

Fires involving chimneys and ducting

New policy number: **834**
Old instruction number:
Issue date: **2 August 2013**
Reviewed as current: **13 June 2023**
Owner: **Assistant Commissioner, Operational Policy and Assurance**
Responsible work team: **Fire and Ops Support**

Contents

1 Introduction 2
2 Hazards 2
3 Planning 3
4 On arrival 3
5 Operational procedures 3
6 After the incident 5
7 Further reading 5
Appendix 1 - Key point summary - Fires involving chimneys and ducting 6
Document history 7

1 Introduction

- 1.1 The purpose of this operational procedure is to identify the hazards and risks associated with fires involving chimneys and ducting, and provides operational personnel with instruction and guidance for dealing with these types of incident.
- 1.2 Chimneys are traditionally non load bearing vertical structures containing an internal flue with a hearth at the base.
- 1.3 A flue is a passage for conveying the products of combustion to the outside atmosphere.
- 1.4 Most modern buildings are designed to include services such as air-conditioning, heating, fume and dust extraction. These services are carried in increasingly complex ducting systems that can run through voids, alongside utilities, across several floors or even through several premises. Ducting often runs horizontally as well as vertically and this can result in the outlet being some distance away from the inlet and in unpredictable locations in relation to a buildings size and layout.
- 1.5 Poorly designed, constructed and maintained extraction and ducting systems can pose a serious fire hazard. Once started fire and smoke can travel rapidly through a building via these ducting systems.

2 Hazards

- 2.1 Operational personnel are likely to encounter the following hazards when attending fires involving chimneys or ducting:
 - (a) **Working at height:** It may be necessary to tackle fires in chimneys and ducting from the roof of a building, this carries with it all the hazards associated with working at height. Internal ducting can be run at height inside premises and accessing this ducting presents similar working at height hazards.
 - (b) **Falling debris:** Chimney linings can spall away from the flue and fall internally into the hearth as can accumulations of soot, ash and dust. Brickwork and chimney pots can become unstable and fall to the ground during a fire. Chimney pots have also been known to break up explosively on the application of water.
 - (c) **Explosion:** Where ducting is used for the purpose of extracting dust, fumes or flammable gases the presence of a fire or even a single spark can lead to an explosion.
 - (d) **Heavy fire loading:** Fires in ducting are often associated with poor housekeeping or maintenance. This can lead to the accumulation of large quantities of grease and fat in ducting system which can in turn lead to rapid and unpredictable fire development.
 - (e) **Unexpected fire or smoke spread:** Fires in chimneys can spread through smouldering joists or concealed voids into unexpected areas of a property or adjacent properties. The path ducting takes through a building can be complicated and radiated heat from a fire in ducting can also lead to lateral or vertical fire development.
 - (f) **Hearth fires:** Building modernisations and conversions can result in the alteration or removal of hearth stones making them no longer fit for purpose. Fires lit in inappropriate fire places can lead to smouldering fires developing around hearths and in joists below the fireplace.

- (g) **Insulating materials:** Chimneys and ducting use various insulating materials for sound proofing and heat protection. This material may including fibrous lagging or loft insulation, asbestos and intumescent paints. During fire conditions, or when broken up, powder or dust may form a respiratory hazard.
- (h) **Electrical extraction systems or filters:** Electrical supplies to extraction system or filters can be compromised as a result of fire and lead to electrical shock.
- (i) **Damage control:** Application of water to chimneys or ducting to extinguish a fire can lead to significant damage following water run off contaminated by soot and grease.
- (j) **Unauthorised building works:** Ducting fitted during refurbishment can create unstopped holes and gaps through compartment and fire resisting walls, leading to rapid and more extensive spread of fire and smoke.

3 Planning

- 3.1 Operational intelligence should be gathered and recorded in accordance with Policy number 800 - Management of operational risk information.
- 3.2 In line with this policy, watch officers should assess the hazards identified for a premises or location and determine the level of risk by reference to factors such as size, complexity and layout. The contents, any processes carried out and occupancy should also be considered and the premises must be included within the operational risk database (ORD) as the premises risk assessment score dictates.

4 On arrival

- 4.1 The incident commander (IC) should ensure appliances are sited in a safe location away from any possible collapse and falling debris. The positioning of appliances should also allow access and egress for aerial appliances and specialist vehicles.
- 4.2 The IC should locate the responsible person for the premises, gather all relevant information and where possible obtain plans of ducting routes or chimneys.
- 4.3 The rapid and accurate location and identification of ducting routes will have a significant impact on the successful resolution of the incident.

5 Operational procedures

- 5.1 Where a fire involves ducting the IC should develop a tactical plan to inspect the full length of the ducting based on the information available from preplanning, early reconnaissance or details available from on-site staff.
- 5.2 Consider the early use of aerial appliances to gain safe access to chimneys or roof top ducting outlets to provide either a covering jet or an observation platform.
- 5.3 The IC must make every effort to obtain building plans to assist with tracking the route of ducting and should consider requesting a fire safety officer to assist with interpretation of these plans.
- 5.4 The IC must ensure that the entire length of the ducting or flue is thoroughly checked for fire spread. Breathing apparatus (BA) crews should utilise thermal imaging cameras to identify hidden fire spread, Policy number 893 - Thermal imaging camera ISG X380 – technical information.

- 5.5 Inspection and access panels should be identified. These may only be opened on the instruction of the IC, appropriate extinguishing media must be in position to cover possible fire spread. Where it is necessary to cut into the ducting to apply firefighting media similar control measures should be applied.
- 5.6 Fire dampers are automatic fire prevention systems used in heating, ventilation, and air conditioning ducts designed to prevent the spread of fire inside the ductwork through fire-resistant walls and floors. These systems usually consist of a shutter system with a thermal element which closes during a fire, isolating the fire. The IC should amend their plan taking into consideration any fire dampers that have actuated and the impact this will have on gaining access to the fire or the application of firefighting media. Fire safety officers can provide ICs with valuable information and support where these systems are fitted.
- 5.7 Where ducting systems have electrical powered electrostatic filters or extractors the IC must ensure they have been isolated if electrically conductive extinguishing media (water) is likely to come into contact with them during firefighting operations. The use of electrical gloves should be considered, these are not a substitute for non isolation of the power supply but are an additional safety measure.
- 5.8 Consider the isolation of other utilities such as gas.
- 5.9 If it becomes necessary to reset, override or isolate any built in engineered systems it is important that where possible the responsible person or senior fire safety officer (SFSO) is consulted. This is particularly the case for modern fire engineered buildings and larger premises where the incorrect operation of such systems can have an adverse effect on the fire or firefighting.
- 5.10 In the majority of cases chimney fires are not dynamic incidents requiring immediate action, therefore ICs should take time to identify the exact location of the fire, formulate a definitive plan to extinguish it and implement an appropriate damage control plan before firefighting operations commence. Whilst ICs are formulating this definitive plan they should ensure that if a chimney fire rapidly develops, as they have done on rare occasions in the past, they will be able to respond immediately.
- 5.11 Extinguishing methods will vary according to the type and size of the structure on fire. Where possible fire crews dealing with ducting or chimney incidents should extinguish a fire from the base of the structure.
- 5.12 The IC must be mindful of using the appropriate weight of attack and must balance the completing demands of using sufficient water to extinguish the fire and at the same time minimising damage caused by water run off.
- 5.13 When identifying the location of a chimney fire firefighters should not look directly up a chimney from the hearth because of the risk of falling burning soot or chimney linings. Personnel should utilise the chimney mirror provided in the chimney gear to inspect the lower portion of the flue. Policy number 791 - Chimney gear technical information.
- 5.14 The application of small quantity of water onto a fire in a hearth or at the base of a chimney will produce steam which can, if the fire is relatively small and close to the base of the chimney, be sufficient to extinguish the fire.
- 5.15 If the above technique does not extinguish the fire then the rose nozzle and chimney rods should be used as per the chimney gear Policy number 791 - Chimney gear technical information to target the application of small quantities of water directly onto the fire.
- 5.16 If the fire is in the upper part of the chimney or ducting then it may then be necessary to attack the fire from the outlet:

- (a) When applying water personnel must wear full structural firefighting personal protection equipment (PPE) and the IC should consider the use of BA to protect crews against steam and products of combustion being blown back when water reaches the fire. Equally personnel must not position themselves directly above, or in front of the outlet for the same reasons.
 - (b) A salvage plan should be in place at the base of the duct or chimney before firefighting commences. ICs should consider protecting the contents of a room by sheeting up, removing furniture to another location, folding back carpets etc.
 - (c) Where the fire is confined to the chimney or ducting, hose reel jets should be used to allow the branch operator more control and to limit water damage.
 - (d) The IC should consider the use of aerial appliances or line operations to ensure safe working at height. Policy number 979 - rescue – NOG.
- 5.17 Consider establishing external cordons with safety officers, inside and outside the building, to mitigate against the hazard of falling debris.
- 5.18 Where the risk assessment indicates issues which prevent the fire from being extinguished, the IC may decide to allow the fire to burn out. In these circumstances exposed risks must be covered with appropriate extinguishing media, and particular attention should be made to identify any possible fire spread utilising thermal image cameras.
- 5.19 Where there exists a risk that the fire has spread from hearths into surrounding joists a thermal image camera should be used to identify potential fire spread. It may be necessary to remove skirting boards, floor boards and carpets to facilitate this.
- 5.20 Before removing fibrous insulation material the IC should identify the material involved and consider seeking advice from a hazardous materials and environmental protection officer (HMEPO). In this circumstance respiratory protective equipment (RPE) must be considered. Policy number 739 – Respiratory protective equipment – operational wearer policy.

6 After the incident

- 6.1 Before leaving the incident the IC should hand over the premises to the responsible person. The IC should consider the following things in the handing over process:
- (a) Reporting damaged or defective site equipment.
 - (b) Breaches in fire stopping between compartments.
 - (c) Reporting failures in fire safety equipment that may compromise the building's safety.
 - (d) Highlighting areas of danger and the status of building utilities.
 - (e) If the building is under construction, it may be necessary to report issues to the HSE.

7 Further reading

- Policy number 893 – Thermal imaging camera –ISG X380 – technical information
- Policy number 739 – Respiratory protective equipment – water wearer policy
- Policy number 791 – Chimney gear technical information
- Policy number 800 – Management of operational risk information
- Policy number 979 - rescue – NOG

Appendix 1 - Key point summary - Fires involving chimneys and ducting

Information on task or event

- Importance of plans of ducting – consider fire safety officer to interpret plan and gather building construction information.

Information about Resources

- Consider early use of aerial appliances.
- Consider requesting a fire safety officer to assist with interpretation of plans.
- Thermal Image Camera.

Information about Risk and Benefit

- Falling debris both internally and externally.
- Dust or gas explosion in extraction ducting.
- Heavy fire loading due to poor maintenance.
- Unexpected fire or smoke spread.
- Insulating material; Asbestos etc.
- Unusual or unexpected electrical supplies.

Gathering and thinking

Objectives

- Protect property.
- Reduce fire spread - The IC must ensure that the entire length of the ducting or flue is thoroughly checked for fire spread.
- Isolate electrical/gas supplies.

Communicating

- Send the required message to control as per Policy number 518 – messages from incidents.
- The IC should locate the responsible person for the premises, gather all relevant information and where possible obtain plans of ducting routes or chimneys.

Controlling

- The IC should consider the use of aerial appliances or line operations to ensure safe working at height. Policy number 979 - rescue – NOG
- Consider establishing external cordons with safety officers, inside and outside the building, to mitigate against the hazard of falling debris.

Plan

- Tactical plan should include full inspection of ducting/chimney with a thermal imaging camera (TIC).
- Where possible extinguish fire from the base of ducting or chimney.
- If fire is tackled from the ducting or chimney outlet consider breathing apparatus (BA) to protect against steam and products of combustion.
- Consider damage control at early stages of the incident.
- Inspection and access panels should be identified. These may only be opened on the instruction of the IC, appropriate extinguishing media must be in position to cover possible fire spread.
- The IC must be mindful of using the appropriate weight of attack and must balance the completing demands of using sufficient water to extinguish the fire and at the same time minimising damage caused by water run off.
- A salvage plan should be in place at the base of the duct or chimney before firefighting commences.
- Where there exists a risk that the fire has spread from hearths into surrounding joists a thermal image camera should be used to identify potential fire spread.

Document history

Assessments

An equality, sustainability or health, safety and welfare impact assessment and/or a risk assessment was last completed on:

EIA	24/04/2020	SDIA	22/04/2020	HSWIA	21/04/2020	RA	12/03/2013
-----	------------	------	------------	-------	------------	----	------------

Audit trail

Listed below is a brief audit trail, detailing amendments made to this policy/procedure.

Page/para nos.	Brief description of change	Date
Page 2 & 6	Key point summary removed from page 2 and KPS flowchart added as appendix 1.	10/09/2014
Page 7	'Subjects list' table - template updated.	04/12/2014
Page 5, para 7	Reference to PN748 removed.	26/11/2015
Throughout	Reviewed as current with no changes made.	15/07/2016
Page 1	Owner title changed to reflect changes in organisational structure and governance due to the abolition of the London Fire and Emergency Planning Authority.	25/03/2019
Throughout	Changes to the policy that reference thermal image camera are now an ISG x 380. Impact assessments updated.	04/06/2020
Throughout	All cross references to cancelled policies have been updated.	08/03/2022
Throughout	Owner updated to Assistant Commissioner , Operational Policy and Assurance. Reviewed as current with no further changes.	13/06/2023

Subject list

You can find this policy under the following subjects.

Chimney	Chimney gear
Ducting	Firefighting - Buildings
Flowchart - Key Point Summary (KPS)	Hazards
Risk	

Freedom of Information Act exemptions

This policy/procedure has been securely marked due to:

Considered by: (responsible work team)	FOIA exemption	Security marking classification