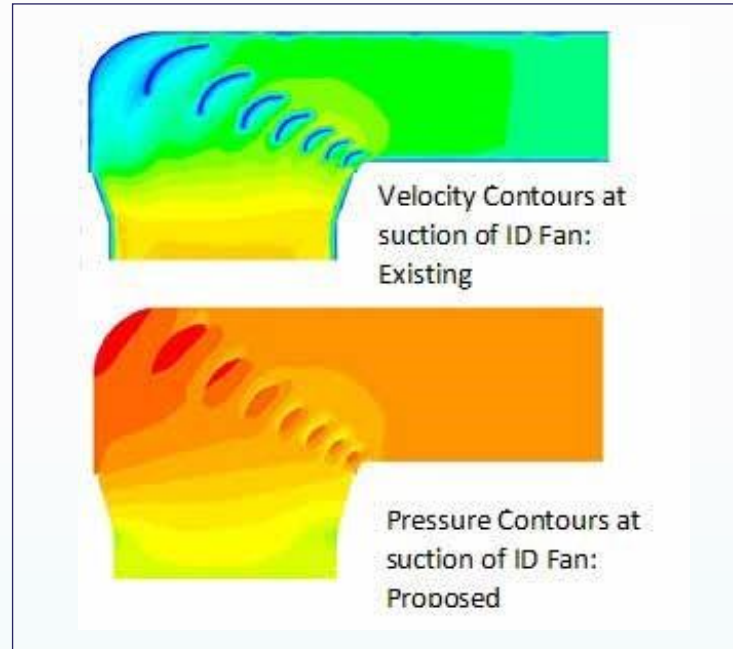
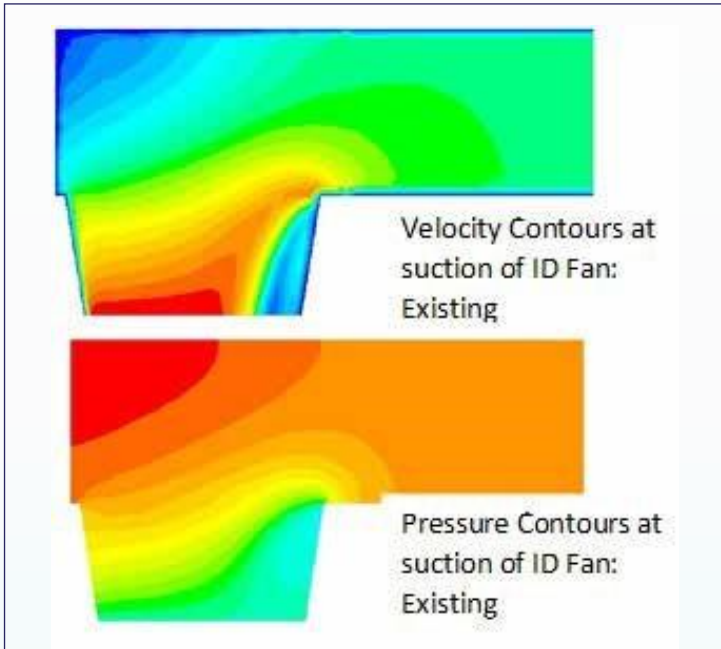


Improving Fired Heater Performance using CFD

Case Study 5 : Reducing System Pressure Losses for ID Fan

Sudden sharp 90o bends at inlet and outlet of ID Fan causes high pressure losses which in turn reduces the overall capacity of the heater or demands for a higher rating fan. CFD simulations provide insight of the flow profile and region of high and low velocity region causing most of the pressure drop in the system.



Installing turning vanes and minor modifications to the inlet duct of ID Fan, uniform flow distribution was achieved at the inlet and pressure drop was reduced by 0.5 inches w.c.

On the ID Fan discharge side, the flow come out through the fan outlet with a typical flow profile, which has higher air velocity in the top and lower velocities in the bottom region. Baffles are installed in the inlet duct upstream of the bend in addition to the turning vanes in the bend to improve the flow distribution and reduce the system pressure losses. A reduction of about 0.5 inches w.c. was obtained by making minor modifications to the duct and installing turning vanes in the stack.

