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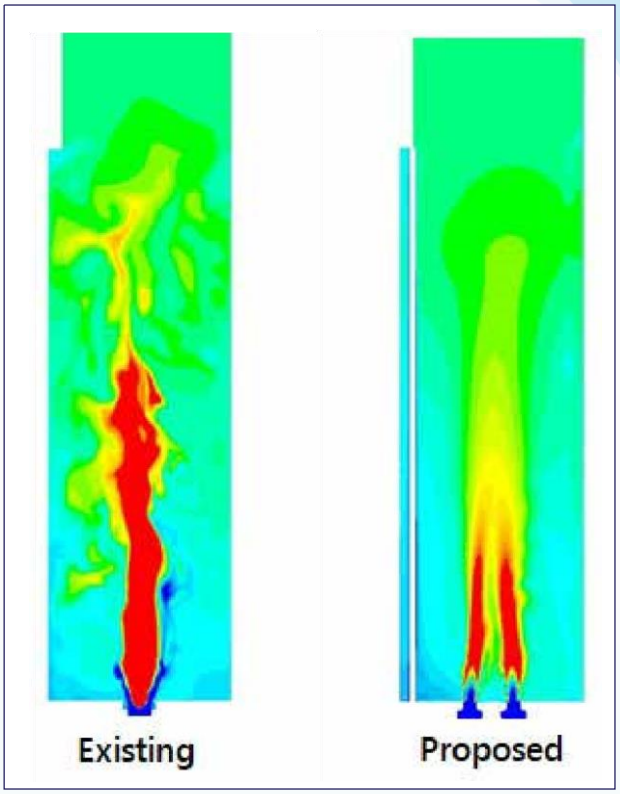
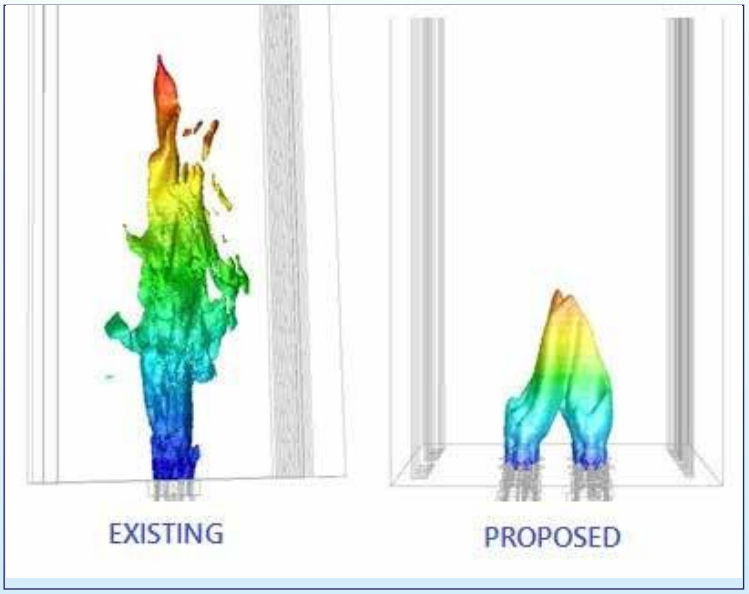
Improving Fired Heater Performance using CFD

Case Study 3 : Combustion Analysis of a Cabin Type Heater

A cabin heater had large burners installed which had issues with long flames, and high temperature flue gases hitting at the top region of radiant tubes. It was proposed to replace large burners with smaller burners. Each burner was replaced by four smaller burners to have equivalent total heat release. Smaller burners reduced the flame height considerably, also the heat distribution was more even in the heater. In order to further improve the heat distribution, burners were inclined towards each other. This helped in moving the flames further away from radiant tubes.





Existing burner configuration has longer and wider high temperature zone. Proposed smaller burners had shorter high temperature zone.

Flame of existing large burner configuration is much wider and very near to the radiant tubes. Flames for smaller burners are concentrated in the center and away from the radiant tubes.