

## Occupational Health and Safety Responsibilities for School Boilers

Heat is provided to a large number of New Zealand schools through the use of solid fuel with an associated hot water or steam boiler system.<sup>1</sup> A growing number of schools are using wood fuel systems having converted an existing coal boiler or installed a new *state of the art* wood fuel boiler.

This note focusses on issues relating to the safe operation of boiler plant from an occupational health and safety perspective. While the note focusses largely on wood fuel systems, regardless of your solid fuel type, there are a number of fundamental safety issues that are mirrored across all solid fuel types. This note therefore can be universally applied.

### Boiler Operation – Occupational Health and Safety Responsibilities

A School Board of Trustees has responsibilities under the Health and Safety in Employment Act 2015 for health and safety at school. Specifically, with respect to boilers, the operation of boilers (unattended) is covered by Part 5 of the *Approved Code of Practice for the design, safe operation, maintenance and servicing of Boilers* (last updated 2004).<sup>2</sup> The Board of Trustees must ensure that the school's boiler facilities are in a good state of repair; that they are modified and maintained in a safe and effective manner; and, that operators are suitably qualified and trained by professionals familiar with boiler technology<sup>3</sup>.

### Boiler Operation – Key Occupational Health and Safety Related Issues

- The Use of Safety Devices
- An Annual Inspection
- Scheduled Regular Maintenance
- Periodic Operator Training

**The Use of Safety Devices** - The safe operation of the boiler system and related equipment is paramount, and all safety devices must be regularly tested and calibrated to ensure their proper operation. Boilers, whether for the production of steam or hot water for heating, should have dedicated safety devices to ensure safe and efficient operation of the boiler. Whether the boiler is a conversion (from coal to wood fuel), a new wood fuel or other solid fuel installation, the safety issues and associated measures noted below are important. It's worth checking that they have been installed and that you are clear on why and how they operate, what information they provide you with and what they are telling you about the operation of your boiler.

The key safety issues to be aware of are as follows:

- Burn back protection
- Fuel control
- Boiler water safety
- Boiler pressure and temperature control.

<sup>1</sup> [Around 40% of the nearly 2,500 schools in New Zealand use boilers for heating](#)

<sup>2</sup> <http://www.business.govt.nz/worksafe/information-guidance/all-guidance-items/acop-boilers/boiler-code.pdf>

<sup>3</sup> [An explosion at Orewa College in 2009 occurred because of a number of poor maintenance practices.](#)

Further details can be found in the Bioenergy Association '**Technical Guide 03 - Guidance Document for Wood Fuelled heat plant Operators**'.<sup>4</sup> This Guide sets out these specific safety issues in more detail and notes how to manage them.

**An Annual Inspection** - An annual inspection can be set up through an Annual Maintenance Contract (AMC) provided by companies to customers for a fee that helps to keep the boiler (and associated equipment) in good working order after all other services associated with a new construction are complete. Such a contract allows for regular check-ups and routine work to keep the performance and quality of the equipment in good condition every year. From a safety perspective this annual contract ensures the equipment is safe to operate. There are a number of types of maintenance contracts that cover labour and or parts.

The key advantages of an Annual Maintenance Contract include:

- Risk management – greater safety assurance; potential link to school insurance cover
- Avoids unexpected breakdowns and technical failures
- Detailed yearly health check.

We recommend that the boiler operator be present during the annual check as this is an opportunity for operator refresher on potential operational issues and safe operation.

An Annual Inspection Certificate should be placed on the wall of the boiler house just inside the entrance so that as part of OHS compliance auditing school administrators can periodically check that inspections have been done.

**Scheduled Regular Maintenance** - A regular maintenance agreement means routine day to day operation of the boiler is optimised by appropriate technical personnel and safe operation ensured.

**Boiler Maintenance and Inspection Experts** - The Bioenergy Association has a comprehensive list of New Zealand based Boiler Maintenance and Inspection Experts who are qualified to undertake a detailed plant inspection and annual maintenance and safety checks. See <http://www.usewoodfuel.org.nz/documents/resource/WWE18-Boiler-maintenance.pdf>

Note the following recommended routine safety checks.

**Recommended Routine Safety Checks**

1. Read pressure and temperature gauges every time the boiler house is entered.
2. Check the condition of combustion daily!
3. Check for air leaks around stoker and base of boiler
4. Check for water leaks from boiler and heating network
5. Check for blockages in the furnace grate that could affect combustion

**Periodic Operator Training** - One of the most important elements in the safe operation of a wood fuelled (or other solids fuel) boiler is having a competent boiler operator. This individual will (should) understand the principles of how the boiler operates. They should undergo periodic training to maintain and develop their understanding but also to learn from their peers. They will be responsible for maintaining a boiler room log-book, for day-to-day operations and maintenance and will play a key role in ensuring the safe operation of the boiler.

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<sup>4</sup> BANZ Technical Guide TG03 - <http://www.bioenergy.org.nz/documents/resource/TG03-summarised-wood-pellet-boiler-operators.pdf>

The Bioenergy Association provides regular 'hands on' boiler safety short courses that specifically target school / rest-home based boiler operators. Attendance (at least every three years ) at these courses is recommended. A Certificate of Attendance is issued to those attending. This should be placed on the wall of the boiler house just inside the entrance so that as part of OHS compliance auditing school administrators can periodically check that training has been done. For details on the next training course see the Bioenergy Association website – [www.bioenergy.org.nz](http://www.bioenergy.org.nz)

**General Boiler Room Safety and Organisation**

1. Ensure all hazardous materials are safely stored and labelled.
2. Ensure there is safe access to the heat plant and to all exit ways.
3. Schedule a general heat plant room tidy-up on a weekly basis.
4. Schedule a regular boiler room clean up to avoid the gradual build-up of dust.
5. Ensure the heat plant room is well ventilated and insulated.
6. Schedule maintenance regimes (daily, weekly, monthly, annually) and maintain a heat plant room log-book.
7. Be aware of general health and safety issues in the heat plant room and with respect to its operation.
8. Maintain a well-stocked First Aid kit.

**Schools using Wood Fuel Boilers**

There are over 50 schools in New Zealand using wood fuelled boilers. Details of who they are and where they can be found are on the Bioenergy Association website - [Information Sheet 05 – Education facilities using wood fuel](#)

**Boiler Case Studies**

One of the easiest ways to find out more about the operation of a new wood fuel heat plant installation in a school situation is to look at a Case Study. A number of school focused Case Studies are presented on the Bioenergy Association wood energy website [www.usewoodfuel.org.nz/wood-energy-case-studies](http://www.usewoodfuel.org.nz/wood-energy-case-studies).