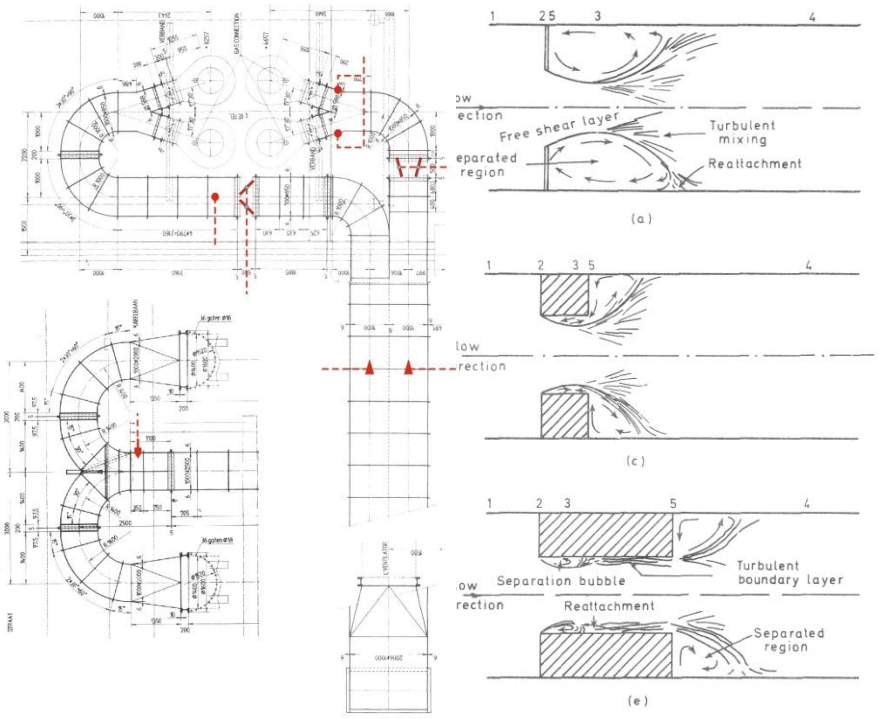
Breathless Oil-Burners

The TOTAL group is a global player in the petrochemical industry. This group has been borned out of two successful mergers with the Belgium oil company Petrofina and ELF Aquitaine.

In various plants in Antwerp (Belgium) vast amounts of water vapour are produced by oil fired burners. These burners are fed with air through a large network of air supply channels, in which the flowrate of the air for the different burners is manipulated and controlled by different types of valves and louvers.

However some burners shut down, when the system setup is changed. In particular this happens during the start-up phase of the plant.



FlowMotion has therefore been asked to look for the reasons for this costly malfunction. To get a deeper insight in the fluid dynamical effects within the system velocity and static pressure measurements have been performed during the preliminary phase of the project. The measurement points have been set at fluid dynamical critical positions the channels.

With the help of the measurement data flow separation regions and vortices could have been found, which are disadvantageous for the homogeneity of the air supply for the burners.

To maximize the accuracy of the investigation of the hidden flow in the air supply network the experimental data have been validated with analytical relations and simplified flow simulations (CFD Computational Fluid Dynamics).

Only by this combination of analytical, experimental and numerical methods sufficient knowledge could have been obtained to predict the behaviour of the entire system for various working situations, which led to a modification of the control routines for the valves and louvers. Since then the number of malfunctions in the water vapour production has been decreased significantly.

Leeghwaterstraat 21, 2628 CA Delft, NL Tel.: +31 15 278 2907
Weenermoorer Str. 193, 26826 Weener, DE Tel.: +49 4953 922 969
www.FlowMotion.nl
www.FlowMotion-Germany.de