energy. The k- ε model has a good prediction in the free stream, but near the walls, the prediction is poor since adverse pressure gradient is presented. For wall treatment scalable wall function is used. Standard wall functions are based on the assumption that the first grid point off the wall (or the first integration point) is located in the universal law-of-the-wall or logarithmic region.

We choose further on 500K also not the lowest mesh density. There exists a circulation zone in front of ignition inlet; this region is one of the most important regions in order to mix flow and better flame. The combustion – turbulence interaction can results in unrealistic combustion model. In further test two other methods will be used, finite rate and eddy dissipation

8. Conclusion

It should be mentioned in the pressure plots and pressure profile of cases, pressure distribution may vary with number of iteration and that is the reason the plots and charts may vary. The variation of the pressure fall into acceptable error range for numerical error, thus the results were accepted. The conclusion from the grid-study is that the mesh-size that is used for the 500K caseis enough, or in other words the results are grid-independent. These conclusions are based on steady-state simulations and were not tested on transient simulations due to limitations of time in the project. This is also important to check in the future work. The 500k mesh size would imply that the number of cells for a full 360o model would be approximately 16M cells. Because this model showed stable convergence and also it predicts flow field better than the other cases.

A new functional expression for such a model parameter, which represents extinction of the flame brush by turbulent eddies, was proposed based on laminar flames. Distribution of air, flow recirculation, jet penetration and mixing are achieved in all the zones of the combustion chamber. The temperature levels near the wall region of the dilution zone suggest some lacuna in the design of this zone.

9. Future Works

The suggestion for future work is to test more models. Also, the simulations done in this work uses CH4 as fuel, while there are varieties of fuels available to use.
Suggestion for future work:

- Test the open source software Open FOAM
- Test different fuels
- Modelling the generic gas turbine combustor with different inlets for fuel and air and use pre heated air.
- Grid study for transient simulations

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