

7.14 Heavy Oil/Low-NO_x Burner Development and Field Evaluation

Objective: To support development of a low-NO_x oil burner that can meet the most stringent ambient air quality standards that are now anticipated, with a wide range of liquid fuels.

Approach: Pilot-scale work with a test configuration that maximizes first stage temperature and seeks an optimum fuel-rich stoichiometry has shown that NO_x emissions (at 0% oxygen) can be suppressed to approximately 85 ppmV with a variety of liquid fuels. The heavy oil/low-NO_x burner design developed earlier will be used to fabricate a practical burner for field evaluation in commercial oil field steam generators. Tests are planned, involving a development contractor, a burner manufacturer, and an oil producer's host site to provide comprehensive evaluation on a 50,000-60,000 lb steam/hr unit.

Rationale: Existing commercial burners emit 250-300 ppmV NO_x, a level much too high to allow the use of oil field steamers in Kern County, CA, and some Texas fields. Burner development would permit increased oil production from these fields of from 500 000 to 750 000 barrels per day while still meeting the current California standards. This low-NO_x oil burner technology, while of special significance for use in one-pass oil field steamers, should have wide applicability to the entire range of industrial package boilers and industrial process combustion applications.

Resources (\$1000's):

	FY81	FY82	FY83
EPA	0	500	400
DOE	490	0	0

Milestones:

- ° Award contract for full-scale evaluation of advanced heavy oil burner for enhanced oil recovery; 10/82
- ° Complete engineering design of prototype burner; 6/82
- ° Complete field evaluation on field boiler; 10/82 and
- ° Complete draft on user's guidelines manual. 9/83

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