

MINUTES OF MEETING
Crowne Plaza Hotel/Atlanta Airport
Atlanta, Georgia
October 8, 9 & 10, 2001

OBJECTIVE

The objective of BLRBAC 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: **Wayman Thompson**
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REGULAR MEMBERSHIP

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

ASSOCIATE MEMBERSHIP

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

CORRESPONDING MEMBERSHIP

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

On written application, eligible candidates may be elected to Regular, Associate, or Corresponding Membership by a majority vote of the Executive Committee.

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

EXECUTIVE COMMITTEE

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<p>EMERGENCY SHUTDOWN PROCEDURES John Andrews, Chairman Westvaco Corp. P. O. Box 118005 Charleston, SC 29423-8005 Tel: (843) 745-3212 Fax: (843) 745-3229 JDANDRE@westvaco.com</p>	<p>FIRE PROTECTION IN DIRECT CONTACT EVAPORATORS Jerry Vuoso, Chairman International Paper 6400 Poplar Avenue, Tower 1 Memphis, TN 38197 Tel: (901) 763-7541 Fax: (901) 763-6900 jerry.vuoso@ipaper.com</p>
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<p>PERSONNEL SAFETY Robert Zawistowski, Chairman Power Specialists Assoc. 531 Main Street Somers, CT 06071 Tel: (860) 763-3271 Fax: (860) 763-3608 bob.zawistowski@psaengineering.com</p>	<p>PUBLICITY & NEWS RELEASE Craig Cooke, Chairman FM Global 815 Byron Drive Oconomowoc, WI 53066 Tel: (262) 567-7370 Fax: (262) 567-7370 craig.cooke@fmglobal.com</p>
<p>SAFE FIRING OF AUXILIARY FUEL Dave Streit, Chairman Buckeye Technology of Florida One Buckeye Drive Perry, FL 32348 Tel: (850) 584-1402 Fax: (850) 5841717 dave_streit@bkitech.com</p>	<p>SAFE FIRING OF BLACK LIQUOR Len Erickson, Chairman Boise Cascade P. O. Box 50 Boise, ID 83728-0001 Tel: (208) 384-4933 Fax: (208) 384-7637 len_erickson@bc.com</p>
<p>WASTE STREAMS John Rickard, Chairman Jacobs-Sirrinc P. O. Box 5456 Greenville, SC 29606 Tel: (864) 676-6393 Fax: (864) 676-6005 john.rickard@jacobs.com</p>	

BLRBAC MEETING SCHEDULE

Spring	2002	--	April	8, 9, & 10
Fall	2002	--	October	7, 8, & 9
Spring	2003	--	April	7, 8, & 9
Fall	2003	--	October	6, 7 & 8

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

■ Past Chairman Lon Schroeder

BLRBAC has created 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 new WEB site and after January 15, 2002, this is where they should obtain the following information for the BLRBAC Spring 2002 meeting.

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 nos., alternate hotel information, etc.

SCHEDULE

List of Subcommittee activities on Monday & Tuesday

AGENDA

Reports given to Joint BLRBAC Meeting on Wednesday

DELTA AIRLINE

Reduced rates and contact phone number, including discounted Avis rates for BLRBAC attendees.

OPERATING PROBLEMS

Mail/e-mail completed questionnaires back to Said & Done. These will be given to the Operating Problems Subcommittee Chairman, Dean Clay. He will see that your concerns are brought up and discussed during the Operating Problems session at the next meeting.

Mrs. Barbara Holich
Said & Done
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BLRBAC Publications

The following is the current status of the BLRBAC publications. Most of these are available at the **BLRBAC INTERNET ADDRESS : www.blrbac.org**

1. **Recommended Good Practice for Firing of Auxiliary Fuel in Black Liquor Recovery Boilers**, Published April 1967; revised November 1998
2. **Recommended Good Practice for Safe Firing Black Liquor in Black Liquor Recovery Boilers**, August 1982, revised March 2001
3. **Recommended Rules for Personnel Safety for Black Liquor Recovery Boilers**, approved April March 1996; revised April 7, 1997
4. **Recommended Emergency Shutdown Procedure (ESP) and Procedure for Testing ESP System for Black Liquor Recovery Boilers**, revised October 4, 2000
5. **Recommended Good Practice - Fire Protection in Direct Contact Evaporators and Associated Equipment**, October 1974 (out-of-print); presently being revised
6. **Instrumentation Check List and Classification Guide for Instruments and Control Systems Used in Operation of Black Liquor Recovery Boilers**, loose leaf, revised October 1999
7. **Thermal Oxidation of Waste Streams**, October 1999
8. **Recommended Training Program Guidelines for Black Liquor Recovery Boilers and Associated Systems**, April 9, 1997.

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MATERIALS & WELDING SUBCOMMITTEE

No formal meeting was held in the fall of 2001

Joan Barna – Chairman

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SAFE FIRING OF AUXILIARY FUEL SUBCOMMITTEE

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SAFE FIRING OF BLACK LIQUOR SUBCOMMITTEE

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Len Erickson, Chair *

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WASTE STREAMS SUBCOMMITTEE

* designates 10/01 meeting attendee

John Rickard* -- Chairman

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Greenville, SC 29606

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<p>John Caine Southern Environmental 6690 West Nine Mile Road Pensacola, FL 32526 Tel: (850) 941-3001 Fax: (850) 944-8270 jcaine@sei-group.com</p>	<p>Bill Caughman* FM Global 246 Woodridge Court Batesburg-Leesville, SC 29070 Tel: (803) 532-7490 Fax: N/A william.caughman@fmglobal.com</p>	<p>E. Scott Crysel* Granite Park One Plano, TX 75024 Tel: 972-731-1658 Fax: 972-731-1820 scott.crysel@fmglobal.com</p>
<p>Ned Dye* Jansen Combustion and Boiler Technologies 12025 115th Avenue N.E., Ste. 250 Kirkland, WA 98034-6935 Tel: 425-825-0500, Ext. 125 Fax: 425-825-1131 ned.dye@jansenboiler.com</p>	<p>James Franks* GE Industrial Risk Insurers 855 Dogwood Road Somerville, TN 38068 Tel: (901) 4656-6645 Fax: (901) 465-0771 james.franks@industrialrisk.com</p>	<p>Dwight Husband* Inland Paperboard & Packaging P. O. Box 1551 Rome, GA 30162-1551 Tel: (706) 236-5306 Fax: (706) 236-5441 dhusband@iccnet.com</p>
<p>Olli Kujanpaa* Andritz-Ahlstrom 10745 Westside Parkway Alphaaretta, GA 30004 Tel: (770) 640-2571 Fax: (770) 640-2455 olli.kujanpaa@andritzahlstrom.com</p>	<p>John Lewis* Fluor Daniel Forest Products 100 Fluor Daniel Drive Greenville, SC 29607-2762 Tel: (864) 281-8535 Fax: (864) 676-7630 john.lewis@fluordaniel.com</p>	<p>Wayne Macintire* International Paper P. O. Box 7910 Loveland, OH 45140-7910 Tel: 513-248-6834 Fax: 513-248-6679 wayne.macintire@ipaper.com</p>
<p>Barry Seidel* BE&K Engineering P. O. Box 12607 Birmingham, AL 35202-2607 Tel: (205) 872-6438 Fax: (205) 972-6300 seidelb@bek.com</p>	<p>H. Bentley Sherlock* Babcock & Wilcox 2302 Parklake Drive. NE, Ste. 300 Atlanta, GA 30345 Tel: (770) 621-3947 Fax: (770) 621-3922 hbsherlock@babcock.com</p>	

Those registered for the meeting were:

Alabama River Pulp

Browning, John, Perdue Hill, AL

Alert Systems, Inc.

Moyer, Scott, Perdue Hill, AL

Borsje, Henk, Duxbury, MA

Alliance Forest Products

Abrams, Larry, Childersburg, AL

Golden, Paul, Childersburg, AL

Griffitt, Frank, Childersburg, AL

Johnson, Eddie, Childersburg, AL

Alstom Power

Barna, Joan, Windsor, CT

Brown, Richard, Chattanooga, TN

Farmer, Robert, Beverly, MA

Gadai, David, Windsor, CT

Hennighausen, Rick, Charlotte, NC

Hollenbach, Dennis, Windsor, CT

LeBel, Mark, Windsor, CT

Seguin, Mike, Ottawa, Canada

Young, Frederick, Chattanooga, TN

Babcock & Wilcox

Dickinson, Jim, Barberton, OH

Hiner, Larry, Barberton, OH

Kulig, John, Barberton, OH

Lombardi, Randy, Barbearton, OH

McKenzie, Phil, Summerville, SC

Pifer, Greg, Barberton, OH

Sherlock, H. Bentley, Atlanta, GA

Yash, John, Atlanta, GA

Barron Industries

Justice, Jeff, Irondale, AL

Ray, Allen, Irondale, AL

BHA Group, Inc.

Shelton, Jake, Kansas City, MO

American Forest & Paper Assoc.

Grant, Thomas, Yonkers, NY

Andritz-Ahlstrom

Collins, Peter, Alpharetta, GA

Holm, Ralf, Alpharetta, GA

Koivisto, Lasse, Alpharetta, GA

Kujanpaa, Olli, Alpharetta, GA

Kvist, Marko, Alpharetta, GA

Nolin, Matt, Alpharetta, GA

Phillips, John, Alpharetta, GA

Saviharju, John, Alpharetta, GA

Sopanen, Jari, Alpharetta, GA

Aracruz Celulose S.A. (Alstom)

Medeiros, Arida Silva, Brazil, SA

Automation Applications, Inc.

McClain, Cliff, Exton, PA

AXA Insurance Company

Abel, Frederic, France

Boiler Tube Company of Amer.

Grant, Tommy, Greer, SC

Boise Cascade

Bolton, Gaylon, DeRidder, LA

Carr, John, DeRidder, LA

Eide, Perry, International Falls, MN

Erickson, Leonard, Boise, ID

Lambright, Whitley, DeRidder, LA

Stuart, Kenneth, Jackson, AL

Bowater Newsprint

Chanook, Bob, Thunder Bay, Canada

Hitch, Tony, Calhoun, TN

Williams, Mark, Calhoun, TN

Hornsby, John, Catawba, SC

Buckeye Technologies

Streit, David, Memphis, TN

Those registered for the meeting were:

Chaddick Consulting, Inc.

Chaddick, Louis, Wando, SC

ChemTreat

Fitzpatrick, Mike, Glen Allen, VA

Kanney, Mike, Glen Allen, VA

Clement Consulting

Clement, Jack, Akron, OH

Coen Company

Barsin, Joe, Charlotte, NC

Wadhvani, B.K., Burlingame, CA

Diamond Power Specialty

Urbach, Jonathan, Lancaster, OH

Whitehead, Brian, Lancaster, OH

Durango Georgia Paper Co.

Crews, Bobby, St. Marys, GA

Eastern Paper - Lincoln Mill

Sanborn, Dennis, Lincoln, ME

EIE Maskin AB

Arfwedson, Peter, Sweden

Bergmyren, Leif, Sweden

Environmental Elements

Campbell, Ken, Baltimore, MD

Bringman, Lewis, Baltimore, MO

Hardy, Kevin, Baltimore, MD

Holbrook, John, Baltimore, MD

Johnson, Deidre, Baltimore, MD

Schickling, Eugene, Baltimore, MD

Shanahan, Dennis, Baltimore, MD

Excelentec, Inc.

Sandquist, Kent, Milwaukee, WI

Fluor Daniel Forest Products

Lewis, John, Greenville, SC

Oscarsson, Bo, Greenville, SC

FM Global

Chase, Larry, Franklin, MA

Hoffman, Daryl, Sammamish, WA

Keyworth, Desmond, Dumdas, Canada

Morgan, Rick, Plano, TX

Parrish, David, Norwood, MA

Polagye, Mike, Norwood, MA

Beaulieu, Andre, Thornhill, Canada

Caughman, Bill, Batesburg, SC

Cooke, Craig, Oconomowoc, WI

Crysel, Scott, Plano, TX

Lamb, Ron, Parsippany, NJ

Lang, David, Bedminster, NJ

Lemay, Brian, Thornhill, Canada

Onstead, Jimmy, Plano, TX

Ward, Ken, Atlanta, GA

G&M Consultants, Ltd

Schreiber, Guido, Canoinhas, Brazil

GA Dept. of Labor

Everett, Earl, Atlanta, GA

Gaylord Container

Bray, Brett, Pine Bluff, AR

Villarrubia, David, Bogalusa, LA

GE Industrial Risk Insurers

Contino, Jamie, Atlanta, GA

DiLeonardo, Lino, Toronto, Canada

Fincher, Daryl, Alpharetta, GA

Franks, James, Atlanta, GA

Kanouse, Kurt, Vancouver, WA

Murch, Douglas, Philadelphia, PA

GeneralCologne Re

Freeman, Stuart, Atlanta, GA

George H. Bodman, Inc.

Bodman, George, Kingwood, TX

Those registered for the meeting were:

Georgia Pacific

Orender, Robert, Atlanta, GA
Bush, Rodger, Palatka, FL
DeCarrera, Robert, Atlanta, GA
Morency, Karl, Atlanta, GA
Proterra, Joe, Atlanta, GA
Smith, Roger, Atlanta, GA

Global Risk Consultants

Jackson, Christopher, Iselin, NJ
Smith, William, Woodstock, GA

Gulf States Paper

Tarpley, Donn, Demopolis, AL

Hartford Steam Boiler

Hess, Ron, Buckhead, GA
McGee, Tim, Canton, GA

Heberer Consulting Services

Heberer, Norman, Augusta, GA

Hercules, Inc.

Gaus, Jeff, Mandeville, LA
Robinson, James, Trevoise, PA

Inland Paperboard & Packaging

Husband, Dwight, Rome, GA
Ja'arah, Majed, Orange, TX
Morgan, Horace, Rome, GA
Peek, Carlton, Rome, GA

International Paper

Camp, Bill, Prattville, AL
Clay, Dean, Loveland, OH
Fuhrmann, Dave, Loveland, OH
Howard, Jeff, Roanoke Rapids, NC
Hughes, Jon, Savannah, GA
Lisenby, John, Roanoke Rapids, NC
MacIntire, Wayne, Loveland, OH
Moore, Lloyd, Loveland, OH

International Paper (Cont.)

Russ, Mary, Eastover, SC
Sargent, Mark, Loveland, OH
Vuoso, Jerry, Memphis, TN

Interstate Paper Corp.

Crosby, Phillip, Riceboro, GA

Irving Pulp & Paper

Mott, Dan, Saint John, Canada
Savoy, Dave, Saint John, Canada

Jacobs Engineers, Inc.

Rickard, John, Greenville, SC

Jansen Technologies

Drottar, Jerry, Kirkland, WA
Dye, Ned, Kirkland, WA

John E. Cover Engineering, Inc.

Cover, John, Birmingham, AL

John Rusch Associates

Rusch, John, Metairie, LA

Kawasaki Heavy Industries

Sakaeyama, Osamu, New York, NY

Kellogg Brown & Root, Inc.

Adams, Wayne, Mobile, AL

K-Patents, Inc.

Pyorala, Keijo, Naperville, IL

Kvaerner Pulping

Geedy, Jim, Charlotte, NC
Hansson, Berth, Charlotte, NC
King, Dave, Charlotte, NC
Lebouthillier, Yvon, Laval, Canada
Morgan, Preston, Charlotte, NC
Ries, Nancy, Charlotte, NC

Those registered for the meeting were:

Kvaerner Pulping (Cont.)

Sherrod, Hank, Charlotte, NC
Smith, David, Vancouver, Canada
Wasson, Eric, Charlotte, NC
Weikmann, John, Charlotte, NC

Liquid Solids Control

Sweeney, Michael, Upton, MA

Longview Fibre

Berg, Greg, Longview, WA

Marathon Pulp, Inc.

Rydberg, Blair, Marathon, Canada

Marsh USA, Inc.

Durham, Rick, Atlanta, GA

Matrix Risk Consultants

Stephenson, Jerry, Miamisburg, OH

Mead

Atkins, Ed, Phenix City, AL
LeGault, Tim, Escanaba, MI
Lindsey, Larry, Phenix City, AL
Swartz, Mark, Germantown, OH
Will, Mike, Phenix City, AL
Williams, Jimmy, Phenix City, AL
Willis, James, Chillicothe, OH

Mechanical & Materials Engrg.

Moskal, Max, LaGrange, IL

Metalspray North America

Southall, Scott, Richmond, VA

National Board of BPVI

Sullivan, Bob, Columbus, OH

Oak Ridge National Laboratory

Keiser, James

Ondeo-Nalco

Diambri, John, Naperville, IL
Totura, George, Naperville, IL

P. H. Glatfelter Co.

Decker, William, Spring Grove, PA
Gentzler, William, Spring Grove, PA

Packaging Corp. of America

Ferrell, Larry, Valdosta, GA
Parks, Kurt, Valdosta, GA
Pedron, Lester, Counce, TN
Pope, Charles, Valdosta, GA
Bruesewitz, Erv, Tomahawk, WI
Pashek, John, Tomahawk, WI
Schulz, Gary, Tomahawk, WI

Potlatch

Hartley, Chuck, Cloquet, MN

Power Specialists Assoc. Inc.

Cummings, Tom, Somers, CT
Madersky, Lee Anne, Somers, CT
Madersky, Tom, Somers, CT
Ruth, Brian, Somers, CT
Zawistowski, Bob, Somers, CT

Process Engineering, Inc.

Almond, Charles, Birmingham, AL
Breeding, Marve, Pelham, AL
Brooks, Mike, Pelham, AL
Moss, Cliff, Pelham, AL
Nolen, Ken, Pelham, AL

Rayonier

Davis, Gary, Jesup, GA
Thompson, Wayman, Jesup, GA

RiNan, Inc.

Pothier, Richard, Peabody, MA

Those registered for the meeting were:

Riverwood

Mercer, Tim, Macon, GA

RJM Corporation

Langstine, Bob, Norwalk, CT

Rockwell Automation

Jenkin, Fred, Mayfield Hts., OH

Sandwell Engineering

Smith, Edward, Atlanta, GA
Townsend, Larry, Atlanta, GA

SAPPI Fine Paper

Aderman, Craig, Skowhegan, ME

Smurfit Carton de Colombia

Cubillos, Jairo, Cali, Colombia
Franco, Daniel, Cali, Colombia

Smurfit de Venezuela

Johnson, Jonathan, San Felipe,
Venezuela

Smurfit-Stone Container

Boudreau, Don, New Richmond, Canada
Brackin, Gerome, Brewton, AL
Cotnam, Jim, Portage-du-Forte, Canada
Elder, Hollis, Jacksonville, FL
Green, William, West Point, VA
Groome, Matt, Panama City, FL
Jenkins, Clareace, West Point, VA
Pate, Winston, Brewton, AL
Phelps, Bob, Hopewell, VA
Rehim, Matt, West Point, VA
Smith, Dan, Hodge, LA

Southern Environmental

Caine, John, Pensacola, FL
Cotton, Rick, Pensacola, FL
Hayes, Charles, Pensacola, FL

Tembec

Little, Debra, St. Francisville, LA
Whittington, Darryl, St. Francisville, LA

Westvaco

Andrews, John, Charleston, SC
Burn, Robert, Charleston, SC
Lipata, Kathleen, Charleston, SC

Weyerhaeuser

Barreca, Clif, New Bern, NC
Burnette, Richard, Oglethorpe, GA
Carter, Larry, Pine Hill, AL
Clare, Dennis, Kamloops, Canada
Dixon, Jim, Pine Hill, AL
Hardison, Will, Plymouth, NC
Knowlen, Bruce, Federal Way, WA
Middleton, Larry, Pine Hill, AL
Pederson, Jerry, Federal Way, WA
Pulliam, Eddie, Valliant, OK
Quandt, Jim, Springfield, OR
Schweizer, David, Valliant, OK
Touchton, Robert, Oglethorpe, GA
Viar, Kari, Plymouth, NC
Woolard, Fred, New Bern, NC
May, Joe, Columbus, MS
Ponton, William, Columbus, MS
Salacki, Len, Grande Prairie, Canada

Willamette Industries

Avery, David, Bennettsville, SC
Beaver, Scott, Johnsonburg, PA
Cherry, John, Johnsonburg, PA
Clarke, Carl, Hawesville, KY
Easterwood, Mark, Albany, OR
Gaynor, Steve, Hawesville, KY
Pieschl, Vaughn, Albany, OR
Pile, Dave, Bennettsville, SC
Worsham, Jesse, Bennettsville, SC
Yerke, John, Albany, OR

INTRODUCTION

BLRBAC's Chairman, Wayman Thompson, called the meeting to order at 8:00 a.m. on Wednesday, October 10th.

CHAIRMAN: Good morning, I would like to welcome all of you to the Fall 2001 BLRBAC General Meeting. As we all can see, attendance is down somewhat. Under the circumstances, I think the attendance has been very good. We had a lot of discussion. At the Registration desk, we feel as though the downsizing was probably more influenced by the state of the economy rather than September 11th. It is good to see all of you here. I hope to have active participation in this morning's session. With that, I would like to move along with acceptance of the Minutes which were posted on the WEB site.

OLD BUSINESS

ACCEPTANCE OF MINUTES OF SPRING 2001 – Wayman Thompson

We expect to continue to post the Meeting Minutes on-line. Do I hear a motion to accept the minutes? Seconded? Any discussion? If not, they are accepted as submitted.

CHAIRMAN: Larry Chase could not be with us today and in his absence Mike Polagye will make the New Members/Representative Changes.

NEW BUSINESS

1. NEW MEMBERS/REPRESENTATIVE CHANGES REPORT – Mike Polagye

There were three applications for membership that were acted on by the Executive Committee at the meeting yesterday afternoon.

NEW REGULAR MEMBERSHIP

CNA – an insurer within the pulp and paper industry.

No Representative or Alternate Representative named.

NEW ASSOCIATE MEMBERSHIP

A.H. Lundberg Associates, Inc. – a supplier of concentrated and dilute NCG systems

No Associate Representative or Alternate Associate Representative named.

Universal Dynamics Technologies – an automation and control systems company

Alan Martin designated as Associate Representative

Eddie Koyama designated as Alternate Associate Representative

MEMBERSHIP COMPANY NAME CHANGES

Tembec, USA

Previously known as Crown Vantage

NEW REGULAR REPRESENTATIVE CHANGES

FM Global

Rick Morgan replaces Kevin Bradshaw as Representative

2. **SECRETARY'S REPORT** – Mike Polagye for Larry Chase

For this meeting we had 212 Advanced registrations plus 30 At Door registrations. Represented were 31 paper companies; six insurance companies; and five boiler manufacturers. Also, there were 35 Associate members and four guests of member companies.

Off-shore we have four people that we are aware of being with us this morning. We welcome Daniel Franco and Jario Cubillos from Smurfit in Cali, Colombia and Jonathan Johnson from Smurfit of Venezuela. Also, we'd like to welcome Fred Abel from AXA Insurance Company of France.

I'd just like to make a couple of other quick comments about Subcommittee reports. If you wish to submit a written report, we would preferred it to be transmitted electronically so that it can be entered directly into the Meeting Minutes. If you only have it available on paper, fine. Just give it to me after the meeting today or let me know that you will be sending it to me. Otherwise, the Subcommittee reports will be the oral transcription of whatever is said at this meeting. If anybody needs my e-mail address, please stop by and see me. Are there any questions? Thank you.

CHAIRMAN: Along those lines as Dean mentioned yesterday, we are attempting to get everyone's correct e-mail address. With all the changes in the industry, that is a constant battle. So, if you could assist us doing that, it would be very helpful since we are now only posting the Minutes on the WEB site. That is now our means of communicating with you. Of course, you can go to the WEB site on your own at any time to get any of those documents, but it is nice to be able to communicate to you when those Minutes have been completed and posted for the current meeting. Our goal is to have those Minutes posted 60-days after the meeting. We are going to make every attempt to do that, but we still would like to be able to contact you electronically in order to tell you when those Minutes have been posted. Also, we would like to be able to post Meeting Notices on the WEB site. We would certainly appreciate your help in that area.

2. **SECRETARY'S REPORT** (Cont.)

SECRETARIAL SERVICES REPORT (Cont.) -- Barbara Holich

Although Representative and Alternate changes appear in the minutes, no changes are made to the official BLRBAC database until a letter (written on company stationery and signed by management who has authority to grant permission to use company funds to attend BLRBAC) is received and which states who the new Rep. and Alt. are going to be. This letter must give the full name, BLRBAC position taken (Rep.; Alt.; Assoc. Rep.; Assoc. Alt. Rep.; Corres. Rep.; or Corres. Alt. Rep.), postal mailing address and e-mail address of the designated person. It is imperative that a written letter be received by the BLRBAC Secretarial Service whenever a designated Rep. or Alt. retires, resigns, dies, or can no longer fulfill their responsibilities as a BLRBAC Rep. or Alt. Rep. This letter should be written in a timely fashion to the BLRBAC Secretarial Services, c/o Mrs. Barbara Holich, BLRBAC Secretarial Services, 1005 59th Street, Lisle, IL 60532. The above also applies to Assoc. Reps. & Alt. Assoc. Reps. A phone call is appreciated (630-512-0144) because it makes me aware of the change, but remember, **no changes are made to the database until an official, signed letter is placed in the BLRBAC files.** Your cooperation in this regard is greatly appreciated.

3. **EXECUTIVE COMMITTEE REPORT** – Wayman Thompson

The Executive Committee met yesterday and had a rather lengthy meeting. There are several things I would like to mention that came out of that meeting. Of course, we have reviewed and approved the new members. Also, the ESP Subcommittee has submitted a wording revision to be entered into their document on the water coil air heater. We approved that. That was in the minutes and during the report by that Subcommittee, we will vote on that change.

The ESP Subcommittee also submitted wording for review on the alternate means of actuating rapid drain valves. The Executive Committee has received that and we will review and provide any comments back to the ESP Subcommittee.

We also received the document for Recommended Good Practice of Fire Protection in Direct Contact Evaporators and Associated Equipment. We have that under review. That is a very good document and I'd like to thank Jerry Vuoso and his committee for putting a lot of effort into that. We will be taking that under review and providing any comments back to that Subcommittee.

We have reviewed a preliminary budget for this year. That will be brought up to the membership in the fall meeting next year.

We also visited for a while the issue of By-laws; their wording and their meaning. It was decided at this time that we are not going to make any changes to our By-laws, but we will continue to review it.

4. **TREASURER'S REPORT** -- Tim McGee

We continue to have to struggle with our finances just a little bit. The good news is that we are starting to see some of the benefits of the recent changes we have made where we have gone more to the WEB site trying to cut-down on our copying and postage costs. However, as Wayman has already said, it's kind of been offset by the attendance over the last couple of meetings which is down, but we are still solvent. Prior to paying for the bills for this meeting, we have:

Checking Account:	\$15,851.00
Money Market Account	<u>26,138.00</u>
Total on hand receipts of:	\$41,989.00

5. **SUBCOMMITTEE REPORTS**

5.1 **ESP SUBCOMMITTEE REPORT** – Bo Oscarsson for John Andrews

In the closed session, there were nine of 12 original members present. We accepted Larry Carter as a new member representing Weyerhaeuser. That should really be communicated to the Executive Committee because Larry will be the Representative for Weyerhaeuser.

Lou Chaddik was temporarily representing Westvaco and Lloyd Moore represented Preston Morgan of International Paper. We still haven't got word on who will be the permanent representative from IP. I guess we will get that later. We certainly would enjoy having Lloyd there. The same members were present at the open session, plus all of the registered people who are here.

[Editorial Note: The PowerPoint slides used during this report are included as Attachment A and a Summary of the Incidents is included as Attachment B.]

In the Incident Report we had 39 North American incidents. There were no explosions. There were 12 critical; 23 non-critical; two dissolving tank explosions; and one non-classified/no leak. Also, reported were six International Incidents. The breakdown of the leak locations were 11 economizer; eight superheaters; six generating banks; nine upper furnace out of which two were water screens; one lower furnace; and one steam coil air heater leak.

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

5.1 **ESP SUBCOMMITTEE REPORT (Cont.)**

The way we break up the root causes is cracking is somewhat subjective. Actually as you read the incident report you can identify multiple causes. This is a personal interpretation of what was there. I think that it is pretty accurate. Where the root cause was cracking, it was broken up into six fatigue, two corrosion, one stress assisted corrosion, four unknown at the time the reports were written and three weld failures. Out of those, there was one that was reported as a temporary repair that gave up. In thinning two were corrosion and one was due to erosion. The erosion was caused by a sootblower. We had a number of rupture-shear type incidents, one was a weld failure, one the result of an original manufacturing defect at installation, three from short term over heat, three from fatigue and one from erosion. For pinhole leaks, one was the result of wear, three from corrosion, one was an original installation manufacturing defect, one was in the steam coil heater, and one from an unknown cause. Also listed as an unknown cause is the incident in which there was no leak.

How the incidents were discovered is very interesting, we still see that operators play the most crucial role in detecting leaks. There is no doubt about that. Thirty leaks were the result of walk downs or field observations, eight were initiated through the control room indications. Again this break down is somewhat subjective because in some cases it could be considered either control room instrumentation or discovery by the operator.

It is always the operator interpreting a control room read out and taking the reading as the absolute first hint of a leak. But, based on what was written, this is how it breaks down. There was one leak detection system indication. Unfortunately that was the one where there was the no leak, which is somewhat disturbing. I want to caution that this gives a little bit of a skewed view because there was a number of incidents reported that when they went back and looked into the documentation from the leak detection system, the leak detection system had actually picked up the leak. In one case there was a communication interface problem between the leak detection system and the reporting function in the DCS. So, the primary sensor apparatus worked better than what this statistic is showing. None the less, but it is the whole system in its entirety that has to work for a leak detection system to be effective.

There was other business that we dealt with in the committee. We looked at the rapid drain water level review. The recommendations remain unchanged at the eight-foot level. The committee will continue to actively monitor developments in this area and will revisit this issue, if needed. International Paper is maintaining the files/data on draining to the eight foot level and are reviewing it on a bi-yearly basis. They will forward any finding to us. The request for Post ESP Water Level Information is posted on the BLRBAC Web site. You are encouraged to collect the requested data and forward it to us.

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

5.1 **ESP SUBCOMMITTEE REPORT (Cont.)**

A clarification to the ESP document has been submitted to the Executive Committee. The main intent is to have an alternate means to initiate opening of the rapid drain valves through the use of a switch or switches for individual valves at a safe locations or access to valve starters from a safe location.

Alternate drain provision for flash to sky system: there is wording within the ESP document. The current language as it is now written states "If an atmospheric rapid drain ("flash-to-the-sky") relief system is used, then alternate drain capacity should be installed on the atmospheric vent line to gravity drain the unit under low pressure situations. The drain time should be comparable to a flash tank system . " We will be revisiting this at the next meeting. There are some concerns about the way the language is written and if in fact it's even possible to have a flash to sky system with that wording. We have to resolve that so that we have a reasonable agreement between reality and text.

Other items for the next meeting include:

"Recommended Guidelines for Post-ESP Procedures" will be submitted to the Executive Committee for review at the next meeting. At the subcommittee meeting on Monday there was some last minute word-smithing that is being reviewed by subcommittee members. Karl Morency should be able to submit the final text to us at the spring meeting.

Jack Clement will also work on the Incident Questionnaire. There are a few things of a word-smithing nature to improve the clarity of the questionnaire. We also talked about potentially removing some pieces of information that don't seem to aid the ESP Committee in understanding the incidents. So, we are looking at possibly simplifying it to some degree. Then if there is additional information that we currently are not getting, we will add that or clarify questions so the needed information is provided. One of those is reporting the remaining water level after an ESP. We definitely are interested in seeing that reported in a consistent manner.

It was brought to our attention in reviewing the document that we need to consider secondary damage potential for live steam piping in the immediate vicinity of the recovery boiler. The reason is that when we do have a serious accident, it has been fairly evident that it is really the rupture of the steam and water pressure vessel that is of major concern for everyone in the boiler house. It may be so that the live steam piping around the vessel itself may be a concern if we should have a failure and then rupture in a major low pressure or medium pressure line. There is no decision on that, but we will review it and will look at what it means. If we can, we will find a way of providing some guidance to the industry.

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

5.1 **ESP SUBCOMMITTEE REPORT** (Cont.)

A question had come up to allow use of the emergency ESP alarm to evacuate the recovery boiler building when there is suspicion of leak. In some cases, such as when maintenance or work is being performed, “non-essential” personnel are in the recovery boiler area. Normally there are very few people in the recovery boiler house, but, if for example, they are gearing up for shutdown and people are starting to bring in scaffolding or you have a lot of other maintenance people around, it may be desirable to clear the recovery boiler area even though an ESP has not been initiated. The ESP Committee doesn’t have a problem with using the alarm in that manner and plans to turn the topic over to the Personnel Safety Committee for review and determining how to deal with that issue.

This concluded our meeting. Are there any questions?

CHAIRMAN: At this point I would like to call a vote on the revision addressing water coil coil air heaters which was in the April 2001 Minutes. In order for it to become part of the document, BLRBAC procedures require it to be voted on and approved by the membership. Bo please read the revision so everyone has in their minds what it is saying. If you have any questions, speak up. It was in the Minutes and there were no comments back to the Subcommittee to the Executive Committee. So, with that, it is ready for a vote.

OSCARSSON: Do you want me to read this in Swedish or English? Actually it was Dave Parish who worked on this and came up with the language that finally was accepted. It is included in Paragraph 5.1 of the April 2001 Minutes of Meeting:

FEED WATER COIL AIR HEATER LEAKS: Some configurations may allow water from a ruptured air heater tube to enter the furnace through combustion air ductwork. The potential for leakage to enter the furnace may be mitigated by the location of the feed water air heater coil and design of the ductwork. The configuration may include a system of air duct low points and drains, water detection alarms, and if necessary air heater waterside isolation or a boiler ESP.

CHAIRMAN: Does anyone have any further questions at this time? If not, I would like to have everyone who has a red ribbon to please stand. You are the voting members and the ones who are allowed to vote on this matter. All those in favor of accepting the revision, please raise your hand. Any opposed? It is unanimous; the wording is accepted as read. Thank you very much.

5. **SUBCOMMITTEE REPORTS (Cont.)**
5.2 **FIRE PROTECTION IN DIRECT CONTACT EVAPORATORS AND ASSOCIATED EQUIPMENT REPORT** – Chris Jackson for Jerry Vuoso

The subcommittee on Fire Protection in Direct Contact Evaporators & Associated Equipment met Monday morning October 8, 2001 with 6 out of 12 subcommittee members and 9 guests present. We met during the morning in Open/Closed session, guests were welcome, but were to limit their input.

The document was worked on at length during the past six months and was sent out for review by subcommittee members. Feedback was incorporated into the document. Jerry Vuoso and Chris Jackson met in Portland, Oregon this past July to make many of the document changes and improvements.

There was no intent, during this meeting, to review the document line by line. We were initially going to review, section by section, with only major issues raised. After starting to make some minor changes to the document, we decided we could end up spinning our wheels forever in the “Word-smithing” phase. Instead, we voted on the document, with a 100% of those present voting to send the document to the Executive Committee.

There were some concerns about having a quorum for the above vote. This was pursued with Dean Clay, Vice Chairman and it was indicated the quorum would not be needed due to the special circumstances (Afgan war, e-mail responses from committee members).

Some of the information in the appendices of the document should not be considered as part of the document. Changes to that information would then not need to be reviewed/approved by the Executive Committee. Incident Summaries would be an example.

Jerry Vuoso will address with the Executive Committee who should receive the incident reports. It is hoped someone on the Executive Committee will receive the reports and will then distribute them to certain subcommittee members. It is felt that the DCE portion of the BLRBAC web site will include summaries of the incidents (brief/tabular form).

The issue was raised concerning the need to save loss information from the 1960s and 1970s that had been reported in the old document? It was decided that only information obtained during the revision process for the document and future incidents would be maintained. The Committee discussed the possibility of having a web link to an incident summary database to possibly include:

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

5.2 **FIRE PROTECTION IN DIRECT CONTACT EVAPORATORS AND ASSOCIATED EQUIPMENT REPORT (Cont.)**

Date of Incident
Type of Evaporator System
Location of Fire
Normal % Solids
Suppression System(s) Used
Was Fire Extinguished on the 1st Attempt
Damage Description
Down Time Due to Fire
Changes Made (Corrective Actions) Due to Fire

This issue was to be discussed during the Executive Committee meeting.

Our subcommittee gathered a large database of DCEs in North America. We will not be keeping this information up-to-date. The information will be given to the Executive Committee.

The Instrumentation document is not in complete agreement with our document. The location of the heat detection will need to be addressed with the Instrumentation Subcommittee, when our document has been approved.

The subcommittee will likely stay active even after the document has been approved. There will be questions as the document is put into use, especially the first few years.

5.3 **INSTRUMENTATION SUBCOMMITTEE REPORT** –Dave Avery for Bill McQuillan

The Instrument Subcommittee met in *open* session on Monday morning and afternoon. We had eight members and 16 guests in the morning, with nine members and three guests in the afternoon. The session opened with a review of “Fire Protection of DCE Units and Associated Equipment” document as drafted by that Subcommittee. The group agreed to incorporate the changes after they have been accepted by the membership. Follow-up discussion on alternate means of actuation for raid drain valves was deferred after information presented indicated that the ESP Subcommittee was working on specific wording to address this question.

New discussion was opened on “Functional Logic Tests for Recovery Boilers” from the field device (sensing) through the logic controller to the final action (interlock). Dialogue included testing frequency, sensing device activation (testing verses calibration), timing of test (when can test be safely performed), management of test procedure and general outline of systems to be tested. The discussion concluded with further development to be undertaken at the next meeting.

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

5.3 **INSTRUMENTATION SUBCOMMITTEE REPORT (Cont.)**

Additional topics included “the potential inclusion of analog/smart transmitter signals for initiating interlocks” and “the installation of an isolation valve in an interlock sensing line.” Potential inclusion of analog/smart transmitter signals for initiating interlocks could improve reliability and improve accuracy for primary sensing activation points. This would compliment the accepted existing discrete signals allowing improved technologies where applicable. The last item covered installation of isolation valves in sensing lines for on-line maintenance. The control of the valve position for interlock integrity would require “an adequate means” to ensure normal functionality. These two items are to be worked with “Safe Firing of Black Liquor” and “Safe Firing of Auxiliary Fuels” subcommittees during the Spring/Fall '02 meetings.

The Spring '02 meeting is scheduled as an *Open* session with an invitation extended to all interested in this subject matter.

5.4 **MATERIALS & WELDING SUBCOMMITTEE -- Joan Barna**

No meeting was held. This Subcommittee is scheduled to meet in the spring of 2002. The time and date will be posted within the Meeting Notice.

5.5 **PERSONNEL SAFETY -- Robert Zawistowski**

The Personnel Safety Subcommittee met on Monday. We had 13 members and a total of 14 guests present. We also had one new member join our group as well. Our representation included four of the OEM's, five insurance companies, six of our operating groups, one consultant and one jurisdictional gentleman.

We have been keeping up-to-date as well as we can on the AF&PA study with the explosion corner design used on some boilers. We are looking to incorporate information from that study as it relates to personnel safety into our document. Right now we are waiting for the final version to come out and we will maintain contact with the AF&PA group to get information as it becomes available to us.

We have also been talking about outage intervals and outage inspections. We have not taken action within our committee to make any recommendations on intervals, but we did look a little bit further into the information that is available out there for the purposes of inspection and inspection programs to increase our knowledge within the committee. We reviewed portions of the AF&PA Inspection Guidelines and some of the company representatives from the operating groups discussed their programs; what they are doing for regular inspections and the programs they have. We also heard from the jurisdictional side what some of the code regulations are, specifically in the National Board recommendations. That was, again, just to increase our knowledge in committee.

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

5.5 **PERSONNEL SAFETY (Cont.)**

So far, at least within the committee, have not come up with any specific concerns. There is a lot of good information available for inspection guidelines and programs. The one thing that did come up in the meeting that was interesting was that while there is a lot of information out there and a lot of good programs, it's how we execute the programs that makes them successful or not. It was brought up that some locations do an excellent job executing plans and staying on top of things, but others just don't do so well. We don't know how to address that yet. We are going to try to explore that a little bit more and our focus will be on Personnel Safety. If we do find areas where specific things should be done, then we'll be looking at talking with other subcommittees, such as Material & Welding, to see if we need to get some language over there which might be of help.

Since the last meeting we had a couple of requests for clarification for information, but they were relatively minor. The other thing that we have been doing is continuing to upgrade the Personnel Safety document. I mentioned at the last meeting that the training guidelines are currently posted as a separate document on the WEB site. As of this fall meeting, we have gotten the language over into our new draft of the document as an additional section. At the next meeting we are going to get into the specifics of training recommendations and further update our documents. I am hoping that we will complete that in the spring of 2002; get the final changes made, and get that document to the Executive Committee by the fall of 2002. Hopefully we will have it ready for you folks to vote on sometime shortly thereafter. Are there any questions?

We are keeping the committee open because we think Personnel Safety is important and we encourage and invite anyone who would like to participate either as a guest or a member at any time to contact me. You can contact me pretty easily by using the e-mail address found in the meeting minutes posted on the BLRBAC Web site.

One final note on my e-mail address. It was updated and if you have my address in your Personal Address Book the BLRBAC Web site is a good place to go and get the latest and greatest version.

5.6 **PRESS RELEASE & PUBLICITY SUBCOMMITTEE REPORT - Craig Cooke**

No report was given.

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

5.7 **SAFE FIRING OF AUXILIARY FUEL REPORT – Dave Streit**

The Auxiliary Fuel Subcommittee met in open session on Monday afternoon in the Fitzgerald room. There were five members/alternates and one guest present at the meeting. Mr. Scott Crysel, representing FM Global, and Mr. Allen Ray, representing Barron Industries, have been designated as new members on the Auxiliary Fuel Subcommittee. Both Mr. Crysel and Mr. Ray were present at this meeting. Mr. Ray will assume the duties of subcommittee secretary, the role previously filled by Tom Gilmore.

There were no agenda items carried over from the previous meeting, so the meeting was opened for general discussions and for new business.

There was discussion regarding the need to have the up-dated document available on the web site. Changes to the document have been approved by the general membership on two occasions, with the last change occurring a year ago, but the document on the web site does not reflect the changes. This item will again be worked with the Executive Committee.

There was no new business brought before the subcommittee, therefore there was some discussion as to the need for a subcommittee meeting during the spring session. Dave Streit will contact the membership of the subcommittee and unless there is a need as expressed by subcommittee members, there will not be an Auxiliary Fuel Subcommittee meeting scheduled until the fall session. A spring meeting can be re-scheduled if the need arises.

5.8 **SAFE FIRING OF BLACK LIQUOR REPORT – Mark Sargent for Len Erickson**

The Safe Firing of Black Liquor Subcommittee met Monday afternoon in open session with seven members and about 50 guests in attendance.

- A. The proposed revisions to the Safe Firing document, including the changes requested by the Executive Committee, have been forwarded to the Executive Committee for review and approval. The committee is waiting for approval or comments from the Executive Committee.
- B. Brian Lemay reviewed proposed changes to the safe firing document which would recommend the use of a keyed interlock switch when using the black liquor guns to wash the lower furnace during a boiler water-wash. The changes would provide a standardized procedure and avoid the current practice of using jumpers to defeat safety systems in order to perform the water wash.

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

5.8 **SAFE FIRING OF BLACK LIQUOR REPORT (Cont.)**

- B. (Cont.) The committee agreed that there was a need to standardize the procedure. Input was received from the guests that four items should be included; bed condition, bed hot spots, bed temperature, and bed cool-down time. Brian will draft proposed language to be reviewed at the spring meeting.
- C. Conditions to allow a reduction in the frequency of testing black liquor solids on those units that fire at solids above 70% were proposed.
- Boilers with an as fired solids less than or equal to 70% BLS
 - No changes are proposed
 - Boilers firing Black liquor at solids levels greater than 70% BLS:
 - Manually test the black liquor a minimum of once per shift or once every eight hours.
 - The refractometers must be within 2%
 - No changes to the weekly TAPPI testing procedures.
 - Increase the low solids divert to 60%

In addition it was suggested that an alarm be added if the refractometers dropped below 70% solids, that the divert be increased to 62 to 64%, and that the starting permissive be increased to 64 to 65%.

The guests suggested that the existing two-hour testing interval be maintained until the boiler is up and in a stable firing condition.

It was agreed that language would be drafted and submitted to the subcommittee at the Spring 2002 meeting. (Len Erickson)

- D. Review the requirement in Chap. 5, **BLACK LIQUOR FIRING INTERLOCK SYSTEM**, page 21, in which we say: “No valve or similar shut-off shall be inserted in the sensing line to any interlock device, such as, a pressure or temperature switch, that could defeat the interlock function if accidentally closed.”

Discussion centered on the need to provide operations some flexibility to maintain instruments without shutting down the boiler. Concerns were; how long the instrument would be out of service, how the isolation valve or device would be secured during normal operation, should verbiage be added to state that BLRBAC does not condone the continued operation of the boiler while instruments critical for the safe firing of black liquor are out of service, etc. Brian Lemay & Mark Sargent agreed to take the lead in putting a discussion document together for the spring meeting.

5. SUBCOMMITTEE REPORTS (Cont.)

5.8 SAFE FIRING OF BLACK LIQUOR REPORT (Cont.)

- E. Review TomLox™ Technology (Forwarded to committee members by Alstom) and the Jansen OEA™ technology for use in recovery boilers.

Kent Sandquist presented the intent of the TOMLOX™ system and its intended use. Tomlox/Alstom asked BLRBAC to send a formal request to the secretary of the Swedish BLRBAC for their guidelines & recommendations. (Len Erickson to follow-up).

- Alstom/TomLox and Jansen Technologies were asked to forward to Rick Young their interlocking strategies.
 - Rick Young will distribute the material to the committee members when it is received.
 - The concerns of corrosion and the operating environment in the lower furnace will be forwarded to the Materials & Welding subcommittee.
 - Safe Firing will place the discussion of oxygen enrichment of the combustion air on its Spring 2002 agenda.
- F. Questions that had been submitted to the committee chair were reviewed.
- One question in particular requires some historical research. “Why does the Safe firing of Black Liquor require the temperature permissive prior to liquor being introduced to the ring header”? The committee is researching the background on this interlock to provide an answer.
- G. Review the proposed Fuel Tec system. This discussion was deferred until the Spring 2002 meeting.
- H. No new business items were raised by the members or audience.
- I. A short closed meeting was held to discuss how to proceed with the TOMLOX requests. The meeting was adjourned at about 2:30.
- Contact Len Erickson at 208-384-4933, e-mail len_erickson@bc.com, or Fax 208-384-7637 or Mark Sargent at 513-248-6086, e-mail mark.sargent@ipaper.com, or fax 513-248-6679 with questions or comments.

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

5.9 **WASTE STREAMS REPORT** -- John Rickard

The Waste Streams Subcommittee met in closed session at 8:00 AM on October 8, 2001 with 11 members present. Two new members, Bentley Sherlock with B&W and Olli Kujanpaa with Andritz-Ahlstrom joined the subcommittee.

We approved the minutes. There had been one question since the spring meeting. It pertained to the turpentine content of a stripper off gas stream. Also, TAPPI has issued two TIP sheets that pertain to thermal oxidation of waste streams in recovery boilers. These documents were reviewed to provide coordination between them and our guidelines.

The subcommittee's present effort concerns waste streams blended with black liquor. Our schedule is to have a document to the executive committee by April, 2002 leading to voting for general approval in October, 2002.

Next we began reviewing the rough drafts of the guidelines for blending waste streams with black liquor. Starting with tall oil blending, much time was spent as we established a "foundation" for the remaining guidelines. Tall oil is much lighter than black liquor so it needs good mixing and should be added after the last tank. We recognized the need to research the guidelines of other subcommittees to ensure that our use of terms, such as "minimum firing" and "stable operation," are consistent with theirs.

Following tall oil, we reviewed tall oil spent acid, which is a different type of liquid from tall oil. It is an aqueous brine and it required extensive discussion to establish its "foundation". Due to its water content, tall oil spent acid should be added to 50% liquor or even weak black liquor.

The third liquid reviewed was secondary sludge and it is different from the first two streams so the discussion again was extensive. Secondary sludge benefits greatly from evaporation. The heat treatment it receives breaks the cell walls of the "bugs" allowing better water reduction. It is not harmful to the evaporators.

To make our goal for presentation to the Executive Committee in Spring 2002, we set the following schedule:

Nov. 15th – Submit revised waste stream write-ups to John Rickard, who will forward them to Dwight Husband for consolidation.

Dec. 15th – Consolidated write-ups from Dwight to John R. for issuing to subcommittee members for review.

Jan. 15th – Comments from subcommittee members to John R.

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

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

If required, teleconferences will be used to clarify comments.

The afternoon session convened at 1 PM in an open meeting. There were 11 subcommittee members present and 10 visitors. Mr. Mike Sweeney of Liquid Solids Control gave us a very informative talk about refractometers and the effect of blended waste streams on their operation.

- Soap will lower the refractive index, making liquor appear to have lower solids. Operators can identify this through off line testing and then shift the solids scale so that they have a correct indication of percent solids in their normal operating range.
- Spent acid can lower the refractive index by precipitating out lignin. The refractometer measures only dissolved solids. It does not see suspended solids.
- Waste streams can coat prisms, impairing measurement.
- Methanol lowers the refractive index.
- The latest design from LSC has multiple calibration curves in its processor. This will allow curves to fit different firing blends.

If waste streams are burned by blending them with black liquor, then the two hour off line testing of solids will be very important because the waste stream(s) most likely will affect the solids reading. In addition, the waste stream blending may not be a continuous process (although continuous is best).

Resuming the draft review that was started in the morning, soap addition was reviewed next. Soap's effect on the refractive index became part of the draft discussion. Soap is more likely to be fired on a batch basis than other waste streams.

The final rough draft for review was ClO₂ spent acid. The subcommittee agreed that the tall oil spent acid guideline would apply to ClO₂ spent acid.

Guests in attendance described blending of turpentine with black liquor, burning liquid methanol in a recovery boiler waste stream burner and soap burning. All of these experiences were timely to our discussion.

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

B.K. Wadhvani of Coen attended our meeting and agreed to talk to us about waste stream burners during our April, 2002 meeting.

With the discussion subsided, the meeting was adjourned. Joe Barsin joined the subcommittee at the end of the afternoon session.

CHARIMAN: I would like to encourage all of you to participate actively in these subcommittees. As you hear, particularly from the operating standpoint, many of the things we are doing are making the BLRB systems more complicated. We are adding waste streams to them. We are talking about changing interlocks. All things that have an impact upon your operation. The best time to have your input is in the formative stages of all these guidelines.

6. **AMERICAN FOREST & PAPER ASSOCIATION REPORT -- Tom Grant**

With its mission to produce greater awareness of safe practices and to improve the operation, maintenance, safety and efficiency of recovery boilers, the AF&PA Recovery Boiler Program continues to meet this target. Each of the subcommittees is working for the Program's mission.

At the latest count, we have 30 companies in the Program including two non-AF&PA member companies. The Program and AF&PA agreed a few years ago to allow non-AF&PA member companies to participate in the Program in the common cause of safe operation of recovery boilers. In this way all companies with recovery boilers may gain the benefits of the Program. There are seven companies that operate recovery boilers in the U. S. that are not in the Program. We have invited them to join with the current members to cooperate in the common cause of the safe operation and research to improve the safety of the recovery boilers. AF&PA decided in the past year to open membership to Canadian companies as well.

The Operation and Maintenance Subcommittee has sponsored Operational Safety Seminars in its efforts to further improve operations and maintenance. The seminars are sponsored in an effort to further minimize the risks of explosions and incidents. Over the years they have proven to be most helpful and informative by providing both formal and informal open forums for the discussion of problems and situations in the safe and reliable operation of recovery boilers. We can see the results of the seminars in the substantial reduction in the number of explosions over this past decade. Three seminars were scheduled for this year. The one in Portland, OR, in March had to be canceled due to the lack of registrations. Two others were held in April and May here in Atlanta - but the number of attendees was sparse - either due to travel restrictions or economical conditions, or complacency in operating the boilers. We do not know the reason, but we will again plan three seminars for 2002. If we find registrations are not sufficient to conduct these seminars, we will be forced to cancel them.

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

Mr. Jack Clement is continuing in his role as the AF&PA explosion monitor. He is also working with the BLRBAC ESP Subcommittee on collecting and reporting on recovery boiler incidents. He and Dr. Grace recently completed the study sponsored by AF&PA to investigate the relationship between recovery boiler furnace design and explosion damage. The results of the study were distributed to the Program members.

The report does not make specific recommendations. It only comments on the level of risk associated with the damage potential of given designs.

The AF&PA Recovery Boiler Training Program continues to be of interest in many mills and many companies (members and non-members) are using this extensive information to their best advantage. Many in the industry feel that it is the best training program available for operating recovery boilers. There is only a handful of mills that do not have the Program, and we hope these mills will obtain the Program and use it for both beginners as well as experienced operators. AF&PA has placed the Training Program onto a CD, but cautions that using them to print a hard copy of the whole program is probably not cost-effective compared to purchasing the printed and bound material. The second caution is that the training is designed to be used in a classroom format with an instructor, and this cannot be replaced by merely purchasing the CDS and making them available to trainees.

The "Kraft Recovery Boilers" book, which was sponsored by the R&D Subcommittee continues to be of interest to all involved in the operation and maintenance of recovery boilers. It is considered to be most helpful to expert engineers as well as to the new people to the recovery area. The book may be ordered through TAPPI.

The Recovery Boiler Char Bed Cooling following an ESP project sponsored by the AF&PA has been very successful in completion of a full-scale test of the use of liquid CO₂ and sodium bicarbonate to cool a char bed during a simulated ESP at the Willamette Industries' Albany, OR, mill. The test results confirmed the effectiveness of both of these coolants and provided detailed information on how they can be utilized. Dr. Tran submitted his final report to AF&PA on the facilitating effective use of accelerated cooling methods. The next phase of the project is underway. It involves experiments that will provide insights into how these coolants interact with bed material and help determine if either coolant has an advantage in penetrating a hard, crusted-over char bed, and help develop improved strategies for using coolants on char beds after an ESP. A video will also be prepared so that it may be used in training. The results should also provide information on the use of bicarbonate for cleaning clogged smelt spout openings. The project is scheduled to be completed in mid-2002.

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

The Research & Development Subcommittee is sponsoring a project with the Pressure Vessel Research Council (PVRC) of the Welding Research Council (WRC) to create a document on damage mechanisms. This project will proceed in full for the refining and fossil power industries. Coverage of the pulp and paper industry will receive the same extent for its portion of the project. Mechanical & Materials Engineering (M&ME) is preparing the portion of the document relating to the pulp and paper industry under contract for PVRC's current sponsors, API and NBIC. Drs. Dave Bennett and Max Moskal are the principal investigators.

The project will produce a document containing standard descriptions of damage mechanisms and inspection methods for determining their severity. This information is a crucial element for the fitness-for-service assessment technology increasingly used for management of in-service integrity of all manner of pressure vessels, tanks piping, etc., in process industry and power generation plants. The main value to plant owners is in avoiding equipment failures and unwarranted replacement or repairs. This trend now is being recognized by the ASME Boiler and Pressure Vessel Code committee, which is producing a post-construction part of the ASME Boiler and Pressure Vessel Code. WRC will publish the entire work product as a WRC Bulletin and supply copies to AF&PA.

The R&D Subcommittee is working with ABB, B&W, Alstom and Andritz-Ahlstrom in a project to investigate floor tube failures. AF&PA is sponsoring the project in which the first phase will be to compile the industry's experience with floor tube failures in order to get a better understanding of the issues involved as well as the magnitude of the problem. Dr. Grace and Mr. Clement will be collecting, and studying, information from operating companies and boiler manufacturers. The Committee is also reviewing work that was done on this issue by the University of Toronto.

An Energy Performance Task Group for Agenda 2020 is continuing to work to develop projects with a vision for the future. There are a number of projects currently underway in both the Sensors and Controls and Energy Performance Task Groups, including gasification, that are funded by DOE and which are related to recovery boilers. Others are being reviewed for possible future funding from DOE with cooperative research at universities, research institutions and at the corporate level. Proposals continue to be reviewed in the selection process by the Task Group.

The AF&PA's Recovery Boiler Program will hold its annual Conference in February. The presentations will include reports on the projects underway relating to the Program; a status report on the research projects in the Agenda 2020 program funding by DOE; the work for the Bed Cooling following an ESP; the results of the investigation of the relationship between recovery boiler furnace design and explosion damage; as well as, the subcommittee reports on their accomplishments. The object of the Conference is to keep not only AF&PA Recovery Boiler Program members informed of the status of current projects, but also boiler manufacturers, vendors, insurers, as well as the remainder of the recovery boiler community. We hope that many of you will plan to attend next year's Conference to be held in Atlanta in February.

7. **TAPPI RECOVERY BOILER REPORT** - Karl Morency

As Tom mentioned, the TAPPI Engineering Conference was rescheduled from September 17th until the week of December 3rd. The Steam & Power Committee Meeting will be held the afternoon of December 3rd and the Recovery Boiler Subcommittee will also be held that same afternoon.

The committee is currently focusing on developing a number of technical information papers for publication. I will just run through this list and give a brief status on each of these activities.

Recommended Test Procedures for Black Liquor Evaporators: This paper has been written and it is in the final review process. I expect that it will be submitted for publication at the December meeting.

Generating Tube Rolling Procedures and Quality Guidelines: This paper has also been completed and is in the process of final review. It will be submitted for publication this fall.

Recovery Boiler Performance Calculations (the short form): The short form calculations are being updated. The long form has already been revised and the short form is being updated so that it agrees with the changes that have been made to the long form Performance Calculations.

Stripping of Condensates and NCG Systems: Both of those papers are in the process of final review for publication and we hope to have them ready for submittal this fall.

Analysis of Soda and Sulfate Black Liquor: This is still being worked on.

Effective Composition on the First Melting Temperature of Fireside Deposits in Recovery Boilers: Dr. Tran has completed the first draft of that paper and we are in the process of sending that out to our review committee to get input on the status of that.

Just one other comment. There is a technical information paper that is being submitted for publication this fall entitled ***Composite Tube Floor Inspection Guidelines***. This paper was written by the Corrosion Material Committee, but I just wanted to mention it so everyone is aware that it will be available shortly.

8. **NATIONAL BOARD OF BOILER & PRESSURE VESSEL INSPECTORS' REPORT**
– Bob Sullivan

The 2001 edition of the **NATIONAL BOARD INSPECTION CODE (NBIC)** is being distributed. The CD will be available October 15th. This edition consists of the 1998 edition, with the 1999 and 2000 addenda. No changes other than those are part of the new edition. Contact the National Board Order Department, Phone: (614) 888-2463, Fax: (614) 847-1147, or e-mail orders to nationalboard.org

8. **NATIONAL BOARD OF BOILER & PRESSURE VESSEL INSPECTORS' REPORT**
(Cont.)

The NBIC has a new chair. Ron Howard of Hartford Steam Boiler Inspection and Insurance Company has resigned and George Bynog, Chief Boiler Inspector for the state of Texas has been selected as the replacement. George is a long-time member of the NBIC and was the Vice Chair.

Kevin Ennis, NBIC Secretary, has also resigned and Chuck Withers, staff engineer, who was the former Chief Inspector of the state of Colorado has been assigned as the new NBIC Secretary.

Fifteen interpretations have been issued. These are listed on the National Board web site (www.nationalboard.org) under NBIC/Interpretations . The interpretations of particular interest to BLRBAC members are:

01-03 Weld Build-Up *Question:* If a pressure-retaining item has multiple areas requiring a weld metal build-up, does the 100 sq. in. limit described in RC-2031(a)(3) apply to the sum of the areas to be repaired? *Reply:* Yes.

01-10 Accreditation of Repair Organizations *Question:* Is it a requirement of the NBIC that an organization performing repairs to pressure relief valves be accredited in accordance with RA-2200? *Reply:* Yes, per RA-2010(d).

01-11 Accreditation of Repair Organizations *Question:* Must the VR symbol be applied to the repair tag on the valve to satisfy RA-2010(d)? *Reply:* Yes, per RA-2262(a)(2).

01-14 Routine Repairs *Question:* Is the seal welding of tubes which are five (5) NPS in diameter and less considered a routine repair? *Reply:* Yes.

Other interpretations should also be reviewed because you may have a need for their use.

9. **WESTERN CANADA BLRBAC REPORT** -- Bob Norton
No report given.

10. **ACTIVITIES OUTSIDE NORTH AMERICA REPORTS**

10.1 **REPORT FROM BRAZIL** -- Guido Schreiber (written report only)

Translation to Portuguese of the following BLRBAC recommendations:

"Recommended Good Practice for the Thermal Oxidation of Waste Streams in a Black Liquor Recovery Boiler" as being "Práticas Recomendadas para Oxidação Térmica de gases Não-Condensáveis em Caldeiras de Recuperação".

10. ACTIVITIES OUTSIDE NORTH AMERICA REPORTS (Cont.)

10.1 REPORT FROM BRAZIL (Cont.)

"Instrumentation Checklist and Classification Guide for Instruments and Control Systems Used in Operation of Black Liquor Recovery Boilers" as being "Lista de Checagem de Instrumentação e Guia de Classificação para Instrumentos e Sistemas de Controle Usados na Operação de Caldeiras de Recuperação".

A "Guide for Inspection of Recovery Boilers" was written-up and published in Portuguese. A second guide is being written-up that covers criteria for minimum thickness for tubes of recovery boilers.

The recommendations described above were distributed during the 14th Latin American recovery Boiler Congress that was held in Campinas, Sao Paulo, August 7 to 10, with 142 participants. People present were from Argentina, Chile, Uruguay and Brazil. The 15th Congress will be in Argentina in 2003..

The BLRBAC questionnaire for incidents was translated into Portuguese, and was distributed to all pulp and paper plants in Brazil. The plants used these questionnaires to report the four incidents that were sent to this October Meeting of BLRBAC.

There was full participation at the 10th Recovery and Utility Seminar last April

The First Recovery Boiler Operator Seminary was held at the Cenibra plant in July 2000 with success.

Regular meetings were made between the four subcommittees under the coordination of President Fernando Paoliello.


11. OPERATING PROBLEMS SESSION REPORT – Dean Clay

We had a good Operating Problems Session yesterday afternoon. We started at 1:00 p.m. and ran until about 2:45 p.m. I want to again thank everyone for their participation. I think the large attendance at the session still indicates that it is considered valuable. Again, any suggestions for improvement would be welcome and can be sent to me at my e-mail address.

One thing we tried to do is to discuss some of the issues that were raised in the ESP Subcommittee review of incidents. We also discussed smelt rushes. How one might attempt to stop them before they got into a dissolving tank explosion issue. We talked about dissolving tank density, crystallization issues, smelt spout erosion and special materials for protection of smelt spout. We talked about refractory protection for floor tubes. We discussed the drawing or not drawing of the recovery boiler after a water wash leading into a major outage. We talked about acid cleaning and issues of tube sampling to determine deposits in the recovery boiler and the potential use of thermal couple tube sections in recovery boilers to monitor deposits as they are laid down on the tubing. We also talked about leak detection systems and a little bit about how they were or were not working. Also, we touched upon NCG combustion. That covered most of the items that we went over.


TIME & PLACE OF NEXT MEETING: The next meeting will be held on April 8, 9, & 10, 2002, at the Crowne Plaza Hotel/Atlanta Airport, in Atlanta, Georgia.

ADJOURNMENT: Are there any other questions or comments, which need to be addressed? If not, this meeting is adjourned. Everyone have a safe trip home!



ESP Subcommittee

Committee Report
Wednesday October 10, 2001



Meeting Attendance

- * Closed Session Monday October 8th
 - 9 of 12 Members Present
 - Accepted Larry Carter as new member representing Weyerhaeuser
 - Lou Chaddick temporary representing Westvaco
 - Lloyd Moore temporary representing International Paper
- * Open Session Tuesday October 9th
 - Same as Monday closed session
 - Registered BLRBAC participants




Incident Questionnaire Review

- * 39 North American Incidents
 - No Explosions
 - 12 Critical
 - 23 Non-Critical
 - 2 dissolving tank explosions
 - 1 non classified (no leak)
- * 6 International Incidents




Leak Locations

- * 11 Economizer
- * 8 Superheater
- * 6 Generating bank
- * 9 Upper Furnace [2 furnace screen]
- * 1 Lower Furnace
- * 1 SCAH leak
- * 2 Dissolving tank Explosions



Root Cause

- * Cracking
 - 6 - Fatigue
 - 2 - Corrosion Fatigue
 - 1 - Stress Assisted Corrosion
 - 4- Unknown
 - 3-weld failure/temp repair
- * Thinning
 - 2 - Corrosion
 - 1 - Erosion



Root Cause (cont.)

- * Rupture/Shear
 - 1-Weldfailure
 - 1-Inst/Manuf defect
 - 3-Short term overheat
 - 3-Fatigue
 - 1-Erosion
- * Other [including pin hole leaks]
 - 1-wear
 - 3- corrosion
 - 1-Inst/Manuf defect
 - 1 - SCAH
 - 1-Unknown
 - 1-No leak



How Discovered

- * 30 - Walkdown or Field Observation
- * 8- Control Room Instrumentation
- * 1 - Leak Detection System
 - 16 - Incidents with Leak Detection Installed
 - 1 - Identified Leak
 - 0 - Confirmed Leak



Rapid Drain Water Level Review

- * Recommendations remain unchanged at 8-level.
- * The committee will monitor further developments and revisit issue if needed.



Guideline Clarification Requests

* Backup Operation of Rapid Drain Valves

- Revised language submitted to Executive Committee.
- General intent is to have alternate means to initiate opening of valves
 - switch or switches for individual valves at safe location
 - access to valve starters from safe location



Guideline Clarification Requests

* Alternate Drain Provision for "Flash-to-Sky" systems

- Current language will remain.
- Committee will revisit issue at next meeting.



Items for next meeting

- * Recommended Guidelines for Post-Procedure will be submitted to the Executive Committee for review.
- * Issue of revised Incident - Questionnaire
- * Consider secondary damage potential for live steam piping in immediate vicinity of recovery boiler
- * Revisit rules for flash to sky vs. flash to drain tank systems
- * Provision to use ESP alarm to evacuate recovery boiler building in case of suspicion of leak in cases when maintenance or work is being performed in the immediate vicinity of the recovery boiler. Topic turned over to Personnel Safety for review.

SUMMARY OF RECOVERY BOILER INCIDENTS

<p>2001 October – 1</p> <p>Location:</p> <p>Unit:</p> <p>Size:</p> <p>Incident Date:</p> <p>Leak/Incident Loc:</p> <p>Downtime hrs due to leak/total:</p> <p>ESP?</p> <p>Classification:</p> <p>How discovered:</p> <p>Leak detection:</p> <p>Sequence of events:</p> <p>Bed cooling:</p> <p>Wash adjacent tube:</p> <p>Repair procedure:</p> <p>Root cause:</p> <p>Future prevention:</p> <p>Last full inspection:</p>	<p>Longview Fibre Co., Longview, Washington</p> <p>CE Contract No. 29572. Start-up 1975</p> <p>3.3 million ppd solids. Operating @ 800 psig & 750F. Design @825 psig. 2 drum / DCE</p> <p>March 23, 2001</p> <p>Economizer – Hole ~ 10 ft. above lower header. Hole on outside of a bend on back of 4th tube from front on right sidewall. Tube thinned to 0.085" thickness (below code).</p> <p>ESP was performed. Secondary air duct damper did not close because damper pressure controller in "Manual" mode</p> <p>Non-critical Incident</p> <p>Fireman found water dripping from economizer casing when inspecting cascade.</p> <p>None</p> <p>Fireman cleared building & initiated ESP in control room. Entered building 5 hrs-40 min. later</p> <p>Not used</p> <p>No</p> <p>Tubes remove and stubs plugged and welded</p> <p>External thinning in direction of furnace due to corrosion. Several leaks over years, mostly at headers</p> <p>UT of economizer; 2 tubes @ 0.099" removed & plugged. Economizer to be replaced September 2001</p> <p>August 2000</p>
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<p>2001 October – 2</p> <p>Location:</p> <p>Unit:</p> <p>Size:</p> <p>Incident Date:</p> <p>Leak/Incident Loc:</p> <p>Downtime hrs due to leak/total:</p> <p>ESP?</p> <p>Classification:</p> <p>How discovered:</p> <p>Leak detection:</p> <p>Sequence of events:</p> <p>Bed cooling:</p> <p>Wash adjacent tube:</p> <p>Repair procedure:</p> <p>Root cause:</p> <p>Future prevention:</p> <p>Last full inspection:</p>	<p>Critical Incident No. 540</p> <p>Fletcher Challenge Canada, Elk Falls, British Columbia, Canada</p> <p>No. 2 Recovery Boiler. B&W Contract No. 5350. Startup in 1963.</p> <p>Rated at 2.4 million ppd solids. Operating @ _____ psig & 675 F. Design @ 650 psig. 2 drum/</p> <p>April 18, 2001.</p> <p>Economizer – 2 bank economizer with leak in rear bank, 3rd tube row from rear, crack on back side of tube. A 3/4" crack located 2" below weld of tube into upper header washed a hole in 1 tube & thinned a 2nd, both to rear of crack.</p> <p>29 hours total downtime</p> <p>None</p> <p>Critical Incident – water from leak location could enter the furnace as boiler bank is crossflow with no baffles</p> <p>Recovery fireman during routine walkdown</p> <p>None installed</p> <p>Fireman determined leak location and boiler shutdown in normal manner</p> <p>None used</p> <p>Yes. 2 adjacent tubes</p> <p>Tube that cracked plugged. Other 2 tubes overlaid, and were scheduled to be plugged during May shutdown.</p> <p>No information</p> <p>Leaks in area a chronic problem. Complete x-ray of welds of tubes into upper header & plug any tubes with cracks</p> <p>May 2000</p>
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SUMMARY OF RECOVERY BOILER INCIDENTS

<p>2001 October – 3 Location: Unit: Size: Incident Date: Leak/Incident Loc:</p> <p>Downtime hrs due to leak/total: ESP? Classification: How discovered:</p> <p>Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure:</p> <p>Root cause: Future prevention: Last full inspection:</p>	<p>Pacifica Papers Inc., Powell River, British Columbia, Canada CE Contract No. CA-65104. Start-up 1967. ABB revamp Contract No. MA-18418 in 1985 2.4 million ppd solids. Operating @ 900 psig & 875F. Design @ 1035 psig. 2 drum/DCE April 6, 2001</p> <p>Economizer – leak at “opened porosity” in old weld overlay in straight tube at center of bank, 2nd tube from right sidewall, short distance above lower header. Downtime due to leak--53 hr-30 min/total outage time—69 hr-10 min</p> <p>No</p> <p>Non-critical Incident Operator discovered water leaking from casing at bottom of economizer header during routine walkdown. None installed Operator confirmed leak in economizer and no water entering furnace. Normal shutdown No No Plugged tube. Also removed & plugged 2 adjacent tubes (4th and 5th tubes in next row). Hydro test found leak in primary superheater at top toe of upper finger bar between SH rows. Finger bar removed, defect ground and crack repaired by welding. Hinge pin installed to replace finger bar. Failure due to porosity in an old overlay weld Continue with annual NDE program NDT September 2000. Chemical clean and boil out 1998</p>
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<p>2001 October – 4 Location: Unit: Size: Incident Date: Leak/Incident Loc:</p> <p>Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events:</p> <p>Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Weyerhaeuser, Grand Prairie, Alberta, Canada CE Canada Contract No. CA-70129. Start-up 1973. B&W Revamp Contract No. 809-0359 in 1990. 3.89 million ppd solids. Operating @ 900 psig & 800F. Design @ 1050 psig. 2 drum/large economizer April 4, 2001</p> <p>Economizer – Seal weld cracks (2) on threaded hydro-plug at center of lower header end plate of economizer, middle section. Total downtime 52.3 hrs</p> <p>No (Irrevocable Policy is to stay out of recovery area 12 hours following an ESP)</p> <p>Non-critical Incident Operator doing a walkdown when he observed the leak. Mass balance system in operation. System did not detect the leak. Boiler in operation on gas because liquor unavailable due to lack of inventory. Bed had been burned out. Operator walkdown observed leak. Bed burned out (6 hours), boiler cooled normally and repair completed.</p> <p>No No Weld around plug removed, PT inspection completed, preheated & rewelded, final PT and hydroed Temporary repair made in January 1998; permanent fix never done. NDT inspection 1st week of May 2000. Chemically cleaned 1990 using EDTA process</p>
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SUMMARY OF RECOVERY BOILER INCIDENTS

<p>2001October – 5 Location: Unit: Size: Incident Date: Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Weyerhaeuser, Flint River Mill, Oglethorpe, Georgia No. 1 Recovery Boiler. B&W Contract No. PR-198. Start-up 1980. 4.3 million ppd solids. Operating @ 900 psig & 825F. Design @ 1175 psig. 2 drums/large 5 pass economizer March 20, 2001 Economizer - 270° circumferential crack around tube at top of attachment weld for the hold down bar lug in front row of tubes. Lug supports lowest baffle/vibration bar closest to lower headers Total downtime 52.3 hours No Non-critical Incident Water/steam flow alarmed. Later discovered water in economizer hopper. Mass balance (chemical derived) type leak detection system was in operation but will not detect an economizer leak. Sootblower No. 63 indicated 'power off'. Operator went to check & observed wrong SB. Started getting leak detection alarms for total steam flow. Operator would acknowledge, clear alarm, then alarm started again; this continued to end of shift. Hoppers were checked for water. At 7h-15m, alarm started for 'excessive feedwater loss'. At 10h-15m, technician found blown fuse in No. 63 starter. Went to inspect SB & found it fully inserted with steam flow. Blower retracted. During the 10 hours, no steam flow indication as 3 blowers at a time blowing & 4th exceeded steam flow upper limit. 'Excess FW' alarm continued for 5 h, then 'suspect tube leak' alarmed. No water in boiler hopper & water chemistry OK. At 15h-15m from 'power off' indication, turned off all SBs and walked boiler down. Found leak. Shutdown. No No Sectioned out tube for minimum replacement length of 18". Tube ends weld prepped and new section butt welded. Welds checked with shear wave (UT) & PT inspection. Tube sounded to verify no obstruction. Hydro tested. Corrosion fatigue cracking initiated on inside of tube as a result of sootblower being stuck for extended period of time. Heat and vibration caused concentrated stress at hold down bar attachment weld Sootblower control system modified to prevent the blowers from running if a failure was detected on any individual blower October 2000</p>
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<p>2001October – 6 Location: Unit: Size: Incident Date: Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Alliance Forest Products, Coosa Pines, Alabama Unit No. 3, CE Contract No. 31174. Start-up 1976. Ahlstrom revamp 1997. 3.2 million ppd solids. Operating @ 600 psig & 750F. Design @ 1100 psig. 2 drum/large economizer May 2, 2001 Economizer – circumferential crack on tube side of weld of a 2-1/2 " OD Sch 160 feedwater supply pipe connection to manifold. Economizer section installed 1993. Downtime due to leak-21 hrs/total downtime-20 hrs No. (Policy is to stay out of recovery area 24 hours following an ESP) Non-critical Incident Shutdown as economizer leak suspected because of sticky ash to precipitator & conveyor take-up shaft bending None installed Shutdown, burned out bed & located leak No No Weld cleaned, dye penetrant checked, ground out & weld repaired Weld defect. Undercut weld provided a crevice for corrosion and stress No previous failures Inspected September 2000. Acid cleaned with HCl in 1998</p>
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SUMMARY OF RECOVERY BOILER INCIDENTS

<p>2001October – 7</p> <p>Location:</p> <p>Unit:</p> <p>Size:</p> <p>Incident Date:</p> <p>Leak/Incident Loc:</p> <p>Downtime hrs due to leak/total:</p> <p>ESP?</p> <p>Classification:</p> <p>How discovered:</p> <p>Leak detection:</p> <p>Sequence of events:</p> <p>Bed cooling:</p> <p>Wash adjacent tube:</p> <p>Repair procedure:</p> <p>Root cause:</p> <p>Future prevention:</p> <p>Last full inspection:</p>	<p>Westvaco PRG, Charleston, South Carolina</p> <p>B&W Contract No. PR-206. Start-up 1984.</p> <p>4.5 million ppd solids. Operating @ 1450 psig & 880F. Design @ 1725 psig. 2 drum/large economizer. Kvaerner retrofit</p> <p>March 26, 2001</p> <p>Economizer – longitudinal crack <u>on</u> lower header of platen. 5th in series of failures at economizer feedwater inlet in 9 months</p> <p>Hours due to leak/Total downtime – 72 hr 25 min</p> <p>No. Current revocable policy is to stay out of recovery area 12 hours after an ESP</p> <p>Non-critical Incident</p> <p>Water observed in ash conveyor during routine walkdown</p> <p>Acoustic (air borne) leak detection system was in operation but did not detect nor confirm leak</p> <p>Operator observed wet ash in hopper, determined the leak was in economizer and boiler shutdown in normal manner</p> <p>No</p> <p>No</p> <p>Defect ground and welded</p> <p>Unknown. Primary cause appeared to be fatigue propagating on the internal surface of the tube, although some indication of corrosion. A B&W Service Bulletin identifies a similar crack as attributable to feedwater temperature cycling</p> <p>Increase time intervals between sootblowers. Review arrgt of additional tiebars. Evaluate bypassing rear section of economizer. Install pressure transmitter & fast reacting thermocouples to monitor feedwater during start-up</p> <p>Inspected May 11, 2001. Chemically cleaned 1989 with chelant</p>
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<p>2001October – 8</p> <p>Location:</p> <p>Unit:</p> <p>Size:</p> <p>Incident Date:</p> <p>Leak/Incident Loc:</p> <p>Downtime hrs due to leak/total:</p> <p>ESP?</p> <p>Classification:</p> <p>How discovered:</p> <p>Leak detection:</p> <p>Sequence of events:</p> <p>Bed cooling:</p> <p>Wash adjacent tube:</p> <p>Repair procedure:</p> <p>Root cause:</p> <p>Future prevention:</p> <p>Last full inspection:</p>	<p>Westvaco PRG, Charleston, South Carolina</p> <p>B&W Contract No. PR-206. Start-up 1984.</p> <p>4.5 million ppd solids. Operating @ 1450 psig & 880F. Design @ 1725 psig. 2 drum/large economizer</p> <p>April 6, 2001</p> <p>Economizer – longitudinal crack <u>on</u> lower header of platen. 6th in series of failures at economizer feedwater inlet in 10 months</p> <p>Hours due to leak/Total downtime – 48hr- 40min</p> <p>No. Current revocable policy is to stay out of recovery area 12 hours after an ESP</p> <p>Non-critical Incident</p> <p>Water observed in ash conveyor during routine walkdown</p> <p>Acoustic (air borne) leak detection system was in operation but did not detect nor confirm leak</p> <p>Operator observed wet ash in hopper, determined the leak was in economizer and boiler shutdown in normal manner</p> <p>No</p> <p>No</p> <p>Platen removed by cutting off tube connections to feed and collection headers and plugging</p> <p>Unknown. Primary cause appeared to be fatigue propagating on the internal surface of the tube, although some indication of corrosion. A B&W Service Bulletin identifies a similar crack as attributable to feedwater temperature cycling</p> <p>Increase time intervals between sootblowers. Review arrgt of additional tiebars. Evaluate bypassing rear section of economizer. Install pressure transmitter & fast reacting thermocouples to monitor feedwater during start-up</p> <p>Inspected May 11, 2001. Chemically cleaned 1989 with chelant</p>
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SUMMARY OF RECOVERY BOILER INCIDENTS

<p>2001 October – 9 Location: Unit: Size: Incident Date: Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Critical Incident No. 541 International Paper Co., Natchez, Mississippi No. 7 Recovery Boiler. CE Contract 210773. Start-up 1976. Revamp CE Contract No. 50089 in 1982 3.4 million ppd solids. Operating @ 1250 psig & 900F. Design @ 1410 psig. 2 drum/large economizer June 16, 2001 Economizer – tube rupture 4" below upper header of crossflow economizer located directly downstream of the single pass boiler bank Total downtime – 61 hours ESP was initiated. Irrevocable policy is to stay out of recovery area 4 hrs following an ESP Critical Incident Steam drum level dropped and tripped boiler None installed Steam drum level dropped suddenly and boiler tripped on low level. Operator immediately initiated an ESP & area was evacuated. While evacuating the area, water was seen flowing from a port between boiler bank & economizer. After 4 hrs, inspected boiler to locate zone of leak, started fans above liquor guns to cool bed & boiler; fans had tripped on low water. No The failed tube was thinned to rupture by water leaking from a crack in a header weld of an adjacent tube Two tubes removed & prefabricated pipe nipples ~ 4" long installed in the header in place of the tubes Most likely boiler water pH excursions in 1995 caused header weld failure All adjacent tubes UT inspection for thinning before start-up Inspection October 2000. Chemically cleaned Sept. 1996 using 6.5% HCl, 0.5% ABF, .2% Rodine 213</p>
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<p>2001 October – 10 Location: Unit: Size: Incident Date: Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>International Paper Co., Kaukauna, Wisconsin No. 10 Recovery Boiler. B&W Contract PR-63. Start-up 1961. 1.17 million ppd solids. Operating @ 600 psig 7 800F. design @ 700 psig. 2 drum/low odor August 1, 2001 Economizer – tube fish mouth rupture 1-1/2" long x 1/2" wide Not applicable. ESP initiated. Policy is to stay out of recovery area 4 hrs following an ESP Non-critical Incident Loss of water to steam drum caused a low water trip. FW pressure also dropped. Water observed leaking from ductwork below the tubular air heater (horizontal tube economizer located directly above AH) None installed Operator immediately initiated ESP with observation of above events. (ESP activation shut off power to precipitator; rappers deactivated. Opacity spiked to 30, but 6 minute averages within kept operation within compliance. Opacity excursion didn't occur) No Pinhole leak in tube No. 4 washed tube No. 3 thinning the wall to rupture. NDT determined tube No. 2 was also thinned. Replaced 3 tube sections. A welding arc strike on the tube caused a pin hole leak over time Additional NDT for upper economizer Inspection April 2001. Acid cleaned April 2001.</p>
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SUMMARY OF RECOVERY BOILER INCIDENTS

<p>2001October – 11</p> <p>Location:</p> <p>Unit:</p> <p>Size:</p> <p>Incident Date:</p> <p>Leak/Incident Loc:</p> <p>Downtime hrs due to leak/total:</p> <p>ESP?</p> <p>Classification:</p> <p>How discovered:</p> <p>Leak detection:</p> <p>Sequence of events:</p> <p>Bed cooling:</p> <p>Wash adjacent tube:</p> <p>Repair procedure:</p> <p>Root cause:</p> <p>Future prevention:</p> <p>Last full inspection:</p>	<p>International Paper, Eastover, South Carolina</p> <p>No. 1 Recovery Boiler. ABB CE Contract No. 31381. Start-up 1984. Superheater modified 1993 2.4 million ppd solids. Operating @ 1450 psig & 860F. Design @ 1500 psig. 2 drum/ large economizer.</p> <p>June 22, 2001</p> <p>Superheater – 1-1/2" long rupture at the bottom of a 'U' bend in the secondary SH inlet bank. Bend is formed of 3rd & 6th tube of a 4 flow/8 tube row loop; outside 2 rows form a hockey stick bend. Located as 2nd bank of SH & in front of nose arch. Bank originally primary inlet</p> <p>Total ESP downtime/total downtime – 70 hours</p> <p>ESP initiated. Policy to stay out of area for 24 hours</p> <p>Non-critical Incident</p> <p>Observed steam and fire blowing from liquor gun ports</p> <p>Statistical drum balance system installed but not in operation. After going on line, system does not calculate drum balance alarm for 5 hours.</p> <p>Boiler start-up after an outage. 5 hours after light-off, boiler placed on line and immediately fire & steam noticed coming from liquor gun ports. Control room operator notified & tripped the boiler. Observed steam & ash coming from upper furnace & heard loud blowing noise. ESP initiated 7 minutes after first noticing port blowback. Management waived 24 hr wait period per procedure as no bed & ESP successful. Unit inspected for hazards ~ 4 hrs after ESP: none were found & ESP reset ~ 6 hrs after initiation.</p> <p>No</p> <p>No</p> <p>Cut line determined by NDT inspection. Lower part of loop removed & replaced with an upgrade T22 material . Welds radiographed.</p> <p>Short-term overheating suspected. Loop had sprung out of alignment due to broken ties & was not protected by hockey stick. Had been inspected 3 months earlier.</p> <p>Shutdown & start-up procedures to be revised as required to ensure flow through the SH. Future replacements in the section will be T22 material. Alignment to be checked & corrected during outages.</p> <p>Inspection March 2001. Also chemically cleaned with 8% HCl/Bromate</p>
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<p>2001October – 12</p> <p>Location:</p> <p>Size:</p> <p>Incident Date:</p> <p>Leak/Incident Loc:</p> <p>Downtime hrs due to leak/total:</p> <p>ESP?</p> <p>Classification:</p> <p>How discovered:</p> <p>Leak detection:</p> <p>Sequence of events:</p> <p>Bed cooling:</p> <p>Wash adjacent tube:</p> <p>Repair procedure:</p> <p>Root cause:</p> <p>Future prevention:</p> <p>Last full inspection:</p>	<p>International Paper Co., Texarkana, Texas</p> <p>No. 2 Recovery Boiler. B&W Contract No. 186. Start-up 1978</p> <p>4.55 million ppd solids. Operating @ 1050 psig & 825F. Design @ 1200 psig. 2 drum/large economizer</p> <p>August 8, 2001</p> <p>Superheater – tube rupture just above lower bend of 4th tube row in 2nd bank of SH. 2nd element from left sidewall.</p> <p>Total downtime-107.42 hours</p> <p>No</p> <p>Non-critical Incident</p> <p>Steam flow decreased ~ 30 minutes after boiler came on-line. Operators investigated & heard steam blowing. Liquor firing had not been started</p> <p>None installed</p> <p>Steam blowing was determined to be a SH tube leak. Boiler taken off line.</p> <p>Not applicable</p> <p>No</p> <p>Bends replaced</p> <p>Tubes sent out for metallurgical analysis; results pending at date of report. A series of short term overheating over a long time is suspected</p> <p>Adjacent tube that was intact removed for analysis. Remaining tubes visually inspected and checked with a gauge for bulging. Analysis results to be evaluated</p> <p>Inspected March 2001. Chemically cleaned in 1995</p>
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SUMMARY OF RECOVERY BOILER INCIDENTS

<p>2001October – 13 Location: Unit: Size: Incident Date: Leak/Incident Loc:</p> <p>Downtime hrs due to leak/total: ESP? Classification: How discovered:</p> <p>Leak detection: Sequence of events:</p> <p>Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Damage resulting from ESP Smurfit-Stone Container Corporation, Brewton Alabama Recovery Boiler No.2. B&W Contract No. PR-79. Start-up 1963 1.1 million ppd solids. Operating @ 860 psig & 830F. Design @ 975 psig. 2 drum/ DCE April 30, 2001</p> <p>Superheater – primary superheater tube in Platen No. 21 (from right side) sheared off just below roof formed as a continuation of front wall tubes. Tube, next to sootblower cavity, sheared near the roof at a 30° bend in tube that passes through the roof for support and then enters tube row on other side of cavity (a 180° bend). Downtime due to ESP – 96 hrs/total downtime – 106 hrs</p> <p>ESP was performed. Irrevocable policy is to stay out of recovery area 8 hours</p> <p>Non- critical Incident [Subsequent damage would be classified to be a Critical Incident] Operator noticed a drop in drum level, a drop in steam flow, increase in water flow, with a blowing noise in furnace</p> <p>None installed</p> <p>Operator initiated ESP. based on discoveries. Filling boiler for hydro after repairs revealed a leak at a smelt spout opening, which was repaired. On the 2nd filling, SH platen No. 24 leaked from a similar crack to that in No. 21. Platen removed and header plugged. Liquor back in boiler after successful hydro Spout opening had two 2" w x 3"h holes at same elevation, one on each side of opening at ~ CL. 2nd tube also had holes. Appears that active smelt washed opening after water drained and remainder evaporated</p> <p>No [Furnace cooled with 170 psig steam injection into lower header] No</p> <p>Removed superheater element and plugged stubs at headers Stress fatigue due to cyclic stress caused by a broken support bar.</p> <p>Inspection March 2001. Chemically cleaned 15 years ago</p>
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<p>2001October – 14 Location: Unit: Size: Incident Date: Leak/Incident Loc:</p> <p>Downtime hrs due to leak/total: ESP? Classification: How discovered:</p> <p>Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Smurfit-Stone Container Corporation, Brewton Alabama Recovery Boiler No.2. B&W Contract No. PR-79. Start-up 1963 1.1 million ppd solids. Operating @ 860 psig & 830F. Design @ 975 psig. 2 drum/ DCE May 19, 2001</p> <p>Superheater – primary superheater tube in Platen No. 20 (from right side) sheared off just below roof formed as a continuation of front wall tubes. Tube, next to sootblower cavity, sheared 12" below the roof at a 30° bend in tube that passes through the roof for support and then enters tube row on other side of cavity (a 180° bend). 3rd failure in same bend of 3 elements Downtime due to ESP – 54-3/4 hrs/total downtime – 65-1/2 hrs</p> <p>ESP was performed. Irrevocable policy is to stay out of recovery area 8 hours</p> <p>Non-critical Incident Operator got a furnace high pressure alarm, a swing in drum level, a drop in steam flow, with a blowing noise in furnace</p> <p>None installed</p> <p>Based on above discoveries, operator ESPd the boiler</p> <p>No No</p> <p>Removed superheater element and plugged stubs at headers Stress fatigue due to cyclic stress as a result of sootblower operation. All 3 failures in area where blowers reverse.</p> <p>Installed ½" x 4" x 4' flat bar across the sootblower cavity; bar strapped to tubes with u-bolts to prevent tube movement</p> <p>Inspection March 2001. Chemically cleaned 15 years ago</p>
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SUMMARY OF RECOVERY BOILER INCIDENTS

<p>2001October – 15 Location: Unit: Size: Incident Date: Leak/Incident Loc:</p> <p>Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure:</p> <p>Root cause: Future prevention:</p> <p>Last full inspection:</p>	<p>Smurfit-Stone Container Corporation, Brewton Alabama Recovery Boiler No.2. B&W Contract No. PR-79. Start-up 1963 1.1 million ppd solids. Operating @ 860 psig & 830F. Design @ 975 psig. 2 drum/ DCE July 1, 2001</p> <p>Superheater – secondary superheater tube in Platen No. 23 (from left side) sheared off just below roof. Tube, next to sootblower cavity, sheared near the roof at an 180° bend in tube that passes through the roof for support and then enters tube row on other side of cavity. Downtime due to ESP – 65.9 hrs/total downtime – 74.5 hrs</p> <p>ESP was performed. Irrevocable policy is to stay out of recovery area 8 hours</p> <p>Non-critical Incident Operating crew heard loud noise and observed a furnace back draft None installed Based on event, ESP was initiated No No Removed superheater element and plugged stubs at headers. 2 more leaks found on starting to increase pressure for hydro, 1 in Primary SH inlet of Platen No. 9 & 1 in Secondary SH outlet of Platen No. 10. No. 10 was plugged at headers & No. 9 weld overlay with heliarc. Fatigue cracking Sootblower pressure lowered to 200 psig. Pressure had been lowered to 225 psig 4-5 years ago when MP nozzles installed. Installed 6" x ½" x 55" Inconel 600 bars strapped to 2 tubes on each side of sootblower path with 1" stainless steel U-bolts. Inspection March 11, 2001. Chemically cleaned 15 years ago.</p>
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<p>2001October – 16 Location: Unit: Size: Incident Date: Leak/Incident Loc:</p> <p>Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention:</p> <p>Last full inspection:</p>	<p>Georgia-Pacific, Cedar Springs, Georgia B&W Contract No. PR-214. Start-up 1990. 2.6 million ppd solids. Operate @ 850 psig & 900F. Design @ 880 psig. 1 drum/large economizer June 18, 2001</p> <p>Superheater – Primary SH inlet 180° bend at furnace gas outlet/SH inlet. Fish mouth opening 4" wide & 7" long located about 4" above bottom bend in No. 11 element from left sidewall Total downtime – 86 hours</p> <p>ESP performed. Area closed for 12 hours. Policy is to not begin any cooldown for 24 hours</p> <p>Non-critical Incident Boiler back pressure and roaring noise coming from boiler None installed Electrician tripped boiler accidentally. On hot restart, operator brought boiler up to quickly before superheater loops cleared of condensate. Bed cooling by Southland Fire & Safety using sodium bicarbonate No Bend and 4 ft. of tube in inlet row of Element No.11 replaced Operator error Training & procedures are in place and operator had training on hot restarts during his 10 years on the job March 24, 2001</p>
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SUMMARY OF RECOVERY BOILER INCIDENTS

<p>2001 October – 17 Location: Unit: Size: Incident Date: Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>International Paper Co., Augusta, Georgia B&W Contract No. PR-89. Start-up 1965 1.79 million ppd solids. Operating @ 850 psig & 900F. Design @ 875 psig. 2 drum/DCE August 9, 2001 Superheater – tube rupture in lower 180° tube bend with opening ~ 3.5” long. Primary superheater in “Row 3”, Platen 20 from south wall, 3rd tube in platen Total downtime – 57 hours ESP Initiated. Irrevocable policy to stay out of area following ESP 4 hours Non-critical Incident Operator observed low steam flow to header, high final steam temperature, a drop in drum level and high furnace pressure. None installed In addition to the indicated changes noted, a steam blowing noise could be heard outside of the furnace. Operators checked to determine if a sootblower was stuck in the boiler. Confirmed no sootblower problem & ESP initiated 13 minutes after first indication of a problem. Floor tubes were monitored & were satisfactory. No No NDT Thinning of the tube wall from corrosion/erosion Inspected April 2001. Chemically cleaned April 1999</p>
<p>2001 October – 18 Location: Unit: Size: Incident Date: Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Critical Incident No. 542 Weldwood of Canada Ltd., Hinton, Alberta, Canada No. 2 Recovery Boiler. ABB CE Contract No. CA-76120. Start-up 1979. ABB Revamp Contract No. MA-18809 in 1991 2.82 million ppd solids. Operating @ 630 psig & 750F. Design @ 800 psig. 2 drum/large economizer June 14, 2001 Boiler Bank – 15” fish mouth rupture on upstream (hot) side of a down flow tube (downcomer tube) at the gas outlet of single pass, crossflow bank, tube 21 from front (gas inlet). Approx. midway between drums. Total downtime 60 hours ESP Initiated. Irrevocable policy is to stay out of area 6 hours Critical Incident The boiler feedwater flow increased and a loss of drum level caused a total fuel trip. Furnace pressure increased. An “in-house” mass balance system is installed but is not in operation as it is unreliable Visual inspection determined no evidence of water entering the furnace. No change in liquor density indicated no water leaking into liquor. 18 min. after fuel trip, water found in economizer & boiler ESP’d. Cooling bed with sodium bicarbonate. Had difficulty getting lances into bed and questionable if there was any time savings. No A seal welded plug installed in each of the two drums and tube removed and sent for failure analysis Localized fireside erosion suspected as being caused by a sootblower due to side-to-side tube misalignment. Sootblower was not contacting tubes. Detailed visual and thickness survey of all adjacent tubes as well as any misaligned tubes. Inspection will continue during future outages looking for this type of failure mechanism Inspected April 2001. Acid cleaned May 2000</p>

SUMMARY OF RECOVERY BOILER INCIDENTS

2001October – 19	Critical Incident No. 543
Location:	Bowater Inc., Coated Paper Division, Catawba, SC
Unit:	No. 2 Recovery Boiler. B&W Contract No. PR-91. Start-up 1964. B&W Revamp Contract SC-0873 in 1984
Size:	2.053 million ppd solids. Operating @ 850 psig & 850F. Design @ 975 psig. 2 drum/large economizer
Incident Date:	September 19, 2000.
Leak/Incident Loc:	Boiler Bank – 1” circumferential crack at outside surface of steam drum in tube 19 in 6 th row from right sidewall. Tube 19 is 8 th tube from gas inlet of bank. Bank with 28’ drum centers does not have vibration bars.
Downtime hrs due to leak/total:	Downtime due to leak – 44 hrs/ downtime total – 44 hrs
ESP?	No (Policy is that management decides when the recovery area can be reentered)
Classification:	Critical Incident
How discovered:	Walkdown and subsequent investigation revealed sounds typical of small leak.
Leak detection:	Mass balance leak detection system in operation, but did not detect nor confirm the leak, although there was a slight, inconclusive indication. Report is an 8 hour average.
Sequence of events:	SH leak suspected, therefore, bed burned out and boiler shutdown. When boiler cool, water droplets were visible in boiler hopper. Hydro located leak.
Bed cooling:	No
Wash adjacent tube:	No
Repair procedure:	Tube plugged in both drums
Root cause:	Slight over rolling and/or vibration; stress/fatigue
Future prevention:	Installation on next shutdown of split ring castings for suppression of any vibration in the bank with 28’ drum centers
Last full inspection:	Inspection in July 2000. Chemically cleaned with inhibited HCl in 1995

2001October – 20	Bowater Inc., Coated Paper Division, Catawba, SC
Location:	Bowater Inc., Coated Paper Division, Catawba, SC
Unit:	No. 2 Recovery Boiler. B&W Contract No. PR-91. Start-up 1964. B&W Revamp Contract SC-0873 in 1984
Size:	2.053 million ppd solids. Operating @ 850 psig & 850F. Design @ 975 psig. 2 drum/large economizer
Incident Date:	October 24, 2000.
Leak/Incident Loc:	Boiler Bank – small, ~1” circumferential crack at outside surface of steam drum in tube 19 in 26 th row from right sidewall (centerline of boiler). Tube 19 is 8 th tube from gas inlet of bank.
Downtime hrs due to leak/total:	Not applicable
ESP?	No Boiler was off-line 5 weeks and open for inspection at time the leak was discovered (Policy is that management decides when the recovery area can be reentered)
Classification:	Non-critical Incident
How discovered:	Water observed running down tube following water wash.
Leak detection:	Mass balance leak detection system not in operation.
Sequence of events:	Not applicable.
Bed cooling:	Not applicable
Wash adjacent tube:	No
Repair procedure:	Tube plugged in both drums
Root cause:	Over rolling and/or vibration; stress/fatigue
Future prevention:	Installation on next shutdown of split ring castings for suppression of any vibration in the bank with 28’ drum centers
Last full inspection:	Inspection in July 2000. Chemically cleaned with inhibited HCl in 1995

SUMMARY OF RECOVERY BOILER INCIDENTS

<p>2001 October – 21 Location: Unit: Size: Incident Date: Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Critical Incident No. 544 Bowater Inc., Coated Paper Division, Catawba, SC No. 2 Recovery Boiler. B&W Contract No. PR-91. Start-up 1964. B&W Revamp Contract SC-0873 in 1984 2.053 million ppd solids. Operating @ 850 psig & 850F. Design @ 975 psig. 2 drum/large economizer December 2, 2000. Boiler Bank – small, less than 1” circumferential crack at outside surface of steam drum in tube 19 in 19th row from right sidewall. Tube 19 is 8th tube from gas inlet of bank. Downtime due to leak – 50.3 hrs/ downtime total – 50.3 hrs No (Policy is that management decides when the recovery area can be reentered) Critical Incident Walkdown – operator thought he heard a leak. Mass balance leak detection system in operation, but did not detect nor confirm the leak. Leak too small for sensitivity of system, however, there did appear to be a small indication. Report is an 8 hour average. Bed burned out and boiler shutdown. When boiler cool, hydro located leak. No No Tube plugged in both drums Over rolling and/or vibration; stress/fatigue Installation on next shutdown of split ring castings for suppression of any vibration in the bank with 28’ drum centers. As of the October 9 meeting, castings had been installed Inspection in July 2000. Chemically cleaned with inhibited HCl in 1995</p>
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<p>2001 October – 22 Location: Unit: Size: Incident Date: Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Critical Incident No. 545 International Paper Co., Texarkana, Texas No. 1 Recovery Boiler. B&W Contract No. PR-144. Start-up 1972 2.6 million ppd solids. Operating @ 650 psig & ___ F. Design @ 775 psig. 2 drum/large economizer July 31, 2001 Boiler Bank - ~ 1/8 “ holes in 2 tubes where the tubes rubbed against vibration restraints in the 4th row from bank inlet, tubes 34 and 35 counting _____ Total downtime – 43.5 hours No Critical Incident Operator making rounds during start-up found water in the boiler bank hopper None installed Determined water coming from a tube leak and shutdown the boiler. There was no bed in the furnace. Liquor firing has not commenced No Tube plugged at both drums Rubbing at vibration restraints. Vibration restraints have been raised above the area. Visually inspected remaining tubes. Future outages will include increased visual inspection & relocation of restraint at first sign of rubbing Inspected October 2000. Cleaned with HCl in October 2000</p>
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SUMMARY OF RECOVERY BOILER INCIDENTS

<p>2001 October – 25 Location: Unit: Size: Incident Date: Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Marathon Pulp, Inc., Marathon, Ontario, Canada No. 4 Recovery boiler. B&W Contract started up in 1978. ABB revamp Contract No. CC-41800600 in 1992 2.2 million ppd solids. Operating @ 650 psig & 750F. Design @ 750 psig. 2 drum/ LAH March 21, 2001 Furnace, Upper – Pinhole leaks (wormholes) in membrane weld to tube. In 1st straight tube adjacent to sootblower wallbox in superheater at mud drum elevation Not applicable – Mill down for inventory outage & recovery boiler in wet, pressurized storage. No (Current revocable policy is to stay out of area for 8 hours) Non-critical Incident Operator saw water running out of smelt spout Mass balance system shutdown Boiler partially drained and weld repaired Not Applicable No Area of leak overlaid with weld, dye penetrant tested, & boiler hydro tested Possible manufacturing defect (delamination) ruled out by analysis. Tube will be removed and replaced during annual outage (May 2001). Analysis determined pinholes the result of thermal fatigue & crack started on outside of tube.. Inspected May 2000. Chemically cleaned March 12, 2001, with HCl/soda ash</p>
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<p>2001 October – 26 Location: Unit: Size: Incident Date: Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Canfor, Northwood Pulp Mill, Prince George, British Columbia, Canada ABB Contract started up in 1983 3.3 million ppd solids. Operating @ 650 psig & 400F. Design @ 750 psig. 2 drum/large economizer March 7, 2001 Furnace, Upper-Bull Nose Arch –1” circular crack in tube at support weld for rear wall buckstay. Located on inside of bullnose of membrane construction Downtime attributed to leak –36 hours No Non-critical Incident Observation of water running down casing that forms the back wall of the bull nose cavity NALCO Trasar system was in operation and did not detect or confirm leak. However, leak probably occurred during cool down. Trasar is very sensitive and was not registering water or chemical loss Boiler was shutdown and had been water washed and cooled down. Water was then observed running down the casing. Not applicable No Cracks ground out and rewelded Assume that thermal expansion and contraction caused a crack to propagate through the wall of tube. Some cracking was found on adjacent tubes (6 total) at the same buckstay weld location Thorough inspection of area at next Mill scheduled outage November 2000</p>
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SUMMARY OF RECOVERY BOILER INCIDENTS

<p>2001 October – 27 Location: Unit: Size: Incident Date: Leak/Incident Loc:</p> <p>Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events:</p> <p>Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Critical Incident No. 547 Westvaco Corp, Wickliffe, Kentucky Unit No. 1. CE Contract No. 17467. Start-up 1970. B&W revamp 1993 2.5 million ppd solids. Operating @ 600 psig & 725 F. Design @ 625 psig. 2 drum/DCE January 7, 2001 Furnace, Upper – crack ~ ¾" long associated with an attachment weld in right wall near rear corner. ~ 72' above floor at an elevation several feet below elevation of furnace screen penetration of rear wall. Tangent tube wall Total downtime due to ESP – 83 hours ESP initiated. Irrevocable policy is to stay out of area 12 hours after an ESP Critical Incident Operator during walkdown observed water on a buckstay Acoustic leak detection system in operation did not detect nor confirm leak No indication of a leak & operator assumed from plugged sootblower condensate drain. Next walkdown, no water in buckstay. Next shift received report and pulled liquor to inspect even though no indication of a leak. Observed wet spot in furnace corner and initiated ESP. No No Bowed tubes pulled into position and re-attached to channel tension bars. Skin casing repaired. Tubes replace in a March 2001 outage Crack in attachment weld caused when tubes bowed due to leaks in skin casing allowing air to infiltrate. Four tubes were cracked at the attachment weld Improve inspection techniques for skin casing Inspected May 1999. Chemically cleaned with chelant in 1994</p>
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<p>2001 October – 28 Location: Unit: Size: Incident Date: Leak/Incident Loc:</p> <p>Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection:</p> <p>Sequence of events:</p> <p>Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Critical Incident No. 548 Georgia-Pacific, New Augusta, Mississippi Unit 62-001-001. Gotaverken Contract No. 551-992. Start-up 1984. GVE revamp Contract No. 83112 in 1992 6.342 million ppd solids. Operating @ 1250 psig & 900F. Design @ 1490 psig. 1 drum/large economizer June 12, 2001 Furnace, Upper – crack at attachment on tube bend at a door opening located immediately above nose arch Total downtime – 62 hours ESP initiated. No fixed time policy on length of time to stay out of area Critical Incident Operator walkdown observed steam coming out from behind casing~ 10-15' above arch The mass balance & RB Advisor systems were in operation. System not sensitive enough to detect the leak. New software has been installed in RB Advisor and will be checked for proper sensitivity Operator discovering leak opened the door and observed leak external to furnace. Began burning out the bed and watching leak closely. After ~ 5 hrs, leak worse & some water spraying into furnace. ESP initiated. Bed cooled with sodium bicarbonate. Credited time savings – 24 hours Yes. Water from crack damaged an adjacent tube. Both tubes sectioned and replaced. Stress crack at an undercut in a weld. Sample sent to lab to determine if crack waterside initiated. No change in inspection procedures Inspected February 2001. Acid cleaned with HCl in 1999</p>
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SUMMARY OF RECOVERY BOILER INCIDENTS

<p>2001 October – 31 Location: Unit: Size: Incident Date: Leak/Incident Loc:</p> <p>Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events:</p> <p>Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Critical Incident No. 549 Skeena Cellulose Inc., Prince Rupert, British Columbia, Canada No. 6 Recovery boiler. CE Contract No. CA-76108. Startup 1978. Kvaerner revamp Contract No. 17497 in 2000. 3.1 million ppd solids. Operating @ 625 psig & 750F. Design @ 800 psig. 2 drum/large economizer May 8, 2001 Furnace, Upper – pinhole leak in a furnace screen platen tube eroded a ¼” diameter hole in an adjacent tube. Hydro after repair revealed a pinhole leak in a membrane to tube weld at the weld line for original erection ~ 60’ above floor, which had almost eroded a hole in adjacent tube. (membrane field welded after tubes butt welded to provide closure of wall) Total downtime – 170 hours</p> <p>ESP initiated. Irrevocable policy is to stay out of area for 12 hours</p> <p>Critical Incident Field engineer cleaning spout noticed water in furnace None installed</p> <p>This No. 6 boiler taken off liquor and burning gas. 1 hr-20 min later spouts being cleaned when water noticed. Rod inserted through spout opening was wet. Shift Supervisor called & water spray falling from upper furnace was observed through liquor gun openings. At 1 hr-30 min, gas burners pulled & boiler shutdown. Building evacuated. At 1 hr-40 min, rumbling noise heard. Source being indefinite, ESP initiated. Adjacent (50’ distance in same building) No. 5 boiler was tripped from control room and operating crew evacuated building</p> <p>No Yes 2 damaged sections of screen tubes replaced & welds RT inspected. Same for front wall tubes. Pinhole leak caused by porosity in an original field weld from 1978 Boilers shutdown June 30 for pulp production curtailment. Plan was to RT inspect screen and furnace field welds before start-up Inspected 1999. Chemically cleaned in 2000.</p>
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<p>2001 October – 32 Location: Unit: Size: Incident Date: Leak/Incident Loc:</p> <p>Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events:</p> <p>Bed cooling:</p> <p>Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Critical Incident No. 550 Abitibi Division St. Felicien, Saint Felicien, Quebec, Canada CE Contract No. CA-76101. Startup 1978. ABB revamp in 1995 4.2 million ppd solids. Operating @ 625 psig & 750F. Design @ 775 psig. March 2, 2001 Furnace, Upper – ¼” diameter hole 10” above right sidewall tertiary opening & 4” above composite cut line. Hole in area of thinned tubes 2” high & 14 tubes wide (4 ft.). Total downtime – 174.5 hours</p> <p>ESP initiated. Revocable policy is to stay out of area 8 hours</p> <p>Critical Incident Operator doing walkdown heard blowing steam noise coming out of liquor gun ports. None installed</p> <p>Sound heard at liquor gun ports intensified. Noise could not be heard at bull nose, but was heard at load burner elevation. Building evacuated except field operators to control room. Initiated ESP 35 minutes later. Bed was huge at 12-14’ high.</p> <p>CO₂ used to quench fires during cooldown. When fires would not reignite, steam lances used to stir up the bed & expose hot spots to air flow. [Started CO₂ to extinguish fires 14h-35m after ESP. Two hours later, started tertiary air fan & bed re-ignited. Restarted CO₂ lancing to kill fires. 13h-30m later, started FD fan & bed started to burn. CO₂ again used to extinguish fire.. Bed reduction with primary air & CO₂ continued. Bed temperature probes used throughout all phases. ~62 hrs after CO₂ started, bed cooled to 840F (450C) and boiler filling started for hydro to locate leak</p> <p>No Spool sections of composite tube 3’ long installed in 16 tubes (length required to span buckstay) Metallurgical analysis suggests gas side acid corrosion with high, turbulent flow gas washing in affected area. Deposit loading in area of hole – 220 g/ft². NDT thickness testing on other 3 walls found no thinning. Tube thickness checked from cut line upward 10 ft. on a <u>2 inch linear pattern</u> Inspected October 2000. Have never chemically cleaned</p>
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SUMMARY OF RECOVERY BOILER INCIDENTS

<p>2001 October – 33 Location: Unit: Size: Incident Date: Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Georgia Pacific, Port Hudson, Louisiana B&W Contract No. 110. Startup 1967. Ahlstrom revamp contract No. 400067 in 2000 2.996 million ppd solids. Operating @ 850 psig & 825F. Design @ 948 psig. 1 drum/large economizer March 31, 2001 Other - No leak was found. Hydrostatic test was negative. Total downtime 54 hrs-50 min ESP initiated Not classified The Alert Systems alarmed to indicate a leak as a result of a small water balance difference Alert Systems mass balance Shortly after hearing the alarm, sootblowers were shut off and the unit walkdown started. A loud noise was heard at 6th floor and operator noticed swings in furnace pressure. Based on alarm and observations, ESP initiated Bed cooled using sodium bicarbonate applied by Southland Not applicable Not applicable Not applicable. On startup, steam was determined to be constantly entering the furnace through sootblower with leaking poppet valve Fine tune leak detection system. Make motor operated valves on sootblowers operational from control room. Inspected November 2000</p>
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<p>2001 October – 34 Location: Unit: Size: Incident Date: Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Critical Incident No. 551 Norske Skog Canada, Crofton, British Columbia, Canada No. 4 Recovery Boiler. CE/ABB Contract No. CA-88105. Startup 1991 4.0 million ppd solids. Operating @ 625 psig & 750F. Design @ 800 psig. 1 drum/large economizer May 2, 2001 Other – secondary air steam coil air heater – leak in upper of 2, 4 row coils at condensate header located 51.5 ft above centerline of secondary air ports. Coils shutdown by installing blanks on inlet and outlet nozzles. Stainless steel tube failed after 12 years of service. Downtime due to ESP – 12.5 hours. Total downtime - 32.5 hours ESP initiated. Irrevocable policy is to not enter area for 12 hrs after an ESP. Critical Incident Recovery assistant observed water in windbox in front of port. No indication of leak on DCS. . None installed Shift engineer joins assistant and observes water being blown into furnace through front wall secondary airports. Boiler ESP initiated 4 minutes after assistant sees water. Recovery Building evacuated. No Not applicable Defective coil will be replaced To be determined Add additional drains downstream of existing drains Inspected April 21, 2001. Boiler chemically cleaned with inhibited HCl in 1996</p>
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SUMMARY OF RECOVERY BOILER INCIDENTS

<p>2001 October – 35 Location: Unit: Size: Incident Date: Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events:</p> <p>Bed cooling: Wash adjacent tube: Repair procedure:</p> <p>Root cause: Future prevention: Last full inspection:</p>	<p>Skeena Celulose Inc., Prince Rupert, British Columbia, Canada No. 6 Recovery Boiler. CE Contract No. CA-76108. Startup 1978. Kvaerner revamp Contract No. 17497 in 2000. 3.0 million ppd solids. Operating @ 625 psig & 750F. Design @ 800 psig. 2 drum/ large economizer November 25, 2000 Dissolving Tank - Total downtime – 35 hours. No. Area was evacuated Dissolving Tank Explosion Minor explosions in one of two tanks. Not Applicable Dayshift reported density control problems on both boilers. Back flushing of standby green liquor pumps discontinued. Nightshift called mechanic to flush green liquor density tubes and to level tubes. Density indication good for 30 minutes when minor explosions were heard in the tank. Fireman inspected south tank and noticed large accumulation of red hot molten smelt in tank. Liquor pulled and boiler shutdown. Operator continued to pump out tank to avoid explosion because of a leaking density control valve. Not applicable Not applicable Dissolving tank locked out, drained, washed out, and inspected. Agitators and density sensing instrument inspected</p> <p>1. Installed temperature indication with alarms in control room. 2. Waterwash procedure revision to drain and inspect tank. 3. Standard operating practice revision around backflushing</p>
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<p>2001 October – 36 Location: Unit: Size: Incident Date: Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events:</p> <p>Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>Westvaco PRG, Charleston, South Carolina No. 1 Recovery Boiler. B&W Contract No. PR-206. Startup 1984 4.5 million ppd solids. Operating @ 1450 psig & 880F. Design @ 1725 psig. 2 drum/ large economizer June 26, 2001 Dissolving Tank – explosion in tank caused by heavy smelt flow from unplugging no. 5 spout (all spouts were plugged). Tank vertical stiffeners bowed 2” Downtime resulting from ESP & Total downtime – 119:55 hrs ESP initiated. Revocable policy to stay out of area for 12 hrs after ESP Dissolving Tank Explosion Acoustic leak detection installed and in operation. Did not detect leak A series of incidents causing the boiler to stop & restart over several days (UPS system trip, FW valve packing blew out, drum level swings) resulting in all smelt spouts plugged when firing resumed & boiler came on-line. Liquor firing with 3 guns for 45 min. to increase heat in bottom was unsuccessful to open spouts. Oil firing continued while working on opening spouts. Sodium bicarbonate fire extinguisher tried with inconclusive results. After more than 24 hrs, a torch was successful in starting smelt to flow in No. 5 spout. Smelt flow progressively increased, tank rumbling turned to booms, firing was stopped, area evacuated, & ESP initiated. Damage was heavy including that from smelt exploding in the U-drains No Not applicable Unplugging the smelt spout after an undetermined UPS trip Inspection May 11, 2001. Chemically cleaned with chelant in 1989</p>
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SUMMARY OF RECOVERY BOILER INCIDENTS

<p>2001 October – 39 Location: Unit: Size: Incident Date Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events:</p> <p>Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:</p>	<p>SAPPI, Muskegon, MI CE Contract No. 460462. Startup 1963. Pressure part rebuild by Tampella Power 1990 & 1993 1.1445 million ppd solids. Operating @ 500 psig & 710-760 F. Design @ ____ psig. 2 drum/DCE June 19, 2001.</p> <p>Economizer - ~ 1.5" rupture along economizer lower bend Total downtime – 1 week. Time for repairs & NDT - 72 hours. Moved up 1 day scheduled 1 week outage None</p> <p>Non-critical Operator notice cascade evaporator level increased ~ 3" for no apparent reason No information</p> <p>Operator attempting to build solids in cascade evaporator before firing liquor noticed the level increase. Smelt bed appeared unchanged & feedwater to steam ratio okay. Operators began unit walkdown & inspection of economizer by opening manways. Shift supervisor joined operators & leak located 10 minutes after level observation. With the superintendent, agreed to shutdown in orderly manner for repairs.</p> <p>No No Inspection (NDT) showed a number of tubes to have significant thinning at the bend. Replaced 12 bends & pad welded an additional 10 tubes Lab analysis of failure pending. Suspect external corrosion/erosion due to high gas velocity Full NDT of area and annually thereafter. Investigation program to determine root cause. Failure area not ESP'd for several years.</p>
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SUMMARY OF RECOVERY BOILER INCIDENTS

2001October–INTL 1 Location: Unit: Size: Incident Date: Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:	International – Brazil Celulose Nipo-Brazileira S.A. – CENIBRA, Belo Oriente, Mina Gerais No. 1 Recovery boiler. CBC contract start-up 1976. CBC revamp in 1994. 3.174 million ppd solids. Operation @ 924 psig & 842F November 20, 2000 Economizer – leak in tube due to external corrosion at right sidewall Total downtime – 16 hr- 40 min No Non-critical (established in Brazil) Operator observed moisture at economizer hopper & deviation of water and steam differential noted in the control room None installed None No One 12" nipple was substituted External tube corrosion Check all economizer walls looking for places where cold air can enter November 2000
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2001October–INTL 2 Location: Unit: Size: Incident Date: Leak/Incident Loc: Downtime hrs due to leak/total: ESP? Classification: How discovered: Leak detection: Sequence of events: Bed cooling: Wash adjacent tube: Repair procedure: Root cause: Future prevention: Last full inspection:	International – Brazil Celulose Nipo-Brazileira S.A. – CENIBRA, Belo Oriente, Mina Gerais No. 2 Recovery boiler. CBC contract start-up 1991. 4.52 million ppd solids. Operation @ 924 psig & 842F November 25, 2000 Economizer – almost a full diameter crack in a tube weld at upper header of No. 2 economizer Total downtime – 34 hr- 10 min No Non-critical (established in Brazil) Water/steam differential observation in control room & inspection detected water in the ash system and at the economizer header None installed None No Substitution of ~ 12" length of tube Crack at thermal affected area at tube weld to header On the next shutdown, PT will be performed on all welds and tubes replaced where necessary February 2000. Screen tubes chemically cleaned in 1996 with HCl
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SUMMARY OF RECOVERY BOILER INCIDENTS

2001October–INTL 3	International – Brazil
Location:	Celulose Nipo-Brazileira S.A. – CENIBRA, Belo Oriente, Mina Gerais
Unit:	No. 2 Recovery boiler. CBC contract start-up 1991.
Size:	4.52 million ppd solids. Operation @ 924 psig & 842F
Incident Date:	January 28, 2001
Leak/Incident Loc:	Economizer – almost a full diameter crack in a tube weld at upper header of No. 2 economizer
Downtime hrs due to leak/total:	Total downtime – 43 hr- 40 min
ESP?	No
Classification:	Non-critical (established in Brazil)
How discovered:	Water/steam differential observation in control room & inspection detected water through the inspection doors
Leak detection:	None installed
Sequence of events:	
Bed cooling:	None
Wash adjacent tube:	No
Repair procedure:	Substitution of ~ 12" length of tube
Root cause:	Crack at thermal affected area at tube weld to header
Future prevention:	On the next shutdown, PT will be performed on all welds and tubes replaced where necessary
Last full inspection:	February 2000. Screen tubes chemically cleaned in 1996 with HCl

2001October–INTL 4	International – Brazil
Location:	International Paper, Mogi Guaçu, São Paulo, Brazil
Unit:	No. 6 Recovery Boiler. B&W Contract No. PR-169. Startup 1976 Revamp in 1993 by Jansen
Size:	1.75 million ppd solids. Operating @ 427 psig & 680F.
Incident Date:	March 21, 2001
Leak/Incident Loc:	Furnace, Upper – crack for ~ 75% of circumference of roof tube next to steam drum; roof a continuation of front wall. Crack in 1 st tube next to sidewall
Downtime hrs due to leak/total:	Total downtime – 83.2 hours
ESP?	No
Classification:	Non-critical (established in Brazil). BLRBAC ESP Subcommittee would classify as Critical Incident because water could penetrate roof refractory and enter furnace
How discovered:	By field operator
Leak detection:	None installed
Sequence of events:	Boiler operating at reduced rating due to low heavy liquor inventory. Field operator during shift walkdown noticed drops of water on penthouse inspection door, opened the door and observed leak. Inspection determined no water was entering furnace. All other operating indications were normal. Orderly shutdown was performed while observing leak until char bed smelted from furnace. Observation was made by an operator in contact with control room so that if tube ruptured, ESP could be immediately initiated.
Bed cooling:	No
Wash adjacent tube:	No
Repair procedure:	New section of tube welded and radiographed
Root cause:	Fatigue crack. Corrosive atmosphere contributed to problem
Future prevention:	All tubes of both drums will be inspected by SAGE and IRIS. Refractory will be removed for external inspection
Last full inspection:	Inspected May 2000. Chemical cleaning during start-up in 1976.

SUMMARY OF RECOVERY BOILER INCIDENTS

2001October–INTL 5	INTERNATIONAL – SOUTH AFRICA
Location:	SAPPI USUTU, SWAZILAND-BHUNYA, SOUTH AFRICA
Unit:	Recovery Unit CRU-2. International Combustion Ltd. Contract No. SB 130. Startup 1971. Upgraded by Kvaerner
Size:	1.15 million ppd solids (520 mt/d). Operating at 645 psig (44.5 barg) & 752F (400C). Design at 754 psig (52 barg). 2 drum/DCE
Incident Date:	May 5, 2001
Leak/Incident Loc:	Furnace – 2” (50 mm) crack in the center of the furnace rear wall in a tube adjacent to the top of a secondary airport. Tube had thinned over a length of 1 meter.
Downtime hrs due to leak/total:	Total downtime – 88 hrs from ESP to liquor in furnace
ESP?	ESP Initiated
Classification:	
How discovered:	Outside operator was changing the liquor gun and noticed a mist on the furnace rear wall.
Leak detection:	No
Sequence of events:	There had been problems with a faulty drum level transmitter. Boiler was on and off liquor for about 5 hours, reducing char bed to a very low level. Liquor firing just commencing when leak noticed. ESP initiated
Bed cooling:	
Wash adjacent tube:	No
Repair procedure:	Section of tube inserted at failure location and also for adjacent tube that was thinned.
Root cause:	External corrosion and overheating above 900F (480C) for a long period of time
Future prevention:	
Last full inspection:	

2001October–INTL 6	INTERNATIONAL – SOUTH AFRICA
Location:	SAPPI USUTU, SWAZILAND-BHUNYA, SOUTH AFRICA
Unit:	Recovery Unit SB-10035. International Combustion Ltd. Contract No. 38634. Startup 1961.
Size:	1.15 million ppd solids (520 mt/d). Operating at 645 psig (44.5 barg) & 752F (400C). Design at 754 psig (52 barg). 2 drum/DCE
Incident Date:	May 21, 2001
Leak/Incident Loc:	Smelt spout – both (2) spouts
Downtime hrs due to leak/total:	Total downtime – 111 hours. Superheater leaks discovered when filling boiler for hydrostatic test. Boiler cooled and drained to make repairs
ESP?	ESP initiated
Classification:	Large and small bangs at 1 to 2 minute intervals
How discovered:	Attendant reported an unusual banging noise of the spout, which when observed more closely revealed water around the inside of the left-hand spout
Leak detection:	None indicated
Sequence of events:	Water source not clear (spout or tube leak inside furnace). ESP initiated. Smelt spout cooling water and emergency cooling water isolated. Earlier, cooling water temperature dropped to 112F with control set point at 149F. Investigation discovered emergency CW valve intermittently opening & closing creating the low temperature & high conductivity. Testing post-ESP determined that non-return valve was jammed, that right hand spout pressure and flow switches not working and left spout flow switch indicating low flow.
Bed cooling:	No
Wash adjacent tube:	No
Repair procedure:	Installed new spouts
Root cause:	Non-return valve on spout cooling water system was jammed. (ESP Subcommittee secretary assumes this to be a check valve)
Future prevention:	HAZOP analysis used to define actions, including control equipment and system changes. Procedures modified. Spouts are replaced annually
Last full inspection:	