Module 7: Combustion and Environment

Lecture 40: Combustion Modification Methods

The Lecture Contains:

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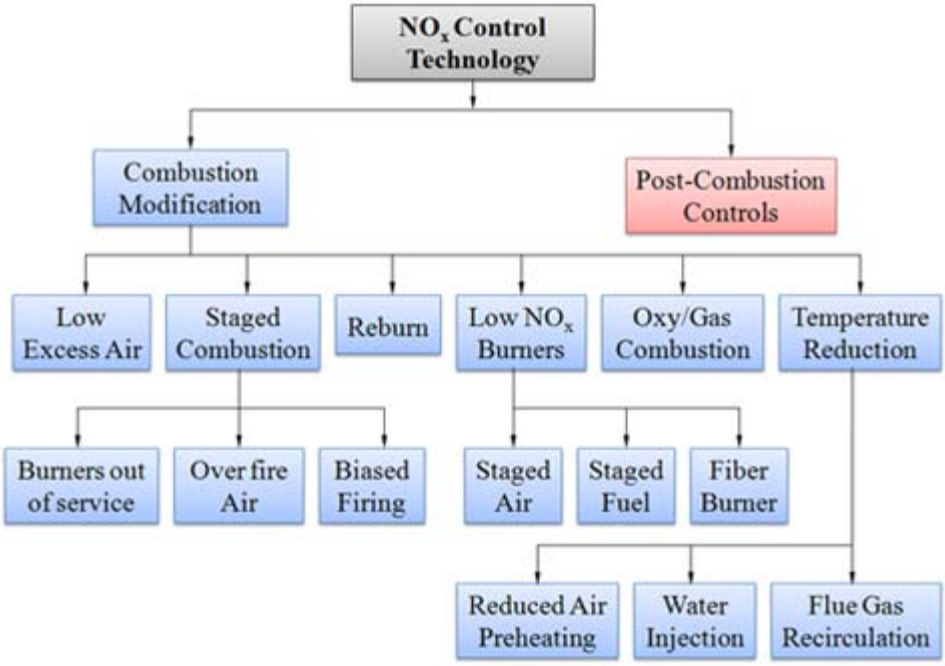
NO_X Control Technologies



(Figure 40.1)

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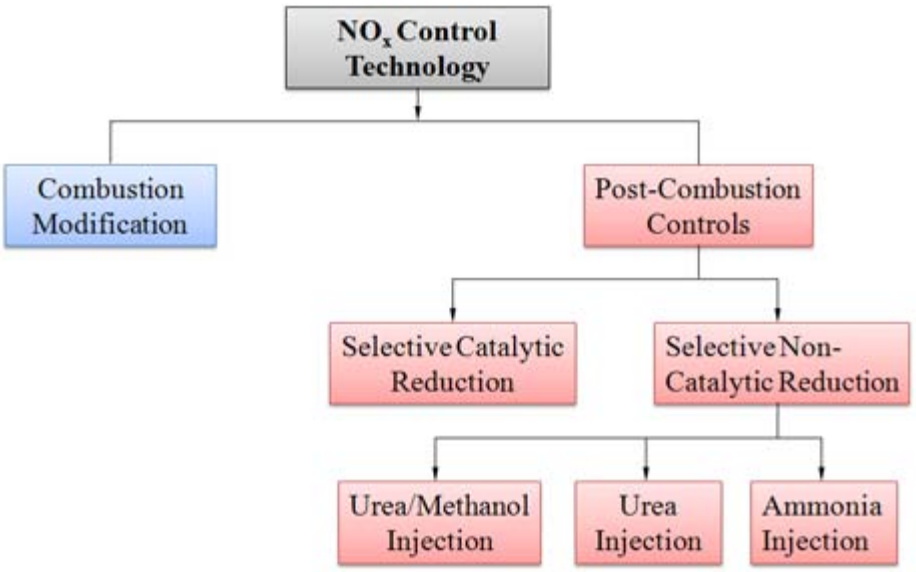
NO_X Control Technologies



(Figure 40.2)

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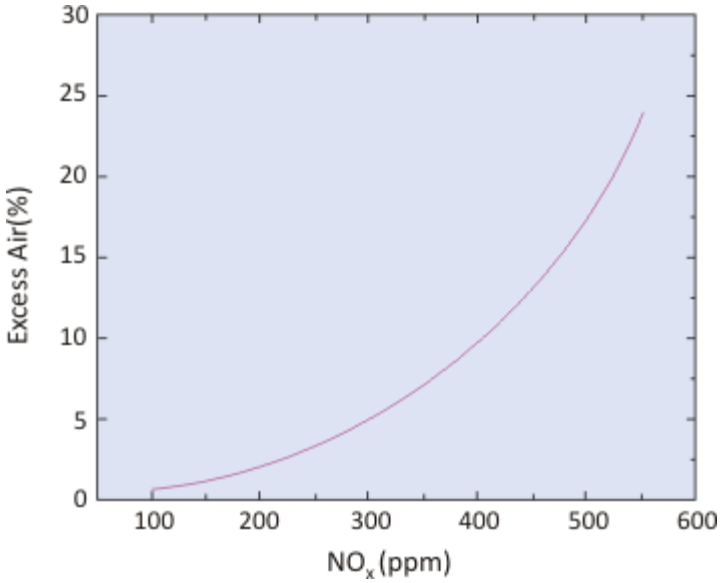
Combustion Modification Methods

Low excess air



(Figure 40.3)

Proper comprise between combustion efficiency, CO and NO_x emissions have to be arrived before deciding the excess air.

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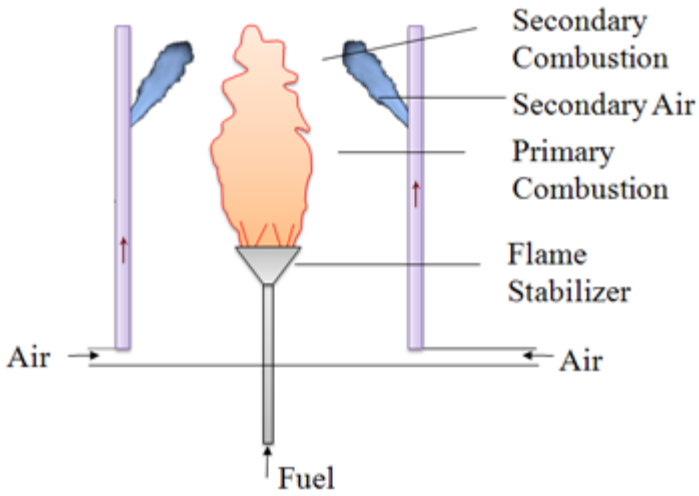
Combustion Modification Methods

Staged Combustion



(Figure 40.4)

- Most effective method to control NO_x formation.
- Upstream burner operates in fuel rich mode.
- Additional air is added in the downstream for burning of fuel in stages.
- NO_x emissions can be reduced by 10 to 40%.

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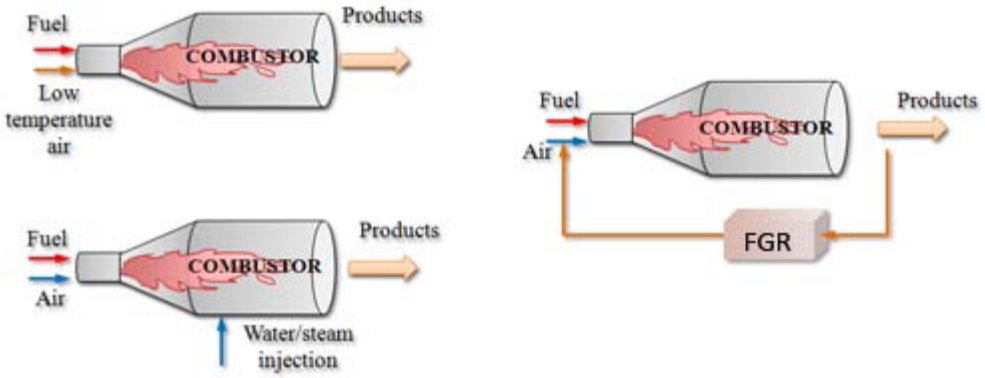
Combustion Modification Methods

Flame Cooling

Thermal NO can be controlled by reducing the temperature.

These three methods reduce the peak temperatures.
May lead to the formation of CO.
10 to 15% reduction in NO can be achieved by these methods



(Figure 40.5)

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Particulate Controls

Cyclone and hydro-cyclone separators are also employed to remove particulates.

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