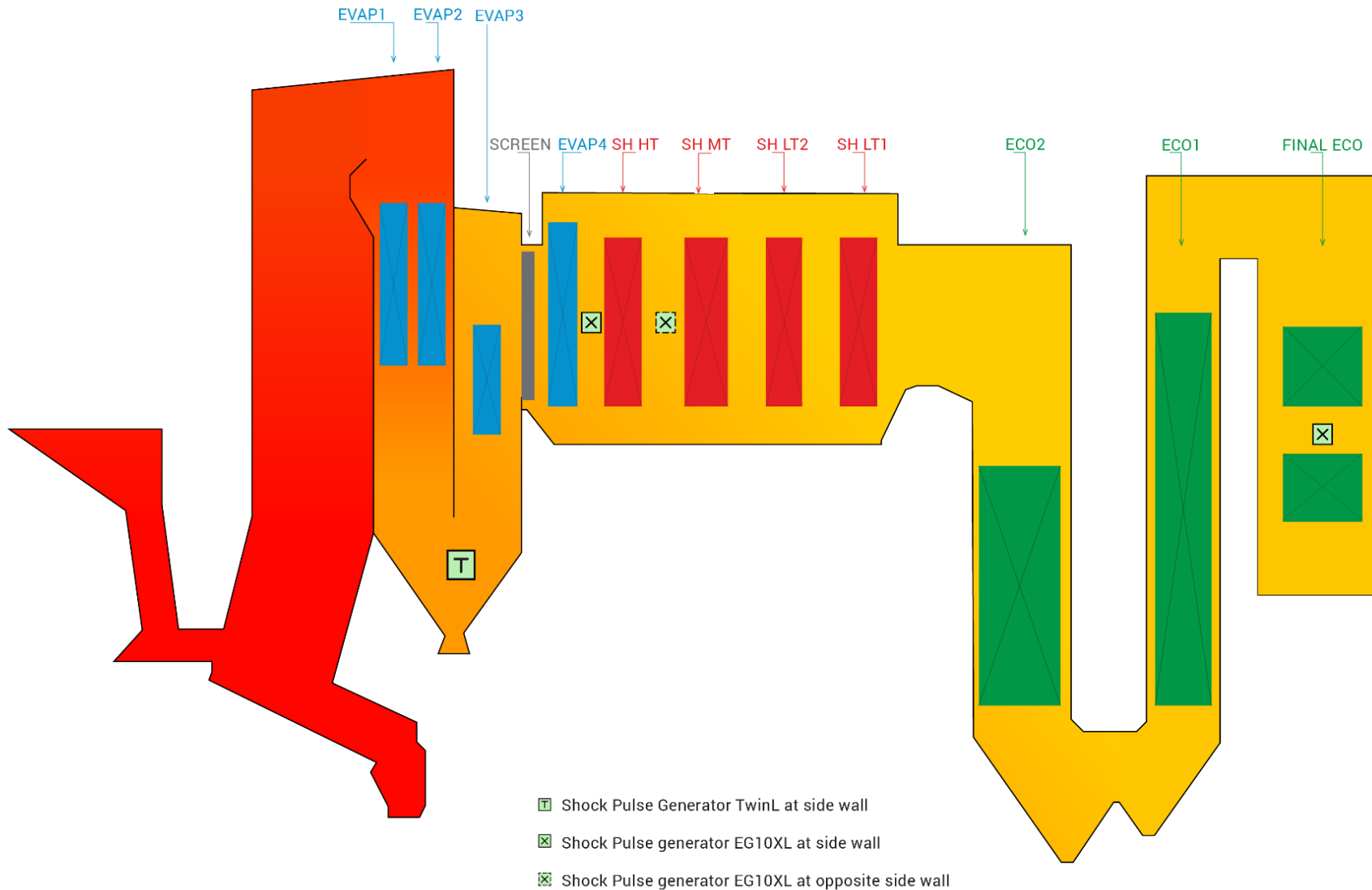


UK – FCC Lincoln reference

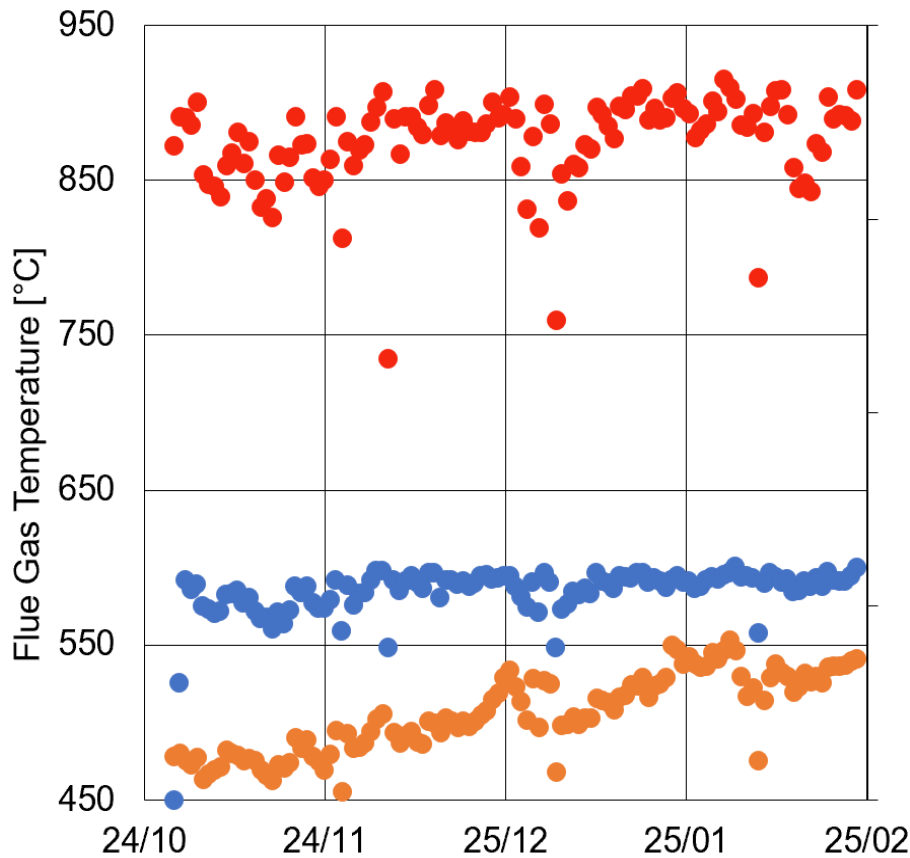


UK – FCC Lincoln reference

- 68 t/h steam flow, 58 bar, 400°C, Throughput: 190,000tpa waste (Original design spec:150,000tpa)
- Boiler width pass 2/3 = 9.4m (with suspended evaporator panels); Boiler width pass 4 = 6.25m
- The plant was just achieving the desired 8000+ operating hours prior to SPG install.
- 1 x TwinL SPG unit operational since August 2016, located at bottom hopper of 2nd/3rd pass, operated at 1 cycle per hour.
- Shower cleaning in 2nd/3rd pass completely stopped from first installation.
- Reduced and maintained stable temperatures at inlet to 4th pass, no need for any online detonative cleaning on the screen tubes which was required previous to the TwinL install. Historically the detonative cleaning had lead to some blockages bringing the boiler offline.
- Hopper is now kept clear, regular cleaning means ash flow is controlled and screw doesn't trip. Before the TwinL was installed, blockages were possible after only 6 weeks, bringing the plant offline.
- Fouling condition and temperature profile throughout boiler improved following stop of shower cleaning and start of the SPG. Didn't require use of SH attemperator sprays for some time and then used only infrequently.
- Since the installation of the TwinL, combined with the stop of the rake sootblower, the final Comeco ECO lasts between 12 month outages without any additional cleaning.
- During maintenance stop: reduced standstill period, less material for disposal and easier to clean.
- In Jan 2019 2 x EG10XL were fitted between the EVAP/SH HT and SH HT/SH MT since rappers were not always effective and some fouling still occurred. 1 x EG10XL was also fitted between the two Comeco finned tube ECO bundles (replacing the rake sootblower).
- The plant is aiming to run 18-24 months between outages, the SPGs installed in 2019 are part of this strategy.
- Plant supplier: CNIM
- Plant operator: FCC Environment

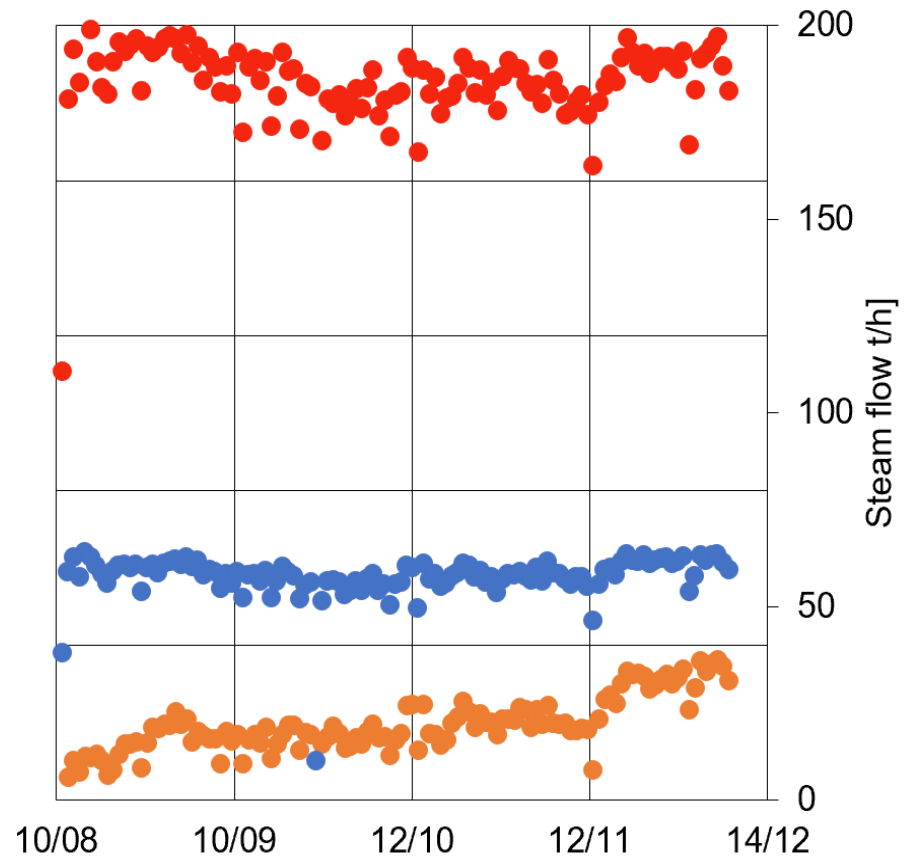
UK – FCC Lincoln reference

2015/16 – With shower cleaning and detonative cleaning (before the SPG was installed)



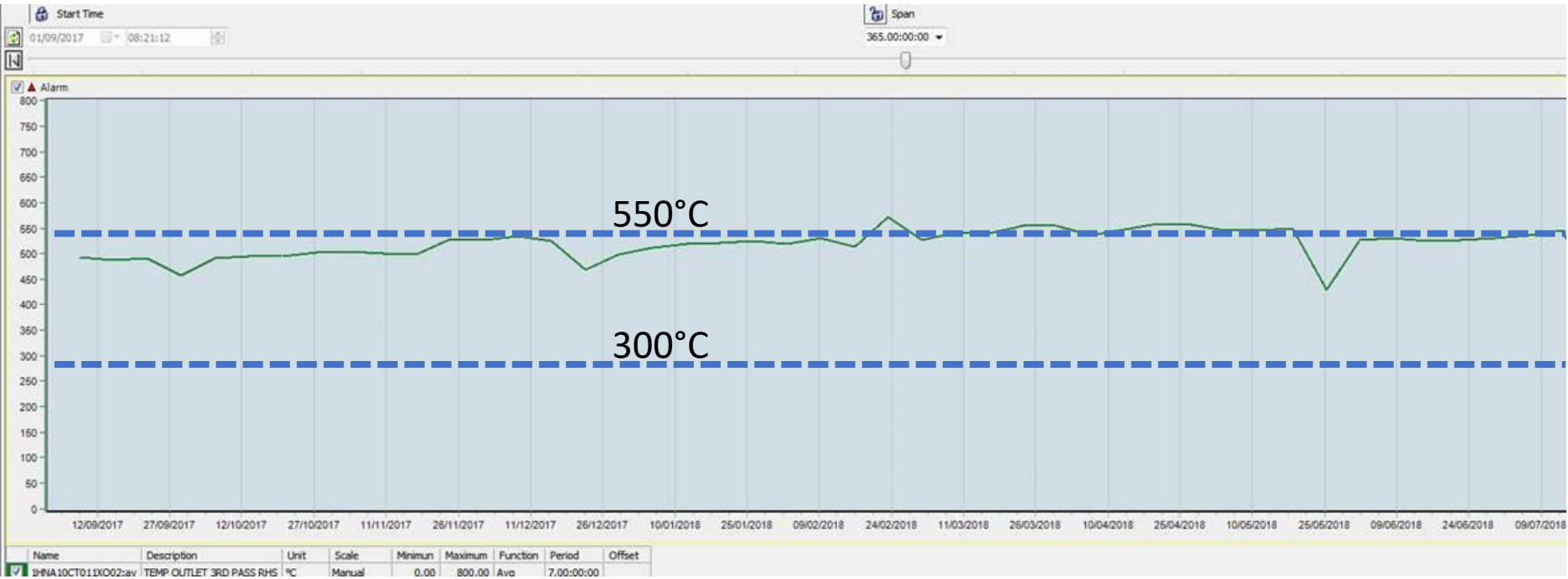
● T furnace [°C] ● T inlet horizontal pass [°C] ● Steam flow [t/h]

2016 – TwinL SPG model installed on 2nd/3rd pass, shower cleaning stopped. Inlet temperature lower and more stable even with higher furnace temperatures



UK – FCC Lincoln reference

The graph below shows 7 day averaged values for flue gas temperature at the outlet from the 3rd pass. The temperature was controlled at/below approx 550 degrees for the entire operating period with the single TwinL shock pulse generator.



Sept. 2017

Dec. 2017

March 2018

Aug. 2018

— Flue gas temperature (outlet 3rd pass)