

## **FINNISH RECOVERY BOILER COMMITTEE**

**Markus Nieminen**



# Finnish Recovery Boiler Committee Report

Markus Nieminen

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6 June, 2019

55th Anniversary International Recovery Boiler Conference



## Content

- 1) Overview to FRBC
- 2) Overview to Finnish recovery boilers
- 3) Incident statistics 1998 - 2018
- 4) Activities

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# 1) Overview to Finnish recovery boiler committee

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## Introduction

- The Finnish Recovery Boiler Committee (FRBC) has promoted safe, economic and environmentally friendly operation of recovery boilers and closely related processes since 1964.
- The Committee
  - collects information about incidents involving recovery boilers and provides details of these to its members
  - publishes guidelines, recommends practices and arranges conferences and meetings
  - conducts and supports research projects related to safe operation and improved economy of recovery boilers

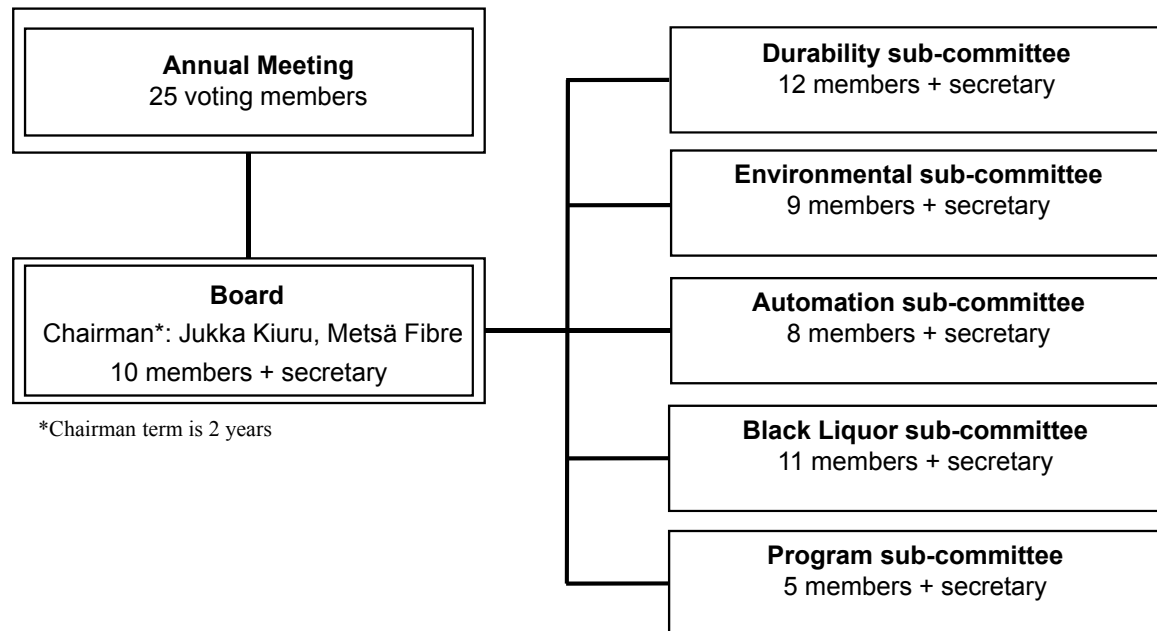
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# Organisation



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# Members

- The members of the Committee include pulp mills, recovery boiler manufacturers, a number of insurance engineering and inspection companies and research organisations in Finland.
- Total 30 members, including 15 pulp mills
  - 25 voting members, 5 universities
- There is a yearly member fee

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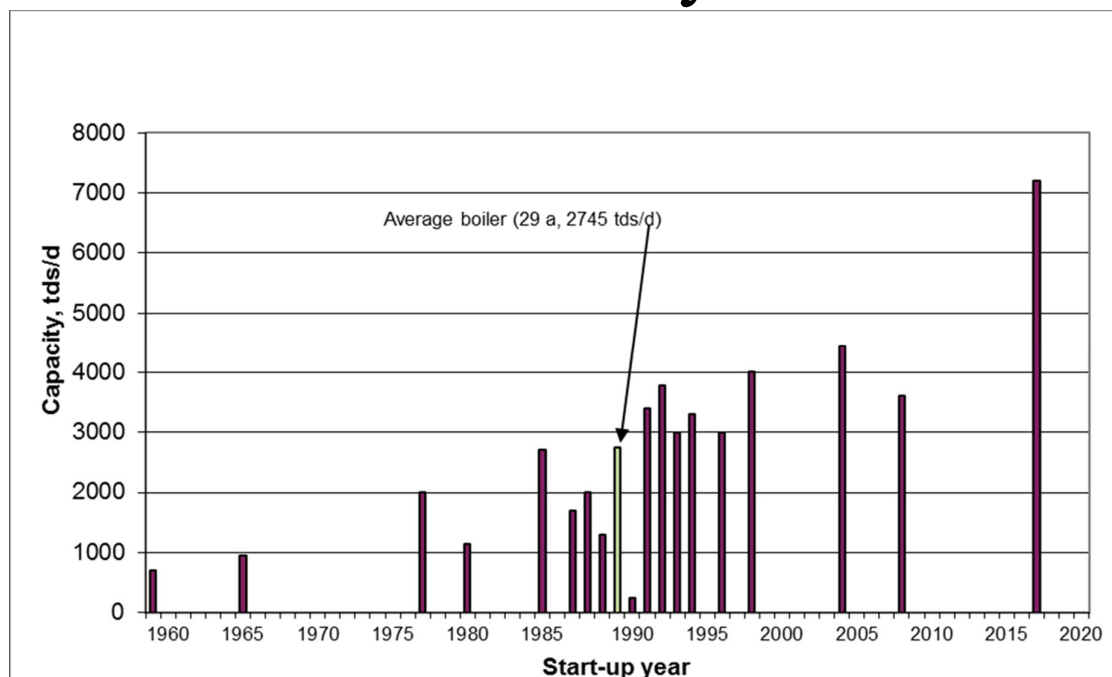
## 2) Overview to Finnish recovery boilers

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### Finnish recovery boilers



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# Finnish recovery boilers

- No. of recovery boilers 17
  - Oldest started up in 1959, CE boiler (700 tDS/d) in Kotka Mills
  - Newest (2017) and biggest (7200 tDS/d, Valmet boiler ) in Metsä Fibre Äänekoski mill
  - Smallest is in Stora Enso Heinola mill, Tampella boiler 250 tDS/d
- Number of mills 15
  - 2 mills operate more than one RB
- Average boiler age 29 yrs (1989)
- Average boiler capacity 2745 tDS/d
- Combined capacity 46 660 tDS/d

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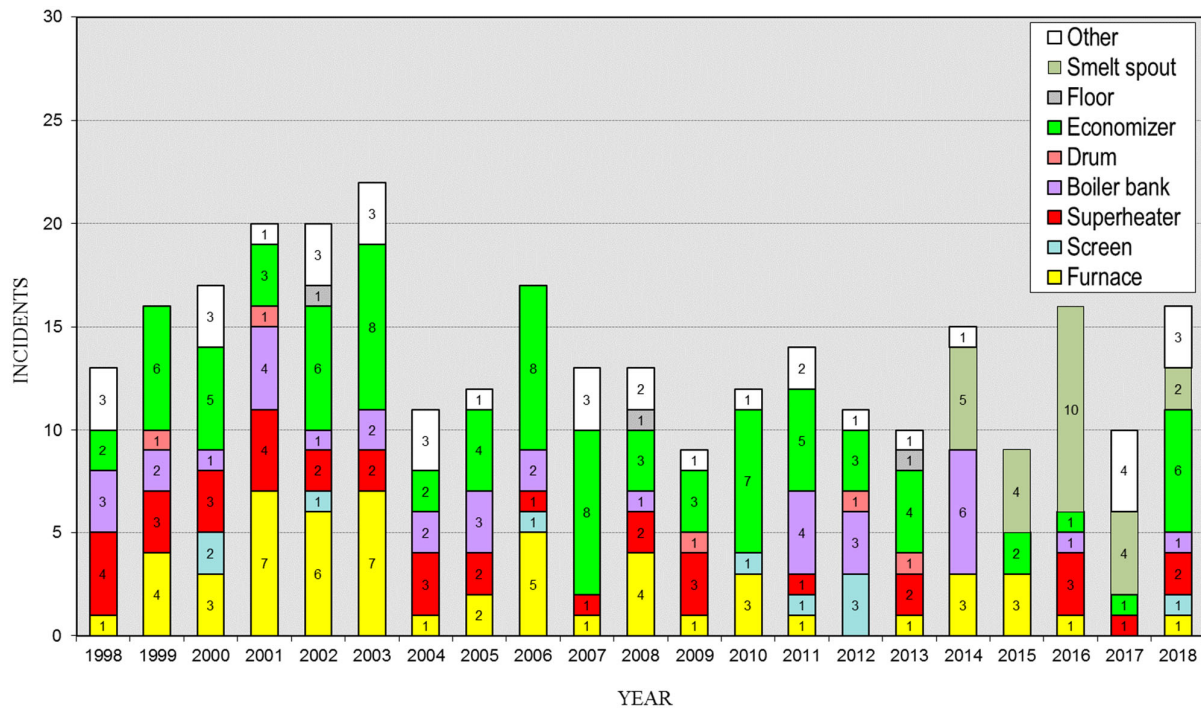
## 3) Incidents statistics 1998 - 2018

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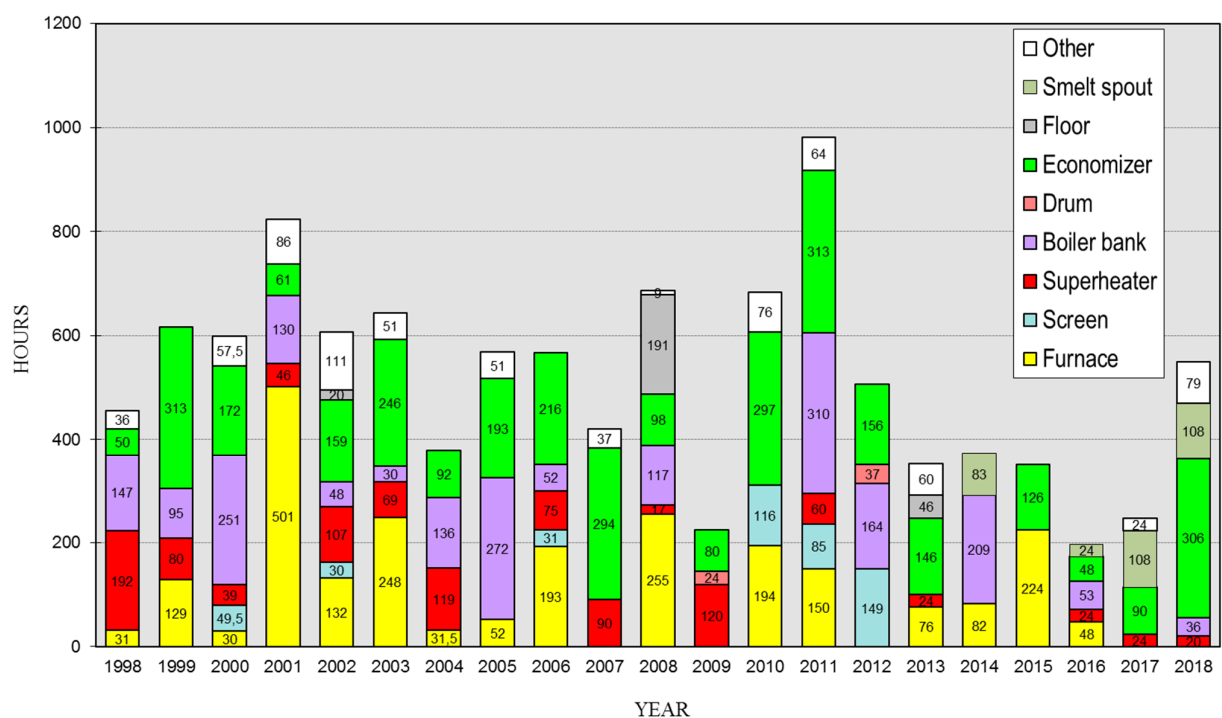
## INCIDENTS 1998-2018



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## DOWNTIME IN FINLAND 1998-2018

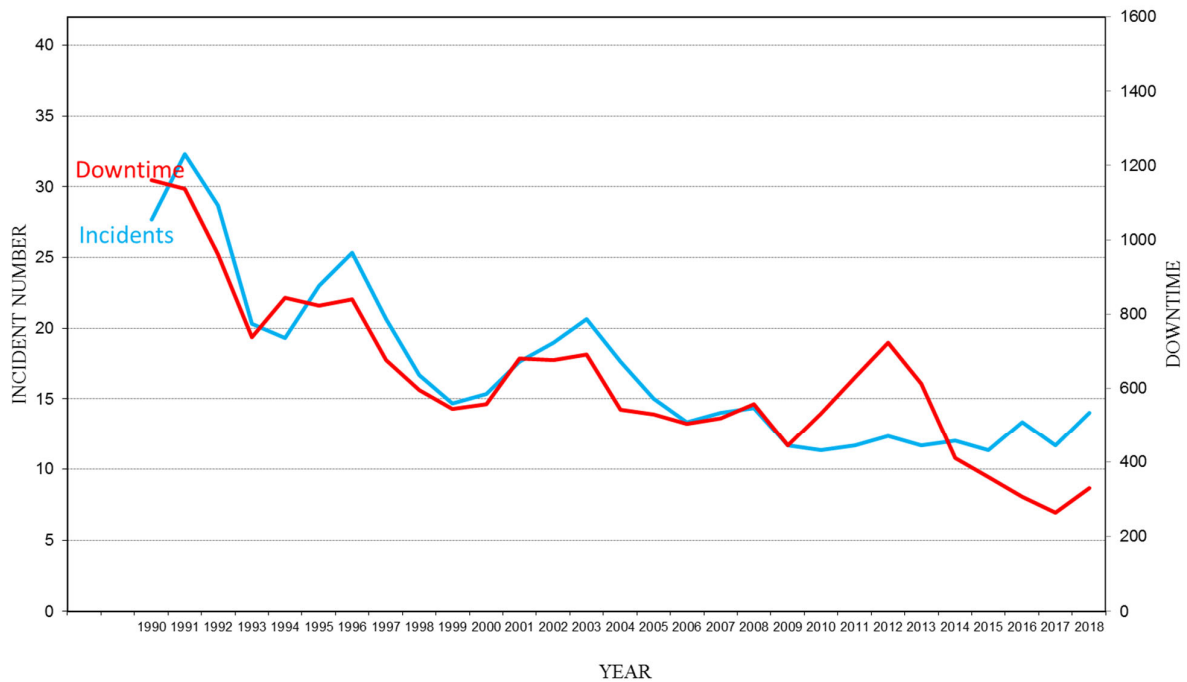


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### INCIDENTS and DOWNTIME trends 3-year running average



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## 4) Activities

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# Activities

- Annual events:
  - Recovery boiler day-seminar will be arranged October 31<sup>th</sup> in Helsinki
  - Chief Engineer Day-seminar will be arranged January 23<sup>th</sup> 2020 in Lappeenranta (Kaukas mill)
  - Operators day -seminar will be arranged in spring 2020
- Projects:
  - Smelt spout recommendation
  - Update of recommended procedure for incineration of NCG
  - NPE (non-process elements) study in the recovery cycle of six mills
  - Biosludge study

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## Smelt spout study

- Smelt spout study / recommendation has been ongoing since 2016 due to several incidents related to smelt spouts
  - one of main challenges when pursuing longer running times between annual shutdowns (over 12 months)
- Process data related to smelts spouts has been collected
- Study on heat loads and smelt flows has been carried out
- Collection of smelts spouts for closer look is ongoing:
  - Spout collection from several mills (after annual shutdown)
  - Metallurgical study on different spouts
- There is no simple solution since every mill has different problems

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# NCG recommendation

- Mill audit study on NCG formation, safe collection and efficient destruction has been carried out
  - Incidents have happened mostly in NCG collection/transfer systems, not in the incineration i.e. recovery boiler
  - FRBC recommendation covers only incineration, not the collection or transfer
- Aim is to expand the recommendation to cover also these parts



# NPE study

- NPEs are “elements that do not participate in the pulping process”
  - NPEs can cause operating problems for example scaling, corrosion and capacity decrease
- During past decades a great deal of studies carried out
- Target is that mills have better knowledge about NPE and comparison to other mills
  - More closed systems in modern pulp mills
  - NPE input higher – biofuels used instead of fossil fuels