Workshop information and registration:
www.opopworkshop.com

OPERATIONAL OPTIMISATION

For waste-to-energy and biomass plants

Energy from Waste

Operational Optimisation

For waste to energy and biomass plants

~~25–26 January 2022~~ Conference Aston, Birmingham

Improving profits today; future-proofing plants for tomorrow

IN ASSOCIATION WITH EfW Net The Energy from Waste Network

Because of covid-19 postponed to:
27–28 April 2022

technikgruppe
COMBUSTION MANAGEMENT

It is our great pleasure to invite you on TECHNIKGRUPPE'S presentation, round table discussion and exhibition booth. SEE YOU IN BIRMINGHAM UK!

www.technikgruppe.com/technology-of-fire

In this **WORKSHOP** basic principles of unique methods for combustion optimization on forward moving reciprocating grates will be explained. Practical results will be analysed. Technical / commercial experts from TECHNIKGRUPPE will contribute in their presentations and **round table discussion** to a better understanding of improvement and modernisation in Waste to Energy and Biomass plants.

Participants are kindly invited to visit **www.technikgruppe.com/technology-of-fire**
If you need additional information please contact Mr. Damir Zibrat **damir.zibrat@technikgruppe.com**

Target audience:

- **plant managers**
- **operational managers**
- **maintenance managers**
- **performance improvement engineers**
- **plant engineers**
- **plant operator supervisors**
- **plant operators**

Key words:

- **technology of fire**
- **combustion optimisation**
- **retrofitting of WtE and BtE plants**
- **forward moving grate**
- **new grate technology**
- **reliability**
- **profitability**

Technology of fire

The combustion process in Energy from Waste and Biomass plants is very complex, and the demands on control systems in those plants are very sophisticated. There are many theories about the best combustion technologies to use and there are equally many different approaches to find the right solutions.

In most conventional control systems there are lots of implemented control algorithms and many arguments how to compare different approaches.

In all of these discussions there are two basic factors that are used in nearly all comparisons:

1. Which main actions have influence on the quality of the combustion process?
2. Which measured parameters can be accurately compared to estimate the combustion quality?

Simplistically there are 3 main actions which have influence on the combustion process.

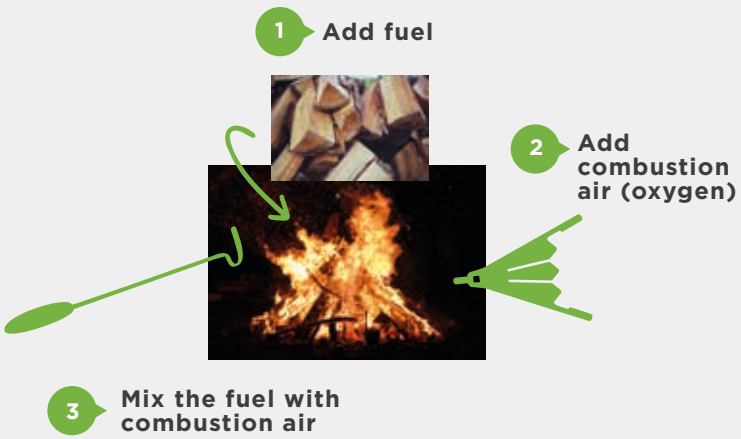
1. Adding fuel into the burning chamber
2. Blowing oxygen into the fire
3. Mixing the fuel with combustion air

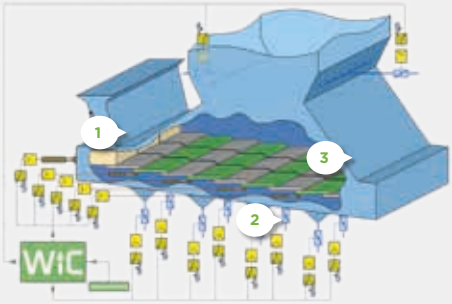
28 April: TECHNIKGRUPPE´s presentation and round table discussion

Session 1A – Combustion optimisation: enhancing combustion performance on forward moving reciprocating grates.

Damir Zibrat, Business Development Manager, **Technikgruppe**
Matthias Lukic, CEO, Technical Expert, **Technikgruppe**
Stephen Othen, Technical Director, **Fichtner Consulting Engineers; speaker / session chair**

Responding to the unique, complex challenges of each plant ensures optimum results and improved throughput and availability.





1. **Feeder = Add fuel**
2. **Primary/Secondary air= Add combustion air (oxygen)**
3. **Grate = Mix the fuel with combustion air**

After more than 25 years of experience in combustion optimization, we can say that forward-moving reciprocating grates are ideally suited to the application of the 3 basic principles for combustion control.

These 3 main actions involve around 30 actuators. But these actuators offer many possible combinations for fine tuning.

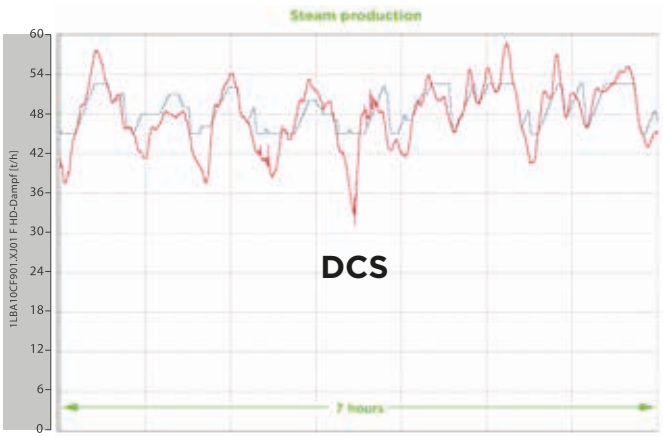
If we have 20 actuators and each actuator has 10 possible positions - **how many possible combinations do we get??**

1 actuator provides 10 combinations // 0-1-2-3-4-5-6-7-8-9-
2 actuators provide 100 combinations // 00-01-02-03-04- 96-97-98-99
3 actuators provide 1000 combinations // 000-001-002-003-004-005-006-007 997-998-999
20 actuators provide 100 000 000 000 000 000 000 possible combinations for fine adjustment //
00 000 000 000 000 000 000 ..... 99 999 999 999 999 999 999

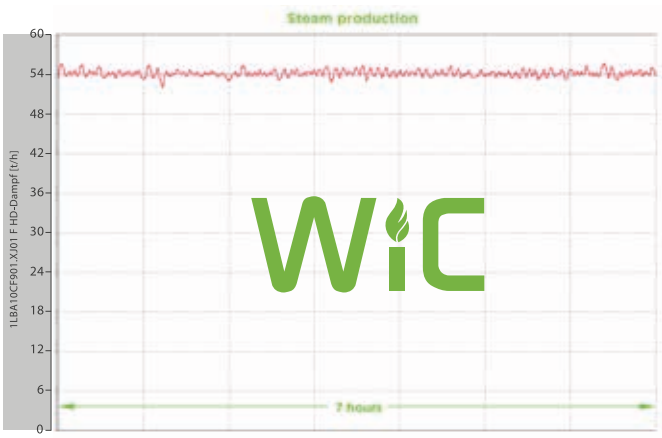
The status of the combustion process is changing every few seconds! **That means - every few seconds we need to fine adjust the actuators.** It is clear that the definition of appropriate combination every few seconds is a very complex task.

Whereas the checking of combustion quality itself is very simple → see some diagrams of KPI's from a combustion process.

Stabilization and enhancement of steam production

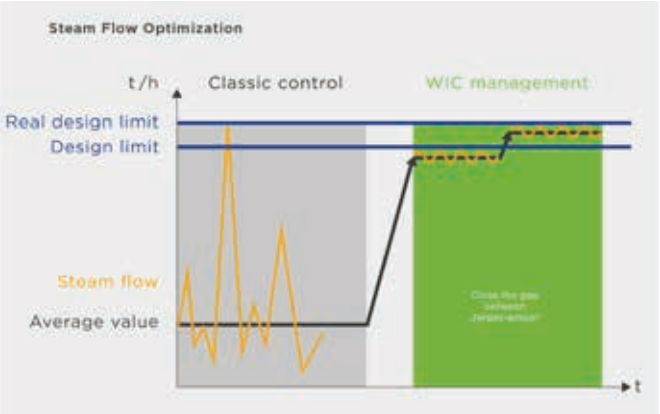


Steam production controlled by DCS



Steam production controlled by WiC (same line)

Enhancement of steam production towards real design limit

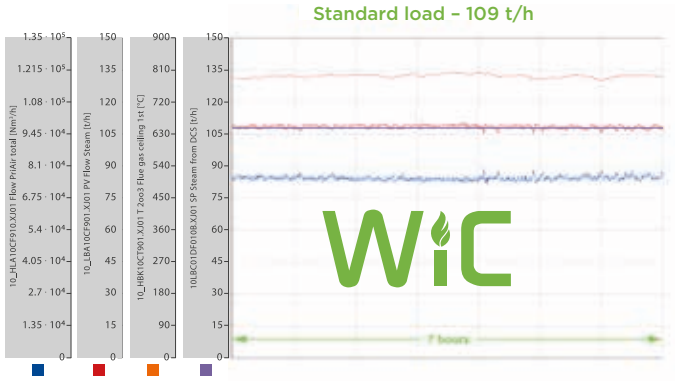


By implementation of classic control, big overshooting of steam production is possible and this is the main reason why the set point (average steam production) is kept below the design limit.

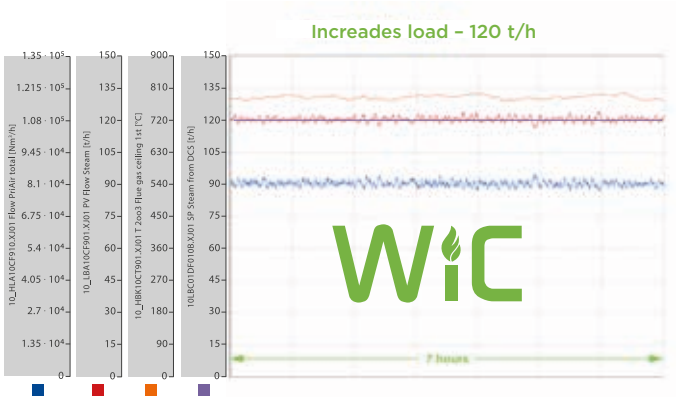
"Classic control" is very likely to produce dangerous overshooting above design limit! Therefore, in most cases, the design limit (MCR) is set **below the real design limit**.

That means, that in most cases the boilers are built with reserves to cover the overshooting due to lack of combustion control quality. These reserves may be utilised by implementing a more reliable and stable combustion control system. → WiC

Enhancing combustion capacity without mechanical changes



After stabilization of steam production, the real capacity could be determined.



This finally led us to a load increase of 10 % from original MCR

It is important to note, that even after increasing steam production from 109 t/h to 120 t/h the steam production is still stable.

In the afternoon/evening of 27th April there will be enough time for talks and discussions. It will be a pleasure to start with English Five O´Clock Tea.

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