Fire Safety Technical Note

MECHANICAL, ELECTRICAL & PUBLIC HEALTH (MEP), UTILITIES, SERVICES, LABS & FIRE BRIGADE EQUIPMENT - DESIGN GUIDANCE

Contents

1.0 Introduction

1.1. This guidance note is provided by UCL the Client to Design Engineers, Consultants, Project Managers and Contractor Staff with general information and guidance in relation to design and interfacing of Mechanical, Electrical and Public Health (MEP) systems and other requirements such as firefighting equipment, lifts, fume cupboards etc.

This guide is to be regarded as a general statement of requirements these specific arrangements are in addition to relevant British Standards or any other instructions received from the Local Fire or Building Control Authorities. All requirements should be discussed at design stage with the UCL Fire Safety Manager.

2.0. MECHANICAL PLANT AND AIR HANDLING CONTROL EQUIPMENT

2.1. **Shut Down in Event of Fire** - generally air handling and other mechanical and electrical services would normally close down running on activation of the fire alarm system.

2.2. **Environmental Ventilation Systems** - increasingly, environmental ventilation systems (e.g. for atria) have dual use as smoke control management equipment as well. These systems require control / interface through Building Environmental Management Systems (BEMS) with the fire alarm. The system design will need recognise the dual function of the equipment and reacts appropriately to a fire alarm signal, where necessary.

2.3. **Mechanical Plant and Air Handling Units (AHU)** - generally mechanical plant and AHU shall be connected to the fire alarm system, the following UCL guidance should be provided and in discussion with the UCL Engineering & Maintenance and the UCL Fire Safety Manager where necessary:

(a). **General Automatic Reset** - when procuring equipment and systems, provide for **automatic reset of equipment** so that the systems re-start and/or come back on line/restart once the fire alarm panel has been fully reset. *[**Comment:** this ensures that there is the minimum disruption to services and the need for time consuming and costly maintenance staff to attend to physically reset and start equipment systems. This also elevates to some extent human fallibility, by ensuring that essential building services are not left shut down unnecessarily or forgotten about].*

(c). **Closedown Interfaces** - generally, design of systems should on activation of the fire alarm system close down all building plant and AHU, **with exception** of Fume Cupboards, Containment Labs and Biological Service Units (see below).

(d). **Boilers and Heating (Gas Operated)** - generally, it is prudent to **zone** the operation of gas valves to shut down boilers on activation of devices (detectors or any call points) within the specific plant room zone. This ensures that in buildings (and particularly in some critical areas) that heating is maintained and not closed down unless there is a specific event with the boiler, the room itself or any ancillary equipment or rooms specifically zoned. ***Comment** - Outside of these specific zones, any activation of heat detectors or a Manual Call Point should close down the system wherever operated, but not the operation of smoke detection in areas outside of plant / boiler rooms etc. unless a multi-detection activation takes place (double knock).*

(e). **Boilers and Standby Generators (Oil Operated)** - generally, oil fire system both boilers and standby generators will be fitted with local *'Kinsway'* (or similar) isolation systems using a heat source to melt the fusible link and release cables to shut down the oil supply weighted valves to shut off oil supplies and drain down of day tanks.

(f). **Mains Gas** - mains gas (and in certain circumstances other laboratory gases), should be provided with **Solenoid Isolation Valves** to shut down the gas supply on activation of the fire alarm system, which may be locally zoned as necessary. The valves should ideally have an auto reset that is a **self-proving solenoid type or similar function** in conjunction with the restarting of the plant or resetting the fire alarm panel, wherever practical.

(1). **Gas Laboratories** - where laboratories are provided with bench gas taps, these must be **self-closing (self-proving)** on loss of supply or pressure, so they will not allow gas to escape *(via unlit Bunsen burners for example)*, when the gas supply is reinstated.

(2). **Gas** - in certain circumstances, it may prudent to zone the operation of gas valves for conjunction with the fire alarm system so as to only shut down if a detector or input/warning device has activated within a specific zone.

(g). **General Key Operation for Fire Alarm Zone Isolation** - where practical, a separate **Key for Zone Isolation** of plant systems is to be provided interfacing with the fire alarm system, to allow for testing / maintenance activities to minimise disruption to ancillary or essential equipment. The key should be a **TOK1** type key.

3.0. FUME CUPBOARD (FC) DESIGN

3.1. **Fume cupboards** - discharge ducting *(with diameters typically between 250mm and 500mm dependent on type, number and setting out arrangements)* **should not** be fitted with internal fire dampers *(see **BS EN14175-2:2003**)*, but provided in fire resisting structure when passing through fire compartments, as any other service would.

- Generally a ducting may be constructed using:
  - **Rigid polyvinylchloride (PVC)** - this is the most widely used material where service temperatures up to 60°c, are envisaged;
  - **Polypropylene** - polypropylene may be used where service temperatures up to 90°c, are envisaged or where organic solvents in condensate form may be present as the material burns readily when ignited by flame and drips as it burns;
  - **Moulded glass fibre/resin laminate (GRP)** - GRP may be used for fume extract systems where a duct of high structural strength is required;
  - **Stainless steel and coated mild steel** - stainless steel and coated mild steel are used when very high air temperatures are envisaged giving some degree of fire protection.

3.2. **Fume cupboards (fire conditions)** - where fume cupboards are used, they will normally be provided with independent AHU / plant from the general building system. The design of these cupboard MEP systems **should not** close down on activation of the fire alarm under normal circumstances, **but kept running.**

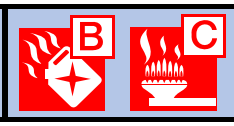
(a). Fume cupboards which continue running whilst other services close down should be provided with a **YELLOW** break glass type **'Firefighter's Switch' fitted/installed at 250mm below ceiling level,** to allow operational firefighters to close down the system if required after consultation.

- Locally on main stair landings or in firefighting stairs / lobbies or entrances to Labs off corridors / adjacent to the fire alarm panel in entrance to building installed at **250mm down from ceiling**;
- These switches should suitably labelled with the fume cupboard and laboratory location details etc. with fume cupboard vented MSC o ***'shut down Lab xxx on floor x'*** or similar;
- To be agreed with UCL Fire Safety Manager.

3.3. **No Requirement Fume Cupboard Fire Suppression** - low risk activities undertaken where no flammable materials used or activities generally confined to tissue culture in microbiological safety cabinets / hoods fume cupboards etc. then **no** fire suppression systems required.

3.4. **Installation of Fume Cupboard Fire Suppression** - should be considered where the processes and substances being used are of an organic nature and / or where rapid flame propagation is likely. Specifically, where the use of chemicals and processes (in table below - not exhaustive) are involved. Fire suppression system should be introduced at the design stage appropriate extinguishing agents for the chemicals or substances that are in generally use within the fume cupboards.

3.5. **Where fire suppression is required** - generally suppression media will be **Monnex**[1] a BC Dry Powder with *Class D fire suppression also available* *(subject to risk assessment for non-standard applications see Table 1 below)*.

Standard Application for Solvent fires: 	**Specialist Applications for Class D Flammable Metal Fires:** 
***Fires involving significant quantities petroleum or solvent based products;** **Note 1: *Monnex** *(see below)* extinguishing agent **is suitable** for dealing with Class BC fires, including a wide range of hydrocarbon oils, gasoline, diesel, fuel oils, liquefied gases like hydrogen, liquefied natural gas (LNG), coal gas, liquefied petroleum gas (LPG), alcohols, ketones, ethers & esters.	**#Fires involving: Sodium Metals# Pyrophoric materials# / Strong oxidising agents# / Metal Hydrides# / Magnesium$ / Titanium$, Aluminium$ / Lithium$** **#Note 2** - specialist-extinguishing agent for flammable metal fires available using low velocity discharge of L2 or M28 Dry Powder; **$Note 3** - specialist for flammable metal fires available using a new extinguishing agent suitable for a wide range of Class D risk, including Magnesium, Titanium, Aluminium and Lithium Fires called for Aqueous Vermiculite Dispersion (AVD) that is a water-based material with a suspension of vermiculite. It forms a foam blanket over the burning metal but is **not suitable for metals that do not burn as a liquid**.

1 MONNEX™ dry chemical powder is based on potassium bicarbonate / urea complex, which interferes with the chemical reactions occurring in the combustion zone, with high temperatures in the combustion zone causing the powder to explode or decrepitate, breaking down the powder into minute particles within the fire. This dramatically increases its surface area for rapid quenching of the free radicals that perpetuate the chain reaction of the fire, providing speed of control and fire extinction. It is suitable dealing with all Class BC fires, including a wide range of hydrocarbon oils, gasoline, diesel, fuel oils, liquefied gases like hydrogen, liquefied natural gas (LNG), coal gas, and liquefied petroleum gas (LPG). **It is also particularly effective against industrial chemicals like alcohols, ketones, ethers & esters, which conventional dry chemical powders find more difficult to knockdown**.

3.6. UCL has a preferred local fire suppression system for fume cupboards:

- **Pneumatically Actuated Fire Suppression System (PAFSS) by Jactone Products Ltd** (www.jactone.com).

FUME CUPBOARD FIRE SUPPRESSION:		
Jactone Products Ltd Springvale Business Park Springvale Avenue Bilston West Midlands WV14 0QL	PoC: Tel: Email: Web: YouTube channel:	Craig Halford (MD) 01902 357777 pafss@jactone.com www.jactone.com **jactone1**

3.7. A 'manual actuator' and fire alarm interface is to be provided for each unit system, which is can be used by operators to discharge the system in a pre-emptive way.

3.8. **Consultation** - potential FC installation of suppression systems should be discussed with the UCL Fire Safety Manager, to ensure that the correct suppression system is provided for the risk:

- **See UCL Fire Safety Tech Note TN038A** - available from the UCL fire safety manager for commercial reasons for specific FC suppression details and specifications;

4.0. CONTAINMENT / GMP LABORATORIES & SPECIALIST CLEAN ROOMS

4.1. Containment Laboratories (CL) & GMP and specialised clean rooms will be provided with independent AHU / plant from the general building systems. The design MEP of these specialist areas **should not** close down on activation of the fire alarm **but kept running in all circumstances**; however:

(a). these specialist areas while continue to run whilst other services close down **shall** be provided with a **YELLOW 'Firefighter's Override Switch' fitted / installed at 250mm below ceiling level** to allow operational firefighters to close down the system if required after consultation with specialist Lab Staff:

- switch location on main stair landings or in firefighting stairs / lobbies / adjacent to the main fire alarm panel;
- these switches should suitably labelled with the fume cupboard / CL Lab / Vented MSC and laboratory location details etc. to ***'shut down xxx in Lab on floor x'*** or similar;
- to be agreed with UCL Fire Safety Manage;
- see Switch options at Item 19 below;

5.0. GENERAL FIRE SUPPRESSION SYSTEMS

5.1. **Kitchen Fire Suppression Systems** - for large kitchens, UCL's preference in conjunction with users and our insurance risk managers an approved type and specification of fire suppression systems if required. Additionally, the fire suppression system will need to provide, suppression in ductworks above the kitchen ranges using:

- **Pneumatically Actuated Fire Suppression System (PAFSS) by Jactone Products Ltd** (www.jactone.com).

KITCHENGUARD - FIRE SUPPRESSION:		
Jactone Products Ltd Springvale Business Park Springvale Avenue Bilston West Midlands WV14 0QL	PoC: Tel: Email: Web: YouTube channel:	Craig Halford (MD) 01902 357777 pafss@jactone.com www.jactone.com **jactone1**

5.2. **Fire suppression systems (other areas)** - other areas that require protection will be looked at on an individual basis with the most suitable system provided - but should be discussed with the UCL Fire Safety Manager, in the first instance.

6.0. COMPUTER SUITES / BUSINESS CRITICAL AREAS / ARCHIVE STORAGE

6.1. **Fire Prevention Systems for Business Critical / Archive Areas** - instead of gaseous fire suppression systems for larger property protection areas such as Data Rooms, UCL requires fire-preventing technologies in the form of Oxygen Reduction (Hypoxic) atmosphere systems. **General suppliers are:**

- **Active Air Technology Hypoxic Air Systems** (www.wmfe.co.uk);
- **Wagner Fire Prevention OxyReduct®** system (www.wagner-uk.com);

6.2. All areas requiring protection will be looked at on an individual basis, with the most suitable and appropriate system being provided. These hypoxic atmospheres will be occupied working spaces with procedures, health screening and suitable risk assessments developed by UCL for this type of working environment.

- **Note** - all oxygen reduction master and essential control equipment must be connected to a **'Locked On'** power control unit (see Item 10 below).

6.4. **UPS Battery Backup (Isolation) Arrangements:**

- These back up devices often do not have any power isolation, as they are designed to filter current for spikes or activate with any disruption to power supplies. However, UCL experienced a fire in a computer frame room that was compounded by the UPS which could not be isolated, the UPS electrical supply current fed the fire causing difficulties to the fire brigade;

- Fire Brigade Switch (a manual override) shall be provided to shut off all electrical power to equipment, including the back-up supplies (UPS);

- See switch types at tables at **Item 19** below but will generally RED in colour and marked Fireman's Switch and in all cases, the functionality of this button must be unambiguous, therefore the isolation point must be clearly identified with its purpose in accordance with **Item 11** below;

- The isolation point should be located in a prominent accessible location and not obstructed, with final position to be agreed with fire safety manager and local stakeholders;

7.0. SMOKE & FIRE CURTAINS / SHUTTERS

7.1. From a practical solution, UCL as Client wishes project design teams to **avoid fire & smoke curtains / fire shutters wherever possible**, experience has shown that they are notoriously unreliable. ***Commentary*** *- often architects and designers want to open up spaces for aesthetic reasons with fire curtains being a convenient solution. However, fire curtains leave a legacy of ongoing and costly maintenance. Additionally, they also present a significant management burden, should they fail to operate correctly. This failure to activate would significant impact on the means of escape and the general fire strategy of the premises, leaving a management burden on UCL the Client and the occupying departments that may affect core business functions.*

7.2. Where there is no option but to install a fire curtain / fire shutter the in terms of specification then the emphasis **MUST** be on the quality in installation and ongoing maintenance. The following provides general guidance:

- To meet LPCB approved smoke curtains (**LPS1182**) requirements and tests for fixed fabric smoke curtains, fixed metal smoke curtains and powered smoke curtains;

- Fire curtains must achieve both Insulation and Integrity ratings of 60 minutes as well as a smoke rating (therefore suitable guiderails will be required) and should be PAS121 compliant;

- Must deploy on activation of a signal from a smoke detector, not a temperature based fusible link;

- There should be warning mechanisms in place to indicate its operation:

- to occupants when the curtain is descending (visually and audibly) with use of flashing beacons and alarm;
- Floors may need to be marked / lineated to identify curtain or shutter closing and operating path;
- furniture and other obstruction will prevent the path of the fire curtain, therefore prevention measures that would block its descent may need installing (i.e. beams that detects any object under the fire curtain);

- The curtain needs to be fail-safe in the closed position;
- There should be a manual override button facilities to open curtain;
- Some manufacturers we are aware of are noted below:
  - www.ascotdoors.co.uk (Shutters & Curtains);
  - www.coopersfire.com

7.3. **Approved Installer and Contractors** - all existing fire curtains and fire shutter equipment is installed, service and maintained through the following contactor:

- **Fisk Fire Protection Ltd** (www.fiskfire.co.uk) - have the contract and responsibility for the maintenance and servicing of this equipment and installation at UCL and it is essential to ensure that whatever is specified can be easily maintained;

8.0. FIRE FIGHTING AND FIRE BRIGADE SYSTEMS

8.1. **Sprinkler Systems** - where UCL has sprinklers provided in its premises:

(a). **Design** - any changes or alterations to existing sprinkler systems must be through an approved sprinkler design company.

(1). Design and maintenance of UCL sprinklers systems SHALL be to the latest edition of **British Standard BSEN12845** - and where appropriate or practical *Loss Prevention Council Rules for Automatic Sprinkler Installations 2009*;

(2). Sprinkler and smoke control design consultants:

- use **Osborn Associates Ltd** (www.osbornassociates.com) as our specialist consultants;

(3). Approved LPC sprinkler design and installation contractors:

- use **Argus Fire Ltd** (www.argusfire.co.uk) or;

- use **Hall Fire Protection Ltd** (www.hallfire.co.uk);

8.2. **Dry Rising Mains & Fire Hydrants** - where UCL has dry rising mains and private fire hydrants on its premises:

(a). **Design & Maintenance** - any changes or alterations to new or existing systems must be through an approved designer, installer, service and maintained contractor in accordance with:

- The latest edition of British Standard BS 9990;

8.3. **Approved Installer and Contractors** - all existing firefighting and fire brigade equipment is installed, service and maintained through the following contactor:

(a). **Fisk Fire Protection Ltd** (www.fiskfire.co.uk) - have the contract and responsibility for the maintenance and servicing of this equipment and installation at UCL:

(1). using **Dry Rise Services Ltd** (www.dryriserservices.co.uk) as our specialist contractor.

9.0. SMOKE CONTROL EQUIPMENT

9.1. Where specific smoke / environmental control has to be installed - also see Table / **Para 19** below:

(a). **General** - these systems must be provided by a UK based company for communality with other existing systems on UCL premises and ease of maintenance;

- The systems controllers and any software should be '**open protocol**' to ensure ease of maintenance;

(b). **Dual Function Vents** - should be installed and maintained in accordance with the prescribed building environmental and smoke control fire engineered solution;

(c). **Dual Function Vents** - where these vents have a dual smoke control / environmental function, they must have suitable controls in the form of a '***Fireman's Switch'*** to override the environmental condition, and be operated in their smoke control mode by the Fire Brigade;

(d). **Smoke Vent Controls** - initiating equipment will generally be identified as **ORANGE COLOURED- BREAK GLASS** and clearly marked (see below). Where manual smoke controls are provided then a local override is to be provided at the top of and entry point (or by the fire brigade control point) - to be discussed with the UCL Fire Safety Manager at design stage.

(e). **Sprinkler / Smoke Extractor Interface** - the primary initiation of smoke extraction fans where it forms part of sprinkler control measures, is to be initiated via the protected area's fire alarm system through a fail to safe connection and protected / enhanced cabling;

(f). **Equipment Operations** - all master and local smoke venting control systems equipment must be connected to a **'Locked On'** power control unit (see item 10 below);

9.2. **Approved Installer and Contractors** - existing UCL smoke vents and smoke venting control systems design & installation / ongoing maintenance from the following:

- **Maintenance - Fisk Fire Protection Ltd** (www.fiskfire.co.uk);

10.0. ELECTRICAL SUPPLY ISOLATION - CRITICAL FIRE SAFETY EQUIPMENT & SYSTEMS

10.1. Both life and business critical fire system must be able to maintain the power supplies and are vulnerable to accidental / malicious isolation. It is essential that these systems comply with the stringent requirements of latest edition BS EN 12101 - 2003 or equivalent.

10.2. Isolation equipment supplied to UCL to control and access fire safety / fire brigade isolation switches (***including smoke control fans, OxyReduct systems and mains electrical control enclosures etc.***) must use the following:

(a). **Suitable electrical supply and power control ratings** for the equipment it is being provided for:

- **Padlocking in both 'On' & 'Off' Positions** *(it is critical that all life safety equipment cannot be switched off inadvertently - a permit to work on these system will be provided)*;
- **Sealing to IP65** (*where appropriate*);
- Ratings to BS EN 60947-3;
- Captive lid fixing screws with security head;
- Enclosure material - Aluminium (LM6);
- Paint Finish:
- **Colour - Red (RAL3020);**
- Supplied with pre-finished steel mounting brackets, where required;
- Local isolation switches to be **Craig & Derricott - Enclosure Type B.**

(b). **3 phase** - where necessary 3 phase 'locked on' enclosure are also available for use with Oxygen Reduction equipment for example;

10.3. **Suitable Equipment Suppliers -** Craig & Derricott produce a range of switch disconnectors that cover the majority of UCL applications. Including,

isolating devices that have a 'High Temperature' range of switch that are purpose designed for this type of function, contact details as follows:

Craig and Derricott Ltd Hall Lane Walsall Wood Walsall, West Midlands, WS9 9DP	Email: Tel: Web:	sales@craigandderricott.com 01543 375 541 www.craigandderricott.co.uk

Craig & Derricott Enclosures (Lock on type)

11.0. INFORMATION AND INSTRUCTIONS - FIRE BRIGADE EQUIPMENT

11.1. In all cases, where smoke or other fire brigade controls are provided, then these controls, including main electrical panels, **MUST** be clearly identified through suitable signage / colour coding / simple explanatory diagrams, as appropriate.

11.2. Signs are generally to be **'Engraved Traffolyte'** type on a **RED** background with **WHITE** writing to fit onto equipment, to be provided with super strong bonding tape fitted to rear surface or screws as appropriate.

Fire Brigade - LAB xxx Fume Cupboard - Close down Switch

Fire Brigade - Containment Lab xxx Close down Switch

Fire Brigade Smoke Vent - Do Not Obstruct

Bespoke signs as required

XXBld NameXXXXXXXXX
(BLDG: 000)

SMOKE EXTRACTOR FAN CONTROL PANEL *(or as required)*

No works to this system without authorisation from the UCL Fire Safety Manager

12.0. TOXIC & FLAMMABLE GAS CYLINDER MANAGEMENT / CABINETS

12.1. The storage of toxic and flammable gases (particularly Hydrogen, Methane, Silane etc.) used in Laboratories require safety containment arrangements to prevent explosion or toxic substance release:

- *Highly Flammable or Toxic gas cylinders to be secured in a vertical position within a cabinet providing at least 60 minutes fire resistance conforming to EN 14470-2 Fire Resistant Gas Cylinder Cabinets with appropriate hazard warning signs displayed prominently;*

12.2. Guidance provided in the **British Compressed Gases Association (BCGA) CoP No 4** presents a calculation for the location of gas cylinders in an enclosed space (particularly Hydrogen), should be given careful consideration as to risk reduction measures to reduce the possibility of fire and explosion.

13.0. BULK FLAMMABLE LIQUID & SOLVENT STORAGE

13.1. Generic guide to the construction of bulk flammable storage based in containers in quantities of greater than 250 litres both internal and external storage facilities and is applicable to flammable liquids contained in metal, glass and plastic receptacles, drums, barrels, tins, IBCs (Intermediate Bulk Containers) etc.

13.2. This guidance provides M&E information of ventilation and electrical systems provided in **Explosion Proof (Ex)** / Intrinsically Safe enclosures for areas designated as meeting the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR).

- See design guide **UCL Fire Safety Tech Note TN109**

14.0. HIGH & PRESCRIBED VOLTAGE ELECTRICAL EQUIPMENT

14.1. Fire-fighters' Switches ***as required by the Regulatory Reform (Fire Safety) Order 2005 - Article 37*** - for prescribed 'High Voltage' apparatus consisting of laboratory equipment, Photovoltaic cell banks or luminous tube signs etc., designed to work at a voltage normally exceeding the *'prescribed voltage'*, or other so designed equipment. The *'prescribed voltage'* means:

(a). 1000 volts AC or 1500 volts DC if measured between any two conductors; or 600 volts AC or 900 volts DC if measured between a conductor and earth;

(b). No apparatus is to be installed unless it is provided a to a cut-off switch on the low-voltage side of the facility to be closed down in an emergency, normally through some form of '***fireman's' switch***.

(c). See UCL Fire Safety Technical Note **TN039** - for further information.

15.0. PHOTOVOLTAIC EQUIPMENT (PV)

15.1. There have been a number of reported instances of fires in photovoltaic (PV) installations and therefore PV installations on UCL premises should be considered carefully:

- The nature of the equipment, which includes direct electric current, poses an increased risk to maintenance and fire-fighting staff involved with the installation;
- There are also property protection implications, as the fire service may not fight a fire involving PVs;
- All green / brown roofs, gardens, decoration, plants, shrubs and general combustible materials should be considered as a potential fire risk where located in close proximity to the PV equipment;
- Where PV cells are to be installed, care should be taken to ensure that these are installed correctly to the manufacturer's recommendations due to concerns that have recently become known in regards to the fire risks associated with poorly fitted installations;
- Provide in all cases 'arc-fault' protection;
- Access for maintenance to the areas where the cells are situated needs to be considered, that it safe, that unnecessary 'man safe' system are designed out;
- **Fire Service Provision** - warning signs, shut down facilities and general information to be made available to the fire and rescue service on arrival;

- Consider application to photovoltaic (PV) bank cells have the potential to generate enough DC voltage for the equipment to fall under **Article 37 of the Regulatory Reform (Fire Safety) Order 2005**, (see Item 14.0 above);
- See UCL Fire Safety Technical Note **TN065** for UCL ERs on PV from the UCL Fire Safety Manager.

16.0. LIFT EQUIPMENT

16.1. Where lifts are provided, provision is to be made for the 'lift control systems' to be interfaced with the fire alarm system:

(a). **General** - lifts on activation of a fire alarm signal are to stop, return and park at ground floor or building entry level as appropriate; so they cannot be used unless there are fire brigade / evacuation 'control' override facilities provided, or the fire alarm has been reset.

(b). **General** - hydraulically operated lifts will ground at the lowest level on activation of a fire alarm signal, due to deign considerations and the need for the hydraulic pump to be operating / engaged at any other level above the lowest floor.

(c). **Fire Service Lift Override Switches** - some older lifts complying with *BS 5655* are fitted with a *'fireman's override'* - to be changed to Euro Key were appropriate:

(d). **Gallagher Security Staff Card Controls** - placing security card control onto firefighting lift must be designed carefully, so as not to prevent the 'fireman's' override from switching the lift into 'fire' mode and thus preventing the brigade from using lifts during an incident.

16.2. Firefighting / evacuation lift communications to be discussed with UCL Fire Safety Manager at design stage, but should comply with BS9999 in design and construction.

17.0. VENTILATION & DUCTING

17.1. Ventilation systems and ductwork can often be responsible for accelerating the initial spread of fire, for example between rooms within a fire compartment, and by the rapid dispersion of smoke and decomposition products.

In the event of a fire within a building, ventilation by natural or mechanical means can be used to limit the spread of these products, which could otherwise hinder or prevent escape and endanger the lives of the occupants or prevent effective rescue and firefighting. The selection of the appropriate measures for effective isolation of the ventilation system, that will confine fire, smoke and decomposition products within the building, in such a way that other areas are subject neither to fire attack nor to the spread of smoke and/or toxic gases, is essential.

17.2. All Building Service Engineers should take particularly care to follow the guidance contained in ***BS 9999: Annex W - Ventilation and Air Conditioning Ductwork.***

17.3. **Air Transfer Grilles** - air transfer grilles in fire doors / firewalls will not only allow air to pass through but smoke and fire also. It is, therefore, essential that to whatever fire door/wall a transfer grille is fitted, the fire and smoke resisting qualities of the door/wall must not be reduced as a result.

(a). Where a grille is fitted purely to resist the passage of fire and not to resist the combination of fire and smoke, a heat activated fire damper is usually acceptable. These are normally of the intumescent honeycomb or fusible strut type of operation.

(b). Where a grille is fitted to protect an **internal escape route** and, the only air transfer grille permitted is one that resists the passage of smoke as well as fire;

(c). This type of damper is electro-magnetically released by the activation of a smoke detector located on the risk side(s) of the door [e.g. a Gilbert Damper www.gilbertsblackpool.com];

- Air transfer grilles in fire doors should not be fitted higher than 1000 mm from the floor threshold;

(d). This type of damper must be provided with the facility of red and green indicating lights to show damper open (green) or damper closed (red). These indicator lights are to be fitted in all cases and located on side of door / wall (corridor) where the damper status can be clearly seen at all times.

18.0. GENERAL REQUIREMENT - PASSIVE FIRE PROTECTION

18.1. **Passive Fire Protection** - in all cases, Building Service Engineers and Contractors must provide appropriate passive fire protection for all works. Contingency sums to be provide to ensure that all new works are covered and additionally any failures of passive fire protection identified during the works is made good and reinstated as necessary (***See UCL Fire Safety Mandatory Instruction MI06/TN066***).

19.0. CONTROL & INITIATING EQUIPMENT

19.1. M&E controls for use by the fire brigade including smoke vent, plant close down or extraction override controls etc. are to be housed using a control switch labelled and positioned at the fire alarm panel or fire brigade control point. Generally, for UCL systems use the following Control Switches (or equivalent) with specific detail below at Table 1 - to be discussed with UCL Fire Safety Manager.

Table 1. Control & Initiating Equipment

Function	Type	Enclosure Colour	Key / Switch	Escutcheon Plate Markings
Use - KAC Alarm Company Ltd or **similar** (see: **www.kac.co.uk**) for products below:				
AHU Extract Override for Containment Labs (CL) / Fume Cupboards etc.	***Preference 1*** *- 9000 Series MCP Break Glass Series:* • ***Fume cupboards*** *installed @250mm below ceiling level;* ***Preference 2*** *–CL shall have key operated isolation located at 250mm below ceiling level to isolate specialist plant including FC/MSC with in CL area;*	**Yellow** **Installed @ 250mm below ceiling level**	**(1) MCP Break Glass FC only)** **or** **(2) Key switch with TOK 1 (Key CL3 Labs Only**	KAC Ltd Ref: **9000 or 9100** **Emergency Shutdown**
Simple Smoke Control Vents on Stairs (1 unit at top of stairs landing area & 1 x unit at base of stair or by other agreed location) & **Smoke Vent Override Controls** (by Fire Alarm panel)	***Preference 1*** *- 9000 Series MCP Break Glass Series –* ***Important*** *where break glass used MUST be programed so that resetting beak glass this closes AOV / MOV* • *installed @500mm below ceiling level;*	**Orange**	**(1) MCP Break glass (*to Open MOV*)** **or** **(2) Key switch with TOK 1 Key**	KAC Ltd Ref: **9000 / 9100**  **Smoke Vent Ventilation Staircases**
Plant Close Down	***Preference 1*** *- 9000 Series MCP Break Glass Series;* ***Preference 2*** *–where Equipment configuration requires: Key Switch - configured to:* (i). Normal (ii). All Off (iii). All Extract	**Yellow**	**(1) MCP Break glass** **or** **(2) Key switch with TOK 1 Key**	KAC Ltd Ref: **9000 or 9100** **Plant Shutdown**
Universal Security Hinge Cover	*KAC Ref – PS200* *Breakable Seals KAC Ref P056*	Any Unit	**Any Unit**	

Table 2. Control & Initiating Equipment

Function	Type	Enclosure Colour	Key / Switch	Escutcheon Plate Markings
These switches should be provided with a clear plastic cover = KAC Ref: **PS200 Plain Hinged Cover**				
Internal High Voltage (i.e. as used in) Lab Equipment	***(See TN037 Regarding prescribed Voltages and closedown of External)***	**RED**	**On Off (Locked or controlled)**	
Computer Suite UPS Isolation	***Preference 1*** *– MCP M8 Series MCP Break Glass Series - Red identified a Fireman's Switch ;*		**On Off (Locked or controlled**	
Emergency Door Release	***Preference 1*** *– MCP M8 Series MCP Break Glass Series;*	Green	**MCP Break glass**	 **KAC Ltd Ref: MCP M8**

Table 3. Control & Initiating Equipment

Note: Wording to be agreed or specific label ordered, where necessary

☑ **ORANGE is to be provide for local Fire Brigade smoke vent control switches in stair enclosures using break glass Only**

☑ **RED** to be used as fireman's isolation of High Voltage (internal) as per Chief Fire Officer's Association CFOA Data

☒ **RED IS NOT ACCEPTABLE** for local Fire Brigade smoke control switches