

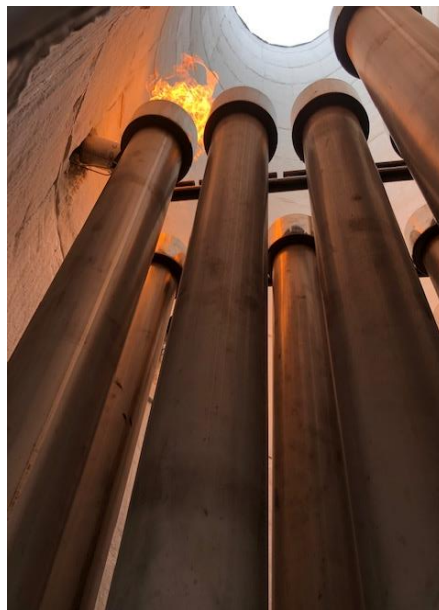
2019-09-05

August has been an intense month with progress in several sub-processes. Together with consultants from ABB, Summ System, Start-Up, UTAB, GEP Group and Alsa, Cortus has commissioned the flare and the entire burner system consisting of 14 burners. All safety features of the flare have been tested and the burners have successfully been operated with natural gas.

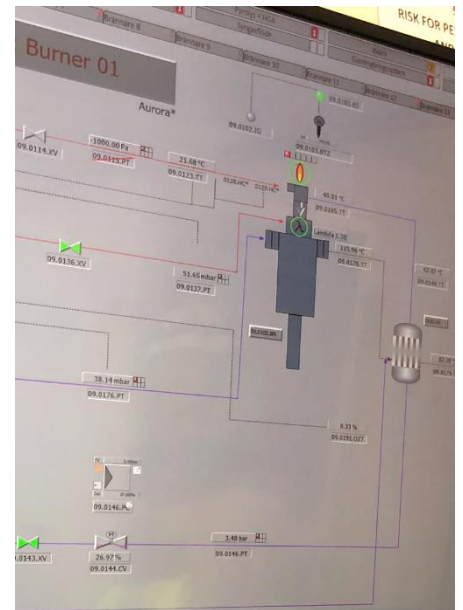
For Cortus, commissioning of both the flare and burner system are important steps forward. Operation of the flare is a prerequisite for further hot tests. The burners together with the gasifier's design are newly developed technology in the WoodRoll® process. The burners have been developed by Kanthal for the project, and they have been modified to run on both natural gas and pyrolysis gas. The gasifier, which forms the heart of the WoodRoll® process, is Cortus' own design. It is based on extensive geometry-, heating- and heat transfer modeling, flows of particles and gas, and reactions in a so-called CFD modeling which has been developed together with ÅF Process.



*Urban Johansson from Summ System is our eminent automation engineer that coordinates the automation work.*



*One of the pilot flames in the flare. The pilot flame is a safety function that verify the flare can handle all combustible gas if an operational error occurs.*



*Human-Machine Interface (HMI) picture of one burner.*

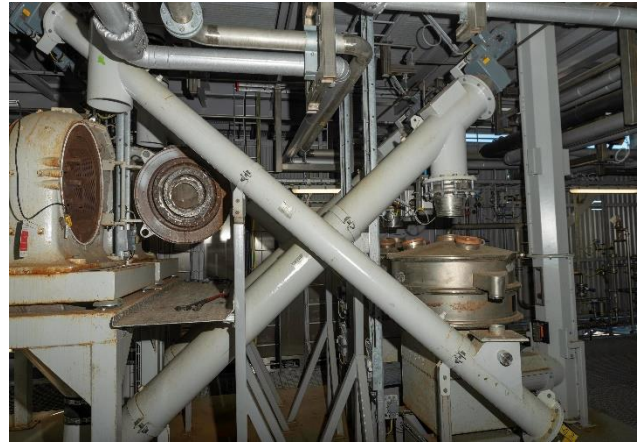
Another important subsystem commissioned during the period is the char system. The system consists of two grinders that grind the pyrolyzed material (coal) and two sieves to ensure that the grinded coal powder is less than 100 microns. The system also contains a number of transport screws and silos which also were commissioned during the period. Upcoming tests include tuning the grinders and sieves with pyrolyzed material (coal) from our test plant in Köping.



*Test of the char transport system without material.*

*Link to movie:*

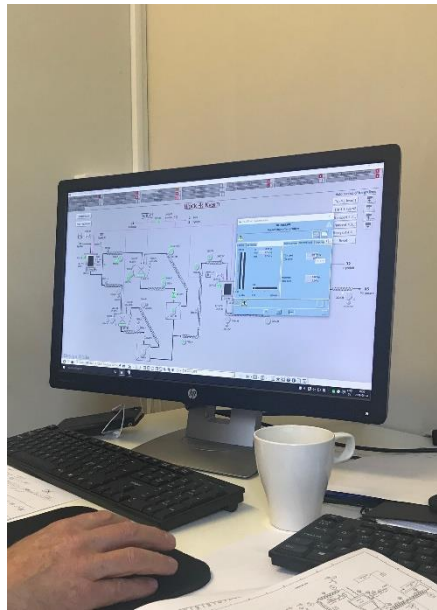
<http://www.cortus.se/hoganas.html>



*Screw from grinder to sieve and return-screw from sieve to grinder. Return-screw returns material larger than 100 microns back to grinder for additional milling.*



*One of our two sieves.*



*Human-Machine Interface (HMI) picture over grinder- and sieve system*



*Cortus Magnus Andersson and Martina Montesino Malmberg during commissioning of the char system.*





*The Board and Steering group of Höganäs Energi together with Cortus CTO, Marko Amovic.*



*Cortus Martina Montesino Malmberg together with Jörgen Held from Renewtec at the top of the gasifier.*

In previous months, we have seen that the interest of our site in Höganäs is huge and is increasing month by month. During the past week we have had a visit from Norway, from a stakeholder with a large supply of raw material - biomass. We have also been visited by the Board and Steering group of Höganäs Energi and Jörgen Held from Renewtec.

Cortus, and parts of Probiostål project, were recognized in Bioenergy International during the month, see pictures and link below.



*The plant in Höganäs, Q2 2018. Read more about Cortus in Bioenergy International:*

<https://bioenergyinternational.com/markets-finance/biogas-the-flexible-and-renewable-enabler-of-european-decarbonization>



*The plant in Höganäs, Q2 2019.*

*Next update is planned by the beginning of October.*