

## IOSH Fire Risk Management Group

Back-to-Basics Webinar 6: FRMG Principal 6: Utilising present and future technologies.

1230-1330. 10 March 2022.

Questions received from Zoom participants and suggested answers offered.

No.	Questions and answers
1	<p data-bbox="300 398 1066 434">Is that possible in the future Fire Fighting will be replaced by AI?</p> <p data-bbox="300 456 1385 680">No, I doubt that Artificial Intelligence will <u>replace</u> fire fighting but certainly, as in many other current aspects of technical endeavour, AI will be able to support firefighters to make their work safer. One aspect is to collect and analyse on-scene data and parameters such as temperature, airflow, environmental factors and gases in products of combustion to increase the efficiency of fighting a fire and to reduce exposure to harmful environments.</p> <p data-bbox="300 703 1358 770">In the USA, NIST has developed a mathematical model to predict when flashovers could occur.</p> <p data-bbox="300 792 975 828"><a href="https://ojs.aaai.org/index.php/AAAI/article/view/17736">https://ojs.aaai.org/index.php/AAAI/article/view/17736</a></p> <p data-bbox="300 851 919 887"><a href="https://www.youtube.com/watch?v=PSDfGRgGBSO">https://www.youtube.com/watch?v=PSDfGRgGBSO</a></p> <p data-bbox="300 909 1238 976"><a href="https://uci.edu/brilliant/research/climate-change/fighting-fires-with-artificial-intelligence.php">https://uci.edu/brilliant/research/climate-change/fighting-fires-with-artificial-intelligence.php</a></p> <p data-bbox="300 999 1217 1034">As the references show, significant research is being undertaken in this area.</p>
2	<p data-bbox="300 1077 1233 1113">You have mentioned Lith-EX with AVD. Is this a new type of fire extinguisher?</p> <p data-bbox="300 1135 1362 1359">Yes. It is a new application of an extinguisher media to the market (aqueous vermiculite dispersion). It uses two pre-existing mode of operation in that the media forms a 'skin' over the article on fire, which instantly dries to provide a non-flammable non-permeable oxygen barrier. AVD is non-toxic and is chemically and physically inert and is environmentally safe in that in operation it only releases steam which is the mechanism by which it cools the fire.</p> <p data-bbox="300 1382 1106 1417"><a href="https://www.avdfire.com/what-is-aqueous-vermiculite-dispersion/">https://www.avdfire.com/what-is-aqueous-vermiculite-dispersion/</a></p>
3	<p data-bbox="300 1458 1385 1570">The management committee in my condominium block are talking about installing electric charging stations in the parking areas. The parking place is below the accommodation block. Is this safe? What precautions should we take if they do this?</p> <p data-bbox="300 1592 1385 1740">As with many other aspects of safety in the built environment the installation of electric vehicle charging points can be entirely safe is the hazards are identified, the risks assessed and appropriate safety and fire safety management techniques are put in place to manage the selected controls.</p> <p data-bbox="300 1762 1358 1955">The issues we outlined in Webinar 3 on Fire Precautions and Webinar 5 on Designing for Fire Safety are both significant here so you would want to revert to first principles in selection of a suitable location where the fire precautions can be properly installed to monitor the charging points and to give early detection and alarm of any issues with vehicles or their batteries.</p> <p data-bbox="300 1977 876 2013"><a href="https://ieeexplore.ieee.org/document/6183283">https://ieeexplore.ieee.org/document/6183283</a></p>

## IOSH Fire Risk Management Group

Back-to-Basics Webinar 6: FRMG Principal 6: Utilising present and future technologies.

1230-1330. 10 March 2022.

Questions received from Zoom participants and suggested answers offered.

No.	Questions and answers
	<p>It is possible that guidance could be forthcoming on this topic, especially in the built environment, soon and we may see amendments to documents such as Approved Document B to account for this new trend in fire safety.</p>
4	<p>Do all commercial buildings need a fire suppression system, i.e. ambient storage warehouses?</p> <p>No, not at all. But if the stock is high value some insurers may make this a requirement to protect the property. As warehousing is not generally used for working space for people life safety is possibly second to property protection and business continuity so sprinklers should be considered by the owners or investors in the business.</p> <p>Businesses running IT systems with large data storage etc or document archives should consider a high technology fire suppression system.</p>
5	<p>Just flagging up the (cost effective) benefit of fire suppression systems on vehicles too. Particularly relevant on high cost/high 'dependency' machines in my own area (farming), such as combine harvesters!</p> <p>Yes, that is very true. Thank you for that very pertinent point. And in this context fire suppression systems on engines, generators, driers and power plant in farming are equally important.</p>
6	<p>With the increase in Electric Vehicles, PV and Hydrogen fuel cells, should the public not be made aware of the specific risks of these developments in particular Lithium and Hydrogen? We do not want another Hindenburg.</p> <p>Yes. Thank you for the point which is well made. However, we have moved forward in many areas of safety since the 1937 disaster in New Jersey and the size and quantum of risk is quite different, as well as the technology.</p>
7	<p>The condensed aerosol technology original used by the Russian space agency as a rocket dry fuel, and later on used as the extinguishing agent for the aerosol fire suppression systems, it has to be used for a special applications as they impose a few hazards with high concerns.</p> <p>True. Thank you for that. The point here is that doing some review of research and development of the market and the technologies available is always valuable in determining your fire strategy before investing heavily in solutions.</p>
8	<p>As Wildfires are an increasing issue, is there not a need for effective plans and technology to tackle these types of fire, rather than dumping water from a specially modified aeroplane.</p> <p>Yes, agreed. However the technology here is not just dumping water but fire retardant. Your point is absolutely right, and as we discussed in Webinar 2 the principle of Fire</p>

## IOSH Fire Risk Management Group

Back-to-Basics Webinar 6: FRMG Principal 6: Utilising present and future technologies.

1230-1330. 10 March 2022.

Questions received from Zoom participants and suggested answers offered.

No.	Questions and answers
	<p>Prevention is paramount. If we can improve awareness, culture and technology to stop fires from breaking-out in the first place we stand a good chance of avoiding losses to the natural environment and putting the lives of residents and fire fighters at risk.</p>
9	<p>Ian thank you for a lovely insight. I have a question, may be a bit irrelevant, but I would like to seek your opinion. Are Lithium Ion batteries able to stand the heat in the middle east?</p> <p>Thank you for your highly relevant question. The numbers often quoted for maximum operating temperatures for charging lithium-ion batteries are 45°C and for discharging the battery (i.e. using it) 60°C. As the lithium-ion battery itself discharge heat, it is essential to keep it at a favourable temperature. Modern batteries are protected with internal electronics to limit operation if safe operating temperatures are exceeded.</p>
10	<p>Do you foresee the UK fire services adopting the innovative technologies that you have shown today such as robotics and drones?</p> <p>Yes. I think that is quite likely and the technology is proven. Spot the Dog and his brother are now reported (The Times, 19 March 2022, page 43) to be on the payroll of the New York Fire Department (the NYFD bought two from Boston Dynamics).</p>
11	<p>Could you advise on issues surrounding wireless fire alarm systems?</p> <p><b>In theory,</b> Wireless Fire Alarm Systems build upon the excellent addressing and reporting features of Addressable Fire Alarm Systems by removing almost all cabling requirements, allowing for quick and easy installation. Whether designing a new system, expanding an existing one, or replacing old components, with a Wireless Fire Alarm System the devices need only be paired with the panel and they are ready to go – there is no need to wait around for an electrician or close important areas of the building for disruptive cabling works.</p> <p><b>In practice,</b> the systems can work very well indeed if, like any wireless internet or communications / data transfer system etc in the built environment you can get a strong, robust and reliable signal. All the same components are there:</p> <ul style="list-style-type: none"><li>a) A wireless control, panel.</li><li>b) Wireless manual call points.</li><li>c) Wireless smoke detectors.</li><li>d) Wireless heat detectors.</li><li>e) Wireless sounders and beacons.</li></ul> <p>Wireless systems are well suited to buildings that cannot be modified or adapted for a wired system, such as some historic or listed properties. In common with all other opportunities for improving or modifying fire precautions take advice from professional fire engineers in the market.</p>

## IOSH Fire Risk Management Group

Back-to-Basics Webinar 6: FRMG Principal 6: Utilising present and future technologies.

1230-1330. 10 March 2022.

Questions received from Zoom participants and suggested answers offered.

No.	Questions and answers
12	<p>A really interesting presentation Ian, thanks! What do you recommend if staff want to buy E-bikes on cycle to work scheme and recharge batteries on site, bearing in mind the dangers of lithium ion batteries causing fires?</p> <p>I think this is a great idea. As with advice in a previous question look at the FRA and the fire precautions appropriate for the building or property. However, one significant point, mirrored in the questionnaire in PAS-79 2020 on FRA, relates to having charging points for electric bicycles (and mobility scooters and motorised wheelchairs etc) within buildings. I accept that you may have your E-cycle charging point inside your home but in the commercial or business environment there is potentially less care taken over this. Consequently, if charging of these machines CAN be undertaken in a place outside of the office or work environment that would be preferred. Once again, fire precautions need to be paramount.</p>
13	<p>Lithium-ion batteries are rechargeable batteries. Lithium metal batteries are non-rechargeable. Lithium battery means 2+ cells which are connected together and fitted with devices for use such as terminals, cases.</p> <p>Thank you for the comment. There is a huge quantity of data and information published on this subject and some relevant information is being made on the IOSH FRMG Web portal.</p>
14	<p>Good afternoon, great webinar. Would you need to add additional fire alarms near to where you have vehicle charging points at an office? Or make sure the wall / windows are fire rated?</p> <p>Thank you for another interesting question. In reverse order, the walls and windows in the structure of the building would have to have an element of fire rating, as would fire doors in the area need to be fire certificated. Fire compartmentation needs to be excellent with appropriate passive fire protection such as fire stopping. In terms of fire precautions Lith-EX should be provided and you may need to consider provision of fire sprinklers. You would definitely need to ensure that you have additional fire / smoke / heat detectors in the area. But whether you would need additional fire alarms? No, probably not. One sounder and flashing beacon would probably suffice but check this out with the competent person who has written the FRA for the building.</p>
15	<p>When will the big red book be available?</p> <p>Soon.</p>
16	<p>My question concerns the mention of wireless fire alarms, and what system the panel would recommend for a church. I have been asked to complete a fire risk assessment and I recommended a wireless fire alarm. There is a great deal of confusion over the best supplier and I would like some advice, please.</p>

## IOSH Fire Risk Management Group

Back-to-Basics Webinar 6: FRMG Principal 6: Utilising present and future technologies.

1230-1330. 10 March 2022.

Questions received from Zoom participants and suggested answers offered.

---

No.	Questions and answers
	<p>A previous answer to a similar question suggested that wireless systems are ideal for buildings, often some particular architectural reasons why wireless systems are easier to install. A traditional church building is a good example of this.</p> <p>However, myself and the FRMG cannot recommend any particular supplier due to the commercial aspects and potential conflicts of interests, although I can say that you will find a reliable supplier and contractor nearby.</p> <p>Take advice from your local Professional Fire Engineers in your locality and an internet search will turn-up relevant organisations who can organise a survey and installation for you.</p> <p>To find a local Fire Engineer registered with the Institution of Fire Engineers, for example, have a look at their website.</p> <p><a href="https://www.ife.org.uk/Find-a-UK-Fire-Engineer">https://www.ife.org.uk/Find-a-UK-Fire-Engineer</a></p>

Keywords:

Artificial intelligence

AVD: aqueous vermiculite dispersion

Condensed aerosol technology

Drones

E-bike charging

EV charging

Fire fighting drench systems

Lith-Ex extinguishers

Robotics

Wireless fire alarm systems