924-5920 hank.beder@weyerhaeuser.com	**‡Mark E. Cooper** FM Global Key Center 601 108th Avenue, NE, Ste.1400 Bellevue, WA 98004 Tel: 425-709-5084 Fax: 425-454-7847 mark.cooper@fmglobal.com
‡Wendy Coyle Weyerhaeuser Postal Bag 1020 Grande Prairie, Alberta Canada T8V 3A9 Tel: 780-539-8183 Fax: 780-539-8344 wendy.coyle@weyerhaeuser.com	**‡Arnie Iwanick** Harris Group, Inc. 1750 NW Naito Parkway Portland, OR 97209-2530 Tel: 503-345-4516 Fax: 503-228-0422 arnie.iwanick@harrisgroup.com	**‡Olie Kujanpaa** Andritz 10745 Westside Parkway Alpharetta, GA 30004 Tel: 770-640-2571 Fax: 770-640-2455 olli.kujanpaa@andritz.com
‡John Lewis Fluor Daniel Forest Products 100 Fluor Daniel Drive Greenville, SC 29607-2762 Tel: 864-281-8535 Fax: 864-676-7630 john.lewis@fluor.com	**‡Wayne MacIntire** International Paper P.O. Box 7910 Loveland, OH 45140-7910 Tel: 513-248-6834 Fax: 513-248-6679 wayne.macintire@ipaper.com	**Winston "Jerry" Pate** Smurfit Stone Container Corp. P. O. Box 709 Brewton, AL 36427 Tel: 251-867-8371 Fax: 251-867-1153 wpate@smurfit.com

‡ Denotes attendance at meeting October 1, 2007

WASTE STREAMS SUBCOMMITTEE (Cont.)

Jean-Claude Patel A.H. Lundberg Associates, Inc. 406 Sagebrush Road Naperville, IL 60565 Tel: 630-355-5120 Fax: 630-355-5120 **jc.patel@lundbergassociates.com**	‡**Paul Seefeld** A.H. Lundberg Associates, Inc. 4577 Pebble Brook Drive Jacksonville, FL 32224-7643 Tel: 904-223-4147 Fax: 904-223-4146 **paul.seefeld@lundbergassociates.com**	‡**H. Bentley Sherlock** Babcock & Wilcox 2302 Parklake Drive. N.E. Suite 300 Atlanta, GA 30345 Tel: 770-621-3947 Fax: 770-621-3922 **hbsherlock@babcock.com**
‡**Michael D. Sides** GE GAP Services 1360 Olympia Park Circle Ocoee, FL 34761 Tel: 407-656-4275 Fax: 888-964-7348 **michael_sides@swissre.com**	‡**Arie Verloop** Jansen Combustion and Boiler Technologies 12025 115th Avenue N.E., Suite 250 Kirkland, WA 98034-6935 Tel: 425-952-2825 Fax: 425-825-1131 **arie.verloop@ansenboiler.com**	

‡ Denotes attendance at meeting October 1, 2007

Registered for the meeting were:

Airtek
Johnson, Al, ???

Alabama Pine Pulp
Browning, John, Perdue Hill, AL
Moyer, Scott, Perdue Hill, AL

Alberta-Pacific Forest Industries
Manzulenko, Greg, Boyle, AB

Alstom Power
Grasso, Bob, Vancouver, WA
Harbacu, Paul, Alpharetta, GA
Hitchins, Mary, Lafayette, GA
LeBel, Mark, Windsor, CT
Mazurek, Matt, Jacksonville, FL
Young, Frederick, Chattanooga, TN

AMEC
Dunlap, Bill, Greenville, SC

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

Andritz, Inc.
Collins, Peter, Roswell, GA
Davis, Joe, Roswell, GA
Kujanpaa, Olli, Roswell, GA
Martin, Jim, Roswell, GA
Phillips, John, Roswell, GA
Rose, Aaron, Roswell, GA
Sopanen, Jari, Roswell, GA
Timotheo, Alvaro, Roswell, GA

Applied Technical Services
Elrod, Mark, Marietta, GA
Floyd, Kevin, Marietta, GA
O'Connor, Shawn, Riau Prima Energi
Orr, Jeremy, Marietta, GA

AXA Corporate Solutions
Abel, Fred, Lyon, France

Babcock & Wilcox
Dickinson, Jim, Barberton, OH
Hicks, Tim, St. Mary's, GA
Babcock & Wilcox
Hiner, Larry, Barberton, OH
Kulig, John, Barberton, OH
Lance, Gail, Barberton, OH
Osborne, Steve, Barberton, OH
Sherlock, Bentley, Atlanta, GA
Yash, John, Atlanta, GA

BE&K Engineering
Dean, Jerry, Birmingham, AL
Keane, Jim, Birmingham, AL

Boise Cascade
Erickson, Leonard, Boise, ID
Hill, Wes, St. Helen's, OR
Lofgren, Jay, International Falls, MN

Bowater
Nixon, John, Catawba, SC

Buckeye Cellulose
Baker, Randy, Perry, FL

Buckman Laboratories
Borsje, Henk, Duxbury, MA
Fannin, Tim, Lugoff, SC
Graham, Jim, Memphis, TN
Olavessen, Len, Memphis, TN

Cariboo Pulp & Paper
Hardman, David, Quesnel, BC

Carter Holt Harvey P&P Ltd.
Beck, Chris, Tokoroa, New Zealand
Lawson, John, Tokoroa, New Zealand
Lovett, Garry, Tokoroa, New Zealand

Clement Consulting
Clement, Jack, Copley, OH

Registered for the meeting were:

Clyde Bergemann EEC
Polanowski, Bob, Hanover, MD
Shanahan, Dennis, Hanover, MD
Tandra, Danny, Hanover, MD

CORR System, Inc.
Ruiz de Molina, Eladio, Birmingham, AL

Diamond Power
Adams, Jason, Lancaster, OH
Kaminski, Robert, Lancaster, OH
McAllister, Phil, Lancaster, OH
Myers, Fred, Sequim, WA

Domtar
Avery, David, Bennettsville, SC
Gore, Chris, Bennettsville, SC
Walker, Robert, Bennettsville, SC
Worsham, Jesse, Bennettsville, SC

Eurocan Pulp & Paper
Lawrence, Dean, Hinton, AB
Wilson, Jon, Hinton, AB

Extra Hand Plant Support Services
Phelps, Bob, Hopewell, VA

Fluor Corp.
Lewis, John, Greenville, SC

FM Global
Beaulieu, Andre, Montreal, Que.
Chuchro, Dan, Richmond, VA
Cooke, Craig, Oconomowoc, WI
Cooper, Mark, Stockholm, Sweden
Crysel, Scott, Plano, TX
Hoffman, Daryl, Prosper, TX
Judge, Chris, Manchester, UK
Labonte, Guy, Montreal, Que.
Lang, Dave, Plano, TX
Matarrese, Rick, Alpharetta, GA

FM Global (Cont.)
Morgan, Rick, Plano, TX
Onstead, Jimmy, Plano, TX
Parrish, David, Norwood, MA
Polagye, Mike, Norwood, MA

Fossil Power Systems
Donahue, Mark, Dartmouth, NS

GA Dept. of Labor
Welch, Paul, Atlanta, GA

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

Georgia-Pacific
DeCarrera, Robert, Atlanta, GA
Morency, Karl, Atlanta, GA
Smith, Roger, Atlanta, GA
Tavares, Alarick, Lancaster, OH
Tenbrunsel, Robert, Atlanta, GA

Glatfelter Co.
Gentzler, William, Spring Grove, PA

Global Risk Consultants
Jackson, Christopher, Beaverton, OR
Macaulay, Charlie, Issaquah, WA
Smith, Andy, Atlanta, GA

GommiTech, Gommi
Julius, Maple Valley, WA

Graphic Packaging International
Harris, Duane, Macon, GA

Harris Group
Iwanick, Arnie, Portland, OR

Registered for the meeting were:

Hercules
Durham, Virginia, Philadelphia, PA

Knowles, Garth, Carp, Ont.

HSB Group
Hess, Ron, Buckhead, GA
Tessier, Henry, Hartford, CT

International Paper
Carter, Jeff, Georgetown, SC
Clay, Dean, Loveland, OH
Fuhrmann, Dave, Loveland, OH
Kiper, Mike, Loveland, OH
MacIntire, Wayne, Loveland, OH
Sargent, Mark, Loveland, OH

Interstate Paper
Helmey, Roger, Riceboro, GA
Jenkins, Lee, Riceboro, GA
Lanser, Jerry, Riceboro, GA

Irving Pulp & Paper
Mott, Dan, Saint John, NB

Jaakko Poyry
Pisto, Outi , Finland

Jacobs Engineering
Rickard, John, Greenville, SC

Jansen Combustion & Boiler Tech,
Dye, Ned, Kirkland, WA
Verloop, Arie, Kirkland, WA

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

Kapstone Paper
George, Tim, Roanoke Rapids, NC
Gums, Larry, Roanoke Rapids, NC

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

Lewis B. Bringman
Bringman, Lewis, Baltimore, MD

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

Liquid Solids Control
Sweeney, Michael, Upton, MA

Longview Fibre
Andrews, Mark, Longview, WA
Gregory, L. Jay, Longview, WA

Lumbermen's Underwriting Alliance
Boutin, Leopold, Dorval, Que.
Correa, Tony, Boca Raton, FL

Matrix Risk Consultant
Garfield, Michael, Lowell, ME

MeadWestvaco
Andrews, John, Charleston, SC
Larrimore, Brad, Pine Hill, AL
Lindstrom, Mathias, Raleigh, NC
Murch, Douglas, Glen Allen, VA
Stiling, Kirkland, Charleston, SC
Williams, Jimmy, Phenix City, AL

MeadWestvaco – MIT
Hammer, Lory, Boston, MA

Mechanical & Materials Engrg.
Loretitsch, Gary, Pflugerville, TX

Metso Power
Abrams, Larry, Charlotte, NC
Brunetti, Louis, Charlotte, NC
Conley, Clark, Charlotte, NC
Cross, Tom, Charlotte, NC
Gadai, David, Charlotte, NC
Gantt, Melissa, Charlotte, NC
Gonzalez, Michael, Charlotte, NC

Registered for the meeting were:

Metso Power (Cont.)
Hatch, Paul, Charlotte, NC
Hughes, Riley, Charlotte, NC
Langstine, Bob, Charlotte, NC

Morgan, Preston, Charlotte, NC
Morris, Richard, Charlotte, NC
Nichols, Jody, Charlotte, NC
Wasson, Eric, Charlotte, NC
Weikmann, John, Charlotte, NC

Mid-America Packaging
Goss, Joe, Pine Bluff, AR

Mondi Packaging Paper Swiecie
Grabowski, Sebastian, Swiecie, Poland
Wiese, Michal, Swiecie, Poland

Nalco
Totura, George, Naperville, IL

Neenah Paper
Fry, Robert, New Glasgow, NS

NewPage
Norton, Leigh, Rumford, ME

Packaging Corp. of America
Fiala, Brian, Tomahawk, WI
Pope, Charles, Valdosta, GA
Stelling, John, Tomahawk, WI

Phoenix Pulp & Paper PCL
Yongvibulsiri, Soonthorn, Khon Kaen, Thailand

Potlatch Forest Products Corp.
Bass, Mike, Dermott, AR
Bliss, Dave, McGehee, AR

Power Specialists Assoc.
Haraga, Rudy, Somers, CT
Henriques, Fabian, Somers, CT
Zawistowski, Bob, Somers, CT

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

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

PROSWECO
Thorslund, Gunnar, Stockholm, Sweden

Proterra Power
Proterra, Joe, Gainesville, GA

Rayonier
Dean, Sam, Jessup, GA
Kicklighter, Thomas, Jessup, GA
McCash, Brad, Jessup, GA

Rick Spangler, Inc.
Spangler, Rick, St. Simons Island, GA

RiNan, Inc.
Pothier, Richard, Peabody, MA

RMR Mechanical
Roy, Bob, Cumming, GA

Rotork
Kundin, Pete, Rochester, NY
Lantz, Rob, Rochester, NY

RSE Pulp & Chemical
Ward, Benjiman, Old Town, ME

SAPPI Fine Paper
Aderman, Craig, Westbrook, ME
Finnemore, Chris, Norridgewock, ME
Hanson, Kevin, Cloquet, MN
Norman, David, Cloquet, MN

Registered for the meeting were:

Savcor Consulting
Duda, Yurij, Vancouver, BC

SCG Paper PLC
Panmanee, Wichate, Bangkok, Thailand

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

Smurfit Kappa Canton de Venezuela
Costra, Jorge, San Felipe, Yaracuy

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

Smurfit-Stone Container
Brown, Monty, Fernandina Beach, FL
English, Phil, Jacksonville, FL
Hunt, Todd, Fernandina Beach, FL
Jones, Robert, Stevenson, AL
Lykins, Michael, Carol Stream, IL
Rogers, Todd, Florence, SC
Smith, Dan, Hodge, LA

SOMPO Japan Risk Management
Muramatsu, Kenichi, Shinjuku-ku, Tokyo

Southeastern Mechanical Services
Sherouse, Jimmy, St. Petersburg, FL

Stora Enso North America
Loos, Bill, Wisconsin Rapids, WI
Wilke, Jack, Wisconsin Rapids, WI

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

T. M. Grace Company, Inc.
Grace, Tom, Appleton, WI

Team Industrial Services
Hinson, Ricky, Daphne, AL
Rackley, Jack, Charleston, SC
Watkins, Tom, Daphne, AL

Verso Paper
Claverie, Alex, Jay, ME

Weyerhaeuser
Alderson, Jason, Savannah, GA
Barreca, Cliff, New Bern, NC
Beder, Hank, Federal Way, WA
Bowen, Brian, Plymouth, NC
Cahoon, Kari, Plymouth, NC
Castro, David, Campti, LA
Cox, Don, Pine Hill, AL
Coyle, Wendy, Springfield, OR
Hinman, James, Federal Way, WA
Knowlen, Bruce, Federal Way, WA
Lonadier, Scott, Campti, LA
Loper, Ricky, Pine Hill, AL
McCurry, Jennifer, Savannah, GA
Phillips, David, Grande Prairie, AB
Roscoe, Michael, Plymouth, NC
Slagel, David, Savannah, GA
Thorn, Peter, Federal Way, WA
Whitfield, Craig, Pine Hill, AL
Yang, Heidi, Grande Prairie, AB

Zampell Refractories
Barrett, Lynn, Tampa, FL
Heffernan, John, Tampa, FL

INTRODUCTION

BLRBAC's Chairman, Len Erickson, called the meeting to order at 8:00 a.m. on Wednesday, October 3, 2007.

CHAIRMAN: This meeting, as are all BLRBAC meetings, is being held in accordance with BLRBAC Anti-Trust Guidelines. As a couple points of order this morning, we will have two votes later on the agenda with changes in Safe Firing of Black Liquor and Personnel Safety. On those votes the eligible voting members are those with the red ribbons. We would ask the members to stand up for the vote and then cast their vote at that time. We request cell phones be turned off. I would like to introduce the members of the Executive Committee: Ron Hess, Treasurer; Mike Polagye, Secretary; Jim Dickinson, Boiler Manufacturer Representative; Jim Onstead, Insurance Representative; Dave Fuhrmann, Boiler Operator Representative; Scott Moyer, Vice President and myself, Len Erickson, Chairman.

OLD BUSINESS

ACCEPTANCE OF THE SPRING 2007 MEETING MINUTES – Len Erickson

The Minutes from the spring 2007 meeting were posted on the Web site. Hopefully everyone has had a chance to review those. Are there any comments, corrections or additions to those Minutes?

JOHN ANDREWS – The ESP Committee has revisited the classification of the Durango incident that was reported last meeting. We feel that there is insufficient information to accurately make a classification since we don't have an Incident Report. So the Committee is requesting that the Minutes of the Spring 2007 meeting be revised to restore the classification of "not classified" to the Durango incident since the cause of the explosion is not known at this time.

CHAIRMAN: Any other comments from the members? Is there a motion to approve the Meeting Minutes as corrected? Second? All in favor say "Aye"? "Opposed"? Thank you. Motion has passed. The spring 2007 Meeting Minutes are accepted and approved as moved:

Secretary's Note: The Spring 2007 Meeting Minutes will not be changed, but are amended in these Meeting Minutes as noted.

NEW BUSINESS

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

   I'd like to take this opportunity to welcome the following new members. Also, I'd like to encourage them and all of you to attend BLRBAC as often as you can and to participate in our subcommittee work.

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

NEW REGULAR MEMBERSHIP

Kapstone Kraft Paper Corporation – Roanoke Rapids, NC. – This was formerly an IP mill. It was sold and became Kapstone on January 1st of this year.

Tim George is the designated Representative.

Ben White is the designated Alternate Representative.

RSE Pulp & Chemical, LLC – they operate a mill in Old Town, ME, which according to their application letter has a focus on renewable energy development, including a capital expansion project that includes a cellulosic ethanol biorefinery. So I hope we will be hearing from those individuals at future meetings as they progress with this project.

Benjiman Ward is the designated Representative.

Kevin Paradis is the designated Alternate Representative.

West Frazer Mills, Ltd. – of which Hinton Pulp is a division. They operate recovery boilers in Hinton, Alberta.

Jon Wilson is the designated Representative.

Dean Lawrence is the designated Alternate Representative.

NEW ASSOCIATE MEMBERSHIPS

FPInnoations Paprican - Vancouver, BC – a provider of research and development services to the North American pulp and paper industry.

Douglas Singbejl is the designated Associate Representative.

Vic Uloth is the designated Alternate Associate Representative.

GommiTech – Maple Valle, WA Jules has accepted the position of ESP Subcommittee Secretary.

Jules Gommi is the designated Associate Representative.

As a sole proprietor, there is no designated Alternate Associate Representative.

Young Technical Services Group – a full service inspection and NDE testing company headquartered in Memphis, TN.

(Associate and Alternate Associate Representatives have not been named)

NEW CORRESPONDING MEMBERSHIPS – None Reported

REGULAR REPRESENTATIVE CHANGES

Hartford Steam Boiler

Henry Tessier has been designated as the Alternate Representative

Tembec

Carl Terrell replaced Debra Tillman as designated Representative

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

ASSOCIATE REPRESENTATIVE CHANGES – None Reported

CORRESPONDING MEMBERSHIP CHANGES –None Reported

MEMBERSHIP COMPANY NAME CHANGES

Metso Power

Previously did business as Kvaerner

*{**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.}*

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

The Executive Committee met in two sessions: an "open" session with the subcommittee chairmen on Monday afternoon and then in a "closed" session Tuesday evening. A number of routine business items were taken care of which the individual subcommittees will cover in their reports.

Last spring, we reported we were going to proceed with appointing a Water Treatment Task Force. That stalled a little bit on. However, I'm pleased to report the following individuals have agreed to serve on the task force to determine if a Water Treatment Subcommittee is neededand make a recommendation to the Executive Committee: Tom Madersky with PSA, Norris Johnston with Hercules, and Rick Morgan with FM Global. There is one additional person from a paper manufacturing company and one from a boiler manufacturing company who have to get back to me. So I won't mention their names at this time.

Also on follow-up, we are waiting to hear back on which provinces in Western Canada have codified BLRBAC publications. We hope to have a report back to the membership at our meeting next Spring..

Last spring the Executive Committee discussed establishing an archiving "Records Retention Policy." That is being put together and will be reviewed at the Spring 2008 meeting. A report to the membership on the policy will be presented at that time.

We discussed classifications of incidents for all subcommittees, not just the ESP Subcommittee. The Executive Committee drafted and approved the following verbiage:

> **"Classification of incidents is to only be done on the basis of an Incident Report submitted by the owner/operator. In the absence of an Incident Report and if litigation has been completed, information available from either the owner/operator of the facility or in a Public Domain Report may be used. This will be applicable to all subcommittees who have questionnaires or surveys."**

We request all subcommittees follow this guidance when reviewing and classifying incidents.

3. **TREASURER'S REPORT** – Ron Hess

We had 180 people Advance register for the meeting and 45 At Door registrations. So we are up a little bit from the last meeting. Of those total numbers we had 35 operating companies, four boiler manufacturers, eight insurance companies and 28 associate members represented. Our overseas attendees for this meeting are from Colombia, Finland, France, Japan, Poland, New Zealand, Sweden, Thailand, the United Kingdom and Venezuela. We thank each of those people for traveling those distances to participate with us.

We had a little confusion with a few people who registered. Something to remember, all Advance Registrations are confirmed with an e-mail from Barbara Holich stating funds have been received and you are registered for the meeting. A couple of the larger companies apparently sent in a check for seven or eight people using names carried over from a previous meeting and not necessarily those who were planning to attend this meeting. So if you think you have been registered prior to the deadline, make sure that you receive an e-mail from Barbara confirming that for you.

We have a new Meetings Manager here at the hotel. Her name is Elizabeth Burks (Elizabeth.burks@ihg.com). So for questions regarding room reservations or any requirements you might have for your meetings, she is our "go to" person now. Maggie Browning, who had served in that capacity for a number of years, had a child in June and has decided she wants to stay at home and take care of her little girl. So we wish Maggie the best and now have a chance to break in a new Meetings Manager.

The hotel has started to refurbish the guest rooms. I think they started up on the 12th floor and are now down on the 6th or 7th floor. So by the time we come back in the spring, hopefully all the rooms will be refurbished. From what I heard from people who were staying on the upper floors, it is making a pretty big difference. The hotel was getting some miles on it!

On the financial side of things, we have our two accounts that we maintain:

Checking Account	-	$44,387.00 (prior to the bills being paid for this meeting)
Money Market Account	-	$13,542.00

So we are solvent and still in good shape. The 2008 Operating Budget was presented to the Executive Committee and they approved it. We should be good to go for 2008.

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

I have just a brief report this morning. As Ron mentioned, this is the third meeting where Barbara Holich has sent out acknowledgements that she has received the registration form and checks for each attendee who is registered prior to coming here. We have received some very positive feedback from people that they appreciate this and we will continue doing this for future meetings.

Also, based on the number of guests who attended the Personnel Safety Subcommittee meeting on Monday morning, I believe posting of the Subcommittee Agenda on the BLRBAC website and outside the Registration Room has been beneficial to you. So this will continue as well.

4. **SECRETARY'S REPORT – (Cont.)**

All of us on the Executive Committee strive to make your time here as helpful as we possibly can to the operation of your recovery boilers. If you have any suggestions to make it better, I invite you to send them to me, or any of the Executive Committee members, and let us know what your suggestions are. Our contact information is included in these meeting minutes as well as posted on the BLRBAC website.

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 changes in people and/or any e-mail address changes.**

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

Someone is needed to take the initiative (in best case scenario, this should be the designated 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 (letter, fax, or e-mail) is received. I keep a file folder for each member company that includes correspondence naming the Representative and Alternate for each organization. These letters usually contain the e-mail addresses I must have in order to maintain the BLRBAC address book.

Therefore, please be sure that I have your current working e-mail address. BLRBAC notice of meetings and meeting minutes are only be sent via e-mail. If an e-mailed notice is returned to me as "undeliverable," for two consecutive mailings, that e-mail address is deleted from the BLRBAC database. We know there are times someone's mailbox is full or there was a system problem at the time of the first mailing, which is why a second attempt is always made.

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

Per BLRBAC's policy, BLRBAC's Secretarial Services will verify receipt of meeting registrations and checks via e-mail when appropriate e-mail addresses are given on the registration form. Despite the comment on the Registration Form not to fax me registration forms, before every meeting I received five or more faxed documents. Be advised that these faxed registration forms are of no use to me until the appropriate fees are paid. Therefore**,** please **DO NOT FAX REGISTRATION FORMS unless you include a cover note explaining the check may be arriving separately.**

5. SUBCOMMITTEE REPORTS

5.1 AUXILIARY FUEL REPORT – Dave Streit

No report. The subcommittee did not meet. The subcommittee is scheduled to meet at the Spring 2008 meeting.

5.2 BLACK LIQUOR REPORT – Mark Sargent

An open Meeting was held Monday, October 1, 2007 at 8:30 AM in the Crawford Room and at 1:00 PM in the Mansfield Room.

In the morning there were 8 members and 15 guests in attendance. There were eight members and approximately 25 guests in the afternoon.

MINUTES:

1. The following language changes were voted on and approved at the conclusion of the spring 2007 BLRBAC meeting. These were posted on the BLRBAC website and no comments or questions came to the Subcommittee since posted for comment between meetings.

Chapter 5

Added text to highlight concerns with black liquor header purging when subheaders are present.

5.2 Some newer large recovery boilers have subheaders on each individual wall to supply the liquor guns. In some instances these subheaders could contain unknown liquids because they are sometimes not included in the black liquor header purge. The owner/operator must be aware of the risks of un-purged sections of the black liquor firing system and develop SOP's or include these sections of piping in an automated purge system to assure there are no sections of piping that contain unknown quantities of liquids.

Chapter 9

For consistency with Figure 2, added satisfactory spout cooling water flow as a required starting permissive interlock for black liquor header purge.

9.2.6 Satisfactory spout cooling water flow permissive start interlock is required.

Chapter 10

For consistency with Figure 2, added adequate dissolving tank level as a required starting permissive interlock for black liquor header purge.

10.2.7 Adequate dissolving tank level permissive for black liquor header purge interlock and low tank level alarms are required.

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

2. We are continuing to investigate and explore recommendations for preferential operator green liquor density testing frequency and methods, i.e; baume vs. T.A. There are some thoughts that when density and/or sulfidity levels are high there is a separation of T.A. vs. baume. The SFBL Subcommittee has engaged Nikolai DeMartini (IPST) to determine if IPST can develop a scope for a potential research project to be funded by AF&PA. The scope will be reviewed by SFBL prior to the October 2007 AF&PA meeting. A follow-u[report will be made at the spring 2008 Meeting.

3. The Subcommittee discussed whether or not to "lock close" or "secure" dissolving tank low suction valves. In addition, a requirement to lock open spout cooling water isolation valves was discussed recognizing that the spout cooling water valves may need to be closed in an emergency situation such as a spout jacket leak. After discussion and looking at the document we felt that there is enough language in the document and in Appendix A – Generic checklist for pre-firing of black liquor to not warrant additional language or requirements for securing valves.

4. The Subcommittee fielded a question from a member company regarding any specific guidelines for non-water cooled spouts. We have had some guidelines submitted from Alstom and will be looking at adding specific cautions for these applications.

5. We are in the process of reviewing the language in Figure 2, Permissive Starting Logic for Black Liquor Firing as it relates to the requirements for purging the black liquor header and commencing liquor firing. Presently one of the main requirements for initiating black liquor header purge and commencing liquor firing is the permissive; "Sufficient auxiliary fuel hearth burners in service" has been in place in the document for some time. In reviewing the Generic checklist for pre-firing of black liquor there are no requirements for ensuing that the boiler is on-line, superheater platens are cleared of condensate and stable firing is established. We will review other BLRBAC documents to see if there are other guidelines stating stable firing is established or superheater platens are cleared of condensate. We are not sure if this lies in SFBL or SF Auxiliary Fuel but we will collaborate with the other Subcommittees to see what improvements to the Recommended Practices should be made.

6. We have reviewed the logic drawings (Figures 1-5) to determine if there are any deficiencies that could lead to an unsafe condition in the common permissive starting and protective tripping logic, the black liquor permissive starting and protective tripping logic, and the lower furnace wash permissives. An initial review showed potential additions to the Logic Drawings as follows:

   <u>Figure 1 – Common Permissive Starting Logic</u>

   1. "Prove fuel header supply safety shutoff valves closed" is currently shown as a permissive to start the first ID fan. This should also be specifically noted as a boiler purge permissive.

   2. "No flame proven" should be added as a required boiler purge permissive.

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

Figure 2 – Permissive Starting Logic for Black Liquor Firing

1. "Prove all black liquor guns out of furnace" is currently shown as a permissive to start the black liquor pump. This should also be specifically noted as a permissive to open/close the header/divert valves as well as a BL header purge permissive.

2. "Sufficient aux fuel hearth burners in service" is a permissive to open the black liquor header and close the divert valve; it should also be added as a BL header purge permissive.

Figure 3 – Black Liquor Header Wash and Lower Furnace Wash Permissives

No deficiencies identified.

Figure 4 – Common Protective Tripping Logic

1. Does BLRBAC allow class 1 igniters to maintain boiler firing in the event of loss of stable liquor firing? May need to modify wording in "No auxiliary burners in service" block.

Figure 5 – Protective Tripping Logic for Black Liquor Firing

1. Similar to fig 4, are class 1 igniters sufficient to maintain liquor firing below 30% MCR?

2. "BL header valve or divert valve failure" should be added as a mandatory black liquor trip.

OTHER ITEMS:

1. A question came up regarding guidelines for water sources inside spout enclosures, i.e., hand held hoses for clean-up. We will review our document and contact Personnel Safety to see if any guidance is provided or needed.

2. Another question came up regarding explosion relief for dissolving tanks. We had received information from several OEM's in 2002 regarding dissolving tank explosion relief design. We will review again and take a look at our document to see that the appropriate precautions are listed.

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

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

CHAIRMAN: Does anyone have any questions or comments? At this time, I'd like the voting membership to stand. All in favor of the proposed changes raise your hand. Opposed? The vote to accept the proposed changes to Recommended Practice for Safe Firing of Black Liquor that was posted on the BLRBAC website was unanimous.

5.3 **ESP SUBCOMMITTEE REPORT** – John Andrews
(See ***Appendix A*** – Incident List)

The ESP Subcommittee met in closed session on Monday October 1st with all members represented. Jules Gommi, who had served the Subcommittee for several years as Chairman before his retirement from Weyerhaeuser, was welcomed as the new secretary. The Subcommittee met in open session on Tuesday morning October 2nd with all members represented and about 190 guests. During the open session, the Subcommittee reviewed 30 incident reports from North America. Of the 30 incidents, there were no boiler or dissolving tank explosions reported. Thirteen (13) of the leaks were classified as critical incidents and 16 were non-critical incidents. One incident was an ESP with no leak. An ESP was performed in 12 of the incidents including 9 of the critical incidents representing 69% of the critical incidents reported. This percentage is in line with the recent history of 60 – 67%.

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

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

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

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

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

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

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, the red were listed as critical incidents and the blue mark indicates an ESP with no leak. The leaks locations are summarized as follows:

- 13 – Economizer
- 2 – Superheater
- 3 – Boiler Bank
- 1 – Furnace Screen
- 9 – Wall Tubes
- 1 – Floor Tubes
- 0 – Smelt Spout
- 1 – ESP w/ no leak

Root Cause

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

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

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

How Discovered

Operator observations during boiler walkdowns continue to be the prevalent method of detecting leaks and accounted for identification of 21 of the leaks (67%). Six (6) of the leaks were identified by the control room indications. Leak Detection Systems identified 1 of the leaks. One of the leaks was discovered by a hydrostatic test during an outage.

Leak detection systems were installed on units in 7 of the incidents (23%) which is a reduction from past meetings. The mills reported that the leak detection system provided the initial indication of the leak in 1 of the incidents. Mills should consider dedicating maintenance personnel to the calibration and repair of the 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 the time between initial indication of the leak and the initiation of the ESP ranged from about 20 seconds to 24 hours. The median time between the first indication of a leak and the initiation of the ESP for the 10 incidents that provided a time line was 37 minutes which indicates there is still room for improvement in making the decision to ESP. Looking for leaks after low drum level trips with high furnace pressure should continue to be emphasized in training.

Incident Review

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

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.

Figure 2 shows the critical incidents reported each year. The 23 Critical appears to be about where we have been running in the recent past.

Figure 3 shows that there has been a significant reduction in the reported boiler explosions with no reported explosions since 2002 and only four boiler explosions in the last 10 years. The five year rolling average is now down to zero. Even with several close calls of late, this trend is encouraging. The absence of Auxiliary Fuel and Black Liquor Pyrolysis Gas explosions since 1992 indicates the positive impacts made through the implementation of the BLRBAC Safe Firing Guidelines.

5. SUBCOMMITTEE REPORTS (Cont.)

5.3 ESP SUBCOMMITTEE REPORT (Cont.)

The Durango incident in 2002 is listed as "Not Classified" under the explosion type. The Subcommittee has determined that since no formal report has been submitted, there is insufficient information available to adequately determine the cause.

Figure 4 shows the history of dissolving tank explosions and there were none reported so far this year. There were no incident reports for dissolving tank explosions submitted prior to 1973 and the incident rate appears to be increasing since that time although it may be that more dissolving tank incident reports are being submitted now where they may not have been reported previously.

Figure 5 is a plot of explosion history per 100-boiler operating years. The smelt water explosion experience is continuing to trend down over time and is down to just above 0.5 explosions per 100 boiler operating years, but the total explosions, which includes dissolving tank explosions, had been holding steady but are starting to drop slightly at just under 0.9 explosions per 100 boiler years. The Total Explosions includes all causes combined, and is being driven by the recent dissolving tank explosions. 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 the making the efforts to try to keep that trending down. Effort should be focused in developing better procedures to handle heavy smelt runs and plugged spouts.

Learnings

There were several incidents reported that were very close calls and two reports indicated that a smelt water reaction occurred but there was no damage reported. There were four reported leaks in wall tubes in the lower furnace. In two of those reports, stress corrosion cracking at a swaged tube caused the leak. If you have a unit with swaged tubes in the furnace, it is very important to inspect those areas for possible cracking. There was one report of a floor tube leak that again highlights the concern with dents, depressions and weld push through that may cause a flow disturbance and steam blanketing in the tube. Any areas found need to be addressed. Localized heavy waterside deposits continue to be reported as a cause for leaks so this, too, is an area of continued concern.

It is human nature to try to find other explanations for problems such as leaks so it is important to emphasize leak detection and leak identification in operator training. Training should also emphasize that the appropriate operators have the authority to initiate the ESP without having to get approval from department supervision.

5. SUBCOMMITTEE REPORTS (Cont.)

5.3 ESP SUBCOMMITTEE REPORT (Cont.)

Clarification of "Dedicated Stand –Alone"

The Subcommittee continues to work on the appropriate language for a clarification of "Dedicated Stand-Alone" as it refers to the ESP system architecture. We are planning to have something to present by the next meeting.

List of Operating Boilers

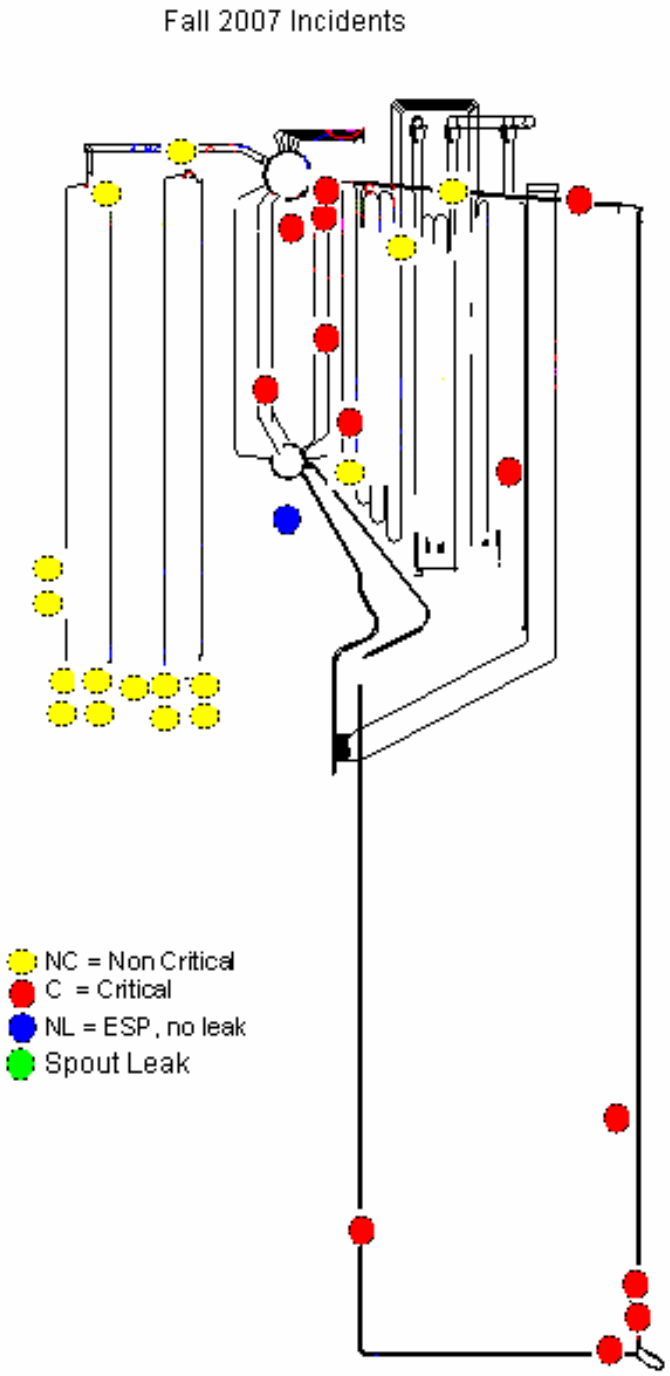
The lists of Operating Boilers in the USA and Operating Boilers in Canada is posted on the BLRBAC Website and will continue to be updated by Jack Clement along with input provided by Greg Manzulenko on the Canadian units.

Incident Questionnaires

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

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

Figure 1


Fall 2007 Incidents
NC = Non Critical
C = Critical
NL = ESP, no leak
Spout Leak

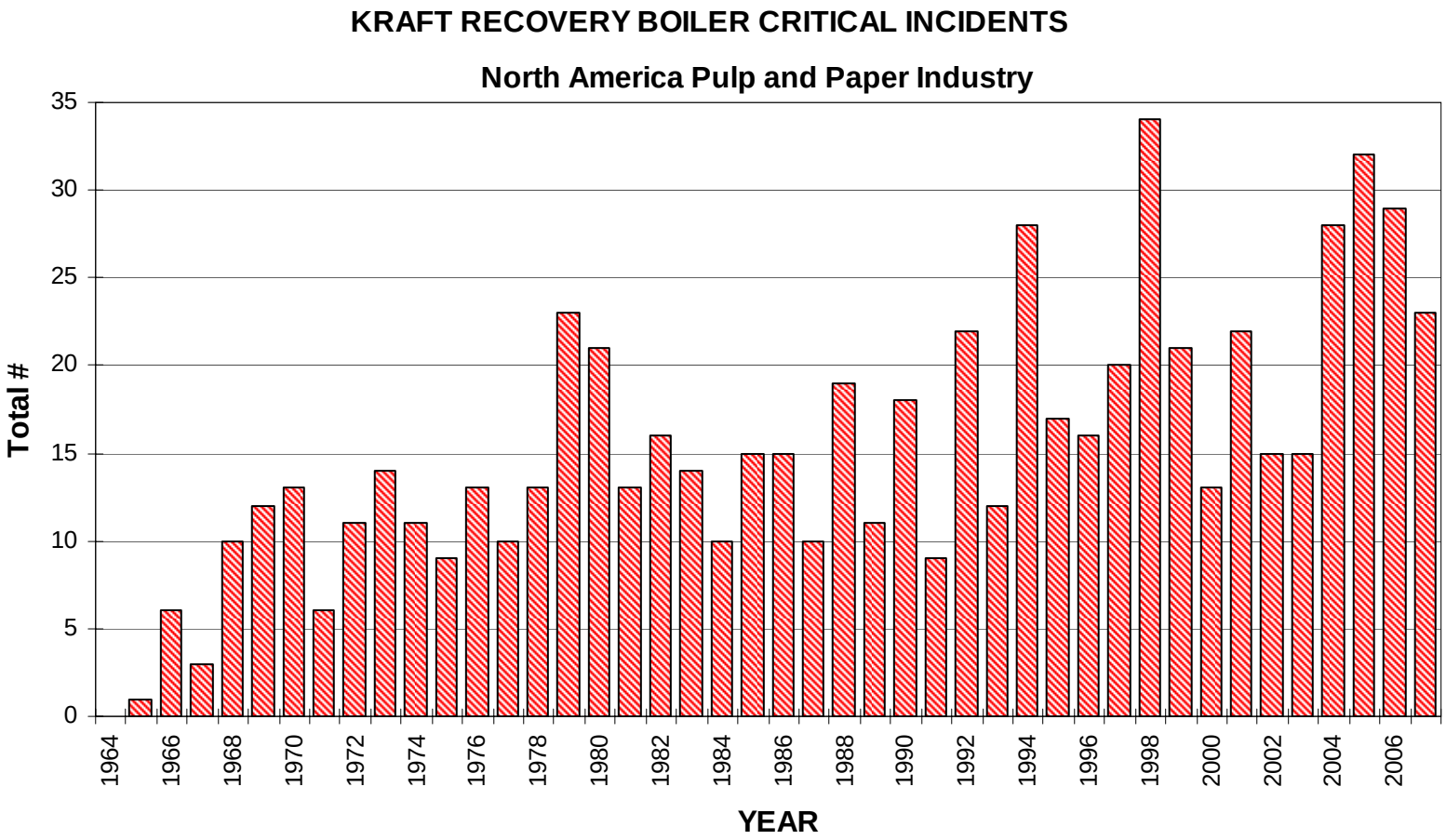
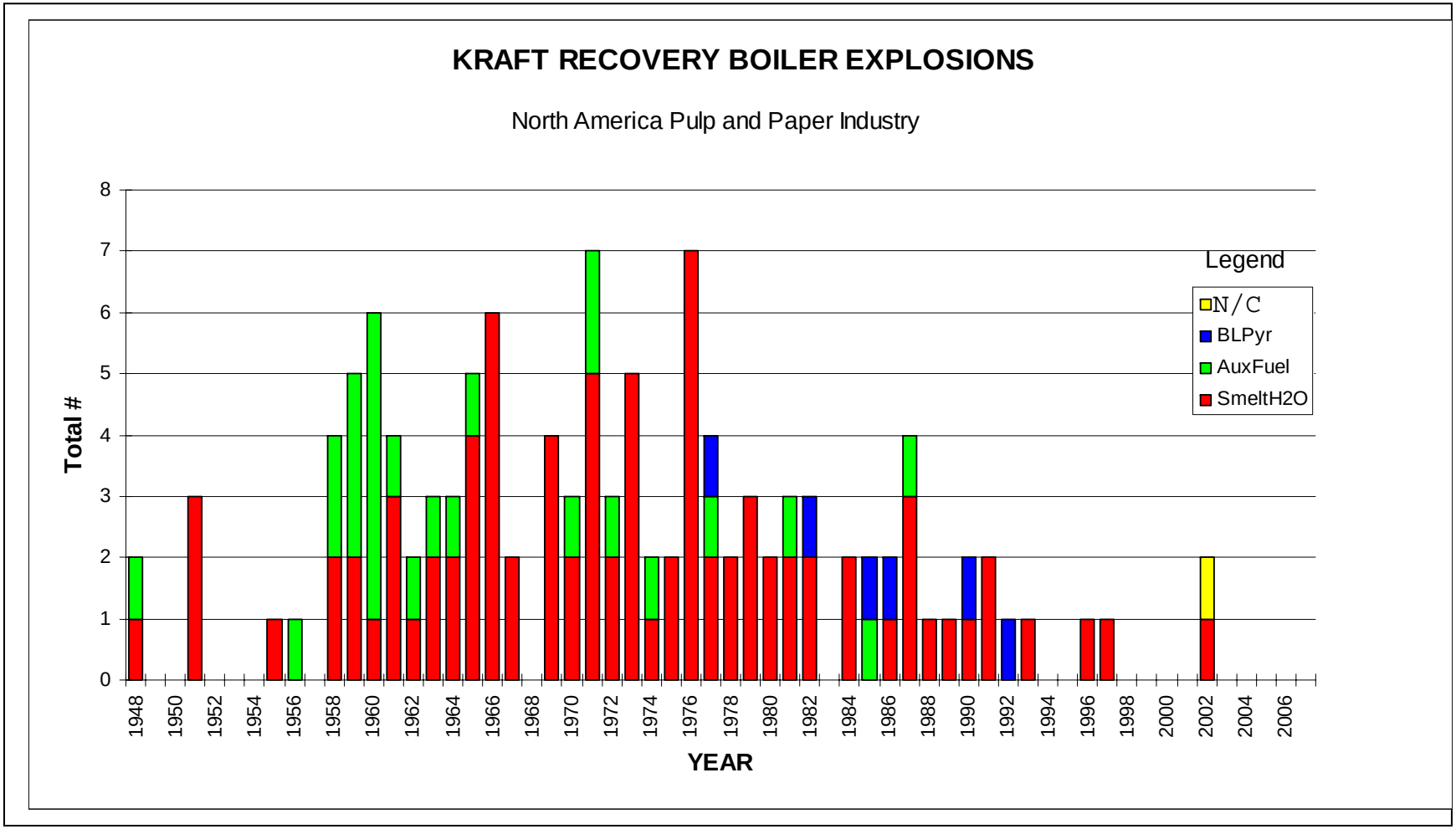


Figure 2

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


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

Figure 3

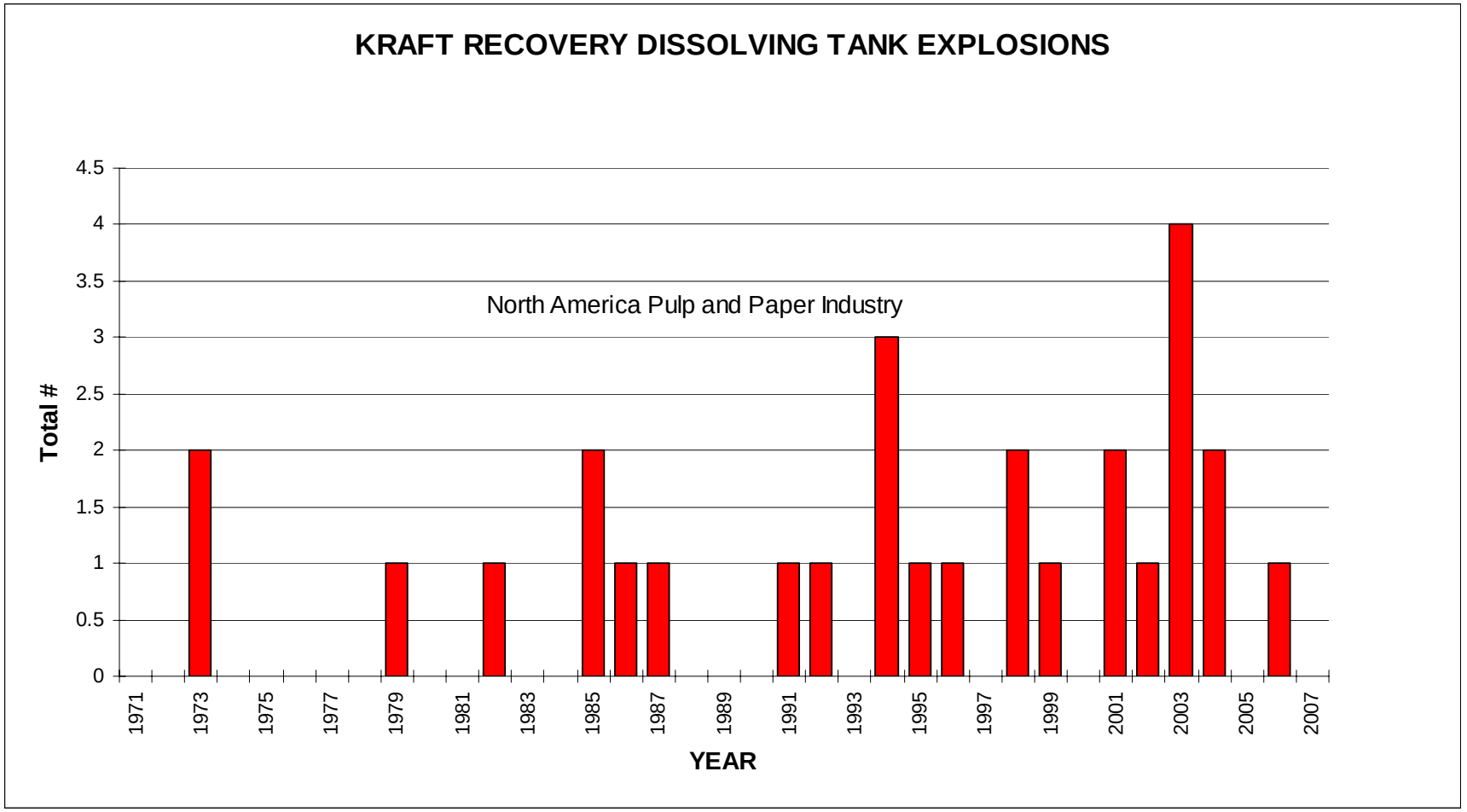
KRAFT RECOVERY DISSOLVING TANK EXPLOSIONS
North America Pulp and Paper Industry
Total #
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
YEAR

Figure 4

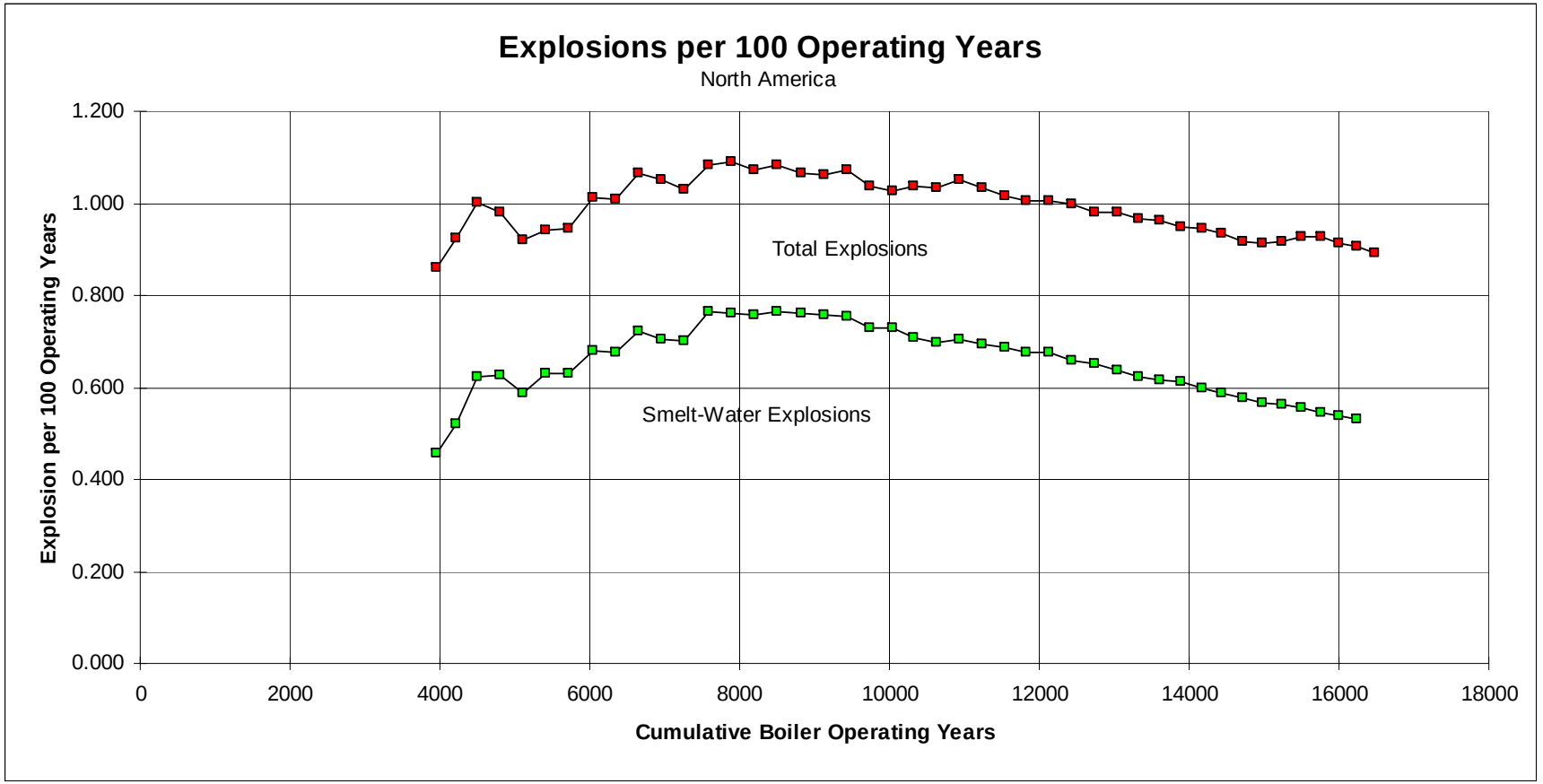
Explosions per 100 Operating Years
North America
Explosion per 100 Operating Years
1.200
1.000
0.800
0.600
0.400
0.200
0.000
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Cumulative Boiler Operating Years
Total Explosions
Smelt-Water Explosions

Figure 5

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

5.4 **FIRE PROTECTION IN DIRECT CONTACT EVAPORATORS REPORT** – Chris Jackson

In the morning we held an Open meeting with four subcommittee members and four quests. There was no afternoon meeting.

As there was no April meeting, the minutes from October 2006 were reviewed and accepted.

A question came in from Carter Holt Harvey (Kinleith Mill) regarding the metric conversions for fire protection designs. We have added metric equivalents to assure our guidelines could be used universally. The specific question was regarding recommended sprinkler design density. There was concern the metric units might not be correct. We have indicated a 0.15 gpm/sq.ft. US design was equivalent to 6mm/ min metric. This is correct and is how people would specify fire protection design using metric units. It is indeed a different way of looking at design density. The US design can be visualized as how much water would be collected in a 1 sq. ft. pan. With a 0.15 gpm/ sq. ft. design, that 1 sq. ft. pan would collect 0.15 gallons after a minute elapses. For the international design, a 1 sq. ft. or 1 sq. meter pan (no difference), 6 mm (millimeters) of water would collect after 1 minute. This can be looked at as more of a rain gage approach to defining density.

Overall, the guidelines in our document are performance based. We purposely did not want to be too prescriptive. We wanted to allow greater flexibility. Some areas may seem vague. We are aware of four mills have revamped protection based on our guidelines and overall the document has worked well. We have made a few tweaks to the document over the past several years.

We had some good discussions centering on Section 4.1, Section 4.2.3 and 4.2.4. Basically, we want to be sure fire protection remains in service until the fire is out. Discussions were centered on how to determine the fire is out and that fire systems should not reset themselves. Manual reset was intended, but was not clearly stated. There is the potential for a fire protection system cycling on/off multiple times if it resets based on temperature. This can prevent complete extinguishment of the fire and could also result in eventual failure of the protection system.

We will add the following:

- **"Regardless of the means of activation, a manual reset should be required of the fire suppression system." 4.1 addition (becomes the 5th paragraph)**

- **4.2.4 modified 2nd bullet final "Manual reset should be based on a mill's procedure defining the reset criteria."**

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

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

Mark Andrews reported having seen smelting in his DCE (cascade) in the back corner in an area 2-4 ft. wide and 3" deep. There was no flame. No water was used or needed. The heat was not adequate to activate protection. The fire was controlled by shutting dampers to starve the area of oxygen (choke it). It appears our guideline provides adequate direction for this. Section 3.3 covers the physical installation and design (rear shelves covered), access for cleaning, and keeping any unavoidable back ledge areas wet.

Next Meeting – It is the subcommittee's intention to hold a spring meeting only if an incident report is received or if a request for assistance comes in that cannot be handled satisfactorily otherwise. There will always be a meeting in the fall, regardless.

CHAIRMAN: The changes that Chris mentioned going into the DC Fire Protection Document will be sent first to the Executive Committee. Provided the Executive Committee agrees, they will be posted on the website for membership review and comment. Then they will be submitted for vote at the spring 2008 meeting.

5.5 **INSTRUMENTATION REPORT** – Dave Avery

The instrumentation subcommittee met in open session on Monday morning with 12 out of fourteen members and 7 guests. Our session began with introduction of members and guests. Everyone was treated to a review of March's minutes. This review highlighted a formatting issue with the updated checklist sections included in our March report. These checklist sections are revisions that will align the current Instrumentation Checklist with Auxiliary Fuels recommended Good Practice. The discrepancies were corrected and the minutes accepted as amended. These changes will be included with our fall minutes. The committee accepted one new member, Andy Smith with Global Risk Consultants, and recognized one change, Bill McQuillan with SAPPI (S.D. Warren Company), Skowhegan, ME has retired and has been replaced by David T. Boudreau. Bill served as a member and as past chairman of the subcommittee. We wish him well. The subcommittee member list will be updated to reflect these changes.

The subcommittee was updated by Rotork's Area Sales Manager, Rob Lantz, on their efforts to address the use of their intelligent valve actuators in rapid drain valve applications. Rotork's known basic application concerns are improperly wired valves, valve travel position memory/battery issues, and required programming setups for the Mark1 & 2 series actuators. It must be noted that the older non-smart 1400 & 1600 series actuators do not have the programming/battery issues. However the 1600 series requires an additional optional hardware circuit board to meet the requirement for the valve to override the local operator switch setting as necessary if an ESP occurs.

Rotork has been using section 3.13 of the "EMERGENCY SHUTDOWN PROCEDURE (ESP) AND PROCEDURE FOR TESTING ESP SYSTEM FOR BLACK LIQUOR RECOVERY BOILERS" Recommended Good Practice. It is proposed to add a new section 3.13.5 that states:

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

"3.13.5 Valve Programming and Wiring
The actuators on rapid drain valves, and all other valves that operate during an ESP, should be arranged to move to their appointed ESP position regardless of any external interlocks, internal wiring and or logic. Additionally, detailed attention is needed in the initial set up, programming, functional testing, and maintenance of programmable actuated valves."

What this means is a rapid drain valve application requires torque limits, stall timers, local operator switches, temperature limiting, and load or current limiting not to interfere with operation of the valve during an ESP.

To meet this functionality the Mark 1 & 2's must be programmed/setup at the factory as described in Rotork's paper "Rotork Actuators on Black Liquor Recovery Boilers" currently posted on BLRBAC's website. Rotork's user accessible program parameters address torque limits and temperature limits through the service tool. **However, stall motor timers and power loss inhibit must be set by Rotork field service or at the factory.** Based on this information, all installed IQ Mark 1 & 2 units not factory setup for these functions are unlikely to perform exactly the way they are expected to. Additional discussion pointed out that to disable the local stop switch at the valve a separate PC board is required for the 1600 and Mark 1 series. **Rob noted that very few if any PC boards have been sold and delivered to customers.**

It would be advisable that your installed 1600 and Mark 1 units be checked for Local stop 'disable' functionality.

The memory/ battery issue is an inherent design concern. The memory is non-volatile. However, the valve senses travel through an encoder, which needs power for the memory circuit to process. If the valve position is changed while the power is off and the battery is out, the valve will not know what the true position is. This only happens if the wrong sequence of events occurs; normally with proper planning one can successfully change the battery in any power mode.

To ensure that valve maintenance hasn't altered valves functionality, the committee supports a functional test after any maintenance and is now drafting language to support this.

Rob will advise us as to how Rotork wants to handle factory setups for ESP functionality when a valve is ordered. He also will provide written answers to our questions and update the advisory paper on the website to include the warning about potential loss of valve position if the improper conditions exist.

The afternoon session had 13 members with 9 quests present.

Work focused on language for using "Smart Valve Actuators in Recovery Boiler ESP systems". The following is a draft in progress:

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

Programmable (Smart) Valve Actuators in Recovery Boiler ESP systems

Valves used in Recovery Boiler ESP systems play a key role in this safety system to protect lives and boiler equipment. It is for this reason that the BLRBAC ESP document has specific requirements on the application of valves and actuators. Several references clearly indicate that upon initiation of the ESP system the valve actuators must move the valve to the correct position regardless of other influences. The intent in application of valve actuators in ESP service is for unimpeded movement to the ESP position when commanded, or be sacrificed in the effort to perform.

Programmable (smart) valve actuators offer a variety of configuration options. However, the use of some features may conflict with an ESP application. It is intentionally stated that no interlocks or switches should prevent the actuator from reaching the intended valve position. Actuator configuration and wiring shall be such that upon an ESP, the following features are disabled:

- Torque limits
- Stall timers
- Local operator switches
- Temperature limiting
- Load or current limiting
- External interlock inputs

Only valve position limit contacts are allowed to stop valve movement in ESP events. Protection features are acceptable only when the actuator and valve are being tested.

Routine testing should clearly indicate the ability of the actuator to perform. During testing, confirm successful complete valve travel with position limit contact outputs

Maintenance on the actuators or interruption of supply power shall not degrade performance through modification of function or loss of chosen settings. A functional test and configuration review shall be performed following any maintenance (including battery changes, etc). Actuators incorporating battery-backed functions require special attention to verify that the actuator state and configuration are correct and match design.

The correct selection (configuration) of these various features makes application of programmable actuators more complex. It is critical for the designer or service technician to select the appropriate actuator and supporting settings that ensure reliable operation in ESP service.

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

This thought has also been expanded to develop general language for the use of Programmable Field Devices on Recovery Boilers to be assimilated into our existing Instrument Guidelines. The following again is a work in progress and development will continue at the spring '08 meeting:

Configuration –

1. Devices with programmable features shall be implemented with a managed system to insure configuration details are documented and maintained in a secure manner.

2. Each device shall be identified as having features requiring specific set-up requirements and cautioning the user to refer to proper documentation.

3. Users are cautioned that some configuration features may be factory settable only. Devices of this type shall be individually labeled and certified by the manufacturer for the intended safety application.

4. User purchasing, store room, and repair operations shall be cautioned as to any specific requirements and/or markings of devices for safety applications.

Batteries –

1. Devices with batteries shall be implemented with a managed system to insure the batteries remain serviceable.

2. Batteries shall be replaced per the manufacturer's procedures so as not to lose set-up, status or position information.

3. Although manufacturer stated battery life might be several years, it is suggested to arbitrarily replace each battery as a task to be performed during the annual boiler outage.

We will continue this exercise along with a parallel task focusing on reviewing Checklist section C "Furnace Draft" for updating and bring the front end of our document to current language and standards.

Finally, the instrumentation sub-committee extends an opportunity to everyone who would like to take it up ……. stop by and join in at one of our meetings. See how you too can have fun with controls.

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

5.6 **MATERIAL & WELDING REPORT** – Jesse Worsham (co-chair)

The Materials and Welding subcommittee met on October 1, 2007 in closed section with 10 of 22 members present. The committee reviewed the membership and dropped two inactive members and accepted one new member, Michael Lykins. Henry Tessier, Jr. of Hartford Steam Boiler will replace Mike Garfield. Dan Chuchro was accepted, as the FM Global alternate for Dave Lang and Gary Loretitsch as the alternate for Max Moskal. The group proceeded to review the document and comments received.

The afternoon session was open with 13 of 22 members present and 13 guests. Michael Bayse of George H. Bodman, Inc. made a presentation on "Acid Cleaning of Recovery Boilers." The committee continued to review the document and comments.

CHAIRMAN: The draft version of the Materials & Welding document that was posted on the BLRBAC website this past summer is being left on the website for on-going membership review. There is a lot of good information in it.

5.7 **PERSONNEL SAFETY REPORT** – Robert Zawistowski

The Personnel Safety Subcommittee met in an "open" session on Monday, October 1, 2007. There were 13 members (out of 18) and 36 guests in attendance during the meeting.

Representation at our meeting by regular members and guests included original equipment manufacturers Babcock & Wilcox, Diamond Power and Metso Power. Representation from insurance and insurance service companies included AXA Corporate Solutions, FM-Global, Hartford Steam Boiler, Lumbermen's, Sompo Japan Risk Management and Swiss Re Global Asset Protection. Operating company representation included Boise Cascade, CHH Pulp & Paper, Domtar, Georgia Pacific, International Paper, Kapstone Paper, Lincoln Paper & Tissue, MeadWestvaco, Mondi Packaging Paper, Neenah Paper, Packaging Corporation of America, Phoenix Pulp & Paper, Rayonier, RSE Pulp & Chemical, Sappi, SCG Paper, SENA, Smurfit-Stone Container, Smurfit Kappa and Weyerhaeuser. Water treatment representation included Buckman Labs. Recovery Organization representation included Poyry Forest Industry; and consultant representation included Power Specialists Associates, Inc.

There was one change in membership since the last meeting. We welcome Alarick Tavares of Georgia Pacific to our sub-committee.

Several requests for clarifications with regard to the Personnel Safety Document were received since the last meeting. Following is a summary of the questions that were answered:

1. Does Personnel Safety recommend pressurizing the emergency stair well? Reply: Based on our current interpretation we do not.

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

2. Has someone within BLRBAC ever resolved the difference in opinion with which way a door should open into an emergency stairwell with OSHA? Reply: Not to the best of our knowledge. It is recommended that the difference in opinion be resolved directly between the company and OSHA along with any state and/or local jurisdictions. One guest indicated there was a difference of opinion with a state inspector. When he was shown the BLRBAC guideline, he deferred to it and withdrew his objection.

3. Several questions originated from Brazil with regard to interlocks, water washing, and bed temperature limits following an ESP. These questions were answered by pointing to the appropriate BLRBAC Guidelines.

No questions or comments regarding the new water wash guidelines that have been posted for membership review have been directed to our attention since the last meeting. These changes were voted on following presentation of this report.

Outi Pisto, of Poyry Forest Products who is secretary of the Finnish Recovery Boiler Committee made a short presentation on protective equipment (PPE). During the presentation samples of materials they have found to work the best were passed around for inspection along with a report of the study that was conducted. Currently newly designed protective clothing is under field evaluation in Finland. This presentation generated a number of questions and desire for additional information. I have asked BLRBAC members and guests to "funnel" information requests through me and I will consolidate them as we continue to exchange information with Outi. In return we have information that may be helpful to the Finnish effort. Within our subcommittee we will continue to obtain information with the goal of being to provide additional guidelines within our document.

Lory Hammer of MeadWestvaco, who is presently attending MIT in a Masters program, made a presentation on "Lean Manufacturing". Lory presented a number of ideas and concepts to consider for companies that are looking at manpower requirements for recovery departments.

A discussion was held regarding locking out sootblowers for maintenance work on gearbox steam tube packing glands. A question was asked if any mills were pulling the poppet valve pin on the linkage and qualifying that as a locked out steam system. Most mills have valves to isolate parts of the sootblower supply tree, a single isolation valve at each sootblower, a single isolation valve at each sootblower with an additional bleed valve downstream of the isolation valve and in one case, a double block and bleed. In the discussion it was generally agreed that pulling the pin on the poppet valve linkage was not sufficient for lock-out.

5. SUBCOMMITTEE REPORTS (Cont.)

5.7 PERSONNEL SAFETY REPORT (Cont.)

A discussion was held regarding clearing plugged smelt spouts. Many mills use steel rods. In some cases steel rods along with sledgehammers are used. In a few cases a propane torch is used. In cases where a torch has been used there has been no apparent overheating of either the spout or wall tube openings. One user indicated they insert a rod into a smelt spout that is flowing in order to preheat the rod. The hot rod is quickly moved over to the plugged spout and it is much easier to push it through the frozen smelt.

One operating group has found that by adjusting draft on the dissolving tank scrubber they are able to minimize room temperature air from drafting up the spouts and into the furnace. They reported this helps keep the spouts open. In their case they have mini-hoods over their spouts and they maintain approximately 1" negative pressure in the dissolving tank.

We are interested in hearing about "near misses." This provided good discussion within the group. We heard about a liquor nozzle that was broken off, possibly by a piece of falling ash that broke the gun loose from the cradle support spraying liquor all around the operating deck. A poor quality weld on the "clam shell" attachment contributed to this failure. In another event, a boiler went positive while changing a liquor gun and resulted in a modified procedure to cease all sootblowing while changing liquor guns. We also discussed an unresolved issue with regard to using face shields (the sides and rear of the neck are exposed when people turn away from blowback) that has resulted in minor burn injuries. (Outi Pisto has some information regarding protective clothing we will obtain that may be helpful in addressing this item.) Failure of an air conditioning unit on a MCC room resulting in elevated temperatures (150 deg. F) leading to an ID fan failure causing positive boiler furnace pressure and damaging a cable tray as well as blowing fire out of boiler openings for nine minutes. (This boiler is a large unit with two ID fans. With a single ID fan trip, the unit stayed on line but went positive.) We discussed that trip limits for high and low furnace pressure are based on structural design to keep the walls from pushing outward or pulling inward. A boiler can go 2" positive and throw a large flame across the unit and still be well below the trip limit.

During the spring meeting with the Executive Committee meeting it was noted that there is a pre-firing checklist for black liquor firing but none for boiler startup. At that time the Personnel Safety Subcommittee was asked to develop a generic checklist to be included in our document. A very rough draft was started and dialog was opened on the topic this meeting. Additional guidance was sought from the Executive Committee. Discussion within our Subcommittee indicated the document, if it is to reside in Personnel Safety should be less of a checklist and more of a tool to list the items to be considered along with the associated hazards. We will proceed along this line and draft material for the next subcommittee meeting.

In closing, we always welcome new committee members who can participate in any capacity.

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

CHAIRMAN: Does anyone have any questions or comments? At this time, I'd like the voting membership to stand. All in favor of the proposed changes raise your hand. Opposed? The vote to accept the proposed changes to the Recommended Practice for Personnel Safety that were posted on the BLRBAC website was unanimous.

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

No report submitted at this meeting.

5.9 **WASTE STREAMS REPORT** – John Rickard

On October 1, 2007 the Waste Streams Subcommittee met in closed session at 8:00 AM with 13 members and 1 visitor present and in open session at 1 PM with 13 members and 3 visitors present.

We had a question about not allowing steam purging of the CNCG line from the double block and bleed valves to the furnace. After discussion, the guidelines will be revised to allow steam purging, in recognition of the larger recovery boilers and pulp mills being built with the accompanying larger volume of the piping in question. The steam purge will also provide maintenance safety. John Rickard will create this revision

The Executive Committee has commented on three documents and we reviewed those comments. Bentley Sherlock led a review of Chapter 7, Guidelines for Thermal Oxidation of Liquid Waste Streams in Dedicated Burners. John Lewis presented revisions to Chapter 4 to include incineration of the dissolving tank vent gases. Both of those documents will be posted on the web site for voting during the next meeting. Mark Cooper created the third document, a questionnaire to be filled out if someone has an incident with waste stream incineration in a recovery boiler. The questionnaire will be posted on the web site and the Waste Streams Subcommittee would appreciate members using it so we can learn from your experiences and improve our guidelines.

Mark Cooper reviewed the different minimum boiler loads that are used for various waste streams and found that there is good consistency. DNCG requires 30% load and it is the lowest risk waste stream (a "malodorous air" stream). All other streams, CNCG, liquids blended with black liquor, and a waste streams incinerated using a dedicated burner, all require 50% minimum load. The subcommittee believes that these streams can increase complexity so the boiler should be in stable operation at a higher load when these streams are introduced. Also, these streams should be removed from the boiler early as load decreases, to avoid a more difficult operating situation. In the future, if experience shows that the minimum load set points should be changed, the subcommittee will reconsider them.

Hank Beder reviewed the latest revisions to the new Chapter 8, Guidelines For Thermal Oxidation Of Chip Bin NCG. This chapter will review the risks of CBNCG and provides guidance on stand alone CBNCG transport and burning unless the location has a "safe" CBNCG stream, in which case combining it with DNCG is reasonable and the reader can follow the guidance in Chapter 4. Both Chapter 8 and revisions to Chapter 4 will be presented to the Executive committee for review within the next few weeks.

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

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

Membership
Currently, 32 companies participate in the Program including 7 non-AF&PA member companies. The Program members represent nearly 96% of the total production of sulphate pulp in the U. S. There are a few other companies operating recovery boilers that are not in the Program. We will 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 119 mills operating 173 recovery boilers in the U. S. They produce about 40% of the total energy used in the U. S. pulp and paper industry. The average age of the boilers is about 29 years. Over 67% of the boilers were installed prior to 1979.

Explosion Monitor
Mr. Jules Gomni is the new AF&PA explosion monitor. He replaced Rick Spangler who resigned this position. Jules is also the new secretary of the ESP Subcommittee for BLRBAC. Many of us will remember Jules who was the manager of power and recovery support at Weyerhaeuser Company for 25 years prior to his retiring. He also was chairman of the ESP Committee and actively served on AF&PA, TAPPI and BLRBAC committees as well as other industry affiliations.

Operational Safety Seminars
AF&PA is continuing to sponsor three Operational Safety Seminars each year as it has done since 1985. Nearly 2,640 superintendents, supervisors, operators and maintenance personnel have attended the seminars. Three seminars were held during 2007 with a total of 107 attendees from 17 companies and 29 mills. Attendance was up from the previous year. This was the second year that we have had the new format of 1½ day sessions, which included a review and discussion of the AF&PA training material and BLRBAC guidelines in addition to the usual discussion of explosions. One seminar was held in Portland OR and the other two were held in Atlanta. Dr. Tom Grace and Ron Mc Carty are the monitors for discussions with the attendees for actual reported explosions and critical incidents, and the review of the AF&PA and BLRBAC guidelines. Attendees continue to feel that the dialogue among the attendees and monitors is outstanding and most beneficial to all. We plan to have three seminars again in 2008, one in Portland, Oregon and two in Atlanta.

Training Program
The AF&PA Recovery Boiler Training Program for computer-based training (CBT) is available through Power Specialists Associates (PSA)). Information may be found on the AF&PA and PSA websites. PSA can arrange an electronic demonstration at the mills. This has worked very smoothly at the mills that have done this.

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

Recovery Boiler Reference Manuals

The Operation and Maintenance Subcommittee is reviewing the AF&PA Recovery Boiler Reference Manuals to include any possible new information. They are also attempting to put the manuals on to CDs to make them more available at the mills. The Committee expects to complete Volume I of this project by the end of 2007.

Non-Destructive Technologies for Detecting Water-Side Deposits

Under the direction of the R & D Subcommittee, an Advisory Group of representatives from operating, manufacturing and water treatment companies, had been overseeing Phase I of a project researching potential non-destructive technologies for detecting waterside deposits in recovery boiler furnace wall tubes. The Advisory Group prepared an outline with BWXT for Phase II to further investigate several technologies including:

- Laser UT
- Radiography
- Pulsed Thermography
- Heat Flux Measurement.

The members assembled a set of tubes with different deposits that were tested under the supervision of BWXT on several outside providers' instruments. In addition to the four technologies mentioned, the Advisory Group is also investigating the Aptech "Kyushu" and Thermo Tech methods. It is expected that the project will be completed by the end of 2007.

Analysis of Economizer Tube Failures

The Economizer Tube Failures study, which focused on failures related to design and operation, was completed last year and was distributed to each member company's representative and the boiler manufacturers who participated in the study. Phase I dealt with gathering, tabulating and summarizing the available information on economizer failures and evaluating the quality of the data. Phase II dealt with analyzing and interpreting the information obtained. Major causes of failures were identified in relation to design and boiler operation.

The overall objective of the investigation was to understand the causes of recovery boiler economizer tube failures and to identify means for preventing their occurrence. Specific objectives were met in the course of this study.

Guidelines were written to highlight potential issues and questions that should be considered in preparing a product specification, proposal review, purchasing, monitoring of contract execution in both manufacturing and erection, startup and operation. A similar document identifying operating practices believed to be detrimental to economizer integrity, supported by case evidence to the extent possible, was also prepared. The Operation and Maintenance Subcommittee is reviewing this material for inclusion into the AF&PA publications.

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

Study of Superheater Failures

Another study sponsored by AF&PA, similar to the Economizer Tube Failure study, is a study of superheater failures. The objectives are to understand the causes of superheater problems and degraded performance and to develop guidelines for superheater design, maintenance and operation to minimize their occurrence. Phase I covered the investigation of AF&PA, BLRBAC and manufacturers' files, publications, and meetings with the major superheater suppliers and engineering organizations. Key issues were identified and defined. Phase II covered a selective approach to operating installations for the purpose of obtaining specific history on failures and maintenance. In Phase III, the investigators did an in-depth exploration of the key issues and developed conclusions and recommendations that could be derived from the data. Guidelines and suggestions for the design of recovery boiler superheaters to operate at final steam temperatures exceeding those in current operation in the US will be included. The project is expected to be completed by the end of 2007.

Possible TAPPI TIP Sheets

From the recent studies sponsored by AF&PA, the TAPPI Subcommittee is reviewing the possibility of preparing TIP sheets for industry use. The four studies being considered are:

- Floor Tube Study;
- Behavior of Furnace Corners in Explosions;
- Economizer Study;
- Superheater Study.

Other Research Projects Under Review

The Committee is also considering a study for causes of smelt spout cracking and failures on recovery boilers. The objective of this study will be to review the frequency of smelt spout cracking and corrosion; the correlation of spout failures with water-side deposits and other factors; and to prioritize and discuss research needs to achieve the goals.

Several other projects being considered are:

- Potential for improving leak detection technology/implementation;
- Dissolving tank explosions – factors affecting them and ways to reduce them;
- Smelt flow restrictors and burners for opening plugged smelt spouts.

Annual Meetings and Conference

AF&PA's annual Recovery Boiler meetings and Conference were held in Atlanta February 13th and 14th. Attendance and participation was very good. As usual, it was open to all operating companies, insurers, vendors and manufacturers. The presentations included reports on the projects currently sponsored by the AF&PA Recovery Boiler Program and subcommittee reports on their accomplishments, as well as other research being done related to recovery boilers. The objective 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 the 2008 Conference that will be held in Atlanta February 12th and 13th.

7. **NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS REPORT** – George Bynog

   No report at this meeting.

8. **TAPPI RECOVERY BOILER SUBCOMMITTEE OF STEAM & POWER REPORT** – Jim Dickinson

   (See PowerPoint presentation – Appendix B)

9. **WESTERN CANADA BLRBAC REPORT** – Greg Manzulenko

   The spring meeting was held in Prince George, BC, this year at the Ramada Hotel on April 18th and 19th. It was followed up with a mill tour at the Prince George North Pulp Mill, which is owned by the Canfor Corporation. A total of 35 people attended which included mill representation and boiler and equipment manufacturers. Five mills did not send any representation due to mill maintenance shutdowns and one mill had ceased operation due to cost survivor supplies.

   We have completed a review of the submitted incidents with the mills each sharing their viewpoints on those incidents. Again the incidents in Western Canada appear to be head trending down which is a good thing.

   We have introduced the Operating Session, which is sharing of operating information. Again it was a great session with a lot of good discussions. One of the biggest focuses this year is the need for more qualified power engineers. With all the work that is happening in the western provinces, there is a big demand for operating engineers.. Over the next three years there is going to be a requirement for 425 additional operators just for one area alone which is the oil industry. There is a big draw on the pulp industry right now.

   Following the meeting we had a dinner and an update was given on the pulp industry in Western Canada from the North Wood Mill's vice-president of operations. The biggest concern is with the rise in the Canadian dollar, which we all know passed the U.S. dollar here last week. With this sharp increase in exchange there will be more mills closing in Western Canada. The exchange rate is actually harming us quite a bit. For every penny that it goes up, we tend to lose two million dollars.

   The next morning the was a mill tour conducted. The focus of the mill tour was around the recovery boiler and the new installation of auto-spout routers and liquor nozzle cleaners. The vendor who supplied the equipment explained how the development of the equipment was done at the Northwood Pulp Mill. A lot of work was done in getting this equipment to function by both the mill and the vendor. The meeting wound up with some concerns around what mills will be open coming this fall in Western Canada. In the near future there is going to be a lot of changes in Western Canada with the pulp operations.

   Our next meeting is scheduled for Hotel Vancouver in Vancouver, BC. It will be on November 13th and 14th.

10. **ACTIVITIES OUTSIDE NORTH AMERICA REPORTS –**

10.1 Report from Finland – Ouiti Pisto (See PowerPoint presentation – Appendix C)

10.2 Report from Brazil – Submitted by Afonso Pereira after the Main Committee meeting. (See PowerPoint presentation – Appendix D)

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

We had a good session yesterday. We started off with Ouiti's presentation on personnel protective equipment after the ESP subcommittee session ended and we got started in the Operating Problems Session with about 175 people present.

We started off with a test. I thought it was a pretty good way to get started and to get people talking. I think people realized that they thought they knew more than they did! We had 31 questions submitted. I appreciate all the questions and those of you who offered your experiences in response. There were a lot of good ones in there. They ranged from water side inspections to rapid drain valve tests and when to test your ESP system.

(See Protective Clothing PowerPoint presentation – Appendix E)

CHAIRMAN'S CLOSING COMMENTS:

NEXT MEETING: April 7, 8 & 9, 2008, at the Crowne Plaza Hotel, Atlanta GA.

ADJOURNMENT: Are there any other questions or comments the membership would like to discuss? If not, can I have a motion to adjourn the meeting? Second? Those in favor? The meeting is adjourned. Everyone have a safe trip home.

TECHNICAL SESSION:

"Low Pressure Sootblowing Technology"
presented by Danny Tandra, Ph.D. of Clyde Bergemann, Inc

"Electrical Power Supplies for Precipitators"
presented by Al Johnson of AirTek

Appendix A Recovery Unit Incidents Summary – Fall 2007

ESP - NO LEAK

FALL 2007 - 1	
Location:	International Paper, Prattville, AL
Unit:	#2 RB, Alstom/CE Contract CE 20278; 2-drum Large Econ; Start-up 1980
Size:	3.2 MM lb ds/day; 506,000 lb/hr steam at 1500 psig, 900°F, 1740 psig Design
Incident Date:	May 6, 2007
Leak/Incident Loc:	**ESP - No Leak**
Downtime hrs, leak/total:	36:40 hrs / 37:20 hrs
ESP?	YES
Classification:	**ESP - No Leak**
How discovered:	**Panel**: Erratic furnace pressure, Leak detector alarm on decreasing PO4 ; then on walkdown heard steam leak
Leak detection:	Hercules Leak Trac (chemical loss)
Sequence of events:	Panel showed Erratic furnace pressure swings, Leak detector alarm; then on walkdown on 7th floor heard steam leak; gave ESP order to control room. ESP went all OK. Hydro found no leak. Inspection found 400# condensate trap blowing through.
Bed cooling enhanc	No
Wash adjacent tube:	No
Repair procedure:	Cleaned plugged furnace pressure taps; Replaced condensate trap; Replace reagent bottle
Root cause:	Plugged draft taps; Blown condensate trap; Leaking & split reagent bottle
Future prevention:	Crosscheck LeakTrac system and readings
Last full inspection:	?

ECONOMIZERS

FALL 2007 - 2	
Location:	**International Paper, Texarkana, TX**
Unit:	B&W Contract PR-144, 2-drum Large Econ, Start-up 1972; Revamp 1985
Size:	2.6 MM lb ds/day; 408,000 lb/hr steam at 650 psig, 750°F, 775 psig design
Incident Date:	February 12, 2007
Leak/Incident Loc:	**Economizer** - Hand hole cap, primary economizer, lower-center header, RHSW end cap
Downtime hrs, leak/total:	27.5 hrs
ESP?	No
Classification:	**Non-Critical**
How discovered:	**Walkdown**: Operator found water in hopper
Leak detection:	None
Sequence of events:	Operator found water in hopper after having trouble unplugging it. Confirmed not soot blower leak. Confirmed leak couldn't enter furnace. Performed orderly shut down and bed burn-out.
Bed cooling enhanc	No
Wash adjacent tube:	No
Repair procedure:	Gouged out old cap, repair seat and weld in new cap**.**
Root cause:	Bad weld
Future prevention:	NA
Last full inspection:	April 2006

Appendix A Recovery Unit Incidents Summary – Fall 2007

ECONOMIZERS

FALL 2007 - 3	
Location:	**International Paper, Ticonderoga, NY**
Unit:	#1 RB, B&W Contract 523-0131, 2-drum Large Econ, Start-up 1969; Econ start-up 1981
Size:	2.01 MM lb ds/day; 300,000 lb/hr steam at 875 psig, 825°F, 975 psig design
Incident Date:	March 16, 2007
Leak/Incident Loc:	**Economizer** -tube 3, row 2, (jvg) upper header 7
Downtime hrs, leak/total:	0/0 hrs for lost time; (33:15 hrs for cool down and repair)
ESP?	No
Classification:	**Non-Critical**
How discovered:	**Walk down** during power outage shutdown, operator saw pink ash in ash hopper
Leak detection:	No
Sequence of events:	16Mar07-06:30 Unit shut down due to mill power failure. 07:30 During walk down, operator saw pink ash in ash hopper. Leak located tube 3 row 2. Confirmed leak couldn't enter furnace. Cooled unit. Repair started 3/17/07-10:00. Completed 16:45. No hydro due to existing smelt bed.
Bed cooling enhanc	No
Wash adjacent tube:	No
Repair procedure:	Removing the tube and plugging it at the top and bottom header (see procedure on sketch encl).
Root cause:	Possible thermal cycling fatigue Only minor OD salt cake corrosion & minor ID pitting. Some history of similar location failures.
Future prevention:	Frequent inspection
Last full inspection:	2006

ECONOMIZERS

FALL 2007 - 4	
Location:	**Domtar (was Weyerhaeuser) Johnsonburg PA**
Unit:	#1 RB, Tampella Contract 90132, **1-Drum** Large Econ, Start-up 1993
Size:	2.8 MM lb ds/day; 400,000 lb/hr steam at 1250 psig, 900°F, 1600 psig design
Incident Date:	April 6, 2007
Leak/Incident Loc:	**Economizer** - Weld crack at tube-to-extruded bottle header, bottom inlet, platen 1, tube 7
Downtime hrs, leak/total:	27.25 hrs/27.25 hrs
ESP?	No
Classification:	**Non-Critical**
How discovered:	**Walk down**: Operator found wet ash in econ hopper.
Leak detection:	No
Sequence of events:	6Apr07-14:15 On walk down, operator saw water in ash hopper rotary valve. Did orderly shut down. 16:40 liquor out. 20:00 bed burned out. 7Apr07-01:30 cool down done. 05:30 water wash done. 07:30 lockout and 1st inspection done. 09:00 unit drained and locked out. 10:05 repair done. 11:50 good hydro done. 14:30 first fire. 19:55 on liquor.
Bed cooling enhanc	No
Wash adjacent tube:	No
Repair procedure:	Grind out defect and weld patch over crack.
Root cause:	Stress corrosion fatigue cracking due to tube length thermal expansion and cantilever effect of sloped portion of tube. Extensive 7-year history of similar failures
Future prevention:	-
Last full inspection:	April 2006

Appendix A Recovery Unit Incidents Summary – Fall 2007

ECONOMIZERS

FALL 2007 - 5	
Location:	**Domtar (was Weyerhaeuser) Johnsonburg PA**
Unit:	#1 RB, Tampella Contract 90132, **1-Drum** Large Econ, Start-up 1993
Size:	2.8 MM lb ds/day; 400,000 lb/hr steam at 1250 psig, 900°F, 1600 psig design
Incident Date:	August 20, 2007
Leak/Incident Loc:	**Economizer** - 4 Weld cracks at tube-to-extruded bottle headers, bottom inlet, **#1.** platen 28, tube 3; **#2.** platen 29, tube 2; **#3.** platen 31, tube 1; **#4.** platen 35, tube 1; each after previous hydro.
Downtime hrs, leak/total:	41.5 hrs/41.5 hrs
ESP?	No
Classification:	**Non-Critical**
How discovered:	**Walk down**: Operator found wet ash in econ hopper.
Leak detection:	No
Sequence of events:	20Aug07-08:30 On walk down, operator saw water in ash hopper rotary valve. Did orderly shut down. 11:30 liquor out. 14:40 bed burned out, cool down done, water wash done. 21Aug07- lockout and 1st inspection done, unit drained and locked out. 05:45 repair done. Hydro found 2nd leak. Repair done. Hydro found 3d leak. Repair done. Hydro found 4th leak. Repair done. 20:00 good hydro done. 22:30 first fire. 22Aug07 05:00 on liquor.
Bed cooling enhanc	No
Wash adjacent tube:	No
Repair procedure:	Grind out defect and weld repair.
Root cause:	Poor shop welds and Stress corrosion fatigue cracking due to tube length thermal expansion and cantilever effect of sloped portion of tube. Extensive 7-year history of similar failures
Future prevention:	-
Last full inspection:	May 2007

ECONOMIZERS

FALL 2007 - 6	
Location:	**Thilmany LLC, Kaukauna, WI**
Unit:	#8 RB, B&W Contract S-9759, 2-drum Small Econ Tubular Air Htr, Start-up 1952; Lucy Boiler Start-up 1982
Size:	**.**750 MM lb ds/day, 128,000 lb/hr steam at 600 psig, 700°F, 650 psig design
Incident Date:	April 7, 2007
Leak/Incident Loc:	**Economizer** - 1/8"crack in left side 6th wall tube-to-buckstay attachment above air htr chamber; tube pulled away.
Downtime hrs, leak/total:	28.5 hrs/31 hrs
ESP?	No
Classification:	**Non-Critical**
How discovered:	**Inspection due to soot blower failure**: Foreman inspection found water running down the wal
Leak detection:	No
Sequence of events:	7Apr07-08:30 Due to broken #12 air htr soot blower, pulled liquor for repair; 11:00 shift foreman inspection found water running down the wall & hard salt cake build-up on wall by soot blower, causing the soot blower mechanical damage.
Bed cooling enhanc	No
Wash adjacent tube:	No
Repair procedure:	Ground out, pad welded the tube and then reattached tube back to the buckstay
Root cause:	Fatigue stress at tube-to-buckstay weld attachment from poor design. Some 8-year history of similar failures
Future prevention:	Alerted crews to potential for this repeat sequence of events. Known that steam/water balance doesn't always indicate problem. Procedures to immediately look for salt cake buildup and leaks with all air heater soot blower issues
Last full inspection:	10/06

Appendix A Recovery Unit Incidents Summary – Fall 2007

ECONOMIZERS

FALL 2007 - 7	
Location:	**Thilmany LLC, Kaukauna, WI**
Unit:	#8 RB, B&W Contract S-9759, 2-drum Small Econ Tubular Air Htr, Start-up 1952; Lucy Boiler Start-up 1982
Size:	**.**750 MM lb ds/day, 128,000 lb/hr steam at 600 psig, 700°F, 650 psig design
Incident Date:	April 19, 2007
Leak/Incident Loc:	**Economizer** - 3/4" crack above previous pad weld repair, 8 tubes from left side, just above lower header.
Downtime hrs, leak/total:	-/48 hrs
ESP?	No
Classification:	**Non-Critical**
How discovered:	**Walk down**. Operator found wet ash in upper boiler ash hopper.
Leak detection:	No
Sequence of events:	19Apr07-11:00 During walk down, assistant operator saw water in upper left side boiler ash hopper. Orderly shut down started. Liquor pulled. Bed burned down. Inspection of economizer through doors revealed obvious tube leak. When bed was gone, load lowered to minimum 30,000 lb/hr. Economizer bypassed, isolated, and drained, as per Oct 06 modification. Liquor back in 16:00. Ongoing operation required to offset # 10 recovery being down for maintenance
Bed cooling enhanc	No
Wash adjacent tube:	No
Repair procedure:	Will be pad welded or tube will be plugged when #10 unit back on line and this unit shut down.
Root cause:	Fatigue. Some history of 28 failures over 8 years. Two rows already plugged.
Future prevention:	Working with B&W, a bypass piping arrangement was installed around the economizer for isolation, with liquor load restrictions to control exit flue gas temperature to precipitator.
Last full inspection:	10/06

ECONOMIZERS

FALL 2007 - 8	
Location:	**International Paper, Riverdale Mill, Selma, Alabama**
Unit:	#1 RB, B&W Contract PR-98, 2-drum Large Econ, Start-up 1966; B&W/Turner Econ 1997
Size:	1.4 MM lb ds/day, 290,000 lb/hr steam at 650 psig, 760°F; 725 psig Design
Incident Date:	April 23, 2007
Leak/Incident Loc:	**Economizer** - 1/8" rounded hole, not a crack, outside tube, econ front pass, left side, 4" above lower header, 1" above tube-to-header weld line, in straight run
Downtime hrs, leak/total:	25.0 hrs
ESP?	No
Classification:	**Non-Critical**
How discovered:	**Walk down**: Helper heard new hissing sound.
Leak detection:	No
Sequence of events:	23Apr07 noon During walk down, helper heard new hissing sound. Inspected furnace but no visible leak. During later walk down, water was found in economizer ash hopper. 15:30 pulled liquor. 17:30 all liquor out. Burned bed down. 22:00 pulled fire. Removed casing to locate leak. Cooled unit with fans. Drained unit. 24Apr made repairs. Hydro OK. 17:50 fired unit up.
Bed cooling enhanc	No
Wash adjacent tube:	No
Repair procedure:	Temporary: ground out defect and welded back using heliarc. Permanent: Annual outage in 3 weeks; took tube out of service, capped it, and plugged both headers.
Root cause:	Likely result of damage from 1997 installation; no thinning, no erosion or corrosion. Isolated case.
Future prevention:	Appears to be isolated case.
Last full inspection:	April 2006

Appendix A Recovery Unit Incidents Summary – Fall 2007

ECONOMIZERS

FALL 2007 - 9	
Location:	**Longview Fibre, Longview WA**
Unit:	#22, Alstom ABB-CE Contract 89102, **One Drum**, Large Econ, Start-up 1992.
Size:	3.7 MM lb ds/day, 623,000 lb/hr steam at 800 psig, 750°F, 1065 psig design
Incident Date:	June 19, 2007
Leak/Incident Loc:	**Economizer** - Pin-hole leak in hand hole plug at lower right side economizer inlet feedwater header.
Downtime hrs, leak/total:	46 hrs
ESP?	No
Classification:	**Non-Critical**
How discovered:	**Walk down**. Helper saw wet ash in ash hopper at rotolock
Leak detection:	**YES**, Hercules, but didn't detect leak
Sequence of events:	19Jun07 11:30 During walk down, helper saw wet ash in ash hopper at rotolock, below header closest to generating bank, on right side. Dry in gen bank hopper, so no ESP needed. Inspection confirmed leak location, only local moisture. Started up #19 unit (20 hour delay) with hourly check on leak status. Took #22 unit down. Inspection confirmed the leak was at a hand hole or PT plug and was very small - more of a mist than a stream of water. After isolating the water side and flue gas side the repair was made.
Bed cooling enhanc	No
Wash adjacent tube:	No
Repair procedure:	Grind out and re weld, followed by a ndt inspection.
Root cause:	Age: Washed out weld on hand hole, Furnace is 14 years old
Future prevention:	During the next annual we will inspect all hand holds and PV plugs. Some history of hand holes leaks on the economizer feed headers.
Last full inspection:	-

ECONOMIZERS

FALL 2007 - 10	
Location:	**Verso Paper, Jay, ME** (was IP)
Unit:	#1 RB, CE, 2-drum Large Econ retrofit CE Contract DE-0193, Start-up 1965, Econ 1986
Size:	2.35 MM lb ds/day, 296,000 lb/hr steam at 900 psig, 825°F, 1000 psig design
Incident Date:	June 1, 2007
Leak/Incident Loc:	**Economize**r - ¼" circumferential crack at tube 34 row 5, 2" above bottom header of the long flow economizer; washed two additional tube leaks Pinhole tube 33 row 5; Tear tube 31 row 6.
Downtime hrs, leak/total:	32 hrs/32 hrs
ESP?	No
Classification:	**Non-Critical**
How discovered:	**Operating Panel**: loss of steam drum level and heard leak
Leak detection:	No
Sequence of events:	1Jun07 02:48 Drum level dropped and started swinging between -6 and +3. Steaming rate was constant, feedwater flow was swinging along with drum level. 03:20 checked feedwater control valve, walk down boiler, heard leak coming from bottom of long econ. Pulled liquor and burned down bed. 03:50 Oil fire tripped due to erratic drum level. Took unit down and did repairs, dye pen, and hydro. 2Jun07 04:20 Tube plug installation complete. 05:20 first fire.
Bed cooling enhanc	No
Wash adjacent tube:	**YES.** This leak washed two adjacent tubes causing a 1/16" pinhole in one tube and a 1" by 3" tear in the other tube.
Repair procedure:	Tubes were cut off and plugged at top and bottom headers. The welds were dye penetrate tested and the boiler was hydrostatic tested before returning to service.
Root cause:	Internal pitting (suspect O2 pitting) propagated into circumferential crack. Believe expansion/contraction stresses on the straight tubes between the top and bottom long flow economizer headers contribute to crack development..
Future prevention:	Investigation ongoing. Similar failure 10Jul03, one leak & one washed tube.
Last full inspection:	April 2007

Appendix A Recovery Unit Incidents Summary – Fall 2007

ECONOMIZERS

FALL 2007 - 11	
Location:	**Appleton, Roaring Springs, PA**
Unit:	#3 RB, B&W Contract PR-204; 2-drum Large Econ; Start-up 1983
Size:	**.**811 MM lb ds/day; 117,800 lb/hr steam at 580 psig, 725°F, 725 psig Design
Incident Date:	June 17, 2007
Leak/Incident Loc:	**Economizer** - 1/16" pinhole or small crack; Roughly ½" above the tube to header weld in the lower economizer header closest to generating bank; Leaks between tube rows #4 and #5. middle tube washed hole into upper tube; 1st row on east side of economizer (RHSW)
Downtime hrs, leak/total:	28 hrs/**.**75 hrs?
ESP?	No
Classification:	**Non-Critical**
How discovered:	**Walkdown**: Operator found water on rodding bar and hopper sidewall while doing routine clearing of hopper
Leak detection:	No
Sequence of events:	Operator found water on rodding bar and hopper sidewall while doing routine clearing of hopper Water flow continued intermittently even after black liquor sluice media was valved out. All other saltcake hoppers were closely inspected by several employees and revealed no further indications of a tube leak. Unit was firing black liquor normally with no auxiliary fuel. Unit shut down orderly. Lower economizer access doors, insulation, lagging, and casing were removed to expose failures. After repairs, Hydro was performed and lower economizer doors, casing, insulation, and lagging were re-installed.
Bed cooling enhanc	No
Wash adjacent tube:	**Yes**. Middle tube washed upper tube to leak
Repair procedure:	Failures were ground-out, weld repaired with 7018A1 rod, and NDE checking using magnetic particle and UT testing procedures.
Root cause:	Stress assisted corrosion. Suspect old vibration stress from years ago.
Future prevention:	Continue to watch DA tank pressure and temperature controls to insure feedwater inlet temperatures into the economizer maintain at least 250 degF. Soon after PR Unit was started-up by B&W Service in early 1983, seven upper economizer tube-to-header welds failed (from April 1984 through April 1985). During that time frame, failures were linked to "Vibration Fatigue". Anti-vibration bars were designed and installed by B&W in June 1985. Similar tube leaks near an economizer header (upper or lower) occurred in Feb. 1998, March 1998, July 1998, Dec. 1999, and Sept. 2004.
Last full inspection:	May 2007

Appendix A Recovery Unit Incidents Summary – Fall 2007

ECONOMIZERS

FALL 2007 - 12	
Location:	**Appleton, Roaring Springs, PA**
Unit:	#3 RB, B&W Contract PR-204; 2-drum Large Econ; Start-up 1983
Size:	**.**811 MM lb ds/day; 117,800 lb/hr steam at 580 psig, 725°F, 725 psig Design
Incident Date:	June 28, 2007
Leak/Incident Loc:	**Economizer** - 1/16" pinhole or small crack; Roughly ½" above the tube to header weld in the lower economizer header closest to **ID Fan** inlet; Leaks between tube r**ows #10 and #11**. middle tube washed hole into upper tube; 12tht row from east side of economizer (RHSW)
Downtime hrs, leak/total:	37 hrs/**.**70 hrs?
ESP?	No
Classification:	**Non-Critical**
How discovered:	**Walkdown**: Operator found water on rodding bar and hopper sidewall while doing routine clearing of hopper
Leak detection:	No
Sequence of events:	Operator found water on rodding bar and hopper sidewall while doing routine clearing of hopper Water flow continued intermittently even after black liquor sluice media was valved out. All other saltcake hoppers were closely inspected by several employees and revealed no further indications of a tube leak. Unit was firing black liquor normally with no auxiliary fuel. Unit shut down orderly. Lower economizer access doors, insulation, lagging, and casing were removed to expose failures. After repairs, Hydro was performed and lower economizer doors, casing, insulation, and lagging were re-installed.
Bed cooling enhanc	No
Wash adjacent tube:	**Yes** - Middle tube washed upper tube to leak
Repair procedure:	Failures were ground-out, weld repaired with 7018A1 rod, and NDE checking using magnetic particle and UT testing procedures.
Root cause:	Stress assisted corrosion. Suspect old vibration stress from years ago.
Future prevention:	Continue to watch DA tank pressure and temperature controls to insure feedwater inlet temperatures into the economizer maintain at least 250 degF. Soon after PR Unit was started-up by B&W Service in early 1983, seven upper economizer tube-to-header welds failed (from April 1984 through April 1985). During that time frame, failures were linked to "Vibration Fatigue". Anti-vibration bars were designed and installed by B&W in June 1985. Similar tube leaks near an economizer header (upper or lower) occurred in Feb. 1998, March 1998, July 1998, Dec. 1999, Sept. 2004, and June 17, 2007 (11 days ago).
Last full inspection:	May 2007

Appendix A Recovery Unit Incidents Summary – Fall 2007

ECONOMIZERS

FALL 2007 - 13	
Location:	**International Paper, Vicksburg, MS**
Unit:	#1 RB, B&W Contract PR-105 (524-0105), 2-drum, Econ with DCE, Start-up 1967
Size:	3.0 MM lb ds/day, 500,000 lb/hr steam at 1000 psig, 825°F, 1200 psig Design
Incident Date:	July 10, 2007
Leak/Incident Loc:	**Economizer** - 1/16 pin hole in Hand Hole cap on upper economize header external of the boiler, on the back side of the economizer (rear) on the far North header
Downtime hrs, leak/total:	15 hrs
ESP?	No
Classification:	**Non-Critical -** leak outside casing
How discovered:	**Walk Down**: Operator saw steam coming out from boiler roof over the economizer
Leak detection:	No
Sequence of events:	Operator saw steam coming out from under the insulation on Recovery boiler roof over the economizer section. Boiler was steaming 500,000 lb/hr @ 1000 psi. No abnormal conditions and everything was normal on the boiler. After leak was found we ran 2 1/2 days while we coordinated the boiler repair folks, lowered the bed size, got on light weights on the Paper machine, Lined up NDT company, Etc. Leak was not bad and it was watched during that time to see if it was getting worse. It did not. There was no chance for water to enter the boiler, since the top of the upper headers are outside the casing.
Bed cooling enhanc	No
Wash adjacent tube:	No
Repair procedure:	Ground out and weld repair
Root cause:	Appears to have been a thin weld area where the welder had his start/stop point
Future prevention:	4 Handhole cap leaks in last 2 years
Last full inspection:	Feb 2007

ECONOMIZERS

FALL 2007 - 14	
Location:	**SSCC (Smurfit), Fernandina Beach, FL**
Unit:	#4 RB, B&W Contract PR-126, 2-drum Large Econ, Star-up 1970. New Econ 2004
Size:	3.00 MM lb ds/day; 495,700 lb/hr steam at 875 psig, 825°F, 1000 psig Design
Incident Date:	September 3, 2007
Leak/Incident Loc:	**Economizer** - Crack in weld of lower economizer hand-hole cap. The crack was about ¼ of the circumference of the cap. 6th floor (107 ft) – located 4th row and 3rd lower header of the economizer. Located over the ID fan
Downtime hrs, leak/total:	27 hr steam; 32.43 hrs liquor
ESP?	No
Classification:	**Non-Critical**
How discovered:	**Walk down**. Operator noticed water coming from the ID fan housing drain on normal round.
Leak detection:	**YES**. NALCO RBLI, , did NOT provide initial detection.
Sequence of events:	During his normal round, the operator noticed that water was coming out of the ID fan housing drain. The operator checked the drain and made sure it was unplugged. The operator checked the economizer hopper which was dry. The bed was burned out and the boiler was taken off line
Bed cooling enhanc	No
Wash adjacent tube:	No
Repair procedure:	The crack was ground out. The hand-hole cap was re-welded
Root cause:	Lack of penetration in the weld; (porosity?)
Future prevention:	Upon visual inspection, the weld had a lack of porosity. This hand-hole cap was replaced in March 2006. There have been several failures in the welds in the hand-hole caps on this unit. This economizer was installed in 2004. All the hand-hole caps have been replaced in either the 2006 (6 replaced) and 2007 (20 replaced) outages. The failure and future actions are being investigated by a team including mill and OEM personnel.
Last full inspection:	Mar 2007

Appendix A Recovery Unit Incidents Summary – Fall 2007

SUPERHEATERS

FALL 2007 - 15	
Location:	**Weyerhaeuser Co, Grande Prairie, AB**
Unit:	CE Contract CA-70129, 2-drum Large Econ, Start-up 1973
Size:	4.s MM lb ds/day, 670,000 lb/hr steam at 900 psig, 800°F, 1050 psig Design
Incident Date:	March 13, 2007
Leak/Incident Loc:	Superheater - Leak was a 2 inch crack on a superheater tube, approx. 8 inches above roof tubes at high crown fillet seal weld where the tube passes through the crown seal into the penthouse.
Downtime hrs, leak/total:	55hrs
ESP?	No
Classification:	**Non-Critical**
How discovered:	**Control Board**: Trending separation of steam and water started investigation. Boiler was taken down for water wash and inspection. No leaks were evident. Boiler was then hydroed to 900 psi prior to water and water was seen on superheater and appeared to be coming from above the roof tube
Leak detection:	No
Sequence of events:	Steam and water differential separating slowly. Boiler also showed signs of increased plugging. Checked chemical concentrations and walked boiler down numerous times to determine if a leak existed. Went off liquor and continued to look for leak, none was found. Prior to washing used thermography to try and find leak location. Leak could not be found. Hydro'ed the boiler to 900 psi and discovered water running out of roof above roof tubes. Proceeded with water wash and repair.
Bed cooling enhanc	No
Wash adjacent tube:	No
Repair procedure:	Ground crack out and repaired using procedure B1-1-1 to repair tube. Crack was welded using GTAW
Root cause:	Weld defect in crown seal fillet weld at crown seal that penetrated and cracked into superheater tube
Future prevention:	No similar failures. Boiler is shut down and retired.
Last full inspection:	April 2006

SUPERHEATERS

FALL 2007 - 16	
Location:	**Interstate Paper, Riceboro, GA**
Unit:	#21996, B&W Contract PR-099, 2-drum Small Econ, Direct contact cyclone, Start-up 1968
Size:	1.4 MM ld ds/day, 219,000 lb/hr steam at 600 psig, 760°F, 725 psig Design
Incident Date:	March 19, 2007
Leak/Incident Loc:	Superheater - 3" circumferential crack extending 180 degree around the superheater tube, adjacent to "D" lug weld; **3rd** (**4th**?) superheater pendant from right wall, 4th tube into pendant toward the steam drum, "D" lug attachment approximately 3' from the roof.
Downtime hrs, leak/total:	51 hrs/51 hrs
ESP?	YES - All functioned OK except for inadvertent tertiary fan shutdown. Did 12 hr evacuate.
Classification:	**Non-Critical**
How discovered:	**Walk down**: Operator heard dull noise in generating bank ash hopper. No leak indications in the control room: draft, feedwater/steam flow, ID fan amps and boiler water tests were normal.
Leak detection:	No
Sequence of events:	18Mar During walkdown, operator heard dull noise in generating bank ash hopper. There were no leak indications in the control room: draft, feedwater/steam flow, ID fan amps and boiler water tests were normal. Several doors were opened and noise location could not be identified. Condition was monitored. 19Mar: when same shift returned approximately 20 hours later; "the noise was definitely louder". 07:41 Boiler was ESP'd. Safe perimeter set up. Bed monitored with TC's and infrared gun until <800F. Boiler hydro'd, leak found. Waterwash SH area, install scaffold. Re-hydro after repair.
Bed cooling enhanc	No
Wash adjacent tube:	UT was done on adjacent tubes. Some thinning but no repairs.
Repair procedure:	remove 'D' lug, grind out 3" horizontal crack, dye penetrant, weld overlay
Root cause:	Suspect fatigue crack at "D" lug weld to SH tube - original 40-yr-old SH
Future prevention:	June 2007 did thorough visual and dye penetrant inspection of "D" lugs. Approximately 15 indications were ground out or repaired.
Last full inspection:	June 2007 (after incident), but ~2002 for SH visual; 1998 last scaffolding for SH UT

Appendix A Recovery Unit Incidents Summary – Fall 2007

BOILERS

FALL 2007 - 17	
Location:	**AV Nackawic, Nackawic NB**
Unit:	B&W London Contract 471-4444, 2-drum Large Econ/ Direct contact cyclone, Start-up 1969
Size:	2.7 MM lb ds/day, 350,000 lb/hr steam at 900 psif, 750°F; 1000 psig Design
Incident Date:	March 9, 2007
Leak/Incident Loc:	**Boiler**. ¾" stress crack, mainly circumferential, on the north tube adjacent to # 11 sootblower wall box, located in the top of the boiler bank front cavity.
Downtime hrs, leak/total:	37.25 hrs
ESP?	No
Classification:	**Critical Incident # 680**
How discovered:	**Walk down**. Field Operator noticed some steam blowing around the wall box and some water on the buckstay under the #11 sootblower serving the upper front boiler bank.
Leak detection:	No
Sequence of events:	9Mar 10:35 During walk down, field operator noticed some steam blowing around the wall box and some water on the buckstay under the #11 sootblower serving the upper front boiler bank. Sup't checked the area, isolated the soot blower system (since use sat'd steam), but still saw water. Evacuated area, check steam/water balance, furnace draft/ furnace conditions, boiler water residuals (all normal), and initiated a normal shutdown of the boiler, while maintaining a higher that normal draft and hot furnace bottom. 11:10 liquor off. Burned out bed. 20:10 oil off. Removed #11 sootblower. Through the wall box sleeve could see steam blowing up across the blower opening from about the 5 o'clock position. Confirmed small stress crack leak. Smelt still covering approx. 1/3 of floor. Primary air increased to cool smelt pool a bit faster. Boiler monitored for any signs of water coming into the furnace. Furnace draft increased more attempting to pull any moisture to the rear of the boiler. All indications were that the leak was small, and while monitoring all conditions there was nothing to indicate that water was entering the furnace. The boiler conditions were monitored closely until the boiler was down and cool, as the plan was to initiate an ESP should any condition out of the ordinary arise.
Bed cooling enhanc	No
Wash adjacent tube:	No
Repair procedure:	Ground out the crack, pressure tested successfully to 850psi; held the pressure on the boiler for approx. 1 hour 20 min., checked the boiler down thoroughly and no leaks were found.
Root cause:	Likely stress crack from the membrane propagated into the tube. Some years ago membrane in the wall box areas were split up into sections to eliminate similar stress cracking leaks (~ 1990?).
Future prevention:	Will check all sootblower wall box areas during our upcoming April 07 shutdown
Last full inspection:	Complete 2003 – Routine in Sept 2004 – Some NDT testing also done fall of 2006

Appendix A Recovery Unit Incidents Summary – Fall 2007

BOILERS

FALL 2007 - 18	
Location:	**Verso Paper, Jay, ME** (was IP)
Unit:	#1 RB, CE Contract 2564, 2-drum Large Econ retrofit Tampella Contract DE-0193, Lower Furnace: Kvaerner/Gotaverken; Orig Start-up 1965, LwrFurn 1986; Econ 1986
Size:	2.35 MM lb ds/day, 296,000 lb/hr steam at 900 psig, 825°F, 1000 psig design
Incident Date:	April 25, 2007
Leak/Incident Loc:	**Boiler bank**. Major rupture. 6" by 2" window opening in tube. Approx 6 feet above mud drum. Cold side of generating bank, first row (right boiler sidewall - Gotaverken), tube number 8
Downtime hrs, leak/total:	45 hrs/45 hrs
ESP?	**YES**. The primary and secondary booster fans tripped on high furnace pressure (1st out) at 14:52:14 and therefore did not remain running after the ESP. #5 sootblower did not retract due to a blown fuse.
Classification:	**Critical Incident # 681**
How discovered:	**Panel**: Flame Failure & High Furnace Pressure Alarm; **Walk down**: Heard rupture; called in ESP
Leak detection:	No
Sequence of events:	25Apr07, 14:52:07 Control room operator received furnace high pressure alarm. Turned around to look and the drum was empty. At the same time operator on the floor heard the leak occur and saw the boiler going positive. He yelled over the P.A. system to ESP #1RB. 14:52:26 Control room operator ESP'ed the boiler. Evacuate. After the 4 hour wait period, boiler was inspected to find the leak location. Determined the leak originated somewhere in cold side of generating bank near right wall, not far from the top of the mud drum, seeing the areas that appeared to have been washed by the water from the leak. Exact location was not identified. Bed cooling began at 2200 with CO2 and Soda Ash. 26Apr07 1200 - Highest bed temp thermocouple probe was 420°F. The suspected area of the leak was staged and inspected but exact location still not identified. 15:00 Began to backfill the boiler. 16:00 leak found at first row along right wall tube number 8 counting from cold side. 18:00 Contractor began work to plug leaking tube and 3 adjacent tubes (row 2, tubes 7,8, and 9) that were bowed 3-4" out of plane due to the pressure from the leak. 27Apr07 00:01 Boiler backfilled 02: 25 Had a dry hydro. 05:10 First fire. 12:00 Liquor fire.
Bed cooling enhanc	**Yes**. CO2 Injection and Soda Ash. Credit 2 - 3 days saving
Wash adjacent tube:	No; but bent from impact and/or heat warpage
Repair procedure:	Plugs installed in mud and steam drum for the leaking tube and 3 adjacent tubes (row 2, tubes 7,8, and 9) that were bowed 3-4" due to water impingement from the ruptured tube
Root cause:	Possible steam impingement from near-by sootblower; or near-by tube failure
Future prevention:	Currently there are steam traps and bypass orifice plates with the drain cracked open to the floor to evacuate all condensate from the sootblower steam header. Modifications to the wallbox sleeves will be investigated to further protect the first row of tubes at sootblower openings. One leak in November, 2006 due to sootblower impingement in the "old" economizer section of the boiler
Last full inspection:	April 2007

Appendix A Recovery Unit Incidents Summary – Fall 2007

BOILERS

FALL 2007 - 19	
Location:	**Marathon Pulp Inc., Marathon, ON**
Unit:	#4 RB, B&W Contract 7386; 2-drum Large Econ; Start-up 1978; (JRMaR3 Alstom rebld lwr furn 1992)
Size:	2.2 MM lb ds/day, 330,000 lb/hr steam at 680 psig, 750°F; 750 psig Design
Incident Date:	April 20, 2007
Leak/Incident Loc:	**Boiler**. Side wall; ½ inch long crack on an upper forward lane sootblower wallbox attachment weld, at #7 IK on the 10th floor approximately 136 feet above the floor, .
Downtime hrs, leak/total:	N/A since starting shutdown; (over 40 hrs)
ESP?	**YES**. 1st ever! All worked well. Measured water level with tygon tubing.
Classification:	**Critical Incident # 682**
How discovered:	**Walk down**. Operator noticed water dripping down outside of the boiler casing on the 8th floor
Leak detection:	No
Sequence of events:	**20Apr07** 03:20 Unit in shutdown mode for 2-week outage. On oil and reduced liquor. 08:10 Operator reported water dripping from the casing on the 8th floor. Area inspected. Pulled more liquor. Confirmed leak near #17 IK, 9th floor. Pulled all liquor; only on oil, Cleared perimeter of shutdown personnel. ESP test had been scheduled, so now wanted to prepare for a real one. 08:27 Did ESP. Followed post-ESP Procedures, including 8-hr vacate. 16:15 Did complete inspection. 17:30 Reset ESP. 19:10 Started FD fan for cooling. Monitored bed temps. **21Apr07** 02:15 Filled boiler to locate leak at wall box. 06:30 Began water wash
Bed cooling enhanc	No. Note: Tygon tubing used to monitor hearth water level
Wash adjacent tube:	No
Repair procedure:	All generating bank sidewall tubes were changed out during the outage, as previously scheduled.
Root cause:	Weld cracked likely from fatigue or SAC (stress-assisted corrosion) over 29 years of service
Future prevention:	All generating bank sidewall tubes were changed out during the outage as previously scheduled. New design minimizes attachment weld to tube
Last full inspection:	Oct 2006

Appendix A Recovery Unit Incidents Summary – Fall 2007

SCREEN

FALL 2007 - 20	
Location:	**SSCC (Smurfit Stone Container), Fernandina Beach, FL**
Unit:	#5 RB, B&W Contract PR-189, 2-drum Large Econ, Start-up 1978
Size:	3.0 MM lb ds/day, 495,700 lb/hr steam at 870 psig, 800°F, 1000 psig Design
Incident Date:	July 11, 2007 (Lucky 7-11-07)
Leak/Incident Loc:	**FURNACE SCREEN**. (And Superheater) 1 inch crack in Screen tube at T&G link weld, ¼ inch pinhole in Superheater tube at T&G link inside female groove, two ¼ inch holes resulting from wastage on the screen tube; all at 9th floor, 132 ft elev., midway up superheater; Screen platen #8, SH platen # 15. The ¼" leak was at the bottom of a 1.5"x1.5" overlay pad from an old repair. Below the leak there was a mechanical wear about 1 inch long where the tongue of the male part on the screen tube wore into the superheater tube. There was also a ¾ inch crack running tangential of the top weld of the male part of the T&G link on the screen tube. This may have been caused from the stress from the link binding up or the superheater leak. Finally, there were two holes in the screen tube above the male part of the T&G link that were eroded. The two eroded areas on the screen tubes became small fish-mouth ruptures about ⅛ and ¼ inch diameters. They were caused by either the superheater leak and/or the screen tube crack.Likely, the superheater leak occurred first.
Downtime hrs, leak/total:	48.33 hr steam/74.37 hr liquor
ESP?	**YES**.
Classification:	**Critical Incident # 683**
How discovered:	**Leak Detection System**. Followed by walk down hearing leak noise.
Leak detection:	**YES**. RBLI Trasar Nalco. Was 1st alarm of leak!
Sequence of events:	17:30 The RB Operator got leak detection system (RBLI TRASAR, Nalco) alarm (concentration), then reset to 0. Unit load was being increased which can give drum level swings and false alarms. He went on a round on the boiler and did not find any indication of a leak. 20:00 the operator got another leak detection alarm on mass balance, with increasing concentration toward an alarm. The operator made another round, heard the leak on 8th floor. Closed manual SB valve, and still heard leak. 20:37 initiated an ESP.
Bed cooling enhanc	No
Wash adjacent tube:	**YES**.
Repair procedure:	Two 24 inch Dutchmen were installed – one for the screen tube and one for the superheater tube. A new T&G link was installed.
Root cause:	Cause of 1st pinhole: not stated, but located at edge of previous old overlay repair. Cause of next two leaks: washed from initial leak. Cause of wear: mechanical rubbing of T&G against superheater tube. Some history of similar failures. (Sep06)
Future prevention:	The screen area was inspected during the March 2007 outage and several T&G links were replaced or repaired. This T&G link and the one from 2006 will be inspected in the 2008 outage.
Last full inspection:	March 2007

Appendix A Recovery Unit Incidents Summary – Fall 2007

ROOF & UPPER FURNACE

FALL 2007 - 21	
Location:	**Domtar, Ashdown, AR**
Unit:	#2 RB, CE Contract 27477, 2-drum Large Econ, Start-up 1979; B&W part, Inst 1990
Size:	4.2 MM lb ds/day, 560,000 lb/hr steam at 850 psig, 850°F, 1075 psig Design
Incident Date:	June 4, 2007
Leak/Incident Loc:	**Roof** Fatigue crack at end of roof tube fin ~ ¾" from penetration into steam drum as a result of bending fatigue **Upper Furnace.** Leak on wall tube in penthouse. Crack at top of membrane on field weld as a result of fatigue
Downtime hrs, leak/total:	165 hrs
ESP?	**YES**.
Classification:	**Critical Incident # 684**
How discovered:	**Bed Camera.** Operator saw disruption in smelt bed on bed monitoring camera
Leak detection:	**Yes**. Recovery Boiler Advisor (mass balance); Didn't indicate nor alarm. Camera found first.
Sequence of events:	Boiler operation was normal with 4 liquor guns, 3.79 MM lbs/dry solids, and steaming 550,000 lb/hr. Operator noticed disruption in smelt bed that was similar to volcanic eruption. Boiler was ESP'ed at 7:45 AM. Building was entered after 6-hour wait time (per S.O.P.) and the thermocouples were inserted through the liquor gun level manway into the hottest areas of the 4 to 5-foot bed. Bed temperatures were monitored with an infrared camera, the thermocouples, and floor tube thermocouples. Bed was manually broken with rods and cooled with CO2 over 3-days.
Bed cooling enhanc	**Yes**. Liquid CO2 injected with lances
Wash adjacent tube:	No
Repair procedure:	Replaced tubes.
Root cause:	High cycle Fatigue crack at end of welded fin due to fatigue; Some minor external corrosion. Per Thielsch Eng'g.
Future prevention:	Performed visual examination of adjacent tubes. Additional NDT to be performed ate planned outage in October, 2007
Last full inspection:	2004

UPPER FURNACE

FALL 2007 - 22	
Location:	**MeadWestvaco, Cottonton, Mahrt, AL**
Unit:	B&W Contract PR-97, 2-drum Large Econ, Start-up 1966
Size:	2.7 MM lb ds/day, 440,000 lb/hr steam at 890 psig, 825°F, 1000 psig Design
Incident Date:	July 2, 2007
Leak/Incident Loc:	**Upper Furnace**. 1/8" pinhole leak at buck stay-to-tube attachment Elev 382',just over arch, in large cavity btwn SH & Bolier
Downtime hrs, leak/total:	24 hrs/86 hrs
ESP?	YES.
Classification:	**Non-Critical** - all exterior to membrane wall
How discovered:	**Walk down**. Operator making rounds found steam blowing out from casing on boiler
Leak detection:	No
Sequence of events:	2Jul07 10:35 Operator making rounds found steam blowing out from casing on boiler. Checked Controls for water/steam - nothing showed. Lifted casing, saw leak, started shut down. With liquor out, inspect fireside. 10:52 ESP'd unit. 11:15 = 100 psig. 12:30 = 10 psig. Area restricted 8 hrs. 18:52 bed at 850F with glowing. 20:40 bed at 400 F with no glow. Filled boiler to find leak.
Bed cooling enhanc	No
Wash adjacent tube:	No
Repair procedure:	Ground out old weld and put down new weld.
Root cause:	Stress crack at buckstay-to-wall box weld due to boiler expanding and contracting [fatigue?-ed]. Isolated case.
Future prevention:	Next outage will use x-ray to inspect welds on other wall boxes and buck stays for signs of fatigue
Last full inspection:	April 2007

Appendix A Recovery Unit Incidents Summary – Fall 2007

UPPER FURNACE

FALL 2007 - 23	
Location:	**Eurocan Pulp & Paper, Kitimat BC**
Unit:	RB BCID 52524, CE ContractCA-68117, Start-up 1969, CE Revamp 1987
Size:	3.6 MM lb ds/day, 2-drum DCE Direct Contact Cascade Evaporator, 530,000 lb/hr steam at 650 psig, 750°F, 750 psig Design
Incident Date:	April 2, 2007, 11:50
Leak/Incident Loc:	**Upper Furnace**, Stirrup weld attachment to buckstay broke off and pulled from crown of tube resulting in a hole in bifurcate tube 115A at 7th floor (~elev 196'-9"), south wall tube, near hot side gen bank.
Downtime hrs, leak/total:	69 hrs
ESP?	**YES**.
Classification:	**Critical Incident # 685.** No damage found in Jun 07 inspection
How discovered:	**Heard and felt** 2 small "rumbles", 2-3 minutes apart. Tube failure caused instant drum level swing, and bed camera showed bed disruption.
Leak detection:	**Yes**. 1992 vintage Betz-Dearborn Hercules GE LeakTrac mass balance - didn't work!,
Sequence of events:	**2Apr07** BC Hydro disruptions, causing boiler trips. 10:57 2 oil guns on. 11:24 Heard 2 rumble bangs 2-3 minutes apart in control room, "probably line hammer". Unit tripped on low water. Bed camera showed bed disruption, "probably salt cake spawling". More bed splash and drum level fluctuation called for walk down. Found water dripping from 7th to 5th floor, under mud drum. Heard surging sound on 7th floor. Opened hatch revealed water jetting toward furnace cavity. **11:50** ordered and initiated ESP. Start 12 hr evacuation and safety perimeter. 23:15 walk down and ESP sequence checked OK. **3Apr07** 00:01 Mill All Clear. Prep for repairs. Repairs made. Added tubes and areas inspected. **4Apr07** 17:36 Hydro to 800 psig 10 minutes, the 600 psig hold, all OK, staging removed. **5Apr07** 20:30 liquor fire.
Bed cooling enhanc	No
Wash adjacent tube:	No
Repair procedure:	59" section of 2-1/2" .165 SA-192 tube replaced on bifurcate 115A, radiographed OK. Added tubes inspected OK.
Root cause:	Weld pulled from crown of tube; (corrosion-erosion-fatigue?)
Future prevention:	The Leak Trac did not function to warn us of the leak. This equipment has proven unreliable and requires an upgrade or replacement. No change to procedures will be done. Rounds on this section of the boiler are frequent enough that increasing them will not be effective. All boiler protection and safety systems worked as tested. The Engineers worked well to get the plant down safely. No injuries occurred to our workforce and no related damage was incurred by related machines or processes.
Last full inspection:	2006 UT and visual; No damage found in Jun 07 inspection

Appendix A Recovery Unit Incidents Summary – Fall 2007

UPPER FURNACE

FALL 2007 - 24	
Location:	**MeadWestvaco, Covington WV**
Unit:	#1 RB, ABB-CE Contract 26370, **1-Drum DCE Direct ContactCascadeEvaps**, 1973 Start-up
Size:	4.6 MM lb ds/day, 640,000 lb/hr steam at 650 psig, 700°F, 740 psig Design
Incident Date:	August 2, 2007
Leak/Incident Loc:	**Upper Furnace**. Front wall tube leak located in 2nd tube in roof from right side of boiler 8th floor, in tube return piping to steam drum. Attachment weld broke loose from roof pulling weld from top side of tube.
Downtime hrs, leak/total:	6 hrs / 139.1 hrs
ESP?	No
Classification:	**Critical Incident # 686** because if running, leak would be in furnace
How discovered:	**Walk down**. 1st Assistant found water running down wall inside boiler while doing hydro fill at end of annual shut down.
Leak detection:	No
Sequence of events:	2Aug07. There was no pressure on the boiler It was being filled for hydro as part of our annual outage. Boiler had been inspected when it was shut down and no leaks were detected. Tube leak was repaired within a 6 hour period. Our schedule outage was plan for 132 hours and it was extended to 139.1 hours.
Bed cooling enhanc	N/A (unit down)
Wash adjacent tube:	No
Repair procedure:	Ground out crack and rewelded.
Root cause:	Possibly outage hydroblasting cleaning of upper furnace caused it with 6000 psig high pressure 200 gpm wash flow beating against roof from inside, likely with vibration or force to break weld connection.
Future prevention:	Any further cleaning we will decrease hydro blasters pressure and flow when cleaning the upper furnace. No previous history. Isolated case.
Last full inspection:	--

UPPER FURNACE

FALL 2007 - 25	
Location:	**International Paper, Bastrop, LA**
Unit:	#5 RB, B&W Contract PR-112, 2-drum Direct contact evap cyclones, 1967 Start, rebuild bottom & SH 1993
Size:	4.2 MM lb ds/day, 550,000 lb/hr steam at 1250 psig, 900°F, 1450 psig Design
Incident Date:	July 4, 2007
Leak/Incident Loc:	**Upper Furnace**. Stress crack in weld at upper right wall, 9th floor adjacent to mud drum, 2nd tube in wall panel, 107 ft above floor. Casing welded to tube, not membrane.
Downtime hrs, leak/total:	26 hrs / 26 hrs
ESP?	No
Classification:	**Critical Incident # 687**
How discovered:	**Walk down**. Operator found small steam leak coming from under insulation,
Leak detection:	No
Sequence of events:	4Jul07 16:00 Operator found small steam leak coming from under the insulation on the 9th floor right wall. Further inspection ruled out sootblowers, and tube leak was then suspected. The steam appeared to be coming from behind a buckstay. 5Jul07 Noon Boiler taken down in orderly shutdown, allowed time for cooldown and depressurization, the leak was located and repaired. The boiler was hydrostatic tested to 1000 psig. No leaks were detected. 6Jul07 02:30 Boiler returned to service on line. 02:30 05:30 liquor in
Bed cooling enhanc	N/A
Wash adjacent tube:	No
Repair procedure:	Crack was fully ground out with a grinder and the weld was repaired with a 6010 root pass with overlay with 7018 rod.
Root cause:	Apparent stress fatigue cracking. Crack formed in joint of boiler casing joint and tube, and propagated into tube. No apparent corrosion.
Future prevention:	Contact OEM supplier re: similar issues. Also submitted info to boiler inspector for adding on to the next inspection outage. It appears that the boiler casing metal has been replaced since original installation. Original installation had a factory installed bar welded to the tube that the boiler casing was weld attached to. The replacement metal has been welded directly to the tube inaccessible
Last full inspection:	

Appendix A Recovery Unit Incidents Summary – Fall 2007

LOWER FURNACE

FALL 2007 - 26	
Location:	**Rayonier Performance Fibers, Jesup, GA**
Unit:	#6 RB, CE Contract 24579, 2-drum Large Econ, 1981 Start; B&W revamp 2001 Start
Size:	4.9 MM lb ds/day, 900,000 lb/hr steam at 1325 psig, 900°F, 1590 psig Design
Incident Date:	July 6, 2007
Leak/Incident Loc:	**Lower Furnace**. Waterwall tube failures due to internal corrosion deposit; 9' long area at elev 50'
Downtime hrs, leak/total:	Not specified.
ESP?	No. - No Power
Classification:	**Critical Incident # 688**
How discovered:	**Panel**. Steam/feedwater imbalance
Leak detection:	**YES** Emerson CyberLeakSmart, but didn't help
Sequence of events:	**2Jul07** Operators reported separation of steam/feedwater. Checked w/no soot blowers and diligent walk downs. **6Jul07** Heard low roar in upper furnace above nose arch. Believed to be SH leak. While pulling liquor and adding oil (in prep of SH repair) when mill lost power and mill tripped everything. No ESP available. Evacuated for 16 hours. Upon reentry, checked smelt bed temps all below 250F. 7Jul Unit hydroed and leak located in lower furnace. 8JulRepairs. 9JulHydro. 10Jul On line.
Bed cooling enhanc	No. Floor tube TC's in use
Wash adjacent tube:	No
Repair procedure:	Dutchman
Root cause:	Internal deposit under-deposit corrosion. No evidence of overheat! Copper, caustic and chlorides present in deposit. Incl chloride pitting under copper cap. Likely local steam blanketing in this area only. Some exterior stainless stress corrosion cracking also present (indicates chlorides). 100% D.I. makeup, no condenste return, so no organics. Cu could sneak through.
Future prevention:	Isolated case.
Last full inspection:	2005

Appendix A Recovery Unit Incidents Summary – Fall 2007

LOWER FURNACE

FALL 2007 - 27	
Location:	**International Paper, Augusta, GA**
Unit:	#3 RB, Gotaverken Contract 711-181, **1-Drum** Large Econ, 1988 start.
Size:	5.5 MM lb ds/day, 817,000 lb/hr steam at 900 psig, 900°F, 1110 psig Design
Incident Date:	May 7, 2007
Leak/Incident Loc:	**Lower Furnace**. Small irregular shaped hole ½" X 1/8". in the furnace lower front wall (opposite the spouts), in composite tubing tube #35; a straight tube next to the bent tube forming the 4th secondary airport opening (looking at the wall from the inside, left to right). Approximately 16' above floor. 1" area with composite gone and 3" long oval with very low MLO's (nothing to 30mils).
Downtime hrs, leak/total:	94 hr
ESP?	**YES**. 4 hr evacuation. All functioned OK except BL heater and soot blower steam valve not indicated as "closed", but they had closed.
Classification:	**Critical Incident # 689**
How discovered:	**Walk down**. While rodding the secondary airports, operator heard a sound that was not normal.. Through one secondary air port the operators could feel something pushing against the rod and confirmed the presence of moisture.
Leak detection:	No. (Subsequently installed a DCS leak detection system.)
Sequence of events:	**7May07**.18:15-19:30 Field operator was making last round of shift on the boiler. While rodding the secondary airports he heard a sound that was not normal. The shift supervisor and two experienced operators helped investigate. Through one secondary air port the operators could feel something pushing against the rod and confirmed the presence of moisture, but classified it as "small", and believed it not getting to bed. Pulled liquor. 19:53 Initiated ESP.4-hour evacuation. Southland contacted. **8May07** just after Midnight: Inspection mirror saw possible leak location. Bed perimeter still molten. Floor tubes likely dry. (TC plots available). 13:00 Southland cooled bed with Na2CO3. 23:15 started waterwash. **9May07** 10:30 Wash complete. Repairs made. Through **10May07**. **11May07** 05:07 Successful hydro. 05:58 liquor fired.
Bed cooling enhanc	**Yes**. Sodium carbonate injection from Southland Fire.
Wash adjacent tube:	No
Repair procedure:	The failed tube was removed and replaced with a new tube section.
Root cause:	Heavy waterside deposits insulated the tube wall from proper water cooling. Local overheat caused accelerated corrosion of the composite tube until it thinned to the point of failure, resulting in small irregular shaped hole ½" X 1/8" with concentric halos and hole being the bull's-eye. 1" area with composite gone and 3" long oval with very low MLO's (nothing to 30 mils). The tube did not get hot enough over a large enough area to result in a large rupture. ID deposits were enough tofill and block tube at floor bend during removal disruption. Other tubes boroscoped = no deposits! No sludge or deposits in steam drum. Unclear why this tube was scaled so badly. Extensive photos and reports available.
Future prevention:	Acid cleaned the boiler starting on June 4; reduced boiler water cycles from 70 to 50; pursuing demin and boiler water quality improvements through better work systems; testing procedures and corrective action plans; and installing bed cameras to monitor the lower furnace conditions. Review of a previous, detailed circulation study with Metso Power indicated that boiler water circulation should not be an issue up to 817,000 lbs/hr steam flow. Completed short term refresher training on indication of tube leaks for operators and supervisors, including required actions to be taken. More detailed leak scenario training is being finalized. No history of similar failures.
Last full inspection:	Oct 2006

Appendix A Recovery Unit Incidents Summary – Fall 2007

LOWER FURNACE

FALL 2007 - 28	
Location:	**MeadWestvaco, Covington VA**
Unit:	#2 RB, Gotaverken Contract 61-2500, **1-Drum** Large Econ, 1991 start
Size:	5.o MM lb ds/day, 769,000 lb/hr steam at 1550 psig, 950°F, 1840 psig Design
Incident Date:	April 14, 2007
Leak/Incident Loc:	**Lower Furnace**. Rear wall leak due to a 4.5 inch crack. Tube #7 tube on the rear wall (Tube 474), ~ 2.0 feet above the floor. The crack ran from where the tube swages from 2.5" to 3" to the weld line where the floor panel ends and the rear wall starts.
Downtime hrs, leak/total:	175.5 hrs/ 175.5 hrs
ESP?	**YES**. A few minor ESP valve indicators failed, but were fixed - actual valves performed
Classification:	**Critical Incident # 690**
How discovered:	**Walk down**. Operator heard noise at primary and secondary air level. Manual check of blowdown conductivity showed a decrease from 81 to 69 mmhos.
Leak detection:	No
Sequence of events:	**13Apr07** Operator heard odd noise in lower furnace. Staff checked for leak. But no other indications. Later shift found boilerwater conductivity dropped from 83 to 67, noise the same, but still no verification. **14Apr0**7 01:20 Still unsure. 01:45 conductivity down to mid 40's. Isolated all other noise sources in area. Noted dull section of bed. 02:00 **ESP** (15 min drain time). 12-hr isolation. 14:00 Inspection confirmed buidup in bed corner near noise. Charts confirmed FW/steam separation. **15Apr07** 02:30 Southland started bed cooling. 05:30 complete. Wait for components to cool. 12:29 Start waterwash. **16Apr0**7 05:40 start hand wash. Started boiler fill. Water spray seen. 11:45 wash complete. Made repairs. Took early planned outage. Hydro OK, **20Apr07** 18:00 First fire. **21Apr07** 09:33 Liquor fire.
Bed cooling enhanc	**Yes.** Sodium Bicarbonate injection by nitrogen; Southland Fire. Big help!
Wash adjacent tube:	No
Repair procedure:	10 inch dutchmen were installed where the three tubes were removed. All welds were x-rayed. Clad and membrane were penetrant tested.
Root cause:	Stress Corrosion Cracking SCC in swaged area of wall tube. Likely local caustic accumulation. Possibly swages not stress relieved, providing stress sites. Exam led to two tubes taken out also.
Future prevention:	Transition from Tri-Ad to Congruent Phosphate water treatment. Improve leak checking. Quarterly ESP tests (vs annual). Develop Leak ID troubleshooting plan. Review history and findings with all shifts. No similar failure history An aside: general stainless clad deterioration in lower furnace.
Last full inspection:	Feb 2006 UT; 2005 Eddy current

Appendix A Recovery Unit Incidents Summary – Fall 2007

LOWER FURNACE

FALL 2007 - 29	
Location:	**MeadWestvaco, Covington VA**
Unit:	#2 RB, Gotaverken Contract 61-2500, **1-Drum** Large Econ, 1991 start
Size:	5.o MM lb ds/day, 769,000 lb/hr steam at 1550 psig, 950°F, 1840 psig Design
Incident Date:	May 9, 2007
Leak/Incident Loc:	**Lower Furnace**. Rear wall leak due to a 5.0 inch crack. Tube #8 tube on the rear wall (Tube 475) , ~ 2.0 feet above the floor. The crack ran from where the tube swages from 2.5" to 3" to the weld line where the floor panel ends and the rear wall starts.
Downtime hrs, leak/total:	175.5 hrs / 474 hrs
ESP?	**YES**.
Classification:	**Critical Incident # 691**
How discovered:	**Walk down**. Operator heard noise at primary and secondary air level.
Leak detection:	No
Sequence of events:	**9May07** 23:40 Operator heard loud noise in lower furnace, same place as last month. Check of charts verified leak condition: Increased IDFan, decreasing conductivity. 23:50 **ESP**! 12-hr isolation. Southland contacted. **10May07** 11:50 Inspection - all in order, could see washed bed area. **11May07** 02:30 Southland started bed cooling. 10:30 Cooling complete. Wait for components to cool. 23:20 started waterwash. Filled boiler and saw leak spraying. **12May07** 15:00 water wash complete. Identical to last month failure. Decided to replace all. 1st hydro found 1 leak due to errant grinder: repaired with dutchman. Next hydro OK. **29My07** 01:10 First fire. 17:58 First liquor (New refractory installation in front wall lengthened start-up)
Bed cooling enhanc	**YES**. Sodium Bicarbonate injection by nitrogen; Southland Fire. Great help!
Wash adjacent tube:	No
Repair procedure:	The entire rear walltube swages, with the exception of the three dutchmen installed in April, were replaced with 10" dutchmen that had been stress relieved. All welds x-rayed and shear-waved.
Root cause:	Stress Assisted Corrosion SAC in swage area of wall tube, along with Stress Corrosion Cracking SCC. Likely acid corrosion from previous acid cleaning, causing pits, which grew to cracks due to SAC. Possibly swages not stress relieved, providing stress sites. One tube had typical SAC cold-side crack into stainless
Future prevention:	The entire rear wall tube swages, with the exception of the three dutchmen installed in April, were replaced with dutchmen that had been stress relieved. Transition from Tri-Ad to Congruent Phosphate water treatment. Improve leak checking. Quarterly ESP tests (vs annual). Develop Leak ID troubleshooting plan. Review history and findings with all shifts. Installed thermocouples on 40 of the rear wall tubes 10 in each corner and the other 20 spread throughout on the tube swage.
Last full inspection:	April 07, Shear wave UT of all swages during last incident and outage.

Appendix A Recovery Unit Incidents Summary – Fall 2007

FLOOR

FALL 2007 - 30	
Location:	**Boise Cascade LLC, International Falls, MN**
Unit:	#1 RB, B&W Contract PR-174, 2-drum Large Econ, 1976 start; CE add decanting hearth 1990; Retube boiler, new economizer and screen 2001.
Size:	2.5 MM lb ds/day, 450,000 lb/hr steam at 1000 psig, 870°F, 1450 psig design
Incident Date:	February 27, 2007
Leak/Incident Loc:	**Floor**. Short term overheat bulge, about 1.5 inch diameter at the crown of floor tube #2 (counting from the left, or south, wall), about 2 feet in from the front (east) wall, about 2 inches into the carbon steel tube from the carbon/clad weld. There were 3 pinhole leaks close together at the top of the bulge. Recent aux fuel period allowed molten smelt to sit there.
Downtime hrs, leak/total:	108 hrs
ESP?	**YES**. All OK except SH vent valve failed to open at 20 min point
Classification:	**Critical Incident # 692**
How discovered:	Series of three short duration **pressure spikes (puffs)**, 1 at 10:38 am, 1 at 1:15 pm and one just before the ESP at 4:09 pm. Boiler water conductivity and phosphate level dropped beginning at about 8 am. Was able to see smelt shooting up in the left front (SE) corner of the boiler just before ESP.
Leak detection:	**Yes**. Triple 5. Did not show nor confirm leak.
Sequence of events:	26Feb07 22:00 Spouts plugging, but associated with soap burning. 27Feb0707:00 Water phosphate test dropped to 10.7 ppm (normally 12 to 18) and conductivity dropped to 57mmho (normally 65). 10:39 Furnace puffs pressurized, but no trip. Phosphate continued slow drop. 13:15 Another furnace pressure spike. conductivity at 56 mmho and phosphates at 10.1 ppm. Feedwater rep suggested a leak. Checked blowdown. Added more phosphate 13:31 Did careful walkdown with no sootblower noise. 14:30 Triple-5 reported slight elevated noise at SH level. 14:55 Another quiet walkdown. 15:10 Phosphate down to 9.5, now outside limits; conductivity dropped to 55 mmho, Lit of oil to remove liquor. 16:06 Hearth burner tripped: furnace tripped. 16:10 Camera showed bed black out, smelt flow stopped. 16:11 Saw bed disturbance and smelt flow. Boiler pressurized again with vibration and shaking. **16:15 ESP! 28Feb07** 12:50 smelt hi temp 782F. 16:10 Confirmed leak in SE corner. Prep for waterwash. 22:00 Start furnace clear in needed repair area. **1Mar07** noon Began tube repair. Evening: boroscoped tubes - all OK.. Drum internals OK. **3Mar07** 13:00 Hydro OK.**4Mar07** Unit on liquor
Bed cooling enhanc	No
Wash adjacent tube:	No
Repair procedure:	Sectioned out about 3 feet of carbon tube and replaced it with a Dutchman
Root cause:	Suspect low, weak, oscillating circulation due to long time on low load using hi load on starting burners rather than load burners, and then due to 1-1/2" negative slope portion of run and 2mm weld push-through in tube that failed, allowing trap of steam bubble allowing overheat by smelt.
Future prevention:	**1st-ever leak; 1st ever ESP!** Completing circulation study to determine possible solutions. Plan to purchase newer, higher resolution bed cameras, possibly with temperature profiling to see a leak sooner.
Last full inspection:	Sept 2002 for floor; May 2006 for rest.

TAPPI Steam & Power/Energy Management Committee

Officers:

- Chairman – Paul Conner – Southern Co.
- Vice Chair – Norris Johnston – Hercules
- Secretary – John Andrews – Mead-Westvaco
- Membership Chair – Jim Dickinson – B&W

Subcommittees:

- Recovery & Power Boilers – Andy Jones – IP
- Water Treatment– Mark Sargent – IP
- Energy– Tom Harriz – Jacobs
- Gasification – Dan Burciaga – Thermo Chem (temp. Chairman)

Membership:

90 members

- 20 Mill
- 18 Suppliers
- 23 Consultants
- 12 AE Firms
- 17 Other (University, Retired, Labs, etc.)

Subcommittee Breakdown:

Recovery & Power Boilers	49
Water Treatment	11
Energy	23
Gasification	7

Objectives:

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

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

Activities:

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

Recovery Boiler – Current Activities:

- Recovery Boiler Performance Calculation Forms
  - Long Form – Updated, completed, in publication form
  - Short Form – Updated, completed, published (includes spreadsheet)
- Stripping of Kraft Pulping Process Condensates – Regulations, Design & Operations
  - Being updated
- Collection and Burning of Concentrated NCG's – Regulations, Design, Operation
  - Being updated
- Recommended Test Procedures for Black Liquor Evaporators
  - New TIP to document test procedures – Dave Clay

Recovery Boiler – Current Activities:

- Recovery Boiler Energy Efficiency Improvements
  - New TIP, based on Andy Jones presentation
- Recovery Boiler Sootblowers – The Basics
  - New TIP (Sootblowers 101) - Alarick Tavares/Danny Tandra
- Guidelines for Replacement of Generating Bank Tubes with Expanded Joints in Two-drum Boilers
  - Being updated - Fred Marcinek
- Operating and Maintenance Practices Impacting Economizers
  - New TIP from recent AF&PA economizer study - Jack Clement

Power Boiler – Current Activities:

- Fluid Bed Database
  - Completed, released - Ed Mockridge
- Biomass Boiler Performance Test Procedure
  - Technical paper, making into TIP – Jack Clement
    - sampling guidelines, adjustments to PTC 4

Recovery Boiler – Past/Recently Released TIP's

- Effect of Composition on the First Melting Temperature of Fireside Deposits in Recovery Boilers
- K and Cl Measurement and Control in the Pulping & Recovery Cycle
- Composite Floor Tube Inspection Guidelines
- Recommended Test Procedure for Black Liquor Evaporators
- Tube Rolling Procedures and Quality Guidelines

Water Treatment Subcommittee - Past Released TIP's

- Water quality and monitoring requirements for paper mill boilers operating on high purity feedwater
- Design engineers tree: paper mill boiler feedwater
- Response to contamination of high purity boiler
- Keys to successful chemical cleaning of boilers
- Water treatment-related opportunities for energy conservation in a paper mill powerhouse
- Evaluating reverse osmosis for treating makeup to the boiler feedwater in a pulp and paper mill

Water Treatment Sub-Committee

- Organizing workshop at TAPPI Engineering, Pulping & Environmental conference this fall
  - Recovery boiler waterside inspection
  - Chemical cleaning frequency and condensate treatment/monitoring
  - Panel Q&A session.

Meetings:

- Twice/year
  - Fall Technical Conference + Spring
    - Next Meeting – Oct. 22, 2007 - Jacksonville

2007 TAPPI Engineering, Pulping & Environmental Conference

- October 21-24, 2007
- Jacksonville, FL

Requirements to Join?

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


SUOMEN SOODAKATTILAYHDISTYS
FINNISH RECOVERY BOILER COMMITTEE
Finnish Recovery Boiler Committee
- Report from Finland
Outi Pisto
PÖYRY
October 3rd
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SUOMEN SOODAKATTILAYHDISTYS
FINNISH RECOVERY BOILER COMMITTEE
Contents
• Overview
• Incidents in Finland
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SUOMEN SOODAKATTILAYHDISTYS
FINNISH RECOVERY BOILER COMMITTEE

Finnish recovery boilers

- No. of recovery boilers 21
- Average boiler age 24 yrs
- Capacity weighted age 19 yrs
- Average boiler size 4,1 Mlb ds/d

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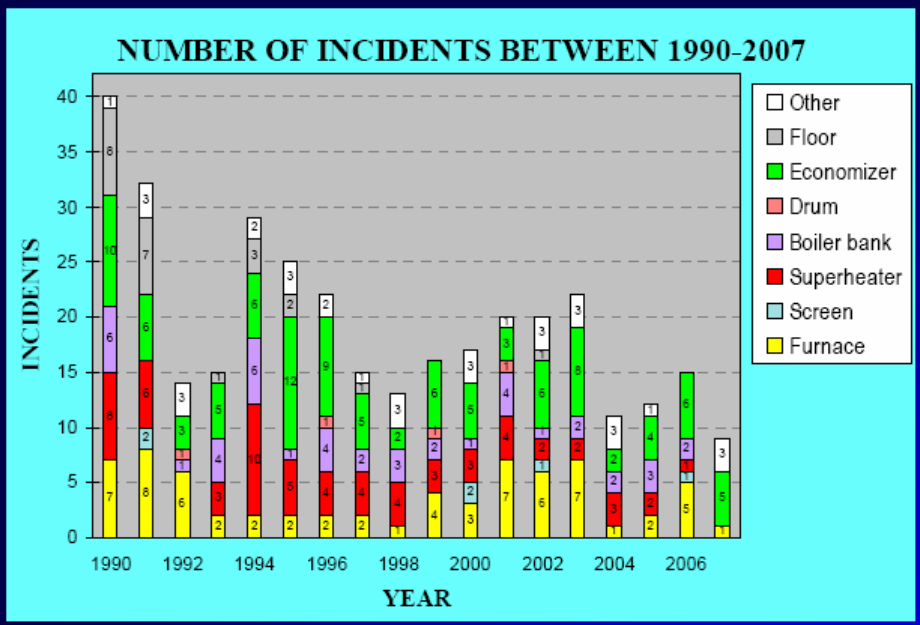
SUOMEN SOODAKATTILAYHDISTYS
FINNISH RECOVERY BOILER COMMITTEE



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SUOMEN SOODAKATTILAYHDISTYS
FINNISH RECOVERY BOILER COMMITTEE

Two furnace tube leaks 1/2006

- Furnace leaks
- 4 in. hole in the furnace tube
  - another hole in the same tube 39 feet lower caused by hydrogen corrosion
- Down time 121 hours

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SUOMEN SOODAKATTILAYHDISTYS
FINNISH RECOVERY BOILER COMMITTEE

Incidents 9, 10, and 11/2006

- All the incidents in the same recovery boiler
  - At the economizer
  - In the furnace wall tube
  - At the screen
- Discovered at the same time during the repairing of the first damage

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SUOMEN SOODAKATTILAYHDISTYS
FINNISH RECOVERY BOILER COMMITTEE

Summary of incidents 2006

- Difficult process conditions (2/15)
- Welding errors (3/15)
- Operation (1/15)
- Construction error (4/15)
- Hydrogen corrosion (1/15)
- Unclear (1/15)
- Fatigue (3/15)

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SUOMEN SOODAKATTILAYHDISTYS
FINNISH RECOVERY BOILER COMMITTEE

DNCG duct damage 1/2007

- Start-up going, DNCG directed to the stack
- Deposit on the bottom of the DNCG duct caught fire
- Both the insulation material and the sheet plates near the DNCG nozzle burned

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SUOMEN SOODAKATTILAYHDISTYS
FINNISH RECOVERY BOILER COMMITTEE

Floor tube cracking 4/2007

- New furnace floor assembled in autumn 2006
- Tube material HR11, Alloy 825 used as a membrane material
- In a routine check, cracking in the fins of the floor tubes were detected
- Researches going on

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SUOMEN SOODAKATTILAYHDISTYS
FINNISH RECOVERY BOILER COMMITTEE

Recovery Boiler in Future II (1/2)

- 3.5 yr project completed
  - More green electric power from recovery boiler
  - New safe and economically sound material recommendations
  - Gather new information for avoiding problems originating from water chemistry
  - Understanding the chemistry of impurities in recovery boiler process

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SUOMEN SOODAKATTILAYHDISTYS
FINNISH RECOVERY BOILER COMMITTEE

Recovery Boiler in Future II (2/2)

- Results
  - Plenty of good knowledge on the studied areas
  - Recommendations during and after the project
- New project for improving electric energy efficiency starts by the end of 2007

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SUOMEN SOODAKATTILAYHDISTYS
FINNISH RECOVERY BOILER COMMITTEE

Other research

- Updating of the recommendation for incineration of non-condensable gases
  - Translation in English
- Study of protective clothes against recovery boiler smelt splashes
- Updating of the recommendation for safety automation system
  - Translation in English
- Heavy metals at a recovery boiler plant

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SUOMEN SOODAKATTILAYHDISTYS
FINNISH RECOVERY BOILER COMMITTEE
Thank you for your attention!
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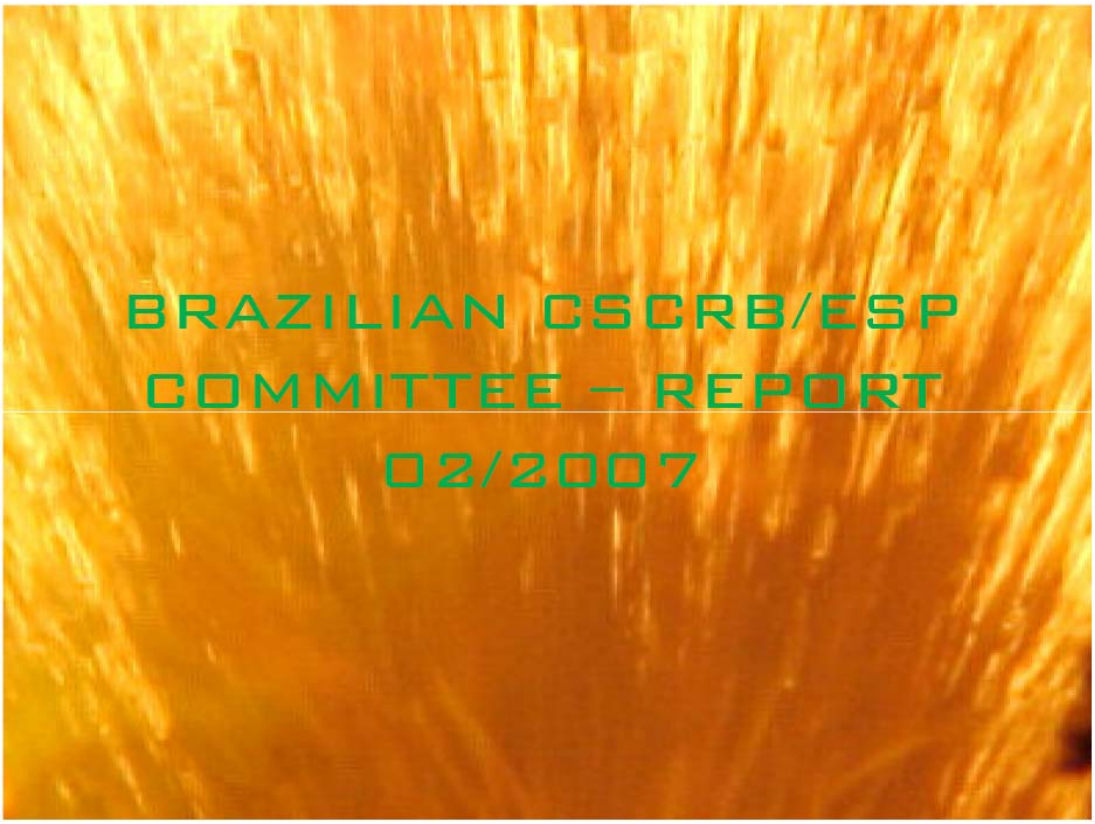

CSCRB-ESP COMMITTEE

ACTIVITIES

1- Brazilian Recovery Boiler database maintenance

2 - Exchange information with other worldwide committees

3 – Incident analysis

4 - Incident presentation

5 - Non ordinary issues

CSCRB-ESP COMMITTEE

1 - Data base maintenance

- Current status:
  - 38 recovery boiler
  - 34 operating
  - 1 Hibernated
  - 4 under erection (Bahia Pulp/Klabin/VCP-tres Lagoas
  - 6 recovery boilers retrofits on the last three year
  - 7 new recovery boiler on the last three years
  - Typical age: 15 years
  - Typical size: : 1672 tss/day

CSCRB-ESP COMMITTEE rec boiler list

#	Empresa	Fornecedor	Status	Start up (ano)	Reforma (ano)	Idade (anos)	Cap. (orig) (tss virgem /dia)	Cap. (real) (tss virgem /dia)	Pressao (bar)	Temp. (C)	Vazao processo (t/h)	Area (m2)	Ratio (tss/m2.dia)	Responsavel
1	Aracruz Celulose	Kvaerner	Em operação	2001		6	3440	3440	64	450	524	156,7	22,0	Saulo Braz
2	Aracruz Celulose	Kvaerner	Em operação	1991	2002	16	2200	3600	64	450	524	165,7	21,7	Saulo Braz
3	Aracruz Celulose	Andritz	Em operação	1997	2000	10	2200	2900	64	455	433	130,8	22,2	Saulo Braz
4	Aracruz - Guaiba	B&W	Em operação	2002		5	1950	1950	64	465	300	125	15,6	Humberto Batista
5	Bahia Pulp	CBC	Em operação	1995	1999	12	750	900	63	450	130	45,63	20,9	Cristovao Santos
6	Bahia Pulp	CBC	Em montagem	2007		0	3000	3300	85	490	494	149,2	22,1	Marivaldo Florentino
7	CENIBRA	CBC	Em operação	1977	2003	30	1440	1800	65	450	250	93,86	19,2	Julio Ribeiro
8	CENIBRA	CBC	Em operação	1992	2004	15	2050	2700	65	450	422	138,13	19,5	Julio Ribeiro
9	CENIBRA	CBC	Em operação	2006		1	3500	3500	66/86	450	524/515	189	18,5	Julio Ribeiro
10	COCELPA	Gotaverken	Em operação	1988		19	160	220	45	425	30	12	18,3	
11	Iguacu	São Caetano	Em operação	1972		35	104	104	16	204	24	17,2	6,0	
12	IP - Luiz Antonio	CBC/Andritz	Em operação	1991	2005	16	890	1550	64	450	246	66	23,5	Carlos Benedito
13	IP- Mogi Guaçu	B&W	Em operação	1976		31	187	320	29	350	28	14,04	22,8	Geraldo Ferreira
14	IP - Mogi Guaçu	B&W	Em operação	1985	2006	22	950	1144	27,6	340	120	51,85	22,1	Geraldo Ferreira
15	Jari Celulose	B&W/ Gotaverken	Em operação	1979	1998	28	1360	1750	59	450	276,12	89	19,7	Ricardo Cintra
16	Klabin-Correa Pinto	CBC	Em operação	1987	1992	20	580	750	65	480	110	49	15,3	Camilo Peter Hoss
17	Klabin Telemaco	Gotaverken	Em operação	1977	2000	30	1100	1850	46	430	250	92,5	20,0	Marcelo Gasparim
18	Klabin Telemaco	CBC	Em montagem	2007		0	1700	1700	106	503	243	79,6	21,4	Carlos Reipert
19	Klabin-Otacilio Costa	Gotaverken	Em operação	1987		20	330	230	42	400	47,4	24,11	9,5	Gilmar Packer
20	Klabin-Otacilio Costa	CBC	Em operação	1998		9	1100	1050	89	483	170,2	69,1	15,2	Gilmar Packer
21	Lwarcel	CBC	Em operação	2002		5	700	826	85	480	120	44	18,8	Cesar Arrie
22	Nobrecel	Stein Robals/CBC	Em operação	1999	2006	8	270	270	45	450	37	16	16,9	Sidervaldo Silva
23	Orsa	Gotaverken	Hibernada	1982		25	140	260	19	200	30	12,6	20,6	Yoshiro Nagao
24	Orsa	CBC	Em operacao	2006		1	400	400	42	400	74	26	15,4	Yoshiro Nagao
25	Rigesa	B&W	Em operação	1987		20	250	250	43	370	35,4	18,3	13,7	Rudimar Klitzke
26	Rigesa	Ahlstrom	Em operação	1999		8	850	600	64	460	126	47,4	12,7	Rudimar Klitzke
27	Ripasa	Gotaverken	Em operação	1972		35	270	510	42	380	65	24,11	21,2	Hildomar Raimondi
28	Ripasa	Gotaverken	Em operação	1981	2000	26	270	510	42	380	65	24,11	21,2	Hildomar Raimondi
29	Ripasa	CBC	Em operação	2002		5	1100	1200	46	400	160	69	17,4	Hildomar Raimondi
30	Suzano- Mucuri	Metso	Em operação	1992	2007	15	1750	3000	85	480	420	144	20,8	Geraldo Simao
31	Suzano- Mucuri	Metso	Em montagem	2007		0	4700	4700	85	484		251	18,7	Geraldo Simao
32	Suzano- Suzano	Gotaverken	Em operação	1973	2004	34	670	811	50	380	110	49	16,6	Marcos Pessotta
33	Suzano- Suzano	CBC	Em operação	1987	2002	20	800	1400	50	420	218	64,1	21,8	Marcos Pessotta
34	Trombini	BW/Orcepa	Em operação	1989	2000	18	140	180	21	420	30	10	18,0	Aleu Scaramocin
35	VCP-Jacarei	CBC	Em operação	1994		13	1430	1990	90	470	240	101	19,7	EstanislauZaulautas
36	VCP-Jacarei	CBC	Em operação	2002		5	2500	2990	93	480	360	149	20,1	EstanislauZaulautas
37	VCP - Tres Lagoas	Metso	Em projeto	2008		0	5300	5500				242	22,7	Fernando Roash Pereira
38	Veracel Celulose	Kvaerner	Em operação	2005		2	4000	4000	93,6	490	630	210	19,0	Ari Medeiros
												3259,9	0,0	
*	Valores médios	N/P		N/P	N/P	15	1435	1672	58	426	199	86	19	N/P

CSCRB-ESP COMMITTEE

2 - Exchanged information

- BLRBAC: Received from Jansen fall/2007 incidents summary
- SNRBC: Received report issued on Feb/2007
- FRBC: Received report issued on May/2007

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CSCRB-ESP COMMITTEE

3 - Incident analysis:

We use four different classifications:

- Critical
- Not critical
- Dissolving tank explosion
- Accident: When people or the recovery boiler itself were under risk, independent of leakages consideration.

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CSCRB-ESP COMMITTEE – EVENT LIST

1/2007 Event List

Company	Seq	Date	Report	Presentation	Downtime	Class	Event
IP-LA	01/07	25/10/06	Yes	No	14	NC	BB side wall crack
Cenibra	02/07	19/11/06	Yes	Yes	57	NC	Eco leakage
ORSA	03/07	23/11/06	Yes	Yes	154	NC	SH Leakage
IP	04/07	01/12/06	No	No	NI	DTE	Dissolving tank leakage
Cenibra	05/07	27/12/06	Yes	Yes	589	NC	SH Leakage

2/2007 Event List

Company	Seq	Date	Report	Presentation	Downtime	Class	Event
Suzano	06/07	May	No	No	No	Hold	Unexpected MFV opening
VCP	07/07	June	No	No	No	Hold	BFW contamination
Orsa	08/07	20/08/07	No	No	No	Hold	Turbine overspeed
Aracruz	09/07	10/09/07	No	No	No	Hold	Broken sootblower lance
Veracel	10/07	22/09/07	No	No	No	Hold	Heavy black liquor tank explosion
Ripasa	11/07	Sept	No	No	No	Hold	BFW contamination
Aracruz	12/07		No	No	No	Hold	Partial ESP
Aracruz	13/07		No	No	No	Hold	Superheater/roof leakage
Veracel	14/07		No	No	No	Hold	SH leakage
IP-LA	15/07		No	No	No	Hold	Smelt leakage

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CSCRB-ESP COMMITTEE

ACTIVITIES

4 - INCIDENT PRESENTATION: DUE AGENDA PROBLEMS 2/2007 EVENT PRESENTATIONS WILL BE MADE ON MAY/2008

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ACTIVITIES

5 - Non ordinary issues: Report from 2006/2007 survey (highlights)

- Load: 19,5 tss/m2.day
- Rec Boiler supplier:
  - Andritz: 10%
  - CBC: 48%
  - Metso: 48%
  - Others: 4%
- Sootblower steam consumption: 8,2% (best practice: 5%)
- Dry solids content: 72,2%
- Boilers with Ash treatment: 41%

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ACTIVITIES

5 - Non ordinary issues: Report from 2006/2007 survey (highlights)

- NCCG burning at the boiler: 22%
- NCDG burning at the boiler: 26%
- Dissolving tank burning: at the boiler: 37%
- Automatic Port cleaning (1ry/2ry/3ry): 78%/48%/26%
- Leakage detector: 44%
- On-line carry over detector: 33%

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Protecting Recovery Boiler Workers Against Hot Chemical Splashes

Outi Pisto

PÖYRY

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Contents

- Background and objective of the study
- Material tests
- Garment design

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Background

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Background – preliminary study in 2003

- Standard type of heat protective clothing
  - Hot smelt burned the fabrics tested and PVC-skin melted causing third degree burns
- Multilayer materials
  - First degree burns
    - Multilayer firemen's material
    - Leather

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Objective (1/2)

To find out:

- what kind of demands working at recovery boilers set on the personal protective equipment
- the capability of protective equipment and clothing materials available to protect against hot chemical splashes
- operator's expectations for a usability of the clothes and equipment

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Objective (2/2)

- to develop a method for testing different materials
- to find a material which protects best against hot chemical splashes
- to improve protective clothing to meet the needs and requirements of the recovery boiler workers and working conditions

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Research methods

- Study of the working conditions
- Enquiries for the recovery boiler workers
- Study of the materials and personal protective equipments available
- Material and protective equipment tests
- Development of the protective clothing
- Field trials

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Accidents taken place at recovery boilers

- During opening of the blocked smelt spout 31 %
- Maintenance work 5 %
- At black liquor nozzle 2 %
- Other 21 %

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MATERIAL TESTS

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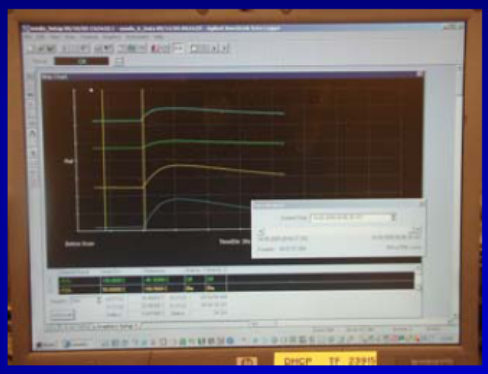
Testing arrangement



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Testing arrangement

- Chemical smelt
  - 70 % sodium carbonate, 25 % sodium sulfide
  - Spilling temperature 1515 – 1711 °F
  - Amount of sample about 1.76 ounce

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Reference material

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Best protection

- 55 % Modacrylic, 45 % Cotton
- 50 % Viscose, 30 % Wool, 17 % PES, 3 % R-stat
- 30 % Kevlar, 70 % Polyacrylonitrile with silicon coating

max. temperature	amount of smelt	temperature
97.5 °F	1.66 oz	1697 °F

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Equipment tests

- Proper head protecting equipment was not found from the market which would properly shield against hot chemical splashes
  - helmet combining face and eye shield and hearing protector

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GARMENT DESIGN

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Requirements

Protection against hot chemical smelt splashes

- Protection of the neck area
- Protection of the ankles
- Suitability both for the working in the control room and in the field
- Compatibility with other protective equipment

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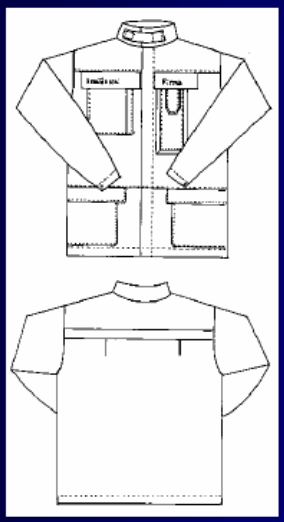
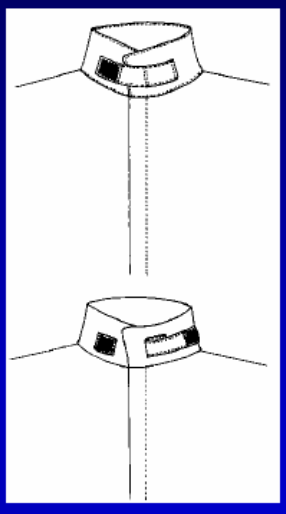
Jacket and collar





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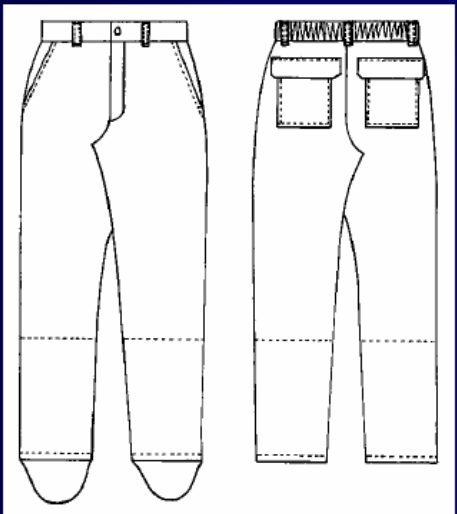
Pants



Material:

- Argos®: 50 % Viscose
  30 % Wool
  17 % PES, 3 % R-stat

Color:

- Dark blue

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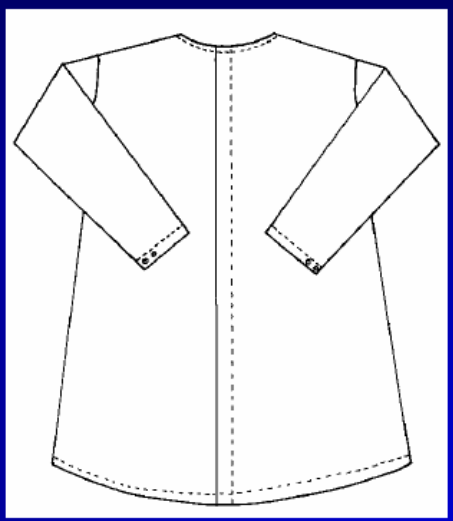
Extra protective equipment

Material:

- F 1120 Si
- 30 % Kevlar(R),
  70 % Panox(R),
  fire retardant treated,
  aluminum pigmented
  silicon coating

Color:

- aluminum grey



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