

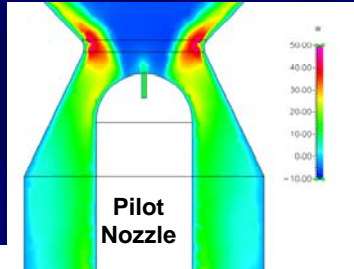
# Premixed Combustion of Hydrogen Augmented Natural Gas

UC Irvine

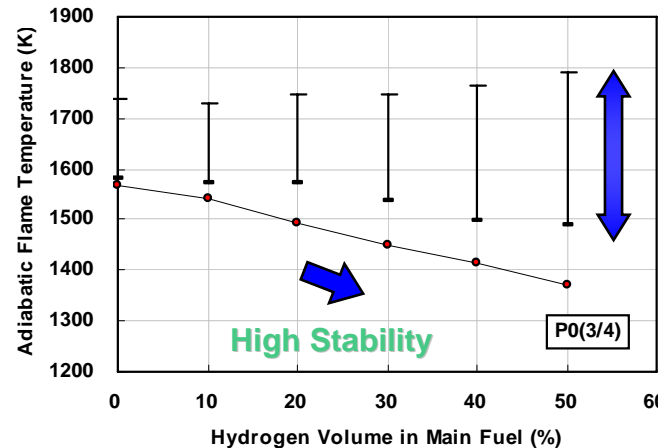
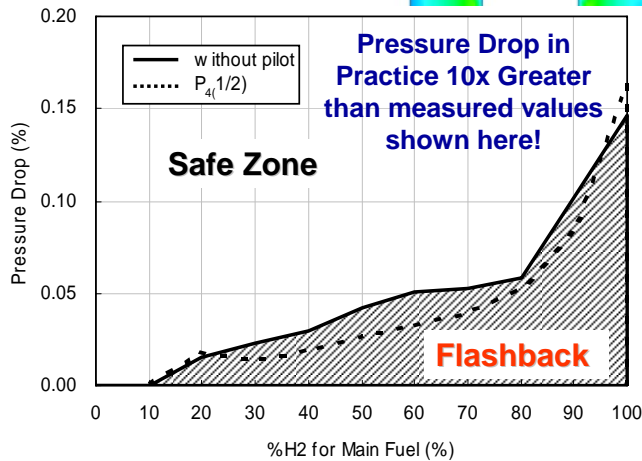
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Careful premixer design required to reduce flashback potential



Stability and emissions performance improve with hydrogen addition



Low emission operational zone  
 NO<sub>x</sub> < 9ppm  
 CO < 10ppm

- Lean premixed combustion
  - Effective for emission reduction with natural gas
  - High hydrogen flame speed requires care in premixer design for SGH fuels
- UC Irvine study quantifies effectiveness of hydrogen augmentation strategy
  - Lean stability limit improves linearly with hydrogen augmentation
  - Emissions reduction can be achieved
- Two OEM's and the California Energy Commission have used the results to help guide them on adapting to hydrogen fuel