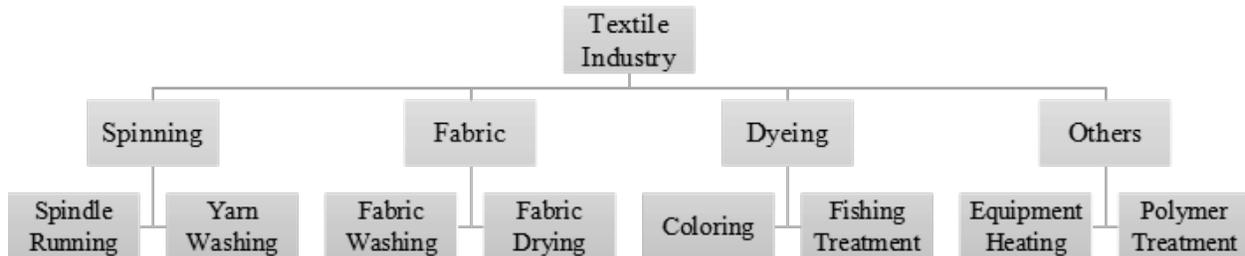


Industrial Boiler Safety

Industrial Boilers are a key part of many manufacturing processes in the garment and textile industry, as can be seen in the illustration.



Over the years there has been a history of boiler explosions, caused by either the steam produced in the boiler, or the ignition of the fuel used to heat the water. These accidents have been caused by lack of effective maintenance of the equipment, operator error or misuse of the equipment. Whatever the cause of the explosion the outcome can be devastating, often resulting in the death of workers at the factory. The unfortunate fact is that all of these accidents are preventable, with an effective preventative maintenance programme in place.

A number of potential accidents involving boilers have been avoided in 2020 due to calls from factories alerting the Helpline and the Nirapon Member Brands of boiler hazards in factories. These hazards have been confirmed after engineers carried out follow up visits. These visits were requested by the Nirapon Brands. This has resulted in one case of a factory needing to buy a new boiler and a second one requiring repairs to the gas lines supplying fuel to the boiler. What is clear is that workers in the factory are recognising that there is a problem with a boiler, before an accident involving a malfunction of the equipment takes place.



A Typical Size Industrial Boiler

As can be seen by the photograph, industrial boilers are very large; any failure of equipment on this scale can result in a significant incident leading to loss of life and serious injury.

The diagram on page 2 provides a simple view of the internal working of the boilers that are typically used in the RMG and other industries. Although these systems appear to be relatively simple, operators using such equipment need proper training in the use and maintenance of such equipment.

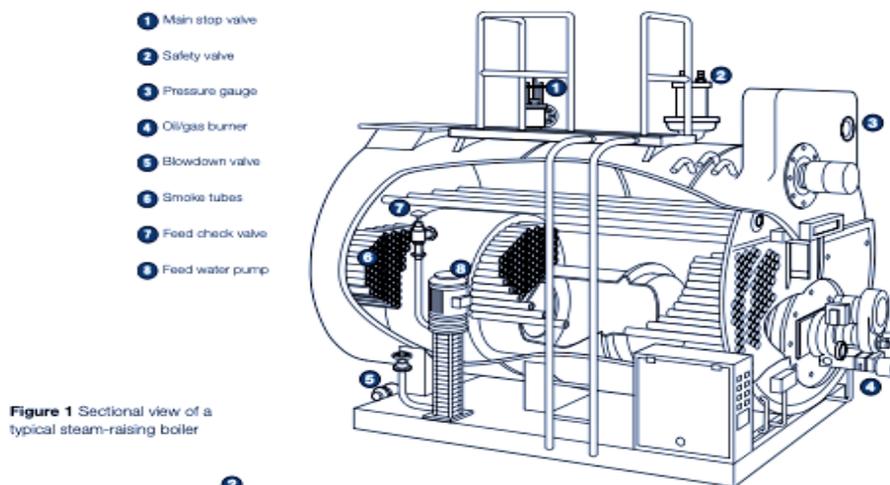


Figure 1 Sectional view of a typical steam-raising boiler

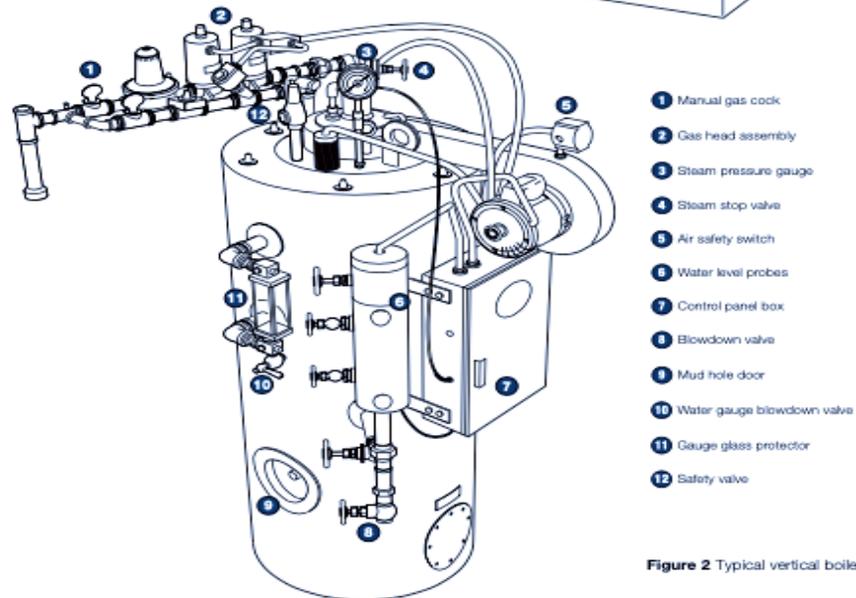


Figure 2 Typical vertical boiler

So, why do boilers breakdown?

Very simply the system is subject to a lot of pressure, the water may contain sedimentary products and will most likely also contain mineral deposits. The sedimentary products will gather as silt or mud in low lying areas of the boiler and may be stirred up and moved into other areas of the boiler by the water as it heats up and turns to steam. The mineral deposits will build up as scale on the equipment, this can lead to problems with the diameter of pipes or start to obstruct valves. This effect is very similar to that of cholesterol on the human heart.

Other factors to consider are that water is corrosive and can cause problems with oxidisation resulting in rust and corrosion of parts such as flanges, joints and seals. At normal atmospheric pressure 1 litre of water will expand to 1,700 litres of steam. If that water is contained within a pressurised vessel (a boiler) that expansion could reach 2,000 litres of steam. This is an incredible amount of pressure and that steam will seek out any weak points in the boiler system with potentially devastating results.

There are many other factors that can have an effect on the safe management and operation of boilers, including the fuel supply. These considerations are set out in figure 3 below. These considerations follow a systems-based approach to safety management as set out in the training provided by BRAC and the guidance set out in the 90-Day Management Guidance and Reporting Process.

What affects the safe operation of boilers?

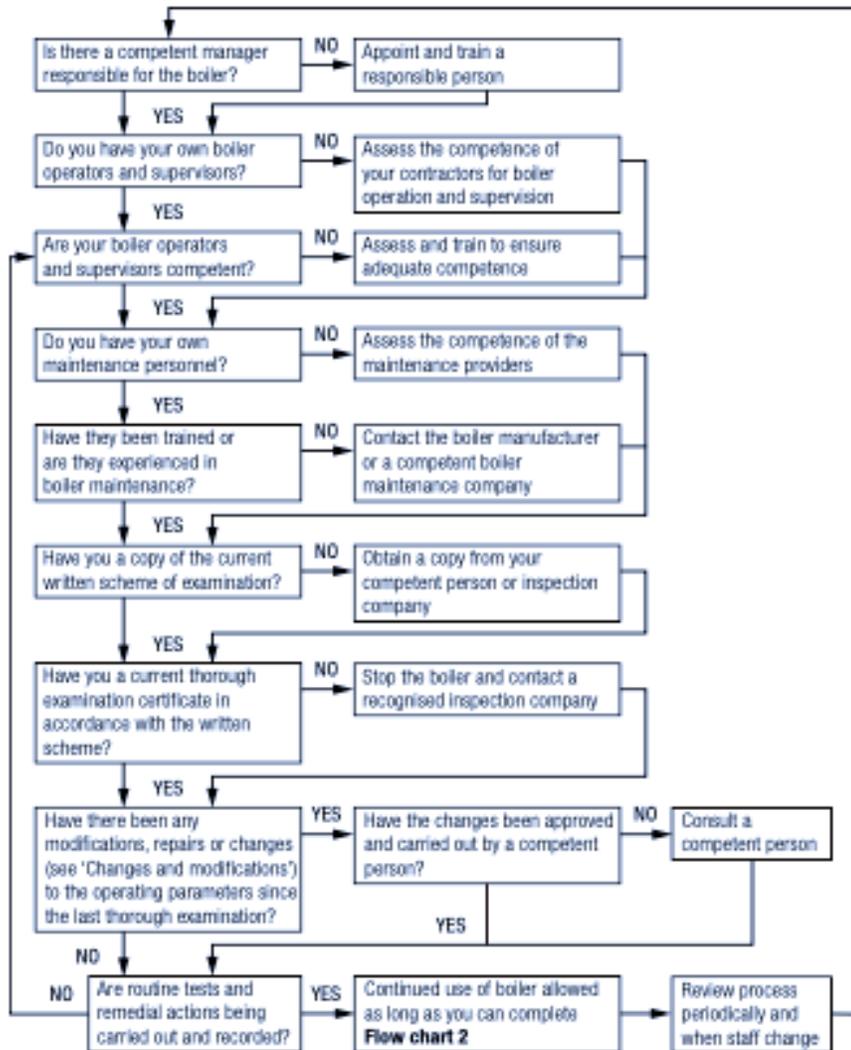


Figure 3 What can affect safe boiler operation?

Finally, to assist factories in using boilers safely here is a flow chart to assess your current safety management system, for boiler operations at your factory.

What do I do next?

Now work your way through the flow charts and take the action indicated to demonstrate that your boiler installation can continue to be operated safely. You may need help from a competent person.



Flow chart 1 Have you got the right people in place?