NFCC
National Fire
Chiefs Council

Fire Contaminants risk assessment –

Estates and premises

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 addresses the foreseeable hazards associated with fire contaminants within fire service premises and training environments. It sets out best-practice guidance for managing contamination and implementing suitable control measures to minimise exposure, reduce the risk of harm to personnel, and prevent secondary exposure through the transfer of contaminants within and beyond the workplace.

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. Working in the appliance bay	Secondary fire contamination from vehicles, PPE, equipment and appliance bay surfaces due to ineffective decontaminati on procedures. **Acute health effects:** Immediate or short-term ill health,	A, B, C, D, F, H	**For associated control measures, please also refer to the following fire contaminant risk assessments:** • **Post fire incident risk assessment** 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. Wash down any vehicle that has driven through a contaminated area outside the building before it enters the appliance bay or				

	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.		building. This includes washing the undercarriage, chassis and cab and lockers. Clean vehicles in a suitable location to avoid any cross-contamination with other water sources, such as water pits. Clean lockers that contained contaminated equipment or other contaminated items on return to the station. Clean the external surfaces of a vehicle to a visibly clean standard after attending an incident. Clean the internal surfaces of the vehicle to reduce secondary exposures, including the dashboard, steering wheel and seatbelts. Clean all equipment thoroughly as per manufacturers' guidance. Ensure vehicle stowage areas are well ventilated. Implement a routine schedule for regular cleaning, inspection and maintenance of service vehicles. Ensure all employees that may have been exposed to contaminants go through appropriate decontamination processes.				

2. Following decontaminatio n procedure.	Poor or ineffective decontaminati on procedures leading to cross-contamination and 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,	A, B, C, D, F, H	**For associated control measures, please also refer to the following fire contaminant risk assessments:** • **Post fire incident risk assessment** • **Operational frontline appliances and vehicles risk assessment** • **Support and other vehicles risk assessment** Ensure local contaminants policy includes details on the control of contaminants in the workplace. Ensure local contaminants control procedures include control measures relating to contaminants in the workplace. Establish and maintain procedures for the management of contaminated PPE. Ensure the incident commander or officer in charge determines the level of decontamination required, including arrangements for: • Bagging and sealing contaminated PPE before it leaves the incident ground • External PPE receptacles for professional laundry collection • Professional PPE laundering				

	including respiratory disease, skin disorders, organ damage, and other life-limiting or fatal health conditions.		• Professional cleaning of heavily contaminated fire helmets Implement procedures to prevent contamination transfer into clean areas. Use clear signage to mark clean and dirty zones. Ensure all station clean zones, including the kitchen, mess room, offices, dorms, and meeting rooms, are kept free of any contaminated clothing or equipment. Do not access clean areas while wearing firefighting PPE. Provide awareness training for all personnel on contamination risks and adherence to clean and dirty zoning. Use appropriate signage to inform all personnel, contractors and visitors as to which designated zone they are in. Clearly identify and keep clean any area where PPE or equipment is stored, serviced or handled, including PPE rooms and BA servicing areas. Establish effective cleaning procedures for any rooms that may become contaminated within fire and rescue service premises.				

			Minimise the time spent in dirty areas in line with risk assessments and guidance. 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. Allow only authorised service personnel to enter dirty zones. Make fire service personnel, contractors and visitors aware of the impact from contamination if entering areas that may be contaminated. Inform fire service personnel and contractors of the correct PPE to be used if working in and around contaminated areas. Where possible, ensure the work environment is well ventilated. Establish a cleaning schedule for each premises to ensure there is no build-up of contaminants in the working environment. Ensure suitable PPE is readily available and conveniently located to enable personnel to wear the correct protection for the task they are completing.				

			Locally manage drying areas to enable drying of non-operational items, including personal clothing, bedding, towels and other relevant items. Note that the separation of personal items and PPE items is vital for preventing potential cross-contamination. Ensure station management maintain station cleanliness through normal station activity, cleaning contracts and monitoring. Ensure regular health and safety inspections and audits cover the effective management of contaminants. Provide a clean space for anyone who is breastfeeding or expressing on station.				
3. Personal hygiene	Poor and ineffective decontaminati on procedures leading to prolonged exposure to fire contaminants effluent. **Acute health effects:** Immediate or	A, B, C, D, F, H	Ensure all employees that may have been exposed to contaminants go through full personal decontamination before leaving the incident ground. Avoid clean zones before having showered and carried out appropriate decontamination processes. Ensure all premises have facilities readily available for the effective decontamination of personnel. Provide suitable washing and showering facilities at stations and training facilities for				

	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.		personnel to decontaminate, including warm water, soap, towels and facilities to enable effective hair drying. Ensure contaminants particles are washed away and showers left in a clean state ready for the next user. Carry out a local assessment to ensure there are enough working showers available for the number of personnel to decontaminate as soon as reasonably practicable following return to station or completion of training. Allow personnel sufficient time to decontaminate. Ensure management support and encourage all personnel to decontaminate thoroughly before leaving the premises. Provide appropriate washing machine and cleaning solutions for personnel to be able to wash contaminated workwear on station. This should be a separate washing machine for non-contaminated domestic items such as tea towels, bedding etc. Provide clean clothing following decontamination.				

			Establish suitable arrangements for laundering and managing contaminated workwear.				
4. Fire station and workplace decontamination	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	A, B, C, D, F, H	Provide labelled external PPE containers at all premises where its likely personnel will be returning with contaminated PPE. Include external PPE containers in premises cleaning regimes and ensure they are cleaned out thoroughly as required to avoid a build-up of particulate matter. Establish appropriate laundering, cleaning and drying controls for PPE, in accordance with ISO:23616. Where required, provide suitable facilities for hanging PPE to allow off-gassing. Use an external location where practicable or, where this is not possible, a secure, well-ventilated area. Where equipment requires further cleaning at stations, open sealed bags and carry out decontamination in a well-ventilated, secure area. Wear, as a minimum, a half mask with FFP3 filters or FFP3 dust mask with standard-level PPE whenever handling any contaminated				

	including respiratory disease, skin disorders, organ damage, and other life-limiting or fatal health conditions.		items, including equipment, PPE and clothing. Inspect, clean and maintain any equipment or PPE that may have become contaminated in line with organisational procedures and manufacturers' guidance.				
5. BA servicing areas	Poor and ineffective decontamination procedures leading to cross-contamination. **Acute health effects:** Immediate or short-term ill health, including irritation, breathing difficulties, toxic effects, infection,	A, B, C, D, F, H	Identify an area of the station or fire and rescue service site for the cleaning of BA sets and re-usable RPE. Ensure the BA servicing area is well ventilated where possible. Use appropriate signage to inform all personnel, contractors and visitors about which designated zone they are in. Establish a structured and routine cleaning regime and ensure surfaces and workspaces are kept clean from dust and soot. Ensure BA sets are visibly clean of any contaminants before handling for inspection and maintenance.				

	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.		Wear, as a minimum, a half mask with FFP3 filters or FFP3 dust mask with standard-level PPE whenever handling any contaminated equipment. Follow appropriate hand hygiene after handling contaminated BA sets by washing hands and any other exposed area of skin with soap and water. Ensure personnel carry out full personal decontamination as soon as reasonably practicable following exposure. Return the BA servicing area to a clean standard following any activities with equipment that may be contaminated.				
6. Live fire training premises	Poor and ineffective decontamination procedures leading to unnecessary exposure to fire contaminants. **Acute health effects:** Immediate or short-term ill	A, B, C, D, F, H	Identify and establish zoning according to the level of risk from contamination, in line with local procedures. Use appropriate signage to inform all personnel, contractors and visitors about which designated zone they are in. Where it is not possible to prevent fire contaminants from entering buildings due to the building design, ensure all doors and windows are kept closed during training and that the associated risks and control				

	health, including irritation, breathing difficulties, toxic effects, burns, 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.		measures are documented in the relevant building risk assessment. Carry out regular air quality monitoring, either with an external provider or locally to identify potential exposures and review control measures to reduce risks to personnel working in office areas. Monitor the movement of the smoke plume and inform site management of any significant change in direction that could result in fire effluent entering buildings. Provide suitable facilities and procedures for the effective laundering of PPE contaminated during training activities. Ensure any washing machines provided have the appropriate backflow protection. Ensure the Officer in Charge (OIC) assesses the risk and determines the appropriate level of RPE for personnel who remain in contaminated PPE. Provide adequate training to personnel who are tasked with cleaning or loading buildings or containers where burns take place Carry out appropriate gas monitoring and wear PPE and RPE appropriate to the identified hazards, including as a minimum nitrile				

			gloves, safety footwear and disposable coveralls. Stow PPE in a well-ventilated area when not in use during training events to enable off-gassing.				

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.