Safe operation of wood fuelled heat plant

Wood fuelled heat plant are designed to be operated in a safe manner and the safety features will differ for specific brands. Anyone operating heat plant must be made conversant with the safety features before they are allowed to undertake any action relating to the operation of the plant. Owners of heat plant should maintain a register which shows the training and refresher training of any person working on the plant. This includes anyone de-ashing, adding fuel etc. Of particular concern is anyone brought in as a relief operator at times when the regular operator is not available.

The biggest risk is of course the high temperature and pressure of the heat transfer medium but the fuel handling and de-ashing can also be dangerous if not undertaken properly.

Boiler maintenance

Boiler maintenance is critical to safe operation of wood fuelled heat plant.

TNSB18 Boiler maintenance

TNSB46 Best practice for confined space entry

TNSB54 Air filtration prevents fires

TNSB55 Explosion protection needs and awareness in the biomass industry

TNSB56 Combustible gas: dryer systems hazards and best practices

TNSB58 Dust hazard analysis

TNSB59 Safe baghouse maintenance

Boiler de-ashing

Modern plant will have automatic features so that operators do not need to do anything manually and thus risky. Most older boiler plant, especially in the timber and sawmill industry, are not sufficiently automated and often get manually de-ashed so care should be taken with them.

Due to the inconsistency of wood fuels (size, moisture, etc,), the higher amount of gas it's producing when exposed to temperatures >300°C these boiler plant can become a real "blackbox" open for surprises whenever you're opening the doors for de-ashing. For this reason almost all modern boilers have automatic feeding and de-ashing systems and some even a service and maintenance switches/programme which ensures certain conditions within the fire box in the event has to open the furnace door.

Under the health and safety legislation all plant owners must have sufficient procedures (such as training and inspection) in place to protect their employees. – Where a furnace door has to be opened for de-ashing there should be signs saying "fire may blow back".

Pressure and temperature

All heat plant equipment will have pressure and temperature gauges. Operators should check these every time they visit the boiler room. Operator manuals should be nearby and easily available (even

for an unattended school boiler where the operator may have limited technical knowledge of boiler operation.

The pressure and temperature relief valves on the equipment are extremely important and the operator should check these regularly. The operator should know what to look for and know the danger signs. Explosions have occurred (Orewa College) when the operator has wrongly read the signs that pressure is building up.

TNSB53 Operation and maintenance of biomass fuelled heat plant

TNSB19 Orewa explosion lessons learnt

Fuel handling

Fuel dust can be explosive as well as a hazard to the operator's breathing. Care should always be taken when opening a fuel store that the dust is safe.

Guidance on fuel storage and handling is available in the following Technical notes:

TNSB38 Dangers of using CO2 to quench wood pellet silo fires

TNSB39 Combustible dust mitigation and control

TNSB40 Dust collection and suppression systems

TNSB42 Combustible gas dryer systems hazards and best practices

TNSB43 Wood dust explosion suppression case studies

TNSB49 Best practices for managing wood fibre storage and combustible dust

TNSB50 Risk assessment – the first step to controlling combustible dust hazards

TNSB51 Safe biomass driers

TNSB52 Explosion flap isolation valves

TNSB67 Fighting wood pellet silo fires

TNSB78 Avoid unsafe work practices around conveyors

TNSB79 Recognising belt conveyor danger zones

TNSB80 Fibre pile management best practices