Shock Pulse Generator Reference Plant: Waste Heat Boiler – Cokenergy, Chicago / USA

- Waste heat boiler with 48 t/h (107 klbs/h) steam capacity processing waste heat from heat recovery coke ovens
- Finned tube design of EVAP and ECO located downstream SH
- Each boiler cleaned solely by 2xEG10L SPG installed upstream SH and ECO (Shock Pulse Interval = 2h)
- Replaced 12 x steam soot blowers per boiler (type T20, D5E) - saved 2.5 t/day of steam per boiler
- Trial run performed in 2016/2017 on boiler D3 – delivered SPGs for battery A to C (in total 12 boilers) since then
- OEM waste heat boiler: Nooter/Eriksen (commissioned 1998)
- Operator: Cokenergy (SunCoke, USA)
Shock Pulse Generator Reference Plant: Waste Heat Boiler – Cokenergy, Chicago / USA

**Waste heat from heat recovery coke oven**

- **EVAP 1**
  - Bare vertical tubes

- **SH**
  - Bare horizontal tubes (staggered design)

- **EVAP 2+3**
  - Finned vertical tubes (fin pitch 20-30mm)

- **ECO 1+2**
  - Finned horizontal tubes

**Dimensions horizontal pass**
WxLxH [mm]:
2'300 x 7'000 x 3'700 (2'350 drum to drum)

**Dimensions ECO pass**
WxLxH [mm]:
2'300 x 2'000 x 4'000
Shock Pulse Generator Reference Plant:
Waste Heat Boiler – Cokenergy, Chicago / USA

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![Graph showing pressure drop in waste heat boiler over days of operation. The graph includes data points for Soot blower boiler cleaning and SPG boiler cleaning. The horizontal section of the boiler is also referenced.](image-url)
Shock Pulse Generator Reference Plant: Waste Heat Boiler – Cokenergy, Chicago / USA

Steam outlet temperature (normalized) = \frac{\text{Mean steam outlet temperature} \times 1500}{(\text{inlet flue gas temperature } S)}

Boiler D3
Shock Pulse Generator Reference Plant: Waste Heat Boiler – Cokenergy, Chicago / USA

12 x steam soot blowers (169 days of operation)
2 x Shock Pulse Generators (136 days of operation)

Boiler D3
Shock Pulse Generator Reference Plant:
Waste Heat Boiler – Cokenergy, Chicago / USA

Boiler D3

12 x steam soot blowers
(169 days of operation)

2 x Shock Pulse Generators
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Shock Pulse Generator Reference Plant: Waste Heat Boiler – Cokenergy, Chicago / USA

2 x Shock Pulse Generators (136 days of operation)

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Shock Pulse Generator Reference Plant: Waste Heat Boiler – Cokenergy, Chicago / USA