Plantware

FGD Chiyoda121: Duct Design R-442

This is not a P-Engineering Design Reference as P-Engineering just handled the Inspection. Since the ducts are coated inside the moisture and ducts is easily visible direct on the surfaces. The Pressure Loos from before the Elbow to after the De-mister was approximately 1000 Pa, which is quite high.

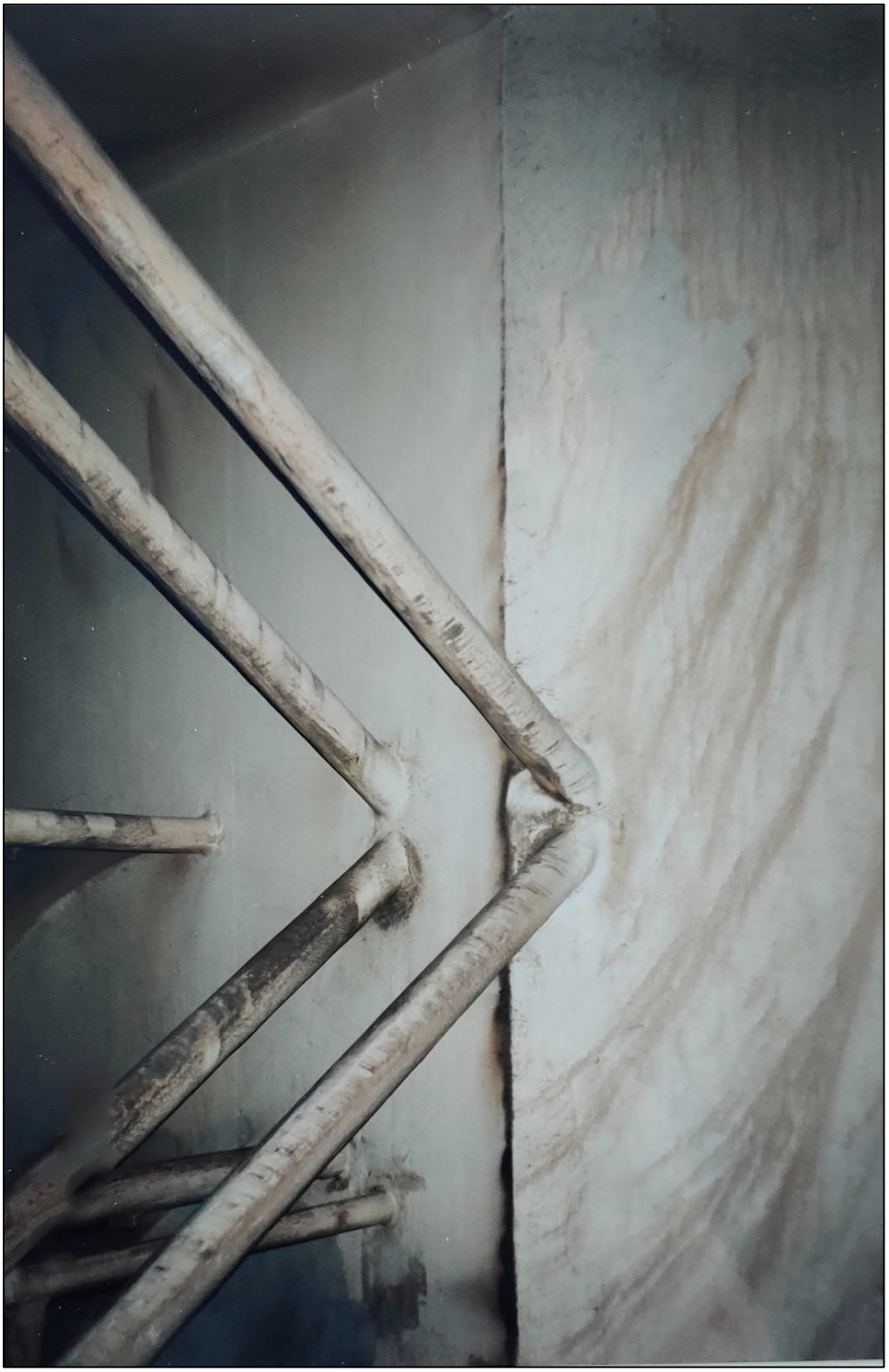
Above the inlet to the De-mister is shown. Turbulence caused by the superfluous retainer plate is visible and visible on both wall and floor.

P-Engineering
Gyden 6, DK-5970 Ærøskøbing
www.p-engineering.dk
Contact: Christian Pallesen, Mobile +45 2526 8805, Mail: cp@p-engineering.dk

R-442; Rev.01 2021-09-03 / CP

FGD Chiyoda121: Duct Design R-442

Furthermore, there is turbulence at the 150° late assembly is clearly visible as dirt deposits along the inside of the duct.



Above the Reduction Transition Piece and Elbow upstream to the Demister is shown. Uneven distributed flow with highest velocity at the inner radius results deposits dirt on the inside of the transition Piece and the same deposits after the angled plate assembly. The White Area is repair of the GRP.

P-Engineering
Gyden 6, DK-5970 Ærøskøbing
www.p-engineering.dk

Contact: Christian Pallesen, Mobile +45 2526 8805, Mail: cp@p-engineering.dk

Plantware

FGD Chiyoda121: Duct Design R-442

Above the top of the Elbow is shown where there are visible results after turbulence at the outer radius of the Elbow, which is not common.

.

P-Engineering
Gyden 6, DK-5970 Ærøskøbing
www.p-engineering.dk
Contact: Christian Pallesen, Mobile +45 2526 8805, Mail: cp@p-engineering.dk

Above picture showing Transition Piece mounted just after the TLT Axial Flow Fan where the Velocity profile is not yet uniform. Correct Design would have been e.g., a

- *2x Straight duct with inner tube to ensure uniform velocity profile,*
- *3x straight without inner tube to have the flow profile develop in the center and fill the void after the inner tube*
- *Diffuser at opening outwards with maximum 15° opening angle*

P-Engineering
Gyden 6, DK-5970 Ærøskøbing
www.p-engineering.dk

Contact: Christian Pallesen, Mobile +45 2526 8805, Mail: cp@p-engineering.dk

Plantware

FGD Chiyoda121: Duct Design R-442

Recommendations:

- *Ducting should have had a higher cross section for a generally lower average velocity.*
- *Reinforcement should have been made with buck-stay corners outside and not with the use of internal stiffeners.*
- *Ducting after Axial Flow Fan should have been made to avoid full Carnot loss of dynamic Pressure*
- *Retainer plate should not have been installed and with and uniform velocity profile the water droplets would never move against the flow.*
- *Area increasing Transition Pieces should have been made with maximum 15° Opening angle*
- *Area Decreasing Transition Piece should have had a smaller opening angle and a piece of straight ducting before and after to ensure uniform Velocity Profile.*

Clean Ducting after De-Mister as the Moisture has been removed.

P-Engineering
Gyden 6, DK-5970 Ærøskøbing
www.p-engineering.dk

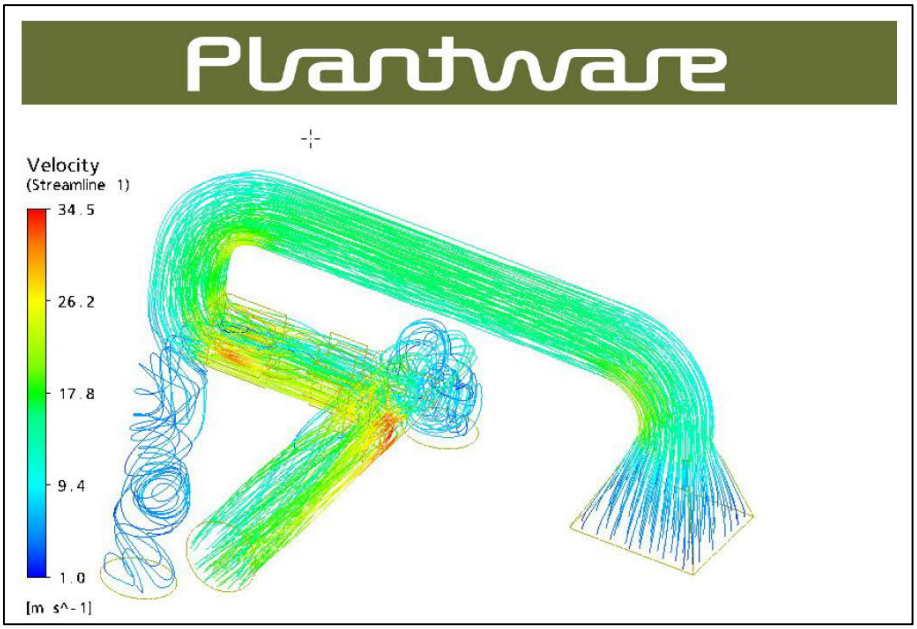
Contact: Christian Pallesen, Mobile +45 2526 8805, Mail: cp@p-engineering.dk

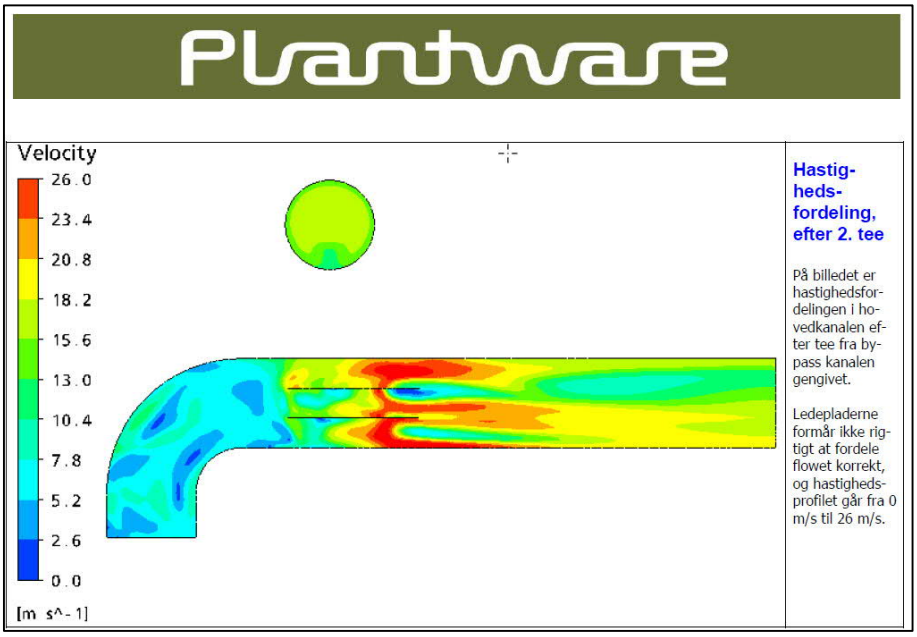
Contact P-Engineering for Optimal Duct Design for High Velocity Flow System:

- *Power Plants*
- *Waste Incineration Plants*
- *Process Ventilation*

And as well for Low Velocity Flow System:

- *Comfort Ventilation.*
- *Kitchen Ventilation*
- *Special Ventilation*





P-Engineering
Gyden 6, DK-5970 Ærøskøbing
www.p-engineering.dk
Contact: Christian Pallesen, Mobile +45 2526 8805, Mail: cp@p-engineering.dk