

ENERGY EFFICIENT STEAM GENERATION AT ABATTOIRS

BACKGROUND

V&V Walsh is one of Australia's leading processors and wholesalers of premium beef & sheep products. V&V Walsh's abattoir in Bunbury, Western Australia, can slaughter 3,500 lamb and mutton per day of which approximately half is boned and packed on-site. The facility can also slaughter 400 head of cattle per day, with the ability to bone and process 300 beef carcasses per day.

V&V Walsh is a family owned business and was established in 1957. V&V Walsh's beef and sheep products are distributed throughout Australia and retail through Woolworth's, restaurants and speciality food stores. The business is also one of Australia's leading exporters, with markets in many countries, including China.

Steam is used in abattoirs for rendering operations, for cleaning, and to maintain temperatures in water and tallow storage systems. The energy costs associated with generating steam, coupled with the cost of engineering maintenance of steam handling equipment, is a significant operating expense. Energy prices at the site had been on the rise and were forecast to rise further in the near future. This prompted management to explore opportunities to take control of the energy costs at the site and consider more efficient means of meeting the electricity, heating and cooling requirements of the facility.

OPPORTUNITIES

The reasonable steam demand and operating pressures of abattoirs means boilers of all types are in use. The most common types are dry and wet back fire-tube shell boilers and 'D' type water-tube boilers. Both types are suitable for firing with most common fuels. Examples of fire-tube and water-tube boilers are illustrated in Figures 1 and 2.

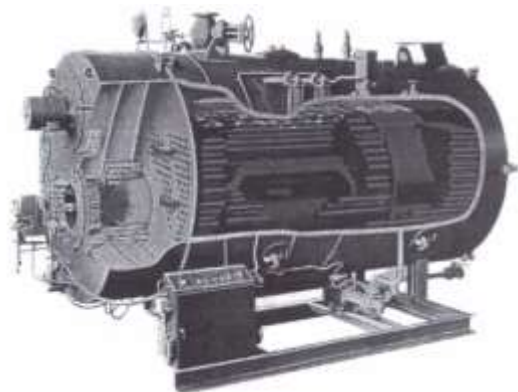


Figure 2 - Part-sectional view of a fire-tube boiler

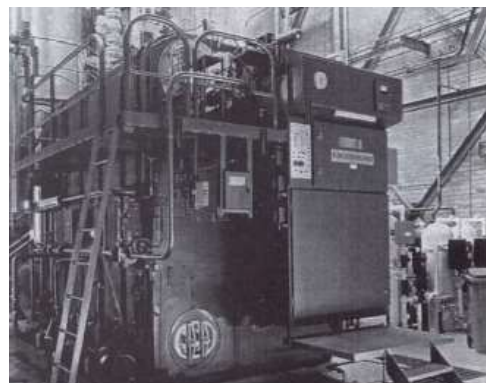


Figure 2 - General view of a water-tube boiler

Water-tube boilers offer a number of advantages over fire-tube boilers, including:

- Can accommodate all fuels
- Are acceptable for limited or unattended operation
- Are most suitable where high steam capacities are required
- Are generally more efficient than a fire-tube boiler
- Have a smaller water volume which allows the boiler to respond quickly to steam demand

Having undertaken a review of the heating system at the abattoir, the management team at V&V Walsh identified that steam could be delivered more efficiently and with more accuracy in relation to operational demand by swapping the incumbent fire-tube boilers with water-tube boilers.

IMPLEMENTATION MEASURES

V&V Walsh's engineering team evaluated the technical and economic viability of the project, taking into account the estimated improvement in energy efficiency.

The \$837,772 project was put forward for contributing funding under the Federal Government's Clean

Technology Investment Program. It met the eligibility criteria under the program, in terms of cost effective carbon abatement, and V&V Walsh were granted one third of the project cost. Subsequently, in late 2013, the existing 2 x 4 megawatt (MW) fire tube boilers were replaced with 2 x 4 MW water tube boilers.

OUTCOMES

Boiler type, together with new technology ancillaries such as economisers, efficient burners units and electronics, will deliver steam at a higher efficiency and more accurately in relation to operational demand. The 12 months measurement and verification process is ongoing, however the project is expected to reduce site-wide carbon emissions intensity by 14% and will result in savings of \$170,000 in energy costs per year.