Guidance on Design and Operation of Biomass Systems

Ref: BG05

CEA
Combustion Engineering Association

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INTRODUCTION

Guidance on Design and Operation of Biomass Systems (Ref: BG05) is a guidance document intended to provide advice to clients, designers and those who operate and maintain commercial or industrial (i.e. non-domestic) biomass systems using wood in the form of pellets or chips.

Those involved in the procurement, design, construction and the ongoing operation (including maintenance) of biomass systems have duties to co-operate and share relevant information required for the development of a safe system of work. They have a number of legal responsibilities (Duties of care) and to comply with these duties, they should possess or have access to good, current knowledge of health and safety legislation and practice, as well as ensuring personnel they employ are competent to carry out the required tasks safely.

The concepts governing safe design and operation are the same regardless of project size, from the smallest domestic installation, to the largest power station. While, this document focuses on the design and operation of new industrial and commercial installations, the information in this guide will also be relevant for smaller installations as well as the refurbishment or conversion of existing installations.

The content is most relevant to designers, building services designers and those practising as biomass specialists, e.g. for importers of biomass boilers. Those engaged in installing, operating or maintaining biomass systems will also find the content relevant and useful.

THE FOLLOWING WORDS CONVEY SPECIFIC MEANING:

Should: Compliance with this clause is not essential where supported by risk assessment and/or design calculation.

Shall: Compliance with this clause is required in order to claim compliance with this document.

Must: Compliance with this clause is a legal requirement within the United Kingdom.

ABOUT THIS GUIDE

This comprehensive guide concentrates upon the unique issues associated with the design, construction, operation and maintenance of biomass systems. We trust that by studying the contents and following this advice your plant will operate safely and more efficiently and provide you with a trouble-free system. It can aid in informing site / project specific risk assessment. If in any doubt contact your manufacturer or system designer for advice.

It is aimed at the clients, designers and those who operate and maintain commercial or industrial (i.e. non-domestic) biomass systems using wood in the form of pellets or chips. It is intended to help them understand the necessity of health and safety, from a design and practical operational perspectives and to improve awareness of the associated the legal requirements.

This guide covers the responsibilities for the safe and efficient operation of biomass plant, and the responsibilities for managing the safe design and operation of this type of equipment. In the operational context at least, the responsibility lies with the most senior person on site; “They Are Responsible”. However, they can delegate the responsibility for daily operations, but only to a suitably trained and competent person on site.

The Combustion Engineering Association (CEA) agreed to write this guide with the help of its Members.

Within this Guide there are a significant number of legal requirements, regulations and standards highlighted, however, these regulations and standards are periodically reviewed and they can and do change, but they are as accurate as possible at the time of first publication.

We (CEA) cannot accept any liability for the information provided in this guide; however, be assured that we have consulted widely with our member companies during the compilation of this guide.

ACKNOWLEDGMENTS

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SCOPE

The use of Biomass has increased significantly over the last ten years. This increase is, in large part, due to a perception that biomass is green, clean and sustainable. These conceptions are, in part, driven by market pressure and, in part, underwritten with Government commercial interventions. The rapid development and deployment of biomass has, in some cases, resulted in the un-informed design, review, installation and operation of allied storage and combustion technologies (with attendant fatality and injury).

To date, there have been several serious accidents and at least one known fatality in the British Isles directly connected to biomass heating systems; accidents which could easily have been avoided if a process that ensures safe design and safe systems of work in biomass had been applied.

The most effective biomass systems are the result of a close working partnership between client, architect, mechanical and building services engineer where all aspects of design, management and operation are carefully considered and integrated, with an emphasis on health and safety.

Biomass systems are subject to the same general health and safety principles, codes of practice, and design, installation and operation standards that apply to gas, oil or coal fired boiler systems, including, for example, the provisions of the Pressure Systems Safety Regulations 2000.

The following are specifically excluded from the scope of this guidance document:

- Detailed design information a might be contained within a British Standard Installation Guide.
- Detailed information that would apply to all boilers regardless of fuel and might be regarded as “standard” boiler issues or pressure systems as governed by the Pressure Systems Safety Regulations 2000 (PSSR) or the Pressure Equipment Regulations 1999 (PER).
- Installations where any fuel is pulverised. The hazard of dust explosions presented by such systems requires special design and operating criteria.