

SIMULATION OF FLUE GAS DUCTS FOR FLOW UNIFORMITY

VERTICAL:
**CONSTRUCTION &
INFRASTRUCTURE**

SERVICE:
ENGINEERING SERVICES

TECHNOLOGY:
CFD

Power Generation Company in Chattisgarh has a large plant which produces flue gas of the order of 800-1000 Kg/s flowing at a temperature of 135 deg C. The flue gas is to be taken out from the boiler through a duct and then released into the atmosphere via a chimney. To create the required velocity to guide it through the chimney four fans are employed. It is desired that the flow is uniform in all the sections that lead to the fans such that all the fans are equally loaded. Flow uniformity would affect the installed capacity of the fans and also the overall power consumption. Also required was to study if the fans are giving sufficient energy to the flow to escape out of the chimney.

Zeus Numerix was tasked with studying the ducts, pressure rise due to fans and flow inside the chimney. Figure shows the system of duct with diverter plates in the ducting and velocity magnitude of air in the ducts. It can be seen that at the location of fan velocity suddenly rises.

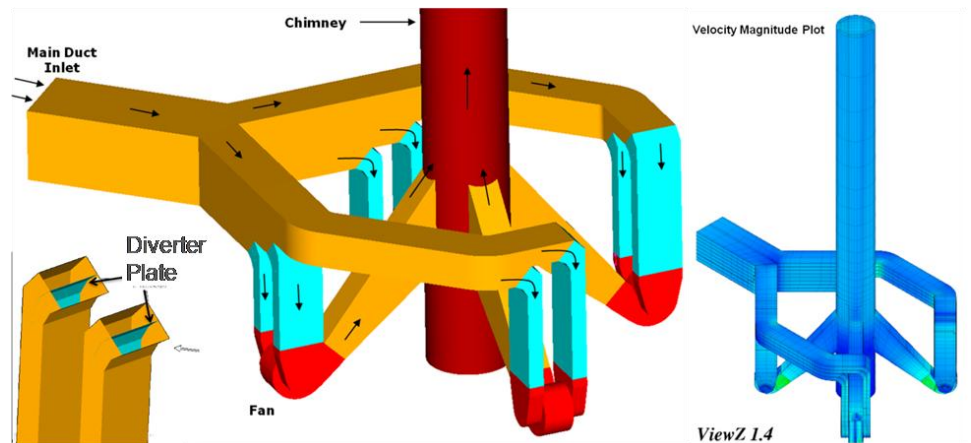


Figure 51: Flow uniformity in four circuits to chimney

Study concluded that the difference in uniformity was meager 0.43% among the four fans. Project is now implemented on ground.