



BRAZILIAN RECOVERY BOILER SAFETY COMMITTEE

50th Conference - Finnish Recovery Boiler Committee
Tampere, Finland, June 11th, 2014

CSCRB

Brazilian Recovery Boiler Safety Committee

- Since 2001 (next meeting ABTCP 47th Pulp and Paper Int. Congress and Exhibition- Oct 9th)
- 4 sub committees:
 - Combustion
 - Safety
 - Maintenance (Now dealing with changes on time between inspection - New Brazilian regulation)
 - ESP

CSCRB – ESP SUB COMMITTEE

ESP Sub Committee Activities

- 1- Brazil (and Uruguay) recovery boiler database maintenance**
- 2 - Exchange information with other international committees (BLRBAC, SNRBC, FRBC)**
- 3 - Incident analysis**
- 4 - Incident presentation**
- 5 - Non ordinary issues**

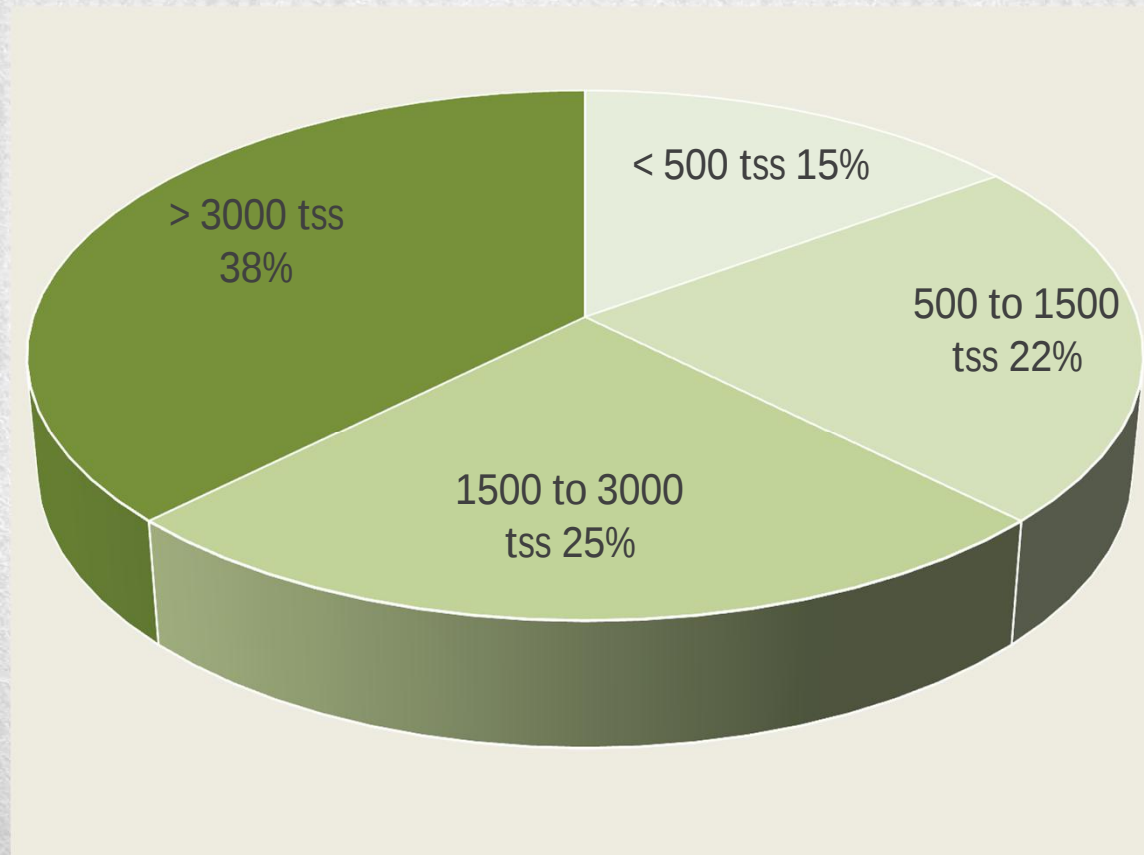


Data base maintenance

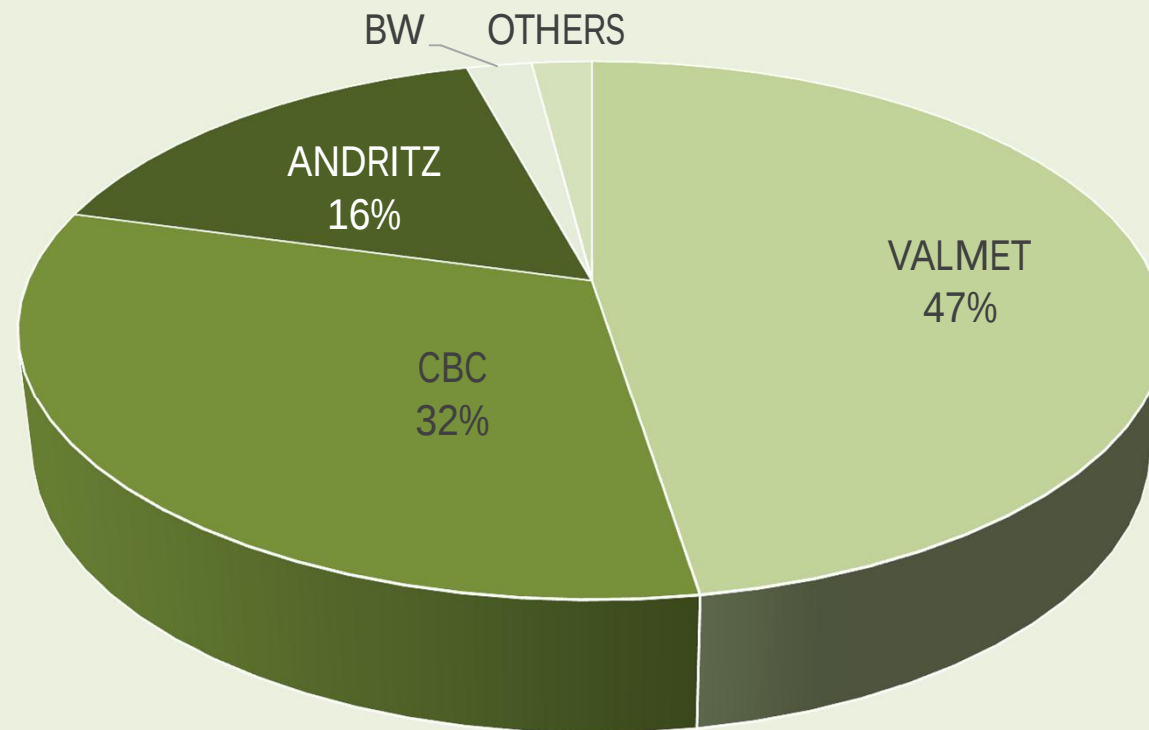
Current status (considering also Uruguay)

- **40 recovery boilers - 37 in operation**
- **1 Hibernated (Jari)**
- **2 Under project (CMPC-Guaiba and Klabin)**
- **10 Recovery boilers retrofits since 2004**
- **13 New recovery boiler since 2004**
- **Typical age: 19 years**
- **Typical size: : 2.600 tss/day**

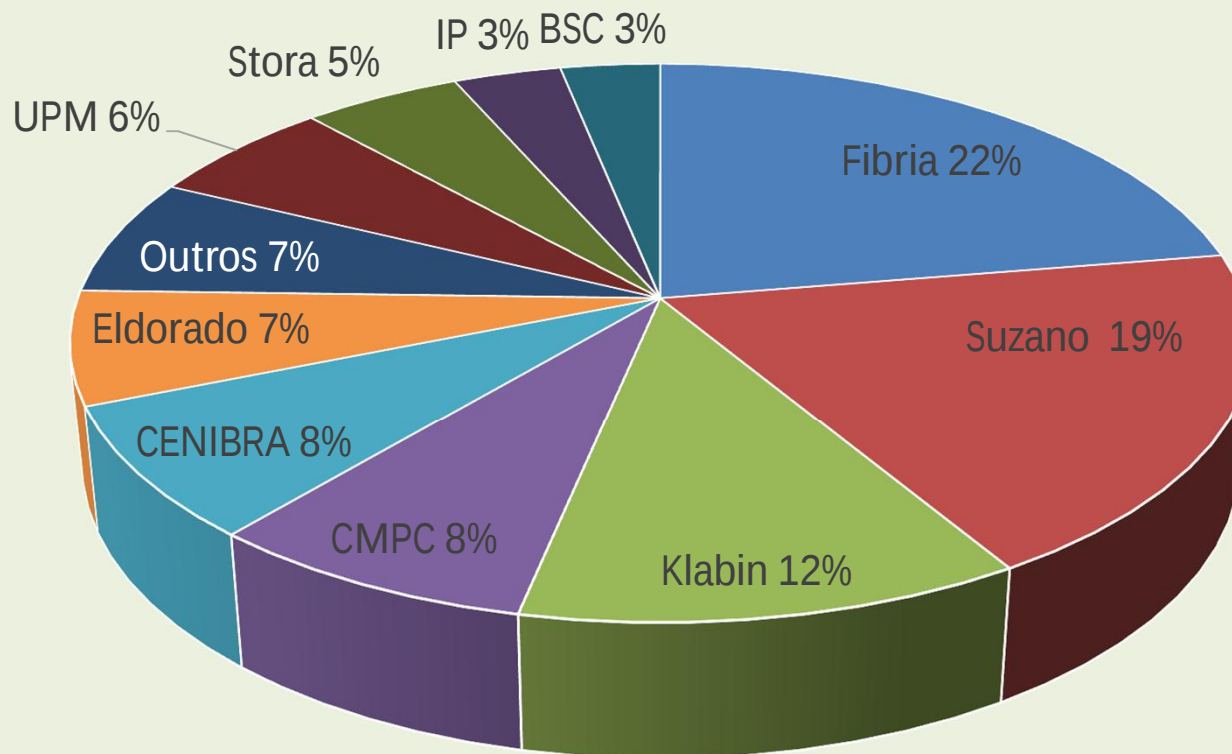
Boilers by size



Boilers by suppliers



Boilers by users



Data base

CSCRB -ESP COMMITTEE - June 2014

#	Company	Supplier	Status	Start up (ano)	Retrofit (ano)	Age (anos)	Capacity Original (tss virgin/d)	Capacity Real (tss virgin/d)	Capacidade Real (as fired/dia)	Pressure (barg)	Temp(C)	Steaming rate (t/h)	Area (m2)	Ratio (tss/m2xday)	Boiler responsible
1	BSC	CBC	Running	2008		6	3000	3300		85	490	494	149,2	22,1	Sandro Yosmini <sandro_yosmini@bahiaspeccell.com>
2	CENIBRA	CBC	Running	1977	2003	37	1440	1800		65	450	200	93,86	19,2	Virgilio Procópio <virgilio.procoppio@cenibra.com.br>
3	CENIBRA	CBC	Running	1992	2004	22	2050	2700		65	450	422	138,13	19,5	Virgilio Procópio <virgilio.procoppio@cenibra.com.br>
4	CENIBRA	CBC	Running	2006		8	3500	3500		66	450	524	189	18,5	Virgilio Procópio <virgilio.procoppio@cenibra.com.br>
5	CMPC	B&W	Running	2002		12	1950	1950		64	465	300	125	15,6	Humberto Batista <H.Batista@cmprs.com.br>
6	CMPC	Valmet	Project	2015		0	6200	6200		95	490	1075	271	22,9	Humberto Batista <H.Batista@cmprs.com.br>
7	COCELPA	Valmet	Running	1988	2010	26	160	270		45	425	30	12	22,5	Aldionir de Liz <aldionir.liz@cocelpa.com.br>
8	Eldorado	Valmet	Running	2012		2	6800	6800		85	485	1116	293	23,2	Murilo Sanches <murilo.sanches@eldorado.com.br>
9	Fanapel	Valmet	Running	1982	2005	32	138	210		62	410	24	9	23,3	dsalvat@fanapel.com.uy
10	Fibria Aracruz CR-A	Valmet	Running	2001		13	3440	3440		64	450	524	156,7	22,0	Ronaldo Schuster <ronaldo.schuster@fibria.com.br>
11	Fibria Aracruz CR-B	Valmet	Running	1991	2002	23	2200	3600		64	450	524	165,7	21,7	Ronaldo Schuster <ronaldo.schuster@fibria.com.br>
12	Fibria Aracruz CR-C	Andritz	Running	1997	2000	17	2200	3300		64	455	433	130,8	25,2	Ronaldo Schuster <ronaldo.schuster@fibria.com.br>
13	Fibria Jacarei	CBC	Running	1994		20	1430	1990		90	470	240	101	19,7	Julio Cezar Macedo <julio.macedo@fibria.com.br>
14	Fibria Jacarei	CBC	Running	2002		12	2500	2990		93	480	360	149	20,1	Julio Cezar Macedo <julio.macedo@fibria.com.br>
15	Fibria Tres Lagoas	Valmet	Running	2009		5	5300	5500		86	487	822	242	22,7	Fernando Raasch <fernando.pereira@fibria.com.br>
16	Iguacu	São Caetano	Running	1972		42	320	320		12	190	24	18,92	16,9	Wilson Lopes <wilsonlopes@iguacucelulose.com.br>
17	IP - Luiz Antonio	CBC	Running	1991	2005	23	890	1702		64	450	245	66	25,8	Edivaldo Verde <edivaldo.verde@ipaperbr.com>
18	IP- Mogi Guaçu	B&W	Running	1976		38	187	320		29	350	28	14,04	22,8	Geraldo Ferreira <Geraldo.Ferreira@ipaperbr.com>
19	IP - Mogi Guaçu	Andritz	Running	1985	2006	29	950	1144		27,6	340	120	51,85	22,1	Geraldo Ferreira <Geraldo.Ferreira@ipaperbr.com>
20	IP -Nova Campina	CBC	Running	2006		8	400	400		42	400	74	26	15,4	fabio.costal@orsalp.com.br
21	Jari Monte Dourado	BHI	Hybernated	1979	1988	35	1360	1750		59	450	276	89	19,7	José Coqui <jcmoreira@jari.com.br>
22	Klabin-Correa Pinto	CBC	Running	1987	1992	27	580	750		85	480	110	49	15,3	Edson Maestri <edmaestri@klabin.com.br>
23	Klabin Telemaco	Valmet	Running	1977	2000	37	1100	1850		46	430	250	92,5	20,0	Bruno Peres <bhperes@klabin.com.br>
24	Klabin Telemaco	CBC	Running	2007		7	1700	1700		106	503	243	79,6	21,4	Bruno Peres <bhperes@klabin.com.br>
25	Klabin Telemaco	CBC	Project	2016		0	7000	7000		104	503	1200	315,4	22,2	Geraldo Simao <gsimao@klabin.com.br>
26	Klabin-Otacilio Costa	CBC	Running	1998		16	1100	1050		89	483	170	69,1	15,2	Edson Maestri <edmaestri@klabin.com.br>
27	Lwarcel	CBC	Running	2002	2008	12	700	826		85	480	120	44	18,8	Cesar Anfe <canfe@lwarcel.com.br>
28	Montes del Plata	Andritz	Running	2014		0	5710	5710		97	494	928	289	19,8	Enrique Debera <enrique.debera@montesdelplata.com.uy>
29	Rigesa	Andritz	Running	1999		15	850	600		64	460	126	47,4	12,7	Fernando Wessler <fernando.wessler@mwv.com>
30	Suzano Imperatriz	Valmet	Running	2013		1	7000	7000		95	492	1207	323,2	21,7	Rudimar Klitzke <rklitzke@suzano.com.br>
31	Suzano Limeira	Valmet	Running	1972		42	270	510		42	380	65	24,11	21,2	Antonio Carlos Andrella <acarlosandrella@suzano.com.br>
32	Suzano Limeira	Valmet	Running	1981	2000	33	270	510		42	380	65	24,11	21,2	Antonio Carlos Andrella <acarlosandrella@suzano.com.br>
33	Suzano Limeira	CBC	Running	2002	2007	12	1100	1700		46	400	180	69	24,6	Antonio Carlos Andrella <acarlosandrella@suzano.com.br>
34	Suzano Mucuri	Valmet	Running	1992	2007	22	1750	3000		85	480	420	144	20,8	Hildomar Raimondi <hildomar.raimondi@suzano.com.br>
35	Suzano Mucuri	Valmet	Running	2007		7	4700	4700		85	480	738	251	18,7	Hildomar Raimondi <hildomar.raimondi@suzano.com.br>
36	Suzano Suzano	Valmet	Running	1973	2004	41	670	811		50	380	110	49	16,6	Heverton Dias <hevertondias@suzano.com.br>
37	Suzano Suzano	CBC	Running	1987	2002	27	800	1400		50	420	218	64,1	21,8	Heverton Dias <hevertondias@suzano.com.br>
38	Trombini	Orcepa	Running	1989	2000	25	140	180		21	420	30	10	18,0	Alceu Scramocin <AScramocin@tbo.trombini.com.br>
39	UPM	Andritz	Running	2007		7	4900	6300		94	490	780	210	30,0	carolina.pesce@upm.com
40	Veracel Celulose	Valmet	Running	2005	2011	9	4000	4800		93,6	490	630	210	22,9	Estanislau Zutautes <estanislau.zutautas@veracel.com.br>
*	Mean	N/P	N/P	N/P	N/P	18,8	2268,9	2588,6		67,7	443,3	386,1	121,4	20,6	N/P
#	Company	Supplier	Status	Start up (ano)	Retrofit (ano)	Age (anos)	Capacity Original (tss virgin/d)	Capacity Real (tss virgin/d)	Capacidade Real (as fired/dia)	Pressure (barg)	Temp(C)	Steaming rate (t/h)	Area (m2)	Ratio (tss/m2xday)	Boiler responsible

Highlights

Company	Capacity (tss/d)	Pressure (barg)	Temp (C)	Area (m2)	Ratio (tss/m2.d)
IP-LA	1700	64	450	66	25,8 (4,1 MW/m2)
Suzano Imperatriz	7000	95	492	323,2	21,7
Klabin TB	1700	106	503	79,6	21,4
Eldorado	7500	85	480	293	25,6



Exchanged information

Boilers comparisons

	Br/Uy	Canada	USA	Finland	Sweden
Recovery boilers	40	43	158	17	27
Age	19 y	35 y	39 y	24 y	29 y
Oldest	42 y	73 y	60 y	55 y	52 y
Biggest	7200 tDS/d	3300 tDS/d	3325 tDS/d	4500 tDS/d	4000 tDS/d
Youngest	2016	2007	2008	2008	2012

Boiler comparisons

- Previous slide presented us the enormous challenge we are facing.
- We must keep boilers with highest availability, always considering its total life cycle

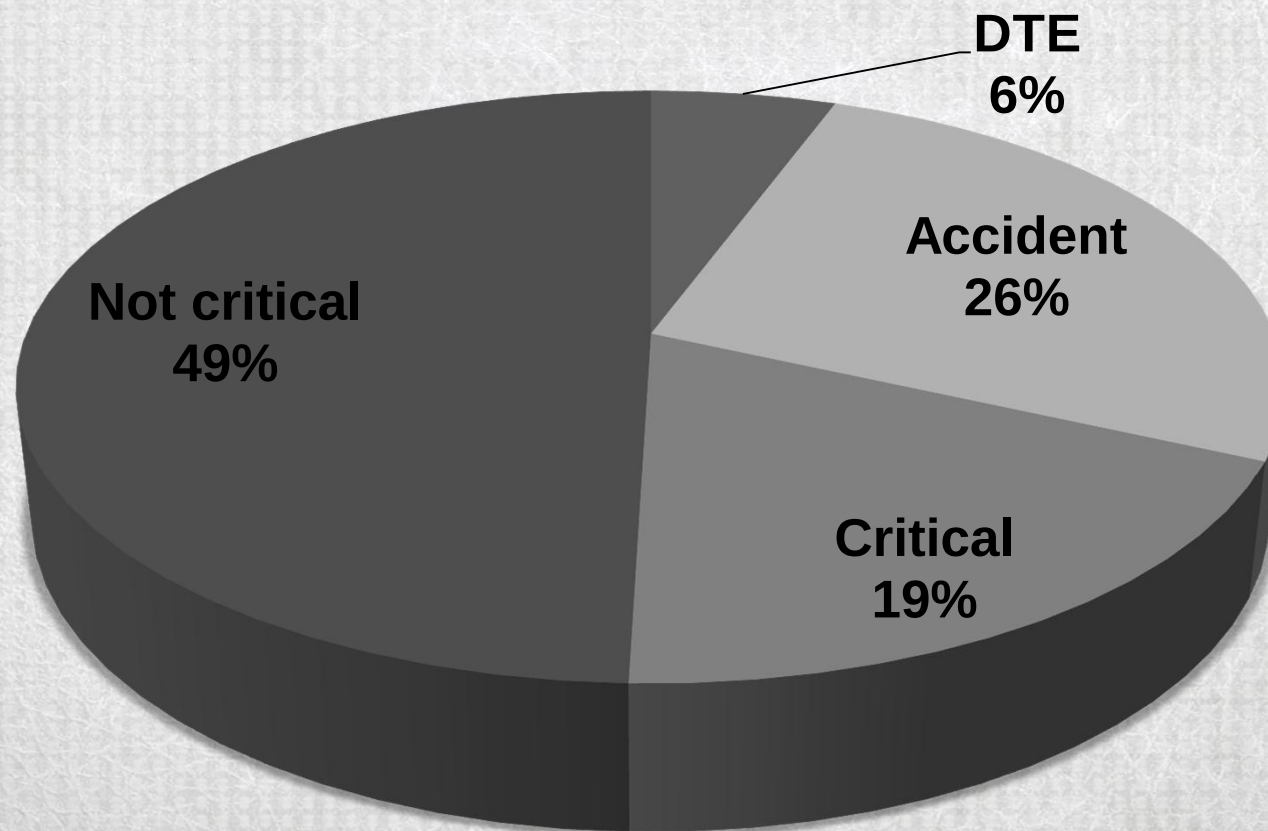


Incident analysis

Classifications

- **Critical**
- **Not critical**
- **Dissolving tank explosion**
- **Accident: When people or the recovery boiler itself were under risk, independent of leakages consideration – examples: HBL Tank failure; BFW contamination...**

Events by type



Events remarks

- Decreased Dissolving Tank events after deep procedure discussions (2006)
- Since 2001 we have only one injured person (DTE) on recovery boiler related events
- One minor explosion due waterwashing a hotter furnace
- Three smelt-water contacts without explosion
- 0 ESP's from 2002 to 2007
- 10 ESP's since 2008 (all of those correctly evaluated by operators)



Incident presentation

Case

2014 Incidents will be presented during ABTCP 2014 Congress



Non ordinary issues

Data base update

- **Survey every five years. First on 2003, second at 2008, third under execution this year.**
- **Results will presented on ABTCP 2014 Congress**

Major concerns

- **Superheater life cycle**
- **Materials for lower furnace tubes**
- **Guidelines for x-large boilers**
- **Cooling time for x-large boilers (7 days were required to cool a particular boiler before inspection/ after ESP)**

Thank you for your attention