Hazard

Unguarded edges

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Hazard - Unguarded edges

Hazard Knowledge

Firefighters responding to incidents may encounter unguarded edges around, for example, roofs, cliff edges, sink holes, docks and quarries. Guards around edges may have been severely damaged in an incident, as in the case of a serious fire in a high-rise building. The safety of crews in these situations should be of paramount importance to incident commanders.

An unguarded edge is generally defined as a floor, gallery, balcony, roof or area that people can access, and where there is no solid wall or raised rail of minimum 950mm high and no intermediate guard rail to offer protection from falling.

The work at height environment and the equipment and techniques used to overcome the inherent hazards will vary from incident to incident.

Most core work at height carried out by fire and rescue services will be on ladders and aerial appliances. Fall protection methods using harnesses are often used, such as rope access and rescue techniques, while wire equipment is used by specialist teams where necessary.

Control measure - Use appropriate work equipment

Control measure knowledge

Where it is not possible to avoid working at height near an unguarded edge then it is essential that a safe system of work is established. Where possible, a temporary physical barrier should be erected to provide collective protection to operational personnel. When the work at height environment is above ground level, ladders (for short duration tasks against stable structures) and mobile elevating working platforms (for long duration tasks and unstable structures) can be used to prevent the need to work near or on the unguarded edge. Such equipment may not be practical when the work at height environment is at ground level; for example, working at the top of cliff edges, sink holes, docks or quarries. Risk assessment should always determine correct equipment selection and deployment.

In any operation, sufficient measures should be identified or established to provide collective and personal fall protection to minimise the distance and/or consequences of a fall. Practical examples of collective protection include safety nets and soft landing systems where present (such as air bags installed close to the level of the work). Personal protection can include using rope-based systems that fall into three categories: work restraint, fall arrest and work positioning.

It is important that incident commanders select the most appropriate equipment and, where necessary, consider using supplementary equipment to add protection to the initial equipment and systems. Using items that will reduce uncontrolled or unexpected movement should also be considered.

Appropriate pre-use equipment and system checks should be conducted before personnel who will rely on work equipment for safety are deployed.

Strategic actions

Fire and rescue services should:

- Make appropriate work equipment available to prevent responders falling from height

Tactical actions

All personnel must:

- Use any work equipment or safety device provided in accordance with training and instructions

Incident commanders should:

- Select the most appropriate work at height equipment for the activities and hazards identified

- Use ladders for short duration tasks and request other equipment (e.g. aerial appliance) for other activities

Control measure - Use a secondary system or build in redundancy

Control measure knowledge

Using rope-based systems for access and rescue gives additional flexibility in certain operational environments but the same systems can be vulnerable to damage or failure. This can lead to catastrophic failure.

Poor selection of, or damage to, anchor systems, poor stowage/maintenance, incorrect system selection or operator errors can put personnel and casualties in danger. Using secondary systems to back up any possible system failure is therefore recommended and should be implemented wherever possible.

Redundancy should be built in to rope access and rope rescue systems, to act as a backup in case of failure. This can be done in many ways, but the most usual is to use a two-line system that starts at the anchors and works through the whole system to the operator and casualty.

Strategic actions

Tactical actions

Incident commanders should:

- Implement predetermined procedures and emergency arrangements at incidents involving working at height

- Use only personnel trained in the equipment and systems to advise or supervise work at height operations
- Ensure that work at height operating systems include an appropriate degree of redundancy

Control measure - Establish appropriate cordon controls: Work at height

Control measure knowledge

An inner cordon will be established to control the immediate scene of operations. The cordon must

take into account the specific factors associated with working at height, such as:

- Almost any object falling from height may cause injury. Personal protective equipment (PPE) should be worn inside the cordon but may not be enough to protect personnel from injury.
- The wind can have a dramatic effect on how far objects travel: for example, a karabiner with a sling attached will travel a considerable distance because the sling acts like a sail in the wind. Even with no wind, some objects will naturally plane away from a structure.
- The height at which work is taking place can have an impact on how dropped objects behave, particularly if the wind is involved and if objects strike the structure on the way down, causing them to bounce outwards.
- There is a risk that equipment may be tampered with, for example, anchors could be vulnerable if set up and then left unattended.

A range of issues must therefore be taken into account when deciding on an appropriate cordon. The unique situation and circumstances of each incident will inform the incident commander's judgment about the size of a cordon and whether the minimum cordons recommended should be increased.

The location and environmental conditions such as wind at the incident will need to be considered when establishing an effective cordon around a work at height incident, as these factors could affect the movement of an unsecured item falling from height. The type and shape of structure can also have an effect on the way that items may fall, for example very tall buildings can create specific wind conditions that can make items move laterally further than may be expected.

See National Operational Guidance: [Incident command](#).

Strategic actions

Tactical actions

Incident commanders should:

- Establish and control inner and outer cordons, taking into account items falling from height and wind conditions
- Secure any unattended fall prevention systems to ensure they cannot be interfered with

Control measure - Incident ground safety

Control measure knowledge

The incident command system is an all-hazards approach that provides the incident commander with a structure they can adapt to every incident. The system helps to achieve a safe and efficient way of organising people and equipment. The incident commander at the scene is the nominated competent person. They can delegate some responsibilities to others; however, they remain responsible for health and safety at an incident.

Providing risk-critical information at an incident is an essential part of the planning process. It has a direct impact on safety. A lack of risk information, or failure to pass it on, can have a critical impact on decisions made by an incident commander. See National Operational Guidance: Operations - Information gathering.

Safety briefings

It will be necessary to organise safety briefings. As the incident develops or where the risk of injury increases those briefings should be more comprehensive. See Communication.

Safety officer

The incident commander or sector commander may appoint a safety officer at any time. This person should have suitable competencies for the role. A safety officer at larger incidents may be designated as the safety sector commander from that time they will co-ordinate the role of other safety officers.

Safety within sectors

Sector commanders are responsible for the health and safety of people in their sector. Due to the demands at an incident the sector commander might nominate a safety officer to assist them.

Although each safety officer should report to a sector commander, organisation of the safety officer(s) will be managed by the safety sector commander.

Emergency evacuation and tactical withdrawal

The incident command system provides two formal means of withdrawing personnel from the scene of operations:

- Emergency evacuation

- Tactical withdrawal

At every incident, the incident commander will apply a command structure. They must establish a safe system of work. This should include a plan for emergency evacuation or tactical withdrawal.

The fire and rescue service retains responsibility for the health, safety and welfare of its personnel working in the risk area. It also has a duty to consider the effects of its actions on the safety of other people, including when undertaking emergency evacuation or a tactical withdrawal.

The plans they make should enable emergency evacuation or tactical withdrawal which:

- Evacuates people at highest risk while protecting escape routes
- Removes people from areas where the risk has become too high

Emergency evacuation is the term used to describe the urgent and immediate withdrawal of crews from a risk area.

The incident commander should inform everyone at an incident of the location of the muster point. At a prolonged incident the location of the muster point may change. They should ensure that everyone at an incident knows about this change. See The Foundation for Incident Command.

The evacuation should include a roll call at a suitable location. Additionally, the incident commander should make sure there has been a roll call of non-fire and rescue service personnel at the scene. Following an evacuation or an evacuation signal being given, no one should re-enter the hazard area without the permission of, or explicit instruction from the incident commander.

Where personnel remain unaccounted for after an evacuation, the incident commander will need to assess the risks and commence appropriate search and rescue procedures.

Tactical withdrawal is the term used to describe the systematic or staged withdrawal of crews from the risk area.

The incident commander may need to redeploy resources or move people from danger. This is a tactical withdrawal. They may also need to withdraw all or part of a sector. When a tactical withdrawal is taking place, an evacuation signal or full incident roll call may not be required. See The Foundation for Incident Command.

Provision of information

Provision of relevant information is essential to ensure safe operations. Command decision-making can be significantly affected if there is a lack of risk information or where information has not been passed on.

Fire control room operators will often be required to receive and communicate risk-critical

information. Where risk-critical information is included on the initial turnout details, it should be easy to identify.

Where specific risk information is available, incident commanders should ensure this is disseminated to all appropriate personnel on the incident ground. This may include provision of information between agencies or organisations.

Strategic actions

Fire and rescue services should:

- Ensure they take into account the need to meet health and safety legislation and regulations when developing their policies and procedures on structuring the incident ground.

- Have procedures for the withdrawal of personnel from the hazard area. These procedures should describe:

    - When each withdrawal type is appropriate
    - The method of implementing the withdrawal
    - The method of carrying out a roll call
    - The communications necessary when withdrawal has been instigated
- Additionally, they should include the actions to be taken when personnel are unaccounted for after the withdrawal, and the procedure for recommencing activity.

Tactical actions

Fire control personnel should:

- Ensure that risk critical information is communicated to the incident commander in a timely manner

Incident commanders should:

- Ensure that everyone on the incident ground is fully briefed on the current hazards, specific risks and control measures including other agencies and organisations

- Appoint suitably competent personnel at safety officers

- Instigate a safety sector at large or complex incidents under the control of a safety sector commander

- Establish and communicate the emergency evacuation and tactical withdrawal plan to everyone on the incident ground

- Establish an appropriate muster point and communicate its location to all personnel, and other responders if present

- Communicate the tactical withdrawal and emergency evacuation arrangements to all personnel

- Inform everyone at an incident of the location of the muster point

- Carry out a roll call of personnel at the scene following an emergency evacuation of responders

- Review situational awareness following an emergency evacuation or tactical withdrawal

- Commit only minimum number of essential personnel to hazard area

- Ensure that effective supervision of operational activity is maintained until the conclusion of the incident