

## Cogeneration plant at the "Râperie de Longchamp" (Tirlemontoise Group), Belgium

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When converting to gas firing, the Raperie de Longchamp (Tirlemontoise Refinery Group), bought a cogeneration unit.

### 1 - THE COGENERATION UNIT

It includes :

- A 4.5 MW TURBOMACH G.T.
- An outlet silencer with connection duct to the HRSG without divertair (fig. 1).
- A PILLARD postcombustion burner, type "GRC INDUCT" dual fuel (diesel/oil-natural gas) of 8 MW.
- A BONO 20 t/hr HRSG producing superheated steam at 25 bar, 350°C (fig.2).
- A 2,5 MW steam turbine using only a part of the steam, the other part is used for process purposes.



Fig.1 : G.T. with silencer



Fig.2 : BONO 20 t/hr HRSG

### 2 - THE PILLARD POSTCOMBUSTION BURNER, TYPE "GRC INDUCT", D.O./NAT. GAS (fig. 4 & 5)

- The former burner was firing gas only with rows. Since the plant required that all the burners be able to operate with diesel oil if necessary, the old burner has been replaced by a new dual-fuel one.
- Thank to their good references, PILLARD has been awarded the supply of the burner, the diesel oil pumping station, the valve sets and the complete BMS.  
The design of "GRC INDUCT" burners is derived from the boiler burners type "GRC".
- A lot of "GRC INDUCT" burner have been commissioned successfully on cogen/combined cycle plants operations, either with liquid fuels (diesel or H.F.O.) in addition to a gaseous fuel, for example 40 burners in operation at FUJAIRAH (UAE) or HFO fired GRC INDUCT's in the PETROBRAZI Refinery (Romania).

- Several homogenizing devices designed by PILLARD with the help of the fluent® software allow to improve the combustive distribution upstream the burner (fig.3).

The total pressure drop loss due to the burner and such homogenizing devices remains lower than 50 mmWG.

This is important to avoid to reduce the G.T.'s useful power.

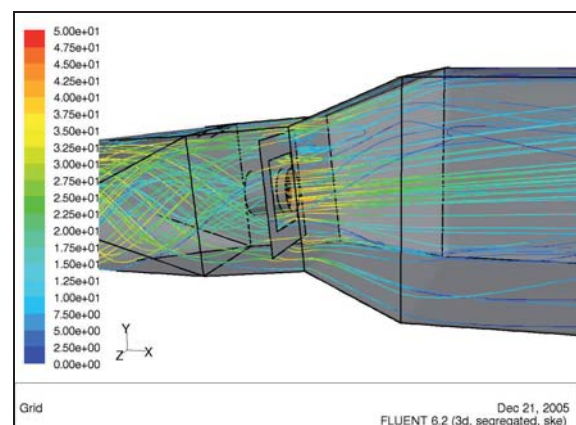


Fig.3 : Photo fluent® simulation



Fig.4 : PILLARD burner type "GRC INDUCT"  
seen from inside the duct



Fig.5 : External view of the burner

- The burner is equipped with a PILLARD ignitor of the last generation type "PACKLIGHT" operating either on natural gas or on propane, and which concentrates in its back head all components including the HT transformer and the self checking ionization detector PILLARD type "IONY". This allows to simplify all the electric connections as well as maintenance.
- The flame detectors have been doubled in order to increase the operational availability. Also of the last generation of PILLARD detectors -type PACKSCAN-, all their components are lodged in the scanner head (without separate box) and they benefit from very extended adjustment possibilities.
- The diesel oil atomisation is achieved thanks to a PILLARD gun type ZV2 and assisted by compressed air (steam should be possible under demand).  
In spite of the high pressure inside the TEG duct, it is possible to remove the burner gun for maintenance in totally safe conditions without stopping the GT thanks to a double closing system.
- The diesel oil pumping set and the gas/diesel oil valve set (fig. 6) used to shut-off and control the fuels flows is pre-wired with junction box.
- The BMS including an Allen Bradley PLC (see fig.7) and a programmable regulator manages the sequences and safeties as well as the fuel flow control in order to maintain constant the HRSG's steam pressure.



Fig.6 : D.O. pumping set and gas/D.O. valve set

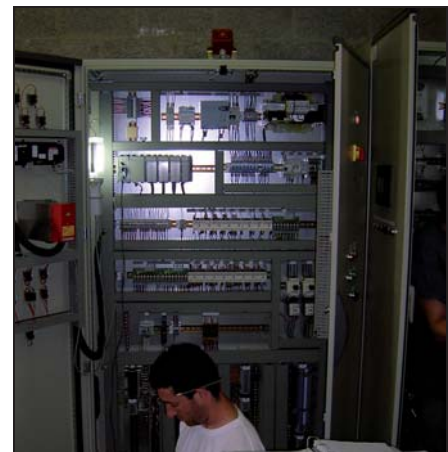


Fig.7 : View of the BMS

### 3 - CONCLUSION

The commissioning has been successfully completed second half of 2005. All guaranteed performances have been reached.

The good operational availability of the postcombustion system allowed to operate continuously during all the Sugar campaign.