# Operator training for coil steam generators

There has been a rise in the popularity of coil type steam generators in recent years with a wide variety of steam users requiring relatively small amounts of steam at short notice for their process. Coil type generators are ideal for this role, but users often have small numbers of staff who have little or no technical or safety knowledge relevant to steam generation and distribution. This is a gap in the industry that now has a solution.

Steam generators are typically manufactured in ranges from around 150 kg/hr to 8000 kg/hr, the largest sizes being significant plant installations whereas smaller generators can sit in laboratories or in tiny plant rooms. Pressures up to 20 barg are readily available (higher pressures can be achieved), and the boilers can be in vertical or horizontal coil arrangements. Most installations are gas fired, and there are estimated to be at least 1000 steam generators in use in the UK today, with many small breweries and distilleries using coil generators as well as food manufacturers and educational establishments.

Coil generators offer a number of advantages over other steam raising equipment such as availability of steam from cold start in as little as 3 minutes, a low volume of water under pressure (which means safety even at very high pressure), and a compact installation local to the steam user giving reduced pipe work costs. However, these boilers are not 'fit and forget', and users need to be aware that they have a responsibility for the continued safe operation of the boiler.

## Why do you need training and assessment?

Coil type steam generators are required to be operated in full compliance with most of the same legislation as traditional shell and tube steam boilers including the Pressure Systems Safety Regulations which require a Written Scheme of Examination (*Reg 8*) for steam at any pressure (*Reg 2*). Additionally, the Provision and Use of Work Equipment Regulations require training and competence of all relevant employees to be demonstrated (*Reg 9*), and HSE INDG 436 says:

> *As the manager of a workplace, you have a duty to manage the risks associated with that workplace. If there is a boiler installation on your premises, you must ensure it remains safe. Are your boiler operators and supervisors competent?*

Boiler Inspectors and insurers are often recommending that Boiler Operation Accreditation Scheme (BOAS) training, or at least training to BG01 standards, should be obtained for all boiler operators, and BOAS needs to cover all steam boiler types. Coil steam generators are currently excluded from BG01 (*Guidance on Safe Operation of Boilers*) but that does not mean that the principles therein and other legislation can be ignored.

The training boiler operators receive must be appropriate for the equipment they will operate. The level of competence and training required must be reviewed when a system is modified or changed, e.g. increased automation or remote supervision (*ref HSE INDG 436*), and training is only any good if the candidates are assessed at the end of the course and then refreshed at appropriate intervals.

## The role of The Combustion Engineering Association

The Combustion Engineering Association (CEA) is an educational charity specialising in the technical training and assessment of boiler operators and managers, and they have been

providing BOAS assessments for the last 10 years or so. Over 4000 boiler operators have been successfully trained and assessed in various categories covering hot water boilers, shell boilers, and water tube steam boilers.

The Boiler Operation Accreditation Scheme which is owned and operated by the CEA has now been expanded to include coil type steam generators as Category 5. The general provisions of BOAS will be applied with a few minor adjustments to suit the market, the specific equipment involved, and the persons who might be operating or managing such installations.

BOAS Cat 5 will be for two levels specifically for steam generators:

- steam generator **Operator**; and
- steam generator **Engineer/Manager.**

Significant parts of the Learning Outcomes for other BOAS categories are directly relevant (safety, legislation, fuels & combustion, water treatment, plant efficiency etc.) and other parts such as boiler construction and coil boiler operational aspects have been amended to suit.

The amendment to the BOAS categories is based on the presumptions that

- The knowledge required of an operator of a small steam generator is often not as wide ranging as that required by a shell boiler operator, **but the requirement to be trained and competent is just as relevant;**

- The risks posed by steam generators may not usually have the catastrophic consequences that are associated with shell boilers, **but risks are present and must be understood, assessed and managed;**

- The risks associated with operation of a very small steam generator (which will probably supply a limited steam network) are broadly comparable with the risks of operating a very large steam generator, although the effects of any incidents may vary.

## Courses launched

BOAS Cat 5 is now being launched for Coil Boiler Operators and Babcock Wanson are organising the first training courses. This one-day course will cover a range of safety and operational issues that the coil boiler operator should be aware of and the training will be assessed through exams that are produced and marked by the Combustion Engineering Association who will issue a Certificate and ID card to successful candidates, valid for 5 years.

Coil boiler operators will be assumed to have little technical or safety knowledge in relation to steam raising plant, so the course will cover some of the basic H&S aspects of steam systems and simple water treatment routines as well as the safe operation of the boiler and how to recognise when the boiler is not performing correctly. The one hour multiple choice examination taken at the end of the day will have around 35 questions relating to specific elements of the course material.

Other companies supplying steam generators already provide equipment specific training for their products in varying degrees, presumably at least sufficient to meet any legal and contractual obligation. Enhancing that training to meet the needs of BOAS will raise the standards of coil boiler operator competence in industry. Courses will be available at manufacturer's or training provider's premises as well as on site, and other training organisations will be joining the scheme as it develops.

Once the Coil Boiler Operator course has been successfully delivered, the steam generator Engineer/Manager course will be finalised. This will require a greater level of knowledge

from candidates and will include some of the more detailed maintenance and supervision aspects of operating a larger coil boiler installation and steam distribution system. Courses for this level will be 3 days duration and include further examinations and an interview with an experienced Assessor.

Experience has shown that competent staff who have the necessary knowledge to operate your steam plant safely and efficiently will save you money by reducing down time, guarding against expensive breakdowns and ensuring best use of resources such as fuel, water and chemicals. Coil type steam generators are an excellent way of getting steam to where you need it when you need it, but they are still steam raising boilers with specific operating requirements including the provision of correctly treated feed water. If your investment is to be properly protected by staff who know how to operate it effectively and safely then adequate training must be considered.

For further information on the BOAS scheme please contact the Combustion Engineering Association - info@cea.org.uk - 01740 625538

For further information about forthcoming **BOAS Cat 5** courses please contact Babcock Wanson UK Ltd - babcock-wanson.co.uk - 0208 953 7111