

The Safety and Reliability Society

Midlands Branch

Evening Meeting: Tuesday 17th March 2020 at 6-30pm

Flammable mist hazards involving high-flashpoint fluids

Speaker: Dr Simon Gant, Health and Safety Executive

Venue: Swithland Room, DNV-GL, Holywell Building, Holywell Park, Ashby Road, Loughborough LE11 3GR

Attendance free, members and non-members welcome, refreshments available from 6.00 PM. Use DNV-GL car park (not visitor's car park), assemble in DNV-GL reception area



Summary- High-flashpoint fluids, whose vapours cannot be ignited and sustain a flame at normal room temperature, are widely used (e.g. kerosene, diesel, lubrication oils and hydraulic oils). If there is a leak of these fluids from a pressurised system (e.g. a leaking pipework flange), they sometimes form a mist that can be more easily ignited. These flammable mist hazards are covered in the ATEX directive and the DSEAR regulations, but are still poorly understood and often dismissed as being unlikely to occur. In 2009, the Health and Safety Executive (HSE) published a review of flammable mist incidents, which identified 37 serious fire and explosion events, 9 of which led to a total of 29 fatalities. In response to the findings, HSE put together a Joint Industry Project (JIP) to study the problem. This ran from 2011 to 2015 and involved a detailed literature review, a series of experiments at Cardiff University and a programme of Computational Fluid Dynamics (CFD) modelling. One unexpected finding was that kerosene leaks were readily ignitable, even at relatively low pressures. This result was counter to a common assumption that only high-pressure leaks are ignitable. However, some important questions remained unanswered and in 2018 HSE launched a follow-on JIP (currently ongoing) to further address flammable mist issues. For example, are other fluids (particularly diesel fuel) also easy to ignite at low pressures? Also, what are the effects of the orifice shape, size and release configuration? This SaRS presentation in Loughborough will provide an overview of the work led by HSE on flammable mists over the last decade.

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