

**FuzEvent® Case Study: Semardel, Vert-le-Grand**

# Performance increase in a Waste to Energy plant

**Semardel, Vert-le-Grand  
WtE Plant Paris**

*The plant, built by Von Roll (now Hitachi Zosen Inova) in 1999, has two identical combustion lines. Waste throughput of each furnace is around 13.5 t/h, and its lower heating value is around 2,200 kcal/kg. Each incineration line is equipped with an air-cooled grate furnace with integrated boiler. The flue gas cleaning system is composed of an SNCR with NH<sub>4</sub>OH injection for the NO<sub>x</sub> reduction, an electro filter, a semidry absorber with lime milk and a fabric filter. The boiler produces super-heated steam at 36 bar/400°C, used for electric power generation. The nominal electrical production capacity is around 14 MWh.*

**The business challenge**

The Semardel, Vert-le-Grand Plant, located close to Paris, France, constitutes an important investment for the owners and the local community. The business challenge on this plant is to secure that it operates at maximum capacity within the safety margins, at the lowest possible environmental load and following any legislations defined for the plant.

The plant recently conducted a major mechanical revamping project and the management decided 2014, as a final action, to carry out a feasibility study in order to evaluate the possibilities of using high-level control for improving the overall combustion efficiency and to maximize the waste treatment capacity within the given configuration of the plant.

Three basic focus areas for the optimization system were identified during the study:

1. Shall be able to handle special situations with difficult waste fractions more efficiently by implementing special control strategies to be activated during such phases.
2. Shall reduce the needs for operator intervention in the combustion control and allow operators to focus more on other important process control issues related to the operation of the plant.
3. Should apply infrared combustion supervision technology on the furnace in order to obtain maximum information about the combustion and reducing the risk of unburned waste leaving the furnace.

The study made by Dublix indicated that it would be possible to increase the stability of the combustion, resulting in about 20% reduced steam flow fluctuations and an estimated increase by 1-2 ton in the steam generation per hour on each combustion line.

**The results**

The first complete operating year - May 2015 to May 2016, with the FuzEvent® system in operation on the plant made it possible to increase the steam production set point on each line with 5%. The FuzEvent® system is estimated to have provided an increase in the total annual waste treatment capacity on the plant with 10.000 ton.

*It is important to understand that high-level control with the FuzEvent® system does not replace operators but assist them in performing much better than average.*

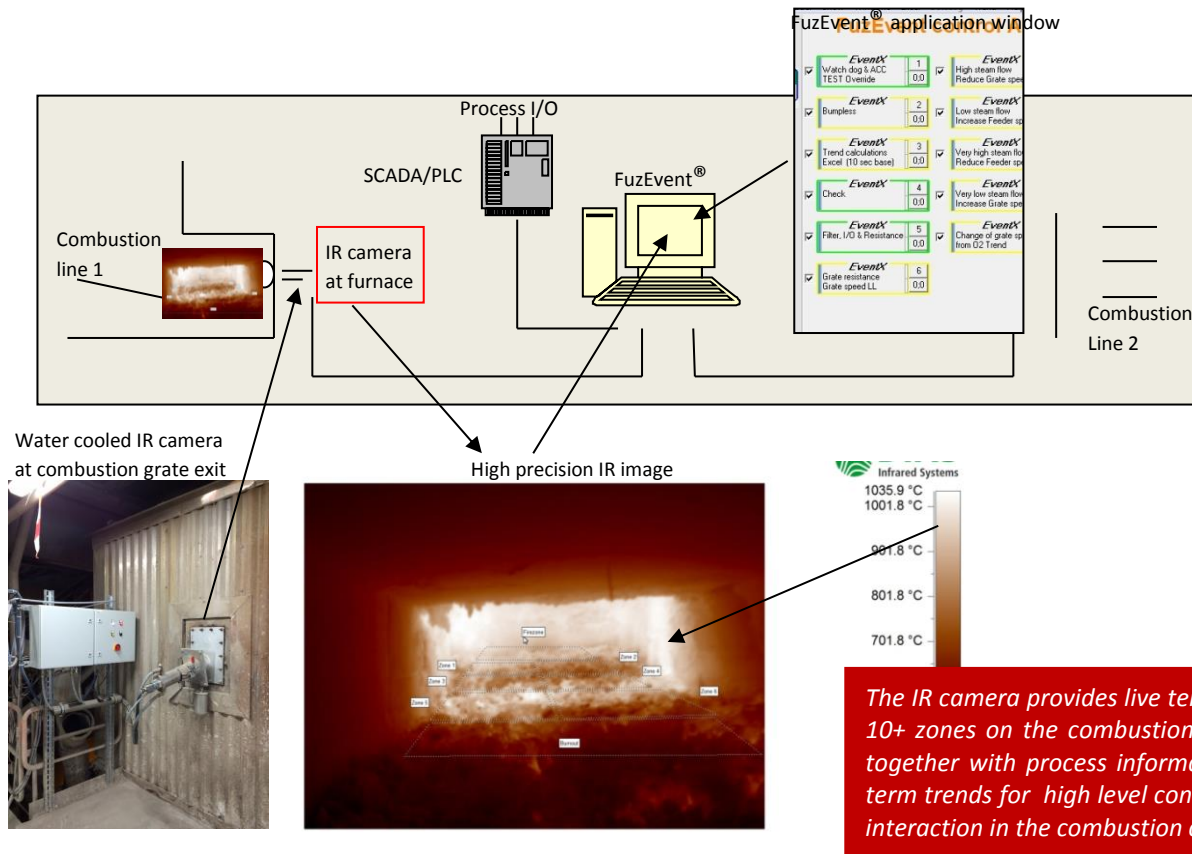
*The FuzEvent® system applies actions comparable to the ones of the very experienced operator; the development of the process is constantly evaluated by combining multiple process signals, long term trends. The process control actions are based on high level control rules with build-in experience from many similar installations in combination with inputs from the plant operators. The end result is a much more stable process, higher steam output and increased plant efficiency.*

*Dublix Engineering A/S*

## The Implemented FuzEvent® solution

The FuzEvent® High Level Control system implemented at the Semardel, Vert-le-Grand WtE Plant was configured with the following additional main instruments and controls:

- New feeder control PLC on both combustion lines.
- Added a few new pressure measurements in some compartments under the combustion grates.
- Added primary air flow measurements.
- Installed 2 infrared cameras located at the combustion grate exit at each furnace.
- The DCS system was modified in order for FuzEvent® control of some PID loop controllers.
- Using OPC protocol in order for the FuzEvent® system to communicate with the plant DCS system.



## The project timeline

September 2014	Design meeting and detailed implementation schedule.
October 2014	Installation of the FuzEvent® computer.
December 2014	Installation of IR-camera's on both lines and added updated pusher control units
Early 2015	Detailed design of control strategies.
April-May 2015	Commissioning and Performance test completed
Jan 2016	Service Contract established

- The project directs operators focus towards combustion optimization.
- A visionary plant operation management supported by engaged operators was the driving forces for the projects.
- The water cooled IR cameras provides important and useful information and keep track of the burnout zones.
- FuzEvent® control provides an increase of 2 ton/hour steam from 39 to 41 t/h steam/hour per combustion line.
- The FuzEvent® control help keeping the emission levels at the lowest possible level.

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