

Power and Renewable Energy

SAFETY ALERT / Incident Report



Incident	Fire at an AD/Biogas Plant	Date of Incident	September 2016
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1, Summary

The AD industry has suffered 3 major fires originating in carbon filters within the last few months in the United Kingdom.

This safety alert is circulated to make the industry, clients and contractors aware of such avoidable incidents.

Description of Incident insured by CNA Hardy

A gas main from the biogas digester to the site engine was undergoing maintenance.

The biogas from the digester enters into an activated carbon filter as part of the gas cleaning process before entry to the engine. This filter removes / reduces unwanted gases such as Hydrogen Sulphide, to diminish engine contamination caused by corrosives formed such as sulphuric acid.

The carbon filter was left open to the atmosphere during maintenance. Site CCTV footage shows this filter expelling dust/debris before igniting/flaming and a major fire subsequently spreading to the building structure. This building's frame was clad in part with timber batons for environmental/ decorative reasons.

The incident occurred in the silent hours and the fire alarm failed to alert the off-site duty operator.

The engine and switch rooms of the biogas plant suffered major damage and the plant was unable to operate further after the incident.

Learning points

The manufacturer's carbon filter maintenance manual gives clear guidance as to the threat of spontaneous or self-combustion with the following notes:-

- If the filter is left open to atmosphere, then either new carbon or carbon with collected hydrogen sulphide may oxidise / overheat.
- If such temperature rise occurs it will be necessary to wet the filter to cool it.

Actions required

Such carbon filter fire incidents during maintenance give rise to a number of safety requirements. A client needs to consider and act appropriately on these for personnel and plant safety as well as to satisfy their insurers that they are acting reasonably.

1. Clients should select a Competent Contractor with suitable experience and the correct level of Liability Insurance (this should be to a minimum of c. £10M).

CNA has a guidance document titled "Safe Working on Plants" which will be provided on request and gives further details on this.

2. Before operating a plant / commencing work the manufacturer's full instruction documents need to be consulted and understood to ensure likely risks are considered.

3. The contractor must complete Method Statements and Risk Assessments before starting work on a plant, providing copies to the client. A work permit must be issued.

The plant should be correctly isolated and the client / contractor have clear understanding of the risks.

On completion of the work the client should be informed of what has been found and whether the plant is ready to return to service or not.

No work permit should be left open if a site is unmanned and it is expected no permit will have a period longer than 12 hours.

4. All fire detection needs to be linked to the operational SCADA systems, to ensure plant operators are alerted. On detection of fire the site plant should enter into a safe mode.

It will be helpful if monitoring CCTV covers all plant and buildings at risk. The operator will then be able to quickly observe if a fire has occurred during the silent hours.

5. The use of combustible construction and insulation materials in biogas plants must be eliminated where possible or reviewed to ensure that the plant has the ability to withstand a fire until the fire brigade arrives with sufficient time to contain the fire spread.

The use of timber as cladding or for building construction or other combustibles as insulants (for example on a digester shell), will likely cause a larger fire loss and may be reflected in the insurance premiums charged or even non quotation.