NFCC
National Fire
Chiefs Council

Fire Contaminants risk assessment – Officers

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 an 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.

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.

Exposure to toxic fire contaminants can be direct, such as at an incident. Exposure can also be secondary, occurring via an unseen contaminated source such as a contaminated seatbelt, steering wheel, or other contaminated equipment.

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

Officers are personnel who attend incidents either in a specialist capacity or to provide a higher level of command dependent on the incident size, complexity, or both. Dependent on the service, they may either use dedicated marked-up vehicles only intended for fire service use or unmarked vehicles adapted for emergency response (lights and sirens) that are also authorised for personal use.

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. En route to incident (emergency response)	Exposure (including secondary transfer) to contaminants in service vehicles by inhaling. **Acute health effects:** Immediate or short-term ill health, including irritation, breathing	B	Keep attending vehicle windows and vents closed before arrival, including doors and lockers. Plan a safe approach route and rendezvous point: Ensure all attending personnel arrive upwind/uphill. Obtain advice from fire control on approach routes that avoid products of combustion where possible. Ensure vehicles are parked a safe distance away from the incident, and where practicable park upwind and uphill. Assess changes in weather conditions (wind				

	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.		direction) and impact on the dispersal of contaminants. Provide a safety briefing (for any pre-identified combustible /contaminants at site). Consider current situation and potential for future escalation. If multiple vehicles are in attendance, provide access guidance to oncoming officers.				
2. Carrying passengers (non-emergency)	Exposure (including secondary transfer) to contaminants in service vehicles by inhaling, ingestion,	B, F, G	Advise passengers of potential contaminants. Limit carrying non-fire service passengers in adapted domestic vehicles wherever possible. Wear clean clothes and footwear. Ensure officers and attending employees wear clean clothes and footwear. A spare				

	absorption/or injection. **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.		set of sealed clean clothes should be kept in the vehicle to change in to in the event of contamination.				

3. Vehicle design	Exposure (including secondary exposure) to contaminants in service vehicles by inhaling, ingestion, absorption or injection. **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		Ensure vehicle specification or design eliminates the need to carry operational equipment or PPE in passenger compartments (clean cab). Use wipeable or disposable seat covers where seats have cloth or fabric coverings. Ensure seat covers are cleaned or replaced regularly and immediately following potential contamination. Allow capacity to effectively stow PPE within the boot compartment for PPE (using airtight containers or bags). Specify HEPA filters where available.				

	respiratory disease, skin disorders, organ damage, and other life-limiting or fatal health conditions.						
4. At incident	Exposure by inhaling, ingestion, absorption or injection. **Acute health effects:** Immediate or short-term ill health, including irritation, breathing difficulties, toxic effects, infection, serious injury or death	B.	**For associated control measures, please also refer to the following fire contaminant risk assessments:** • **At operational incidents** Ensure vehicles are parked a safe distance away from the incident, and where practicable park upwind and uphill. Position personnel upwind and/or uphill of an incident wherever possible. Account for contaminant risks in initial dynamic risk assessment (DRA), ongoing analytical risk assessment (ARA), and environmental risk assessment (ERA). Establish decontamination zone and procedures at an early stage. Apply incident zoning:				

	Chronic health effects: Long-term ill health, including respiratory disease, skin disorders, organ damage, and other life-limiting or fatal health conditions.		• Inner cordon: clean, dirty, decontamination • Outer cordon: police (attending responding agencies) Ensure strict control of access to and within the inner cordon. Limit contact with obviously contaminated areas where possible, avoiding areas that contain potentially hazardous materials. Avoid direct contact with the face and mouth while on the incident ground. 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 or 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.				
5. Post incident	Exposure (including secondary	B	Wear, as a minimum, a half mask with FFP3 filters or FFP3 dust mask with standard-level PPE whenever handling any contaminated				

	exposure) to contaminants in service vehicles by inhaling, ingestion, absorption or injection **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,		items, including equipment, PPE and clothing. Wash vehicle at a fire service premises. Clean the external surfaces of a vehicle to a visibly clean standard after attending an incident. Vacuum the vehicle passenger and storage areas using a class H vacuum and clean internal surfaces to remove visible contaminants. Undertake routine cleaning to maintain vehicle cleanliness and operational readiness. Regularly check and maintain any air-conditioning or other filters. Bag and seal any PPE, RPE, clothing or equipment that cannot be effectively decontaminated at the incident. Place the sealed bag into an appliance locker, transport vehicle or compartment away from the main vehicle cab or passenger compartment. Establish suitable arrangements for transporting contaminated PPE, clothing and equipment.				

	organ damage, and other life-limiting or fatal health conditions.		Leave any equipment that may have become contaminated, including PPE, outside for a minimum of ten minutes (where possible) to allow “off gassing”. Implement a cleaning regime for contaminated storage containers. Launder contaminated PPE in line with service procedure. Provide suitable washing and showering facilities for personnel to decontaminate, including warm water, soap, towels and facilities to enable effective hair drying. Ensure personnel undertake personal decontamination as soon as reasonably practicable following exposure. Wear clean clothing following decontamination. Establish suitable arrangements for laundering and managing contaminated workwear.				

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.