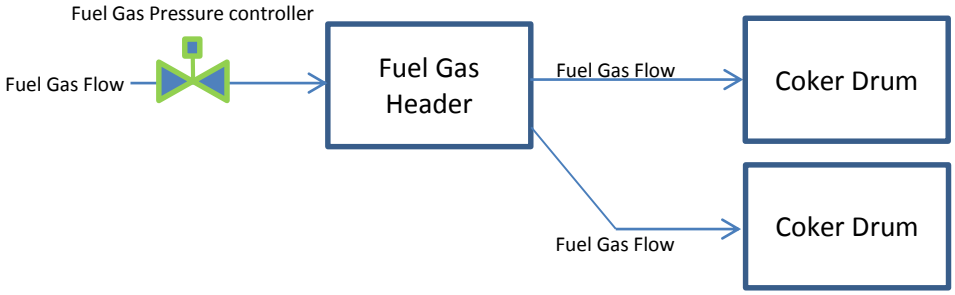
1. Introduction

A refinery had a fuel gas pressure controller which caused disturbances in the whole refinery. The disturbance was caused by switching the coker drums, which led to a fluctuation in the fuel gas flow pressure. Whenever coker drums switching is taking place the fuel gas generation is less.

A schematic overview of the fuel gas pressure loop:



2. Tuning Project Approach

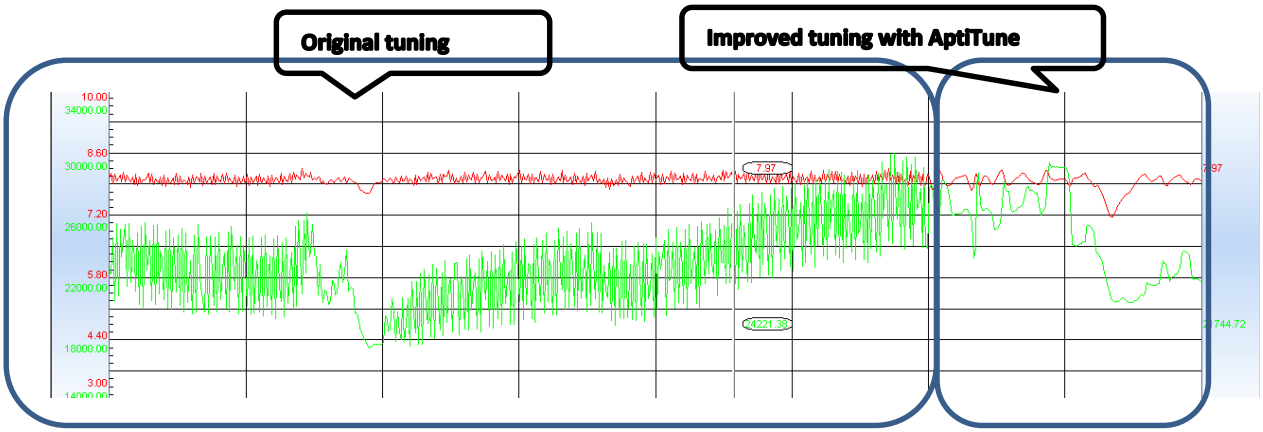
The following project steps were following in order to improve the tuning of the loops:

1. Open Loop Step Test
2. Open loop model identification
3. PID tuning with AptiTune

To identify the proper tuning parameters for the fuel gas pressure controller it is required to firstly identify an open loop model. It is generally required to put loops in manual and do some step tests before identifying the open loop model. The identified model is further used in AptiTune to get optimal tuning parameters for the fuel gas pressure controller.

3. Results

This controller was tuned using INCA AptiTune's tuning capability. The DCS system used by the client is Yokogawa. The tuning values calculated by INCA AptiTune are optimally calculated with the use of the gathered open loop models. Without AptiTune it would have been very difficult to determine the new optimal controller settings.



Legend: In the plot above the Red line represents the Drum pressure PV; The green is the fuel gas flow from the coker drum.

4. Conclusion

This problematic pressure loop has been tuned correctly, which stabilises the fuel gas header pressures. This led to the reduction of disturbances in the whole refinery, which were caused by the initial pressure loop tuning. This stabilisation of the fuel gas pressure by is shown in the trend above, as the drum pressure and fuel gas flow show reduced disturbances. This disturbance reduction allowed the refinery to operate more efficiently.