

# RETUBING OF TOMATO PROCESSING BOILER MAINTAINS HARVEST SCHEDULE

## BOILER CASE STUDY

### J.G. Boswell Tomato Company

Buttonwillow, California

Boiler Retubing

### CUSTOMER APPLICATION AND KEY CHALLENGES

J.G. Boswell is a tomato processing company that uses two Cleaver-Brooks industrial water tube boilers to process approximately 4,800 tons of fresh tomatoes per day. When the tomatoes are brought in from the field, they're flash steam cooked and mashed into a paste. The paste is then packed into large wooden crates and shipped to the end user customer.

The boilers used for the flash steaming process are constantly exposed to the elements, so over time moisture can soak through the insulation and oxidize the tube sidings. Eventually, one of the deteriorated tubes ruptured, leaving the boiler inoperable just weeks before the harvest season. J.G. Boswell needed the whole side of their boiler retubed in less than two weeks, or they'd fall behind schedule and miss crucial deadlines.



Crates of processed tomato paste await transport at J.G. Boswell Tomato Company

### THE R.F. MACDONALD CO. ANALYSIS & SOLUTION

R.F. MacDonald Co. was rushed in to assess the ruptured boiler tube problem and get the equipment back online. On the water tube boiler at J.G. Boswell, there is a steam drum on top of the boiler and a mud drum on bottom. A lattice of water tubes connect the two drums and create a furnace effect by forming a front wall, a rear wall, a target wall, and a dividing pass down the inside of the boiler. In practice, there's rarely a problem with the drum itself; the problem is usually that the tube has split open or ruptured. A retubing job involves removing all of the degraded sections of tubing which have either failed, or are expected to fail soon and replacing them with new tubes.

Before technicians begin tearing out the old tubes, the root cause of the corrosion must be identified and corrected to prevent further degradation. Once the root problem has been isolated and solved, a single tube is removed from the drum and used as a template for bending the replacement tubes into the correct shape. After the tubes have been properly molded, the membranes are welded on and the new tubes are ready for installation. In the J.G. Boswell case, over 100 tubes were replaced, each one carefully inspected to ensure the proper safety and functionality of the boiler.



The completed section of tube replacement for the boiler front wall

BOILERS

PUMPS

SYSTEMS

SERVICE

PARTS

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New outside tube sections moulded, welded and installed in the existing boiler

### PROJECT RESULTS

In addition to the side wall corrosion problem, routine maintenance had identified an ongoing issue with the refractory walls. As a result R.F. MacDonald Co. recommended an upgrade to convert the refractory wall tubes to a membrane style. This resulted in correcting the long term problem.

The new tubes were installed on schedule and J.G. Boswell achieved all of the set deadlines. All season long, the water walls ran efficiently with no hot spots and no problems.

New heaters were placed in the siding to evaporate any moisture that gets trapped in the insulation, located outside the boiler tubes. Boilers exposed to constantly shifting cold and hot states are prone to condensation, so R.F. MacDonald Co. has coordinated a service plan to periodically change the insulation padding and prevent condensate build-up from escalating into a serious problem. With the proper care and maintenance, R.F. MacDonald Co. estimates the new boiler water walls will supply years of reliable service.

**"R.F. MacDonald Co. addressed the underlying problem for this boiler and implemented a lasting solution to the condensation and moisture problem, not just a quick fix."**