


## Risk Control Working Group

Project Updates  
30<sup>th</sup> September 2016

**Howard Passey**  
Principal Consultant, Fire Protection Association  
& Convenor, RISCAuthority Risk Control Working Group

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## Participants

### Broad representation

- Aviva
- NFU
- RSA
- Ecclesiastical
- Zurich
- RSA
- Ageas
- AXA
- Sterling
- Chubb
- AIG
- Liberty Mutual
- Allianz
- QBE
- Mitsui Sumitomo
- UMAL
- ACE
- Tokio Marine


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## Purpose

- To oversee and direct the development of loss prevention / risk control guidance for industrial and commercial processes and systems
- Ensure existing advice remains current and fit for purpose
- To monitor related issues that may affect loss experience
- Provide information in a form that is suitable for use not only by insurance industry professionals but also other end users


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## RC Series

- Existing suite of RC documents comprises 57 current guidance publications (RC1 – RC63)
- Anomalies due to numbering inconsistencies, re-numbering, withdrawn, superseded titles
- RC2 – Builders of Contractors Operations (1980) – Now JCoP
- RC20a, b and c – now RC's 55, 56, 57
- RC6 – Storage use and filling of LPG in containers (1989) – withdrawn
- In 2002/2003 when FPA first took on responsibility for this scheme the series extended to RC33 (32 documents).


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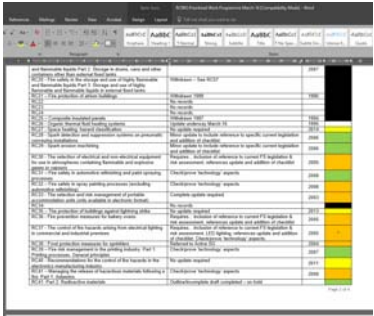
## Non RC publications

- Other documents which fall under the WG remit include:
  - Joint Code of Practice Fire Safety on Construction Sites
  - Business Resilience guide (now with BC WG)
  - Code of practice for the protection of empty buildings
  - Fire Risk Management Guidance for the Food Industry
  - E-Cigarettes Briefing Note


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## Prioritised Work Programme



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## Recently Completed

- **RC62** – Recommendations for fire safety with use of PV panels
  - Correlated with IET Guidance
- **RC63** – Recommendations for minimising the impact of legionella in fire fighting systems
  - Supported by BAFSA
- **RC8** – Recommendations for the storage, use and handling of industrial gases and cylinders
  - Passed for press this week
- **RC49** – Acetylene cylinders involved in fires
  - Passed for press this week
- **RC60** – Recommendations for fire safety with food smoking kilns
  - Passed for press this week

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## Work in progress

- **RC44** - Recommendations for fire risk assessment of catering extract ventilation
  - To reflect changes to HVAC publication TR/19
- **RC64** - Fire safety in the manufacture, storage, use of biomass fuel pellets
  - Proposal approved. Work yet to start
- **RC65** - Fire Safety in 3D Printing
  - Initial draft reviewed internally and under update
- **RC66** – Fire safety management of composite panels
  - Proposal complete - work transferred to the Passive WG

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## Work in progress

### Existing documents prioritised for update

- **RC26** - Organic thermal fluid heating systems
- **RC15** - Use of portable and transportable space heaters
- **RC37** - Control of fire hazards arising from electrical lighting
- **RC61** – Recommendations for battery hazard controls
  - Update proposed to better consider the issues associated with lithium battery hazards

### New document proposed

- **Fire safety in electrical cables & firefighter safety**
  - Proposal considered and approved Sept 2016

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## Work in progress

### Other projects

- **Kitchen extract ductwork cleaning**
  - Towards development of an LPCB certification scheme for extract ductwork cleaning
  - All site research trials have been completed and BRE are considering validation of the scheme following feedback and amendment resulting from consultation
- **Working Group are supporting**
  - DECC Solar PV fire statistics and investigation project by IET (headed by BRE)
  - Development of the IET Code of Practice for Electrical Safety Management
  - Development of an approvals/certification scheme for Thermographers

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## RC62

- Provides guidance and background information on fire safety regarding the installation of photovoltaic panels on commercial and industrial premises
- Location and fitting of the panels on buildings
- Some aspects of electrical safety, where this has an impact on the prevention of fires
- Mitigation of the threat to life, property loss and business interruption
- Guidance on the safety of fire fighters, particularly from electrical hazards associated with the DC side of the installation
- Emphasis is made on the need for systems, including free standing arrays of panels, to be carefully designed, properly installed by competent persons and protected by suitable security measures

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### RC62 Key points

- **Planning**
  - Review the existing fire risk assessment at the planning stage to identify and eliminate fire hazards that may be introduced with the installation and use of PV panels.
  - Also review any assessment carried out in compliance with the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) as some elements of the PV installation represent potential sources of ignition. This may impact on the hazard zones.
- **Design**
  - Although economics may require the largest possible coverage of a roof with PV panels, a sufficient area of roof should be maintained free of panels to allow for safety during access and maintenance work
  - Where designs of new build premises include the integration of PV panels into the fabric of the building, ensure that the fire-related properties of the elements of structure remain compliant with building legislation.

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### RC62 Key points

- **Safety**
  - Provide a switch in a prominent location readily accessible to firefighters to isolate the DC side of the PV system near the panels to ensure the safety of firefighting personnel.
  - Be aware that PV panels produce DC current from daylight and other light sources, including street lighting and any floodlights, even if the AC side of the circuit is isolated from the mains electrical supply.
- **Following installation**
  - Do not allow hot work such as welding, flame cutting etc to be undertaken during the installation process or in the vicinity of PV panels following installation.
  - Following installation, contractors' operations involving work on roofs where PV panels have been installed should be subject to a permit to work.

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### RC62 Other issues

- PV arrays and unprotected cables must not straddle fire compartment walls
- Consider during the design phase for large free-standing arrays the potential for the land selected to flood in poor weather
- Consider roof loadings exerted by the panels and the possible additional weight of a build up of snow.

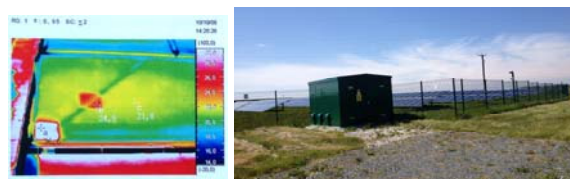


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### RC62 Other issues

- Thermographic examination recommended of the panels, inverters and other relevant parts of the installation
- Secure sites with large free-standing panel arrays with security fencing and CCTV
- Etch or otherwise permanently mark panels to aid identification if stolen

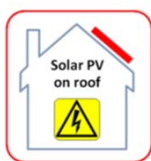


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### RC62 Other issues

- Ensure adequate access to the premises / roof is available for fire and rescue service
- Provide information
- Provide a 'fire service' switch to isolate DC side
- An array on a roof may not be obvious from the ground. Suitable prominent signage required.



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## RC60

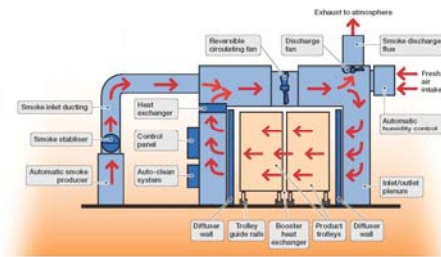
- These recommendations provide advice regarding the smoking of food both in a modern factory environment and with traditional kilns
- Good management of a process that involves the generation of smoke within the workplace
- The precautions that should be taken to minimise the frequency of false and unwanted fire alarm actuations associated with the procedures

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## Process

Essential elements of a smoke box



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## RC60 Key points

- **Comply with the law**
- Where significant quantities of fuel pellets are stored there is a danger of carbon monoxide being produced and thus an assessment should be undertaken by a competent person in accordance with the Dangerous Substances and Explosive Atmospheres Regulations 2002 (as amended in 2015).
- **Ensure the continued wellbeing of your business**
- Fire hazards and the threats to the business are increased where food smoking processes have to continue during the night or over weekends when few or no staff may be present. Consider implications when specifying equipment and when the fire risk assessment is undertaken.

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## RC60 Key points

- **Fire safety management**
- Keep stocks of combustible packaging materials in the food processing area to a minimum.
- Staff who work in an area where smoke is produced as part of a process should be trained in the use of the smoking equipment.
- Smoking equipment should be located in a fire compartment with a fire rating as agreed with the insurers of the property.
- Wood chips, sawdust and similar fuels for smoke generators should be stored outside the building with only sufficient material in the factory for the current work period.
- All ductwork, including exhaust flues, should be constructed of galvanized or stainless steel and fittings should be external to the duct to prevent introducing a grease trap within the duct.

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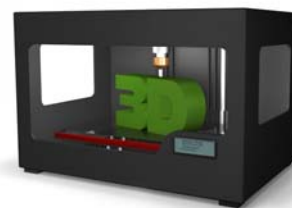
## RC60 Key points

- **Traditional smoking kilns**
- Where a smoking room is built as part of factory premises, it should be located on an external wall and open directly to the outside. Walls and structural elements between the smoking room and other parts of the premises should provide a fire rating as agreed with the insurer.
- **Fire protection**
- Areas in which food smoking is being carried out should be protected by flame detectors or detectors with multiple sensors that detect smoke, heat and CO so as to minimise unwanted fire alarm actuations.
- High temperature alarms are required in the ductwork, exhaust flues, smoke generator and smoke chamber.
- An automatic fire suppression system (steam, sprinkler or water mist) should be provided in the ductwork, exhaust flue, smoke generator and smoke box in.
- Effective cleaning of extract ducts and flues.

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## RC65 - Additive Manufacturing



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## RC65

- These recommendations have been produced to minimise the likelihood and consequences of a fire involving a 3D printing in commerce and industry.
- Applies to a wide range of printing processes and equipment utilising all forms of printing media.
  - Business Continuity
  - Siting
  - Fire safety management
  - Fire protection
  - Training of staff

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## Process

- The term 3D printing originally described a process that deposits a binder material onto a powder bed with inkjet printer heads layer by layer. More recently, the term is being used to encompass a wider variety of additive manufacturing techniques
- 3D printers build components by depositing thin layers of material and fusing them together by heating, often through the use of lasers
- The building material is typically fine, powdered metals, plastics, ceramics or glass
- The technology used by most 3D printers to date is fused deposition modelling, a special application of plastic extrusion

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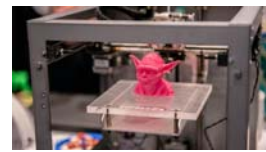


## Types

Process	Materials
Fused deposition modelling (FDM) or Fused filament fabrication(FFF)	Thermoplastics, eutectic metals, edible materials, Rubbers, Modeling clay, Plasticine, Metal clay (including Precious Metal Clay)
Robocasting or Direct Ink Writing (DIW)	Ceramic materials, Metal alloy, cermet, metal matrix composite, ceramic matrix composite
Stereo lithography (SLA)	Photopolymer
Digital Light Processing (DLP)	Photopolymer
Powder bed and inkjet head 3D printing (3DP)	Almost any metal alloy, powdered polymers, plaster
Electron-beam melting (EBM)	Almost any metal alloy including Titanium alloys
Selective laser melting (SLM)	Titanium alloys, Cobalt Chrome alloys, Stainless Steel, Aluminium
Selective heat sintering (SHS)	Thermoplastic powder
Selective laser sintering (SLS)	Thermoplastics, metal powders, ceramic powders
Direct metal laser sintering (DMLS)	Almost any metal alloy
Laminated object manufacturing (LOM)	Paper, metal foil, plastic film
Directed Energy Deposition	Almost any metal alloy
Electron beam freeform fabrication (EBF)	Almost any metal alloy

## Risks

- Unattended processes
- Malfunction
- Printing medium used
- Storage of printing medium
- Associated processes



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## RC65 Key points

- **Business Continuity**
- Plan carefully to avoid unnecessary disruption to the efficient functioning of the business.
- Consider also the computer software and electronic design files that drive the printers. Ensure they are duplicated off site and so are not lost in the event of fire. Primary samples should also be kept off site to allow them to be available for scanning if necessary.
- Fire hazards and the threats to the business are increased where processes continue during the night or over weekends when few or no staff may be present. Consider implications when specifying equipment and when the fire risk assessment is undertaken.

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## RC65 Key points

- **Fire Safety Management**
- Ensure process is functioning correctly before leaving to run unattended
- Consider need for earthing and bonding where a static electricity risk exists.
- **Location**
- Where running unattended of high risk in nature then site printers in separate fire compartment.
- Where in separate fire compartment, must not also be used for combustible storage
- No combustible materials to be stored near printers sited elsewhere.

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## RC65 Key points

- **Fire Protection**
- Suitable fire detection and alarm system installed in premises. Ideally linked to an ARC for monitoring out of hours.
- Consider the need for a suitable suppression system, particularly where process ins left to run unattended. The installation should be designed to minimise the likelihood of an unwanted actuation and thus the most appropriate detection method should be adopted; i.e. conventional detector heads, passive infra red or heat detectors, break-glass bulbs, fusible links or other suitable mechanisms
- In small enclosed printers proprietary fire suppression systems that take the form of a polymer tube linked to a pressurised container of extinguishing medium may be appropriate as they allow heat to be detected over a wide area and release the extinguishing agent directly onto the source of heat.

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## RC66 (as was!)

- Fire safety management of composite panels



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## RC66 - Principal considerations

- Whole life considerations
  - Selection, delivery, installation, management and demolition
- Consideration of fire safety, structural stability and other factors which may impact on a dynamic risk assessment undertaken by the fire and rescue service
- Means to non-invasive identification
- Potential hazards arising from the design and quality of construction with reference to joints, corners and avoiding the introduction of thermal bridges. Also, measures to avoid delamination of the panels.
- Measures that should be addressed when retrospective building works, refurbishments, refitting and installation of new services are being considered.
- Potential problems relating to exposure of the panels to the elements, prolonged heating, mechanical damage and their resistance to hazardous materials.

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## RC6?

Recommendations: Electricity and Fire Fighter Safety

- **Colleagues of two firefighters who died tackling a tower block blaze have welcomed a change in wiring regulations designed to prevent a similar tragedy**
- Jim Shears and Alan Bannon were overcome by excessive heat in Shirley Towers, Southampton, on 6 April 2010.
- An inquest found they had become entangled in fallen cables
- A change is being made to the British Standard regulation requiring electrical cables to be mounted in metal trunking instead of plastic
- The change was recommended by coroner Keith Wiseman following an inquest into the firefighters' deaths in 2013

*BBC Website*

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*Courtesy: Hampshire Fire & Rescue Service*

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## Principal considerations include

- Fire safety management of mains electricity with an emphasis on the routing of cables and periodic testing and inspections of installations and fixed equipment
- Stand-by generators: when and how they operate
- UPS systems and their operation
- Battery powered systems
- Hazards associated with PV panel installations
- Locating and isolating power supplies

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RC8: Recommendations for the storage, use and handling of common industrial gases in cylinders

RC49: Recommendations for the storage, handling and use of acetylene cylinders

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### Free to Download from RISC Authority website

- Free Document Library includes:
  - Risk Control, Building, Security and Business Continuity guides
  - Easy linking and sharing options
  - Over 30,000 document downloads in 2015
  - Printed versions sent to RISC Authority member companies

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### Top 12 Downloads in 2015

- RC7 Recommendations-for-hot-work
- RC48 Arson-prevention
- RC8 Recommendations-for-the-storage-use-and-handling-of-industrial-gases-and-cylinders
- RC16b Recommendations-for-fire-safety-in-commercial-kitchens
- RC18 Fire-safety-in-warehouses
- Code-of-practice-for-the-protection-of-empty-buildings-fire-safety-and-security
- Business-resilience-a-guide-to-protecting-your-business-and-its-people
- RC44 Recommendations-for-fire-risk-assessment-of-catering-extract-ventilation
- RC12 Recommendations-for-the-prevention-and-control-of-dust-explosions
- RC11 Recommendations-for-use-of-fork-lift-trucks
- RC19 Recommendations-for-the-storage-of-aerosol-products
- RC59 Risk-control-fire-safety-when-charging-electric-vehicles

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### Suggestions for New Guidance

Topics for new risk control documents welcomed:

- New and Emerging trends affecting loss experience
- Fill gaps in current loss prevention guidance
- Focused on industry and/or process

Email: [riskcontrol@riscauthority.co.uk](mailto:riskcontrol@riscauthority.co.uk)

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### Thank you for listening!

Howard Passey  
Principal Consultant, Fire Protection Association  
Convener, RISC Authority Risk Control Working Group

**Don't forget ...**

**RISC Authority London Seminar: 17.10.2016**  
*Royal College of Surgeons*  
Over 160 members registered to-date but bookings close 10<sup>th</sup> October

To view the programme and book online go to  
[www.riscauthority.co.uk](http://www.riscauthority.co.uk)

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### YOUR QUESTIONS???

Next Webinar topic

'Latest research on thatch fires and new guidance'

11<sup>th</sup> November 2016  
12:00pm  
Dr Jim Glocking

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