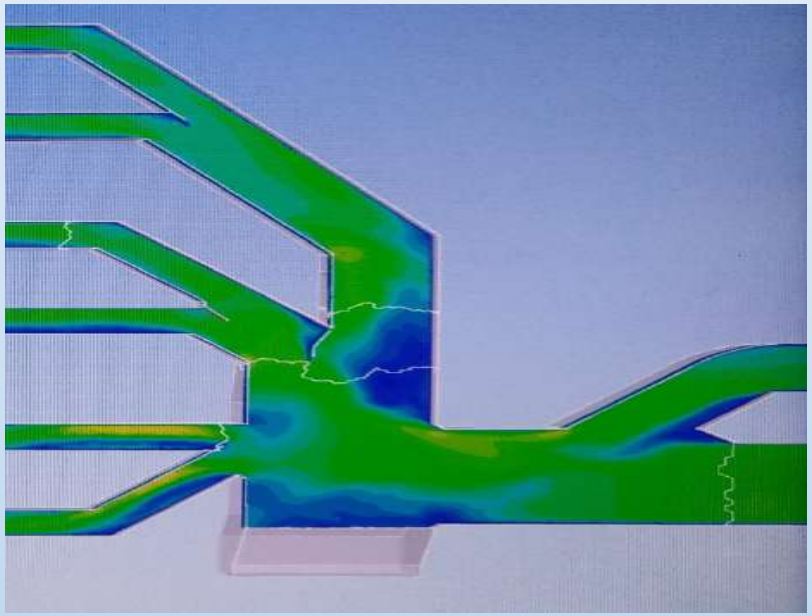
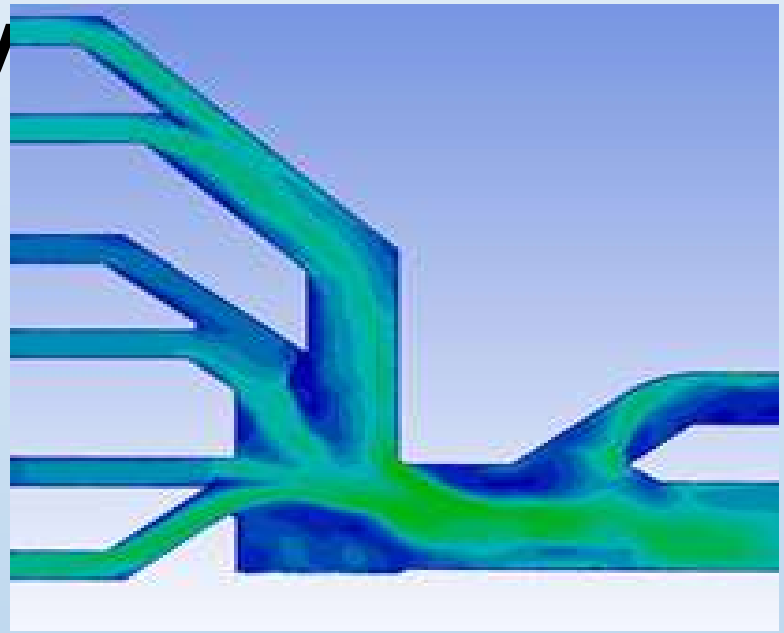
CFD Analysis for ESP running
n Full load and part load conditi
(800 MW)

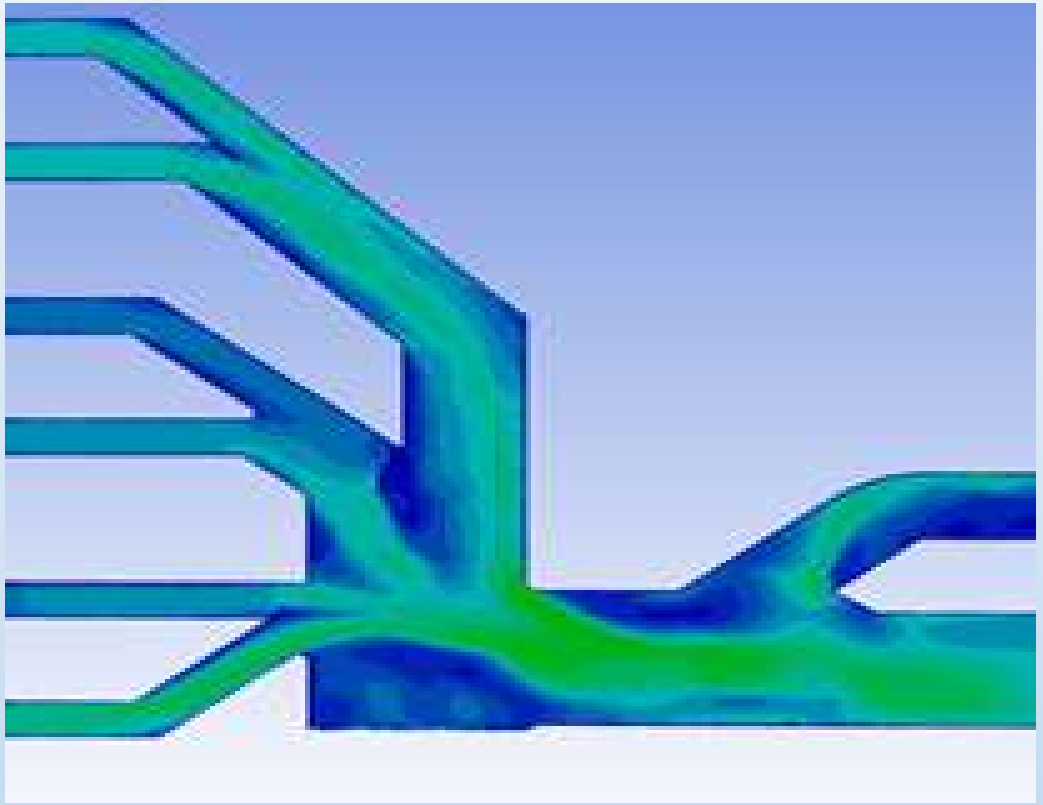
The velocity profile of duct horizontal cross-section at the height of 1.37 m from common inlet duct bottom at 100% and 60 %TMCR condition. Both the profiles, highlights the ash deposition zone, with dicated by

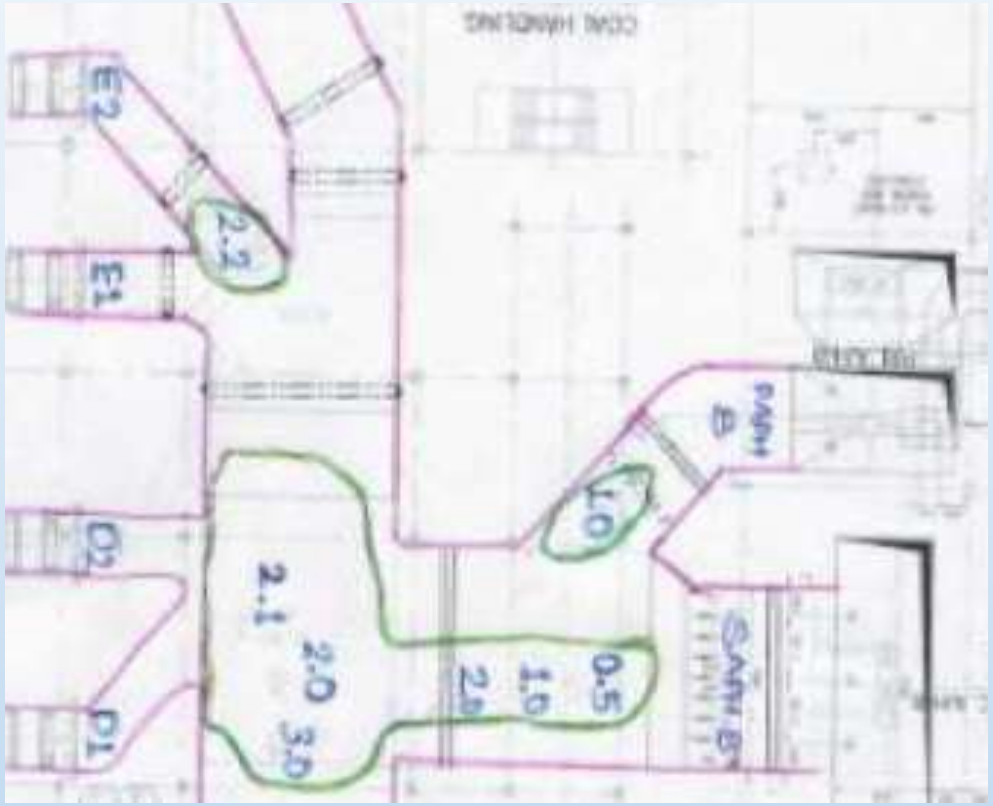




100 % TMCR

60 % TMCR





ERPT FROM THE CFD Results (60 % TMCR)

EXCERPT FROM THE ASH DEPOSITION PRO

- **The CFD simulation was conducted through CFD considering the entire ducting system from APH outlet to ID fan inlet.**

- **The new profile at 60 % TMCR matches in close approximation with ash deposition profiles as highlighted in the previous slide**

- **The elimination of sharp bends by recommending smooth curvature/guide vanes at several locations, may reduce the pressure drop, but it will not help in completely eliminating the ash deposition zones.**

- **The average velocity at common ducting system cannot be significantly varied by placing guide plates or vanes at the appropriate location, as this will be useful only for rearrangement of flow at each ESP inlet as well as reducing the overall pressure drop. If the duct velocity is to be increased, the only option is to reduce the flow area of the common ducting system, where the flue gas flows.**

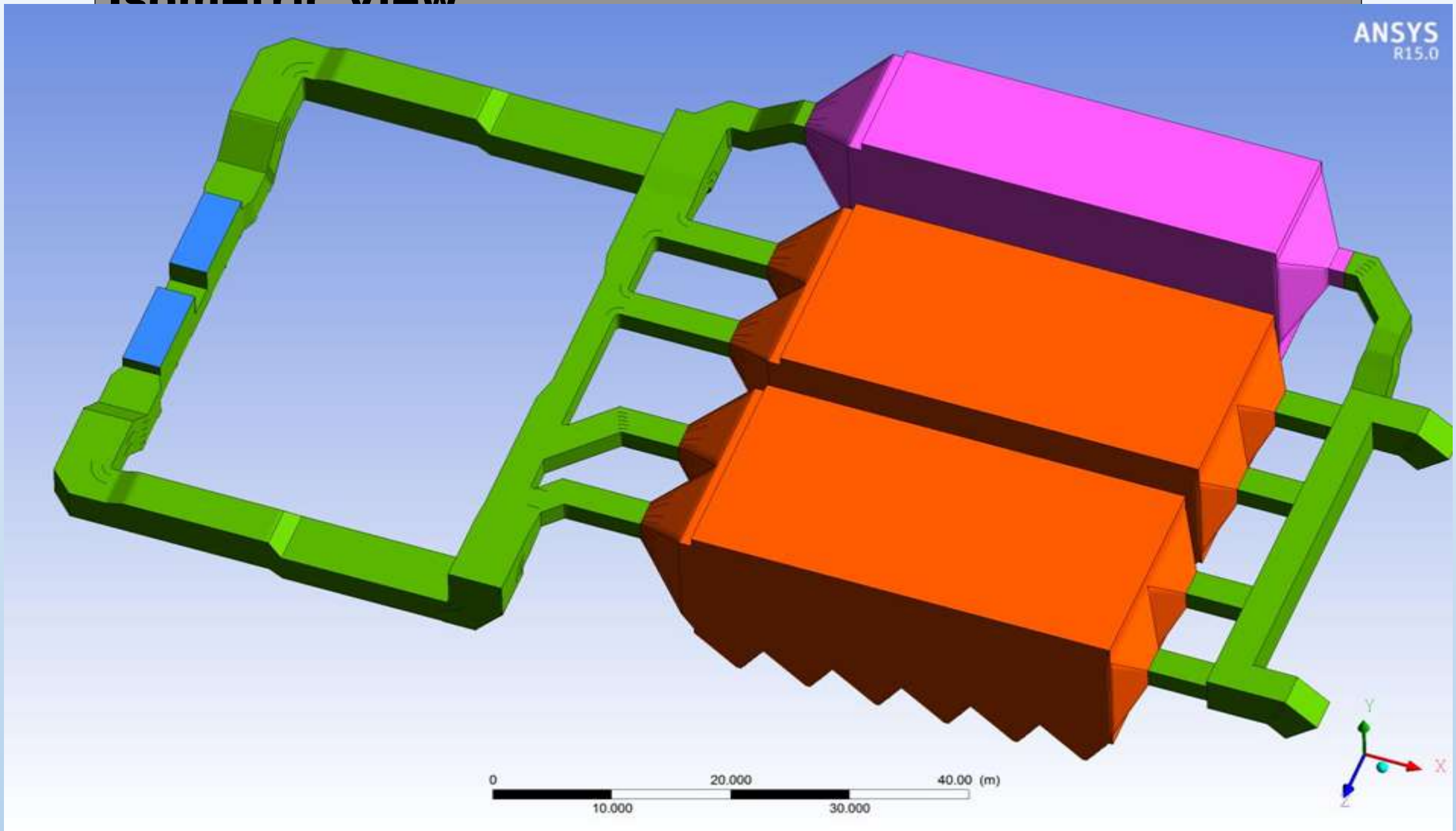
possible solutions

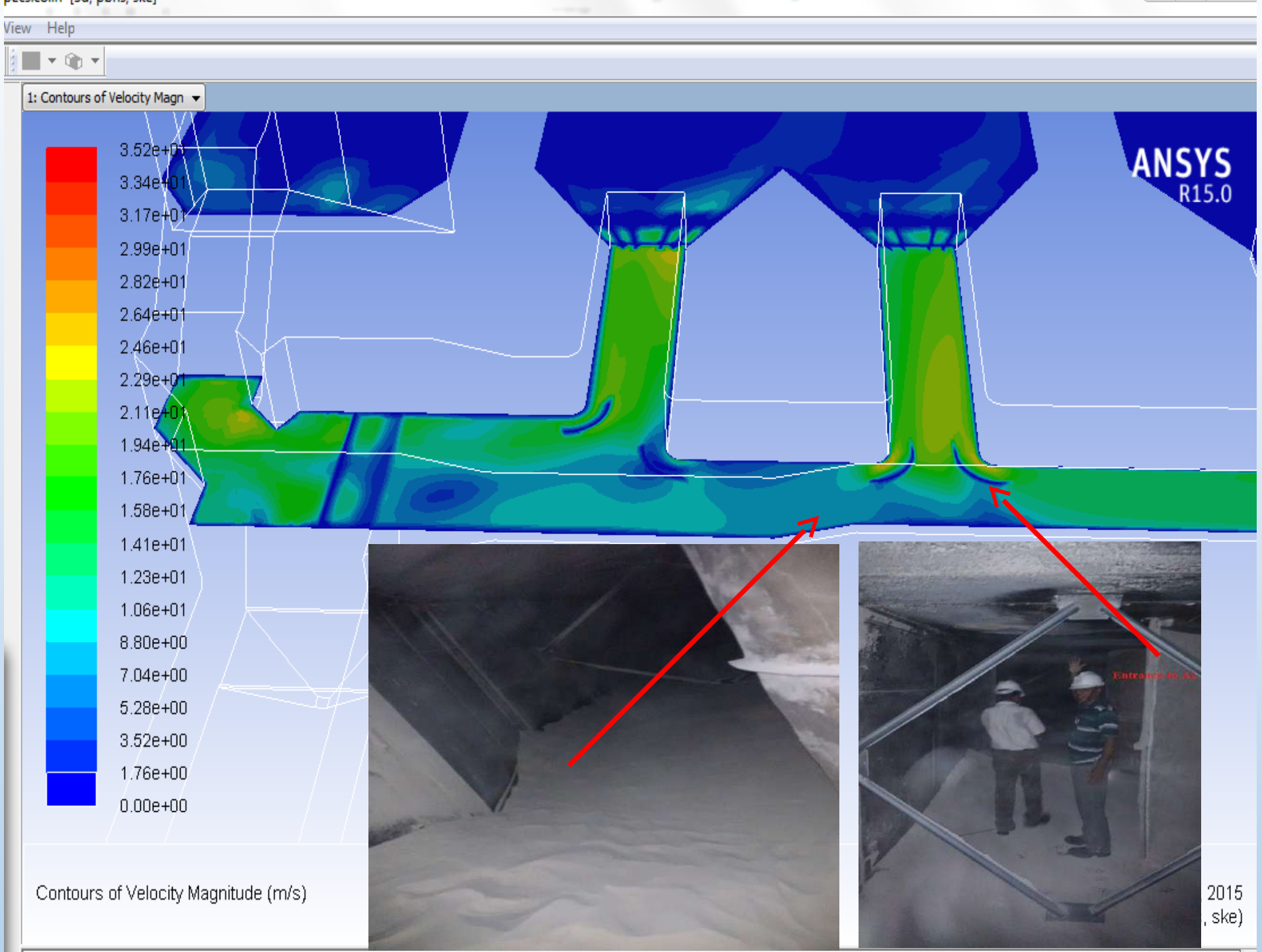
S1) It is not recommended to run unit at the partial loading condition, with all ESP's are in operation, when design velocity is less than 10 m/s for full load condition

S2) If the unit is required to be run at partial loading condition, it is better to run with closing of ESP C and its mirror ESP D, which is nearer to the interconnecting duct. (for this typical 800 MW case)

Another typical case running at part load condition (210 MW)

Geometry of ESP & its Ducting (As Erected in Site) - Isometric View




View
Help
1: Contours of Velocity Magn
3.52e+01
3.34e+01
3.17e+01
2.99e+01
2.82e+01
2.64e+01
2.46e+01
2.29e+01
2.11e+01
1.94e+01
1.76e+01
1.58e+01
1.41e+01
1.23e+01
1.06e+01
8.80e+00
7.04e+00
5.28e+00
3.52e+00
1.76e+00
0.00e+00
ANSYS
R15.0
Contours of Velocity Magnitude (m/s)
2015
, ske)