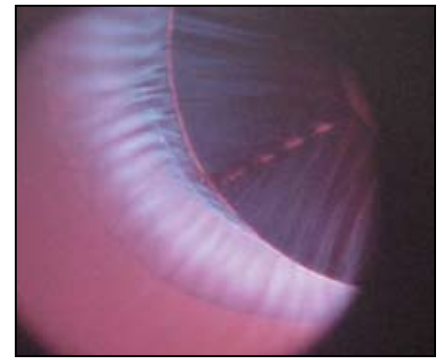


## Ultra Low NOx Upgrade of Steam Plant



50,000 lb/hr package boiler with ultra low NOx burner being lowered into boiler room at Cribari Winery, Fresno, CA.



Flame pattern of the 9 ppm ultra low NOx burner.

### Replacing Brick-set Boilers with State-of-the-art, Ultra Low NOx Package Boiler

#### Background

Cribari Winery in Fresno, California, owned by Canandaigua Wine Company, needed to increase the steam capacity of their boiler facility to meet growing demand for process steam. The boiler room contained four brick-set boilers, dating back 50 years or more, and one package boiler. The local air pollution control agency, the San Joaquin Valley Unified Air Pollution Control District, required that the replacement boiler meet the most stringent Federal Environmental Protection Agency emission regulation of 9 ppm NOx and 50 ppm CO, at the time.

#### Problem

Replacing the brick set boilers to increase steam capacity involved several significant problems: first, the equipment must meet the new 9 ppm or better NOx emission stipulation; second, access to and space within the boiler room were extremely limited

#### Summary

- Increase capacity of decades-old steam plant
- Install new package boiler in existing boiler room
- Meet 9 ppm NOx emission restrictions
- Minimize interruption of on-going plant operations
- Meet peak-season deadline with fast-track supply and installation

making installation a demanding job; and third, Cribari's approaching peak-season dictated a very tight delivery schedule (grapes don't wait).

#### Solution

One 50,000 lb/hr, Nationwide Boiler stock package unit was selected to replace three of the brick-set boilers to meet the increased capacity requirement. The boiler selected was retrofitted with an ultra low NOx burner. The advanced technology incorporated in this burner assures that NOx levels will not exceed 9 ppm. This is accomplished using simple controls and no flue-gas recirculation.

Removing the roof of the boiler room

solved the access problem. The 30-ton boiler was hoisted over the boiler-room walls and placed on a concrete pad.

#### Results

The package boiler was delivered to the Cribari Winery site on schedule. A large hydraulic crane lifted the boiler over the boiler-room walls and positioned it on the prepared pad. Fuel, water, electric and steam connections were made. Once preparations were complete, the boiler tune-up procedure was accomplished in one day. Subsequent third-party, emission compliance tests demonstrated that NOx levels averaged 5 ppm during three separate 45 minute tests at different loads.

#### Equipment Used

- A 50,000 lb/hr, skid-mounted water-tube boiler
- 9 ppm ultra low NOx burner