NFCC
National Fire
Chiefs Council

Fire contaminants risk assessment –

Post fire incident

Ref no.:

Issue date:		Review date:		Issue no.:	

Description of activity/task/environment/role assessed

These risk assessments are provided as a suite to support services to identify hazards related to fire contaminants, assess the level of risk, and implement appropriate control measures to reduce exposure to a level that is as low as reasonably practicable (ALARP). Each fire and rescue service remains legally responsible for undertaking and maintaining its own suitable and sufficient risk assessments. When creating their own risk assessments, services should take into account local risk, operational context and incident type.

This risk assessment has been developed by the NFCC Fire Contaminants Working Group and has been subject to an independent quality assurance process undertaken by a qualified occupational hygienist from Bureau Veritas. This process has provided additional professional scrutiny of the assessment, including the identified hazards, exposure risks and proposed control measures.

NFCC recommends that this document is used as risk assessment guidance, in line with your service contaminants risks, and reviewed in accordance with your risk assessment procedures.

Fire contamination is defined as a mixture of toxic, irritant and carcinogenic chemicals, the composition of which varies depending on the specific materials burning and the fire conditions. They can be released in the form of particles which will include aerosols, dust, fibres, gases, and vapours.

Contaminants can move from the incident ground through a chain of environments, increasing the risk of secondary exposure if not controlled. This chain includes incident ground, fire appliances and equipment, premises, internal workplaces, welfare facilities (showers, kitchens, rest areas), personal vehicles, and ultimately homes. Breaking this chain relies on effective management controls.

This risk assessment provides best practice guidelines for control measures to mitigate toxic fire contaminants that personnel may encounter following fire and rescue activities. These control measures are intended to ensure that risks are kept as low as reasonably practicable (ALARP).

For the purposes of this risk assessment, PPE is defined as follows:

- **Standard full PPE:** Disposable nitrile gloves (double up), overalls, safety boots and eye protection. Disposable overalls to be considered dependant on task.
- **Structural firefighting PPE**: Firefighting tunic and leggings, firefighting boots, fire gloves, fire hood and fire helmet.
- **Lighter firefighting PPE:** Firefighting tunic and leggings, firefighting boots, fire gloves and fire helmet.
- **Respiratory protective equipment (RPE):** This is defined as self-contained breathing apparatus (SCBA), or a FFP3-rated mask. Tight-fitting RPE must be face fit tested, as per HSE INDG479 guidance.

The most effective way to manage contaminant risk is to prevent exposure in the first place.

Relevant legislation

- Health and Safety at Work etc Act
- Health and Safety at Work (Northern Ireland) Order
- The Workplace (Health, Safety and Welfare) Regulations
- Workplace (Health, Safety and Welfare) Regulations (Northern Ireland)
- Provision and Use of Work Equipment Regulations(PUWER)
- Provision and Use of Work Equipment Regulations (Northern Ireland)
- Management of Health and Safety at Work Regulations
- Management of Health and Safety at Work Regulations (Northern Ireland)
- PPE (Personal Protective Equipment) regulations
- Personal Protective Equipment at Work Regulations (Northern Ireland)
- The Personal Protective Equipment at Work (Amendment) Regulations
- Personal Protective Equipment at Work (Amendment) Regulations (Northern Ireland)
- Control of Substances Hazardous to Health Regulations (COSHH)

- Control of Substances Hazardous to Health Regulations (Northern Ireland)
- The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR)
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (Northern Ireland)

Activity / task / environment	Hazard and outcome	Risk groups	Best-practice control measures	Level of risk			Additional control measures to consider to further reduce risk
				L	S	R	
1. Reducing personal contamination following fire incidents	Ineffective decontamination procedures leading to unnecessary exposure to fire contamination. **Acute health effects:** Immediate or short-term ill health, including irritation, breathing difficulties, toxic effects, infection, serious injury or death. **Chronic health effects:** Long-term ill health including respiratory disease, skin disorders, organ damage, and other life-limiting or	A, B, C, D, F	Develop and adhere to a local fire contaminants policy. Develop appropriate fire contaminants awareness training and ensure all employees who may be exposed to fire contaminants complete the training and apply its principles in practice. Develop and adhere to local decontamination and cleaning procedures. Avoid contact with contaminants where possible to avoid cross-contamination. Use visual indicators, incident knowledge and gas monitoring to determine the level of PPE and RPE required. Wear appropriate PPE and RPE based on the activity and the level of contamination risk.				

	fatal health conditions.		Provide half masks or minimum FFP3-grade masks for all personnel who could be exposed to fire contaminants. Wear, as a minimum, a half mask with FFP3 filters or FFP3 dust mask with standard-level PPE whenever handling any contaminated items, including, equipment, PPE and clothing. Wear respiratory protection in line with any local standard operating procedures (SOPs), local risk assessments, manufacturer's instructions and HSE guidelines. Tight-fitting masks must comply with COSHH ACoP requirements (paragraph 16) and form an airtight seal around the wearer's nose and mouth. These requirements apply to all employees entering the risk area. Carry a spare set of workwear to change into before returning to station. Store this spare set in a sealed container, for example a bag. Where available, use disposable coveralls or suits if workwear is contaminated, and no spare workwear is available, disposable coveralls or suits should be used where available. Use disposable cleaning wipes to remove products of combustion from				

			the skin. Bag and seal used wipes appropriately and dispose of them on return to the station.				
2. Return to the workplace from fire incidents	Poor and ineffective decontamination procedures leading to unnecessary exposure to fire contaminants. **Acute health effects:** Immediate or short-term ill health, including irritation, breathing difficulties, toxic effects, infection, serious injury or death. **Chronic health effects:** Long-term ill health, including respiratory disease, skin disorders, organ damage, and other life-limiting or fatal health conditions.	A, B, D, F	Wear, as a minimum, a half mask with FFP3 filters or FFP3 dust mask with standard-level PPE whenever cleaning any contaminated items, including equipment, PPE and clothing. Ensure all employees that may have been exposed to contaminants go through full personal decontamination before leaving the incident ground. Leave any equipment that may have become contaminated, including PPE, outside for a minimum of ten minutes (where possible) to allow off-gassing. Establish suitable arrangements for the transport of contaminated PPE, clothing and equipment. Bag and seal any PPE, RPE, clothing or equipment that cannot be effectively decontaminated at the incident and place the sealed bag into an appliance locker, transport vehicle or compartment away from the main vehicle cab or passenger compartment. On return to station, carry out final cleaning and maintenance. Thoroughly				

			clean contaminated BA sets and any other equipment (such as thermal imaging cameras, radios and other items or equipment). Where applicable, ensure cleaning processes reflect the manufacturer's instructions. Clean lockers that contained contaminated equipment or other contaminated items on return to the station.				
3. Personal decontaminati on. (including but not limited to at fire stations, training facilities and workshops)	Poor and ineffective decontamination procedures leading to unnecessary exposure to fire contaminants. **Acute health effects:** Immediate or short-term ill health, including irritation, breathing difficulties, toxic effects, infection, serious injury or death **Chronic health effects:** Long-term ill health including, respiratory disease,	A, B, C, D, F	Implement procedures to prevent contamination transfer into clean areas. Use clear signage to mark clean and dirty zones. Provide suitable washing and showering facilities for personnel to decontaminate, including warm water, soap, towels and facilities to enable effective hair drying. Ensure personnel carry out full personal decontamination as soon as reasonably practicable following exposure. Provide clean clothing/footwear following decontamination.				

	skin disorders, organ damage, and other life-limiting or fatal health conditions.		Establish suitable arrangements for laundering and managing contaminated workwear. Inform and instruct personnel about contaminant risks and decontamination arrangements. Report and manage exposure events in line with service procedures.				
4. Handling PPE, RPE, equipment and clothing at station following a fire incident	Poor and ineffective decontamination procedures leading to unnecessary secondary exposure to fire contaminants **Acute health effects:** Immediate or short-term ill health, including irritation, breathing difficulties, toxic effects, infection, serious injury or death. **Chronic health effects:** Long-term ill health, including respiratory disease, skin disorders, organ damage, and other life-limiting or	A, B	Use, as a minimum, a half mask with FFP3 filters or FFP3 dust mask with standard-level PPE whenever handling any contaminated items, including equipment, PPE and clothing. Carry out on-scene decontamination of PPE, RPE or any other contaminated equipment to remove gross or loose contamination. If further cleaning is required, bag and seal PPE and equipment before transporting it back to workplace. Carry out a final clean at the workplace. Bag and seal any PPE, RPE and equipment that cannot be effectively decontaminated at the incident and place the sealed bag into an appliance locker, transport vehicle or compartment away from the main vehicle cab or passenger compartment.				

	fatal health conditions.		Inspect, clean and maintain any equipment or PPE that may have become contaminated in line with organisational procedures and manufacturers' guidance. Re-stow clean PPE that is not being sent for laundering or cleaning in a well-ventilated area. Ensure the laundering service supplier is adhering to a cleanliness standard, which is audited and follows the correct processes. Do not store firefighting gloves inside helmets, boots, pockets, or other enclosed parts of PPE. Wash firefighting gloves in line with local and manufacturers’ guidance. Wash firefighting fire hoods in accordance with local and manufacturers’ guidance Keep a log of all operational PPE washes and repairs, regardless of whether these are carried out through a managed PPE contract or local laundry system. Identify and designate an area of the fire station or fire and rescue service				

			premises for the cleaning of BA sets and re-usable RPE. Open bags containing contaminated RPE in a well-ventilated area. Wear appropriate RPE and a minimum of standard-level PPE when opening the bags. Replace half mask filters as stated in the manufacturer's guidance and local standard operating procedures (SOPs).				

12.Who could be exposed to the hazards? State identified persons at risk in column 3							
A: Firefighters	B: Officers	C: Instructors	D: Trainees	E: Control personnel	F: Non-operational personnel	G: Public	H:Other agencies

To be complete by fire and rescue services

Risk assessment sign-off	Name	Signature	Date	Review date
Risk assessment lead author				
Health and safety advisor				
Trade Union health and safety reps				
Accountable manager				

Risk calculator

Risk is the chance that harm will be caused by a hazard. It is measured in terms of severity, likelihood & population affected.

A simple approach to quantifying risk is to define measures of likelihood and severity such as the descriptors given below. This allows the construction of a risk matrix which can be used as the basis of identifying acceptable and unacceptable risk.

Likelihood x Severity = Risk

Risk matrix

	Likelihood				
Severity	**Rare (1)**	**Unlikely (2)**	**Possible (3)**	**Likely (4)**	**Almost certain (5)**
Catastrophic (5)	**5**	**10**	**15**	**20**	**25**
Major (4)	**4**	**8**	**12**	**16**	**20**
Serious (3)	**3**	**6**	**9**	**12**	**15**
Minor (2)	**2**	**4**	**6**	**8**	**10**
Negligible (1)	**1**	**2**	**3**	**4**	**5**

Risk bands and suggested response

Risk band	Score	Required response
Low	**1–2**	Manage through routine controls. Maintain controls and review if circumstances change.
Moderate	**3–4**	Proceed where existing controls are effective. Consider further reasonably practicable controls; record, monitor and review where appropriate.
High	**5–12**	Further risk reduction is required. Review controls and reduce risk so far as is reasonably practicable. Where a residual High risk remains, apply explicit management or command oversight and continue to review the risk.
Very high	**15–25**	Intolerable for planned or non-emergency activity: do not commence or continue until risk is reduced. At emergency incidents, only proceed in exceptional circumstances where there is a compelling operational benefit, no safer reasonable alternative, and the decision is appropriately authorised, recorded and continually reviewed.

Likelihood descriptors

Level	Category	Descriptor
5	**Almost certain**	Expected to occur repeatedly or in most comparable circumstances unless further controls are applied.
4	**Likely**	Expected to occur at some point in the activity or relevant exposure period; has occurred repeatedly in comparable circumstances.
3	**Possible**	Could occur; credible and reasonably foreseeable, including events known to have occurred in comparable fire and rescue operations.
2	**Unlikely**	Could occur, but is not expected where controls are effective; uncommon and normally dependent on a less common combination of circumstances or control failure.
1	**Rare**	Exceptionally uncommon but still reasonably foreseeable; would normally require unusual circumstances or multiple independent control failures.

Severity descriptors

Level	Category	Descriptor
5	**Catastrophic**	One or more fatalities; a health effect reasonably capable of causing death or materially shortening life; or multiple permanent, life-changing injuries or cases of ill health.
4	**Major**	Permanent or irreversible injury or ill health; significant long-term impairment or disability; or a serious non-fatal health effect requiring substantial treatment or prolonged recovery.
3	**Serious**	Significant but reversible injury or ill health requiring medical treatment beyond first aid, temporary absence or restricted duties, or a short- to medium-term health effect requiring clinical assessment or treatment.
2	**Minor**	Minor injury or ill health requiring first aid or limited treatment; short-lived symptoms; little or no time away from normal duties; full recovery expected.
1	**Negligible**	No injury or ill health, or transient discomfort requiring no treatment and causing no lost time or lasting health effect.