



National Operational Guidance

Section Search



NFCC
National Fire
Chiefs Council

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Operating principles

There are four phases in every search and rescue scenario. Depending on the incident, they may be present to a greater or lesser degree. They are known by the 'LAST' acronym:

Locate

Access

Stabilise

Transport

These phases are the basis of a set of principles that may be applied at every incident requiring search and rescue operations. The nature and complexity of the situation should determine the levels of management and control applied to the incident and the scale of the search and rescue operations.

Fire and rescue services should be prepared to deal with this type of operation. Guidance for operational planning may be found in Section 7 of the government publication [Fire and Rescue Authorities, Health, safety and welfare framework for the operational environment](#).

The overall responsibility for search and rescue operations should rest with the appropriate (lead) agency and their representative. A competent person from the lead agency should be nominated as soon as possible in the operations to co-ordinate resources and activity around the search and rescue principles.

The requirement for search and rescue operations will usually fall into one of the following broad categories:

- Operations in the built environment, such as a fire in a building or a collapsed structure
- Operations in the natural (open) environment, such as unstable ground or a wide area search on land or water

Please note that an incident involving a confined space may occur in either of these categories.

Locate



- 'Locate' represents the search phase. This may be brief, in the case of a clearly identified casualty, or protracted, when the person is reported to be missing.
- Identify, record and mark the point last seen (PLS) or last known position (LKP), collectively referred to by UK search and rescue organisations and the police as the initial planning point (IPP).
- Record the casualty details and time at PLS or LKP
- Assess the situation in terms of significant hazards, operational activity and the required resources. Resources include personnel, personal protective equipment (PPE) and work equipment (including firefighting, rescue and communication equipment).
- Allocate tasks and brief operational crews on the working environment, hazards, tasks and communication method - enhance the briefing with visual information, such as suitable plans that have been annotated to provide clarification
- Take into consideration the resources available and, en route, consider what else may be required
- Establish search management records. Operational crews should landmark any recognisable features to:
 - Provide orientation, and therefore support. for effective briefing of crews
 - Support effective recording of the areas and compartments that have been searched
 - Communicate progress to inform the overall tactical plan
- If the casualty is not immediately located, a number of search phases may be identified and considered: primary phase, secondary phase, tertiary phase and so on
- Identify and employ a safe system of work throughout
- Ensure this information is communicated and included in the overall tactical plan

Access

- Start a dynamic risk assessment (DRA) and communicate the findings when the casualty is located
- Identify the agency with the appropriate capability to access the casualty
- Update search management records using progress and activity reports

Stabilise

- 'Stabilise' should involve stabilising both the situation and any casualties
- Stabilise the situation to reduce the risk to operational crews and prevent further harm to any casualties. Examples may include securing unstable structures or ground, or controlling a fire compartment
- Stabilise the casualty by physically isolating them from any immediate hazard with the potential to cause harm. Ideally, any hazard should be removed from the vicinity of the casualty. If the hazard cannot be removed the casualty should be moved to a place of (relative) safety
- Assess and secure the casualty following the <C> Ac B C D E approach

- Carry out casualty packaging for transport, extrication and rescue using, for example, a vacuum mattress, scoop stretcher or basket stretcher
- Prepare for transport and rescue
- Communicate progress to inform the overall tactical plan

Transport

'Transport' is the final part of the operation. It should provide the removal of any casualties to a place of relative safety and definitive care.

- It is important to remember that the casualty should be protected from any harm during this part of the operation
- Information that may be relevant and important for casualties to be safely and effectively transported should be passed to the responsible agencies. The hand over of accurate standardised information recognised by local medical responders is essential. An example of an acronym to ensure that this is done is ATMIST, details of which can be found in the Casualty care section of this guidance. Information transferred in this format should contribute to successful pre-hospital care.
- Operational crews, their personal protective equipment (PPE) and other equipment should be removed to a place of safety

End of the incident

Operational activities should be safely and effectively managed throughout the closing stage of an incident. A debrief should be conducted to identify best practice and lessons learned.

Guidance on incident debrief can be found in Section 12 of the government publication [Fire and Rescue Authorities, Health, safety and welfare framework for the operational environment](#).

See National Operational Guidance: [Operations](#) - Incident closure and handover



Hazard - Lack of co-ordinated search plan: All searches

Hazard Knowledge

Fire and rescue services may need to search for people in a variety of settings; this may involve wide area searches.



Additional hazards for specific search environments are provided in:

- Lack of co-ordinated search plan: Outdoor searches
- Lack of co-ordinated search plan: Unstable or collapsed structures
- Lack of co-ordinated search plan: Mode of transport

The lack of a co-ordinated search plan may present hazards including:

- An increased time taken to locate people, resulting in:
 - A deterioration in the condition of casualties
 - Needing to search in [reduced visibility](#)
 - Needing to search in worsening [weather conditions](#)
- A delay in finding people, which allows time for them to move away from their last known position (LKP); they may move due to factors such as:
 - The impact of the incident, such as firespread or flooding
 - Confusion
 - Seeking assistance
- An increased time to complete the search of an area, as a result of:
 - Duplication of effort, with the same area being unnecessarily searched more than once
 - Areas being searched out of sequence or being missed
- Difficulty in managing resources and equipment when searching, which could result in:
 - Deploying resources to search for people who have already left the area or building
 - Withdrawing resources from the area or building while people are still unaccounted for
 - Having insufficient resources or equipment to achieve the search plan



Control measure - Situational awareness: Search for a missing person

Control measure knowledge

The search for a missing person on land is the responsibility of the police. However, the fire and rescue service have a duty to protect life and could be the first to arrive at an incident that involves a missing person. The police should request fire and rescue service attendance if the incident involves fire. They may also request assistance for complex area searches. Other agencies may also request fire and rescue service assistance to search for a missing person.

Through a risk assessment made by the police, a category of risk will be applied that reflects the risk to the individual and the public. The risk assessment will dictate the level and speed of

response required, in addition to the level of police management and resources. For example, a high-risk missing person will require the immediate deployment of police resources, including a police search adviser (PoLSA) and informing the media.

At any search that requires a multi-agency response, the [JESIP Joint Doctrine](#) should be applied. Joint training and exercises help to establish roles and responsibilities when searching for people.

It is important to gain situational awareness when searching for a missing person, as this may improve the effectiveness of the search.

Information gathering

Point last seen (PLS) is defined as the last known sighting of a person; this may be based on witness information or visual evidence, such as closed-circuit television (CCTV).

Last known position (LKP) is defined as the most recent positive confirmation of a missing person's location. This may be based on physical indicators, such as property, clothing or tracks.

Depending on the information available, the police and other rescue organisations may use the PLS and LKP as the initial planning point (IPP); the area at which a search commences. However, if the PLS and LKP vary, a PoLSA or search co-ordinator may opt to base the IPP on only one of them.

When searching for missing people, the information gathered should include elements such as:

- The number of missing people
- The condition of each missing person, including their:
 - Age
 - Pre-existing health concerns
 - Injuries
- The potential impact on the missing person of the:
 - Location
 - Weather
 - Length of time missing
- The potential impact of the incident on the location of missing people, for example:
 - If they could have been thrown a distance away from the scene
 - If they could have moved or been moved away from the scene

Useful sources of information include:

- Registers
- Visitor books
- Roll calls
- Ticket information

- Instantly accessible closed-circuit television (CCTV)
- Lists of passengers, including public transport drivers or crew (refer to [Review passenger or cargo information](#))

These sources of information may not be accurate, especially if there is the potential for there to be unrecorded or unauthorised occupants, passengers or trespassers.

Signs of occupancy may also be a source of information about the numbers, condition or location of missing people. Based on the context of the incident, these could include:

- In modes of transport:
 - Child seats or 'child on board' signs
 - Disabled badges or mobility aids
 - Personal possessions
- Fastened seatbelts on unoccupied seats
- Windscreen damage, such as bullseyes
- In buildings:
 - Lights on
 - Closed curtains
 - Vehicles on the property or in an associated car park
 - Dogs barking

Recording information about people found

It is very important to gather information about people found at the incident, in order to eliminate them from the search. This information should include:

- Their name and description
- Where they were found
- Their current condition
- Their current location

The information gathered should be appropriately recorded and communicated to emergency responders at the incident ground and to the relevant control rooms, taking into account data protection requirements. This especially applies to the current location of people, as they may not want this to be divulged.

Search plan co-ordination and communication

Gathering and maintaining information throughout the incident will contribute towards the development of a co-ordinated search plan, as well as providing continuity when trying to find missing people. It will also help to determine the extent of the area needing to be searched, either by initial responders or as part of a multi-agency or National Resilience response. The search plan



should take into account external conditions, who is involved in carrying out the search, and the potential impact on missing people.

If survival guidance is being given, this should be co-ordinated between the incident ground and the fire control room. Survival guidance may affect the behaviour of people, influence where they can be found and provide a credible source of information about their location. It is also important that fire control rooms understand progress, to ensure the guidance they are providing to callers is accurate.

Co-ordination and communication between the incident ground and the fire control room may assist in providing relevant and timely information on the location and needs of missing people. This information should be communicated to all emergency responders at the incident, including police search advisers (PoISA).

Establishing a search sector may assist with the command of a complex incident. A search sector commander can gather information from multiple sources, such as the fire control room and incident command points. This co-ordination function can effectively manage the information received to:

- Determine its impact on search plans
- Assist with co-ordinating search activities
- Maintain a record of the people located or rescued, so that cross-checking can be accurately carried out, thereby ensuring all missing people have been accounted for

By providing the incident commander and fire control room with regular updates, the search sector commander can help them to maintain situational awareness and adapt their activities accordingly.

For further information about search sectors, refer to Incident command – [Sectorisation](#).

Strategic actions

Fire and rescue services should:

- Provide incident commanders with the means to access relevant information at search incidents
- Participate in joint training and exercises with other agencies to improve interoperability at search incidents

Tactical actions

Incident commanders should:

- Share and exchange information gathered about missing people with emergency responders and the fire control room
- Implement a co-ordination process for survival guidance being given by the fire control room
- Use the information gathered to develop and communicate a co-ordinated search plan
- Consider establishing a search sector with a search sector commander
- Liaise and co-ordinate activity with other emergency responders, including police search advisers (PolSA)
- Record and appropriately share information about people found with emergency responders and relevant control rooms
- Cross-check records of people found against those of people still missing



Control measure - Effective search management

Control measure knowledge

Areas requiring search

An effectively managed and co-ordinated search will ensure that a systematic and methodical approach is applied to the search area.

A primary search may be brief, for example in the case of a single unlocated casualty, or protracted and complex if it is for a missing person.

Splitting search areas into manageable boundaries early in the incident will contribute towards effective search management. It will also assist in improved identification of the areas that require

clearing by search activity.

Information sources, such as building plans, maps and geographic information systems (GIS), can help to co-ordinate searches. These visual aids can:

- Be used to illustrate areas that require searching
- Be annotated to indicate what areas have been searched
- Help to brief personnel
- Reveal hidden areas or access and egress points

A central search command point can be established to co-ordinate search elements, such as search information, communications and resources. This will normally be managed by the police, apart from building searches. Incident commanders should liaise with the police search adviser (PoISA) through joint briefings.

Personnel should landmark any recognisable features to provide orientation and support effective briefing.

Depending on the level of control required, incident location or complexity, the incident commander may establish a forward control point (FCP) to co-ordinate activity and information closer to the identified scene of operations.

Planning

Planning for the search and the required resources should begin en route, using maps, information from the fire control room and other emergency responders, and any available Site-Specific Risk Information (SSRI). Planning should also consider what may be required to assess the incident, any hazards and the necessary controls to carry out operational activity safely.

When allocating tasks, incident commanders should brief personnel on the working environment, hazards, tasks and communication methods. Briefings may benefit from the use of visual aids, such as suitably annotated plans or maps.

If the missing person is not immediately located, the use of appropriate search phases should be considered; primary, secondary and tertiary. These phases may increase levels of concentration, planning and the amount of resources and equipment required throughout, to methodically cover areas that require searching.

Defining the search area

To carry out a co-ordinated search plan, the best way of defining and subdividing the search area should be considered. If searching in the open environment, physical barriers such as rivers, drains and fences can be used to define search 'boxes'.



Establish clearly defined parameters for the search area and subdivide into appropriate sizes, depending on:

- Structure
- Terrain
- Natural features
- Type, size and number of modes of transport to be searched
- Type, size and number of buildings to be searched
- Available resources
- Line of sight
- Access and egress, including any restrictions or limitations
- Visibility and weather conditions

Once designated and briefed, search teams should confirm their understanding of the search area and provide regular updates to the incident commander. The search plan should be constantly reviewed based on the elimination of areas that have been searched, the resources available and the environment that emergency responders are working in.

Areas that have been searched

To prevent duplication of effort and potential delays in covering unsearched areas, there should be effective search co-ordination as the incident progresses. Live information sharing and debriefing of teams, on their progress against objectives and the extent of the areas they have covered, should be carried out and the results recorded. This may be achieved using communications, such as radios, and centrally identifying areas, rooms or properties that have been cleared.

Any areas that have not yet been searched should be prioritised and identified to subsequent or additional search teams as part of their brief.

A search co-ordination function can be used to manage the information, by helping to identify the areas that have been searched. This may be assisted by:

- Gathering information and annotating it on a search plan
- Using an agreed system to visually indicate the areas that have been searched
- Co-ordinating information received from callers via the fire control room
- Gathering debrief information provided by and to personnel

It should be recognised that a missing person may be avoiding being found and may intentionally move into an area that has already been searched.

Strategic actions

Fire and rescue services should:

- Provide personnel with the means to effectively co-ordinate, record and communicate search information

Tactical actions

Incident commanders should:

- Co-ordinate the search plan based on who is being searched for, the search area, conditions and resources available
- Implement a co-ordinated search plan, define parameters and sub-divide the area where necessary
- Brief search teams on search plan, search area and casualty information
- Liaise with police search advisers (PoISA) and other emergency responders
- Consider establishing, or having a presence at, a central search command point
- Consider establishing a forward control point (FCP)
- Constantly review the search plan based on the progress being made
- Identify sources of information that may assist with search planning or defining the search area
- Debrief teams following search activity and record outcomes to be shared with subsequent or additional search teams



Control measure - Primary search: All searches

Control measure knowledge

Prioritisation may be given to searching high-risk areas first, to eliminate them from the search efforts and to avoid an increased level of search resources in the latter stages of an incident. This may also be beneficial if weather conditions could worsen or visibility will reduce.

Searching large or complex areas may mean personnel are separated by large distances or physical barriers. Effective communication and clear lines of reporting are important to ensure safe working. A safe system of work suitable for each area of search should be confirmed and regularly updated; this information should be communicated and confirmed by all search teams and updated in written plans or risk assessments.

Incidents that require search activity can be dynamic, with a need to react to information as it is presented. Credible information may change a search plan and the actions of the fire and rescue service. Information may be received from the initial caller, witnesses, or relayed by the fire control room or other agencies.

The impact of planned or unplanned evacuation on searching should be considered. Appropriate resources and co-ordination should be considered to ensure searching is effective at incidents where simultaneous evacuation could take place.

If fire and rescue services have identified that there is potential for their involvement in co-ordinating a search or being involved in a co-ordinated search, consideration should be given to providing appropriate:

- Search equipment
- Communication methods for information and data sharing with other emergency responder agencies

Gather information from people leaving the incident

It is important to gather information from, and assess the condition of, people leaving the incident; there may need to be a cordon established around the location or building to support this.

The information gathered should include:

- Their name



- A description of them, including what they are wearing
- The location they have left
- The conditions in their original location and the egress route taken
- Whether they are aware of any people who cannot or will not evacuate, and their location
- Whether they have spoken to any emergency services control room

This information should be passed to whoever is co-ordinating the search to ensure resources are not used to search for people who have been found and to inform the ongoing search for people who are missing.

In addition to gathering information from people leaving the incident, an initial assessment of them should be carried out, including:

- Physiological condition
- Psychological condition
- Requirements for medical attention or shelter

This assessment may be carried out by any of the emergency responder agencies, with the information recorded and shared appropriately in the best interests for the welfare of the individual.

Multi-agency search response planning

As many searches involve a multi-agency response, the [JESIP Joint Doctrine](#) should be applied. As with all multi-agency activity, joint training and exercises help to establish roles and responsibilities for searches at incidents. Establishing memoranda of understanding (MoUs) with relevant agencies for search capabilities should be considered.

Strategic actions

Fire and rescue services should:

- Consider providing communication equipment suitable for wide-area searches
- Consider providing communication methods for information and data sharing with other emergency responder agencies
- Consider establishing memoranda of understanding with other agencies for search assistance



Tactical actions

Incident commanders should:

- Liaise with other agencies to prioritise search areas
- Consider the impacts of evacuation on search efforts, and put in place appropriate controls
- Gather information from people leaving the incident to update search co-ordination
- Assess the condition of people leaving the incident and consider their medical and welfare needs



Control measure - Lighting: Search and rescue

Control measure knowledge

Search and rescue incidents may need to be carried out in reduced visibility. For further information refer to Operations – [Reduced visibility](#).

Adequate scene lighting should be used to define safe routes and the scene of operations. This will help emergency responders to search for and rescue people in reduced visibility.

The duration of activity should be considered when selecting lighting. If appropriate, the use of battery-powered lighting that is silent and does not create exhaust gases should be considered.

Alternatives, such as generator-powered or vehicle-mounted lighting, may restrict movement and present additional hazards. The potential hazards of exhaust gases are of particular concern in restricted or enclosed areas, such as stairwells or confined spaces.

National Resilience may be able to provide equipment for incidents that require large scale lighting; requirements should be discussed with a National Resilience tactical adviser.

When determining the appropriate level and type of lighting:

- Consider how appropriate personal or scene lighting should be used



- Whether search activity will be static or likely to move
- Ensure adequate lighting resources are requested for the anticipated duration of the incident
- Ensure generators or vehicles are located at an appropriate distance from the scene of operations, to reduce the hazard of exhaust fumes or impact of noise
- Ensure lighting will last an appropriate duration, considering fuel for generators and life of batteries
- Lighting should be suitable for the environment, considering its power, weight and mobility; it should also be to an appropriate level of ATEX compliance for the atmosphere
- Whether individual torches may be necessary for personnel working beyond centralised lighting

Following a consistent approach when using lighting to indicate hazards and safe routes, will help emergency responders to navigate. This can be achieved by using colour-coded lights, for example:

- Red – Danger or hazard area
- Green – Safe entry or route
- Orange – Area of interest
- White – General illumination
- Blue – Specialist interest, such as structural monitoring equipment

A combination of colour-coded lights may be required.

These colour-coded lights vary to those used for water rescue or flood response, the details of which are provided in the [Department for Environment, Food & Rural Affairs \(Defra\) Flood rescue concept of operations \(FRCO\)](#) (page 38).

For further information refer to Operations – Safe system of work: [Reduced visibility](#).

Strategic actions

Fire and rescue services should:

- Have arrangements with agencies to request a range of lighting equipment suitable for use in search and rescue operations
- Consider providing lighting to consistently indicate the location of physical elements at an incident

Tactical actions

Incident commanders should:

- Request adequate lighting equipment that is appropriate to the location and hazards of search and rescue operations
- Consider using battery powered lighting for search and rescue operations
- Locate generators or vehicles at an appropriate distance from the scene of search and rescue operations
- Anticipate the duration of search and rescue activity to ensure lighting does not fail due to battery life or generator fuel requirements
- Consider requesting National Resilience lighting equipment for large scale search and rescue activity
- Consider the requirement for ATEX-compliant lighting at search and rescue operations
- Consider the use of colour-coded lighting to indicate the location of hazards or routes at search and rescue operations, and ensure all emergency responders are briefed on their meaning



Control measure - Thermal imaging or scanning: Search and rescue

Control measure knowledge

Thermal imaging can be used to search for people and can be of particular benefit in reduced visibility. A methodical system should be adopted when using thermal imaging equipment to search for people.

The heat energy radiated from people or objects, in the form of infrared waves, is picked up by thermal imaging equipment. This can identify the energy differences from the people or objects being scanned and convert the readings into visual images, which are based on the temperature differential. Residual heat, showing where a person has been, for example sitting in a mode of transport, may also be detected.

Images may be displayed in black and white or in a colour range. The manufacturer's information should be referred to for descriptions of how higher or hotter temperatures will be displayed on their equipment.

The use of thermal imaging equipment has operational limitations. Examples of these would be the detection of a heat source from people in the water, people with hypothermia or people hidden in areas with dense plant or tree growth.

Thermal imaging equipment may include:

- Thermal imaging cameras (TIC)
- Thermal imaging equipment fitted to aerial resources, such as:
 - Drones (classified as a type of [unmanned aircraft](#) by the Civil Aviation Authority)
 - Helicopters

Aerial resource thermal imaging equipment needs to be supported by a downlink, which personnel can view when searching for a person.

Strategic actions

Fire and rescue services should:

- Make arrangements for personnel to be able to use thermal imaging when searching for people
- Consider providing an appropriate size screen for the display of downlink data from thermal imaging equipment

Tactical actions

Incident commanders should:

- Consider requesting appropriate thermal imaging resources when searching for people, especially in reduced visibility

- Adopt a methodical system when using thermal imaging equipment to search for people
- Consider the limitations of thermal imaging equipment when searching for people



Control measure - Specialist resources: Search

Control measure knowledge

Search specialists can bring a wide range of skills and equipment to assist with searches. This can include resources from:

- Fire and rescue services
- National Resilience capabilities, including urban search and rescue (USAR)
- External resources, including Category 1 and Category 2 responders

When carrying out an initial survey, or while en route to the incident, consideration should be given to the benefits of requesting specialist search resources at an early stage. Resources could include:

- Canine search teams from:
 - Police
 - Fire and rescue service
 - Urban search and rescue (USAR)
- Aerial resources, including:
 - Drones (classified as a type of [unmanned aircraft](#) by the Civil Aviation Authority)
 - Helicopters
 - Audio or visual equipment

Strategic actions

Fire and rescue services should:

- Have arrangements with other Category 1 and Category 2 responders for mobilisation and co-operation at search incidents
- Maintain a directory of specialist resources for incidents

Tactical actions

Incident commanders should:

- Consider requesting appropriate specialist search resources
- Identify appropriate specialist search resources and the benefits of their attendance



Control measure - Aerial resources: Drones for search

Control measure knowledge

The use of drones (classified as a type of [unmanned aircraft](#) by the Civil Aviation Authority) may be beneficial at a wide range of incidents.

Further information about the use of drones at multi-agency incidents is provided in the JESIP publication, [Combined Tactical Air Cell \(CTAC\): The Management of Multi-Agency Air Assets](#).

Features and benefits of drones include:

- A similar search capability support as a helicopter, depending on airframe type and equipment grade, but with:
 - Longer available on-scene time
 - Less noise
 - Less downdraft
- Thermal imaging
- Night vision
- High-resolution zoom camera
- An instant video downlink that can provide an overview to personnel, and has the potential for being displayed in command vehicles or fire control rooms
- Allow information to be gathered from high-risk areas, without putting people at risk

If the use of drones could be beneficial for carrying out an effective search, they should be requested from the nearest and quickest source; this could be:

- A fire and rescue service, including through mutual aid arrangements

- National Resilience Fire Control (NRFC)
- Police
- Coastguard
- Other emergency services
- Voluntary search and rescue organisations, although they cannot fly them under the Civil Aviation Authority (CAA) exemptions granted to the emergency services

It will be necessary to brief the drone operator about their task, objectives and any hazards identified. Communication between the incident ground and the drone operator will need to be established and maintained; it may be necessary to provide the drone operator with communications equipment to support this.

The information gathered by using drones should be used to:

- Improve situational awareness
- Assist with risk assessments
- Inform search and tactical planning
- Provide up-to-date information to operational and fire control personnel
- Ensure personnel are available, ready and in the correct location to respond

Consideration should be given to the limitations of drones, such as the impact of weather conditions, and flight times being dependent on battery life.

Civil Aviation Authority compliance

All emergency services that operate drones must comply with the Civil Aviation Authority (CAA) guidance, [CAP 722 - Unmanned Aircraft System Operations in UK Airspace](#). The guidance helps agencies developing drone operations to identify the route to certification and outlines the methods of obtaining permission for aerial work, thereby ensuring all relevant requirements are met.

The publication highlights the safety requirements that must be met before a drone can operate in the UK. By gaining permission for aerial work from the CAA, emergency services can operate in areas not normally permitted to drones, such as urban areas.

The CAA have published an exemption for the emergency services, [Small Unmanned Aircraft - Emergency Services Operations](#). This exemption allows a more flexible, but still controlled, use of drones during an emergency operation, if an increased threat to life becomes apparent at short notice. It should not apply to longer-term planned or routine operations, when more detailed permission or exemption would be required. This exemption also allows emergency services to use drones for training in a controlled environment.

The publication provides up-to-date exemption details and information about the post-incident

reporting that may be required by the CAA after a drone has been deployed under the emergency services exemption.

Strategic actions

Fire and rescue services should:

- Establish arrangements with certified drone providers, and maintain a register of their search capability and how this can be requested
- Consider providing the means for downlink data to be appropriately viewed at the incident and in fire control rooms
- Consider improving and maintaining interoperability between aircraft providers or pilots, and fire and rescue personnel by organising co-operative training and joint multi-agency exercises
- Ensure drones are deployed appropriately and in compliance with Civil Aviation Authority (CAA) guidance

Tactical actions

Incident commanders should:

- Consider requesting drone resources to assist with a search incident
- Use the information gathered through the use of drones when planning and to improve understanding of the situation for operational and fire control personnel
- Consider providing communication equipment to the drone operator
- Brief the drone operator of the required task and objectives, and details of hazards identified
- Log details of when drones are used under the Civil Aviation Authority emergency services exemption
- Ensure personnel are available, ready and in the correct location to respond to information gathered by the drone



Control measure - Aerial resources: Helicopters for search and rescue

Control measure knowledge

Helicopters can be mobilised to assist in search and rescue activities including:

- Accessing stranded people
- Moving casualties
- Reconnaissance of inaccessible areas
- Providing an aerial view to inform and improve ground-level searches

The required capabilities should be considered when requesting helicopter assistance:

- Search and rescue helicopters – requested through the Coastguard:
 - Searchlight
 - Winch capable
 - Operate in a wide range of weather conditions
 - Surveillance capabilities, including night vision and thermal imaging
 - A range of logistical tasks, including transporting emergency responders
 - Fully equipped medical facilities
- Police air support – requested through the police:
 - Searchlight
 - Surveillance capabilities, including high-resolution zoom cameras, night vision and thermal imaging
- Helicopter Emergency Medical Service (HEMS) – requested through the ambulance service:
 - Searchlight
 - Advanced trauma care
 - Treatment and transfer of casualties

Limitations should also be considered when requesting helicopter assistance:

- Impact on the incident ground
 - Noise
 - Rotor wash that can disturb water, dust and other objects, and even turn over vessels
 - Present a hazard for personnel working in the vicinity of helicopters, especially if they need to land
- Weather conditions
- Visibility



- Location:
 - Physical features or hazards in the search area
 - Landing requirements, although decisions about access or landing arrangements will be made by the pilot
- Fuel supply and flying time

When requesting helicopter resources, the following information will need to be provided:

- Location of incident (grid reference)
- Description of the incident
- Nature of tasking, for example, rescue, reconnaissance, medical assistance, transport
- Number and location of casualties
- Hazards at the location, such as overhead power lines
- Weather conditions and visibility
- The resources on scene or en route to the incident

Once the helicopter is on-scene, it will be necessary to brief the pilot or aircrew about their task, objectives and any hazards identified. Communication between the incident ground and the helicopter pilot or aircrew will need to be established and maintained; the correct air channel will need to be used to support this.

The information gathered by using helicopters should be used to:

- Improve situational awareness
- Assist with risk assessments
- Inform search and tactical planning
- Provide up-to-date information to operational and fire control personnel
- Ensure personnel are available, ready and in the correct location to respond

Search and rescue helicopters

The Coastguard's Aeronautical Rescue Coordination Centre (ARCC) responds to requests for search and rescue helicopter assistance if there is a threat to life. Helicopters are mobilised by the ARCC from several sites around the UK. The ARCC manage the deployment and support of search and rescue helicopters, including identification of refuelling sites and arranging reliefs.

Further information is provided in the publication, [Working with the ARCC](#), which is hosted on ResilienceDirect.

Police helicopters

The police air support units, National Police Air Support (NPAS), Police Service of Northern Ireland Air Support Unit and Police Scotland Air Support Unit, can provide additional support, advice and

communication links.

Strategic actions

Fire and rescue services should:

- Ensure personnel know how to request appropriate helicopter resources and what information will need to be provided
- Develop mutual aid arrangements and emergency planning for joint working with local helicopter service providers
- Pre-plan to identify radio channels that can be used for ground-to-air communications at multi-agency incidents

Tactical actions

Incident commanders should:

- Consider requesting helicopter resources to assist with a search or rescue incident
- Ensure personnel understand the hazards of working in the vicinity of helicopters, especially if they need to land
- Use the information gathered through the use of helicopters when planning, and to improve understanding of the situation for operational and fire control personnel
- Establish and maintain communications with the helicopter pilot or aircrew
- Brief the helicopter pilot or aircrew of the required task and objectives, and details of hazards identified
- Ensure personnel are available, ready and in the correct location to respond to information gathered by the helicopter



Control measure - Request National Resilience resources: Urban Search and Rescue

Control measure knowledge

The National Resilience urban search and rescue (USAR) capability provides a response model that offers a range of predetermined mobilising options. When deployed, they can improve the response of local, cross-border and national resources and support the affected fire and rescue service.

The USAR response model is flexible, scalable and able to support timely decision-making, even when only limited information is available. This ensures there is an appropriate and proportionate response, based on the principles of predetermined and intelligent mobilising.

USAR response model

Response option	Description	How an affected fire and rescue service should request assistance
1	<p>Remote USAR advice from the nearest USAR hosting service.</p> <p>USAR TacAds should be contacted by their fire control room and a request made for them to contact the incident commander of the affected fire and rescue service.</p> <p>The TacAd will make an assessment based on the information provided by the incident commander and advise on the escalation to another response option if required.</p>	<p>Through mutual aid arrangements, between each service's fire control rooms, to provide a rapid and co-ordinated response to a USAR incident.</p> <p>If a USAR TacAd is not available, contact NRFC to request an alternative, making them aware of the initial request.</p> <p>The affected fire and rescue service need to inform the NRAT that a National Resilience asset has been deployed.</p>



Response option	Description	How an affected fire and rescue service should request assistance
2	Attendance at the scene by a representative of the most readily available USAR asset for capability advice, or deployment of specific components of the capability. For example, a USAR search dog team or search equipment.	Through mutual aid arrangements, between each service’s fire control rooms, to provide a rapid and co-ordinated response to a USAR incident. If the required USAR component is not available, contact NRFC to request an alternative, making them aware of any locally arranged deployment.
3	Attendance of a USAR unit, which can deploy to support operations with a full suite of personnel and equipment.	Through mutual aid arrangements, between each service’s fire control rooms, to provide a rapid and co-ordinated response to a USAR incident. If the nearest USAR unit is unavailable, contact NRFC to request an alternative, making them aware of any locally arranged deployment.
4	A group response is the deployment of five USAR units from the teams surrounding the affected fire and rescue service, which is known as a response zone.	As a deployment of this scale involves multiple fire and rescue services, the request needs to be made through NRFC. It will attract management and control from NRFC as detailed in the NCAF.
5	Attendance of a double group USAR response, which is ten USAR units from two response zones.	As a deployment of this scale involves multiple fire and rescue services, the request needs to be made through NRFC. It will attract management and control from NRFC as detailed in the NCAF.



**Response
option**

Description

**How an affected fire and rescue
service should request assistance**

Key to abbreviations in USAR response model:
NCAF [National Co-ordination Advisory Framework](#)
NRAT **National Resilience Assurance Team**
NRFC **National Resilience Fire Control**
TacAd **Tactical adviser**

USAR awareness

The affected fire and rescue service is responsible for ensuring that personnel have received appropriate awareness training about the [National Co-ordination Advisory Framework \(NCAF\)](#), and how to access specialist National Resilience capabilities. This is essential pre-incident knowledge for the affected fire and rescue service, as they are responsible for surveying the scene, assessing the impact of the incident and requesting appropriate resources.

Subject to appropriate risk assessment, actions to save life, prevent incident escalation or to provide humanitarian aid should not be delayed while waiting for USAR resources. Personnel should apply USAR awareness training and recognise the hazards associated with the type of incident. This should in turn be used to determine the limits of initial responder actions.

The primary focus for the USAR capability is to be equipped, trained and available to respond to large-scale events such as collapsed structures or major transport incidents.

The capability can also be used to support incidents including:

- High-profile searches for missing people
- Responses to extreme medical cases requiring technical rescue
- Support to other agencies, providing additional expertise and technical capability, such as confined space operations

USAR equipment includes:

- Visual search equipment
- Stand-off search capability
- Audible search equipment
- Structural monitoring equipment
- Canine search
- Breaking, breaching and cutting equipment
- Shoring equipment
- Lifting and moving equipment
- Safety equipment



- Communications equipment
- Lighting equipment
- Equipment for confined space operations
- Safe work at height equipment
- Medical equipment

Information required by NRFC for a group or double group response (response options 4 or 5)

The request to NRFC will prompt the mobilisation of National Resilience USAR resources from one or more hosting fire and rescue services. The NRFC should provide an estimated time of arrival; this information will assist the incident commander in determining what level of initial operational response is required.

If the incident commander believes that USAR assistance is required, they should provide the following information to NRFC:

- Incident location
- Type of incident
- The approximate number of people involved
- Scale of the incident:
 - Approximate size
 - Footprint
 - Number of floors
- Construction of the structure, if involved:
 - Light structure – light frame or traditional (un-reinforced) masonry construction
 - Medium structure – heavy timber, reinforced masonry, and modular concrete construction
 - Heavy structure – reinforced concrete or steel frame construction
- Initial location for a rendezvous point (RVP), strategic holding area (SHA) or multi-agency strategic holding area (MASHA) – for further information refer to the GOV.UK guidance, Multi-agency strategic holding areas: a guide

Additional information regarding the incident should be shared with NRFC and the USAR team, including:

- Number of people confirmed trapped or missing
- Occupancy – the possible number of people, likely locations and any complex requirements
- Occupancy type – children or adults
- Time of day – refers to the time of the event that caused the structure to collapse, which is a critical factor when combined with the number of people
- Information from witnesses about known trapped casualties, or last known position of potential casualties

- The use of the structure
- Possible cause of collapse, the current state of the structure (total or partial collapse) and potential for further collapse
- Main hazards and any involvement of damaged utilities
- What actions have already been taken and the current tactical mode
- Other emergency responder agencies present

Consideration should also be given to requesting other specialist resources; for further information refer to Incident command – [Specialist resources](#).

These requests are in addition to the need to send a [M/ETHANE](#) message.

Strategic actions

Fire and rescue services should:

- Ensure relevant personnel are aware of the National Coordination Advisory Framework and the National Resilience capabilities
- Have systems in place to request USAR advice and resources from the National Resilience Fire Control
- Ensure relevant personnel have an understanding of the National Resilience capabilities

Tactical actions

Incident commanders should:

- Establish the quantity and types of resources being provided and identify suitable locations for them – RVP, SHA or MASHA
- Establish the estimated time of arrival for the NR resources
- Consider requesting the attendance of other specialist resources



Control measure - National Resilience: Urban search and rescue team arrival at incident

Control measure knowledge

The process for booking-in on arrival at the assigned rendezvous point (RVP), strategic holding area (SHA) or multi-agency strategic holding area (MASHA), will depend on the urban search and rescue (USAR) level of response; this could be a single unit or group response.

USAR single unit response

The designated unit leader will report to the incident commander and hand over a copy of the 'USAR 01 Unit Fact Sheet Form', which provides an overview of the USAR modules, personnel deployed and their specialist skills. A second copy of the form should be handed to the USAR tactical adviser (TacAd) or group response co-ordinator. A third copy is retained by the unit.

USAR group response

USAR units should report to a pre-determined RVP, SHA or MASHA. USAR teams will book in using the standard process with information on personnel, vehicles and modules being captured on the asset management tool (AMT); this may be via the enhanced logistics support (ELS) team if in attendance. 'USAR 01 Unit Fact Sheet Form', should be handed to the USAR group response co-ordinator, or USAR co-ordination cell upon arrival at the incident ground.

The ELS team will retrospectively capture information for any units that are sent straight to the incident.

Fire and rescue service briefing

When the USAR capability arrives at the incident an initial plan of action (POA) should be provided by the affected fire and rescue service. This should support the carrying out of rapid USAR operations.

The following should be included in the initial POA:

- Details of potential worksites – size, nature, scale
- Numbers of people trapped or missing
- Allocated escape routes, RVPs or marshalling areas
- Presence and status of significant hazards, such as utilities

- Allocated location for USAR vehicles and equipment
- A fire and rescue service point of contact name and number
- Details of the incident command organisational structure
- Information on any specialist advisers or investigating organisations requested or in attendance, for example:
 - Structural engineers
 - Health and safety regulatory bodies
 - Environmental agencies
 - Local authorities
 - Transport enforcing authorities

USAR co-ordination cell

As USAR becomes more embedded into the incident, a USAR co-ordination cell (UCC) will be implemented.

The primary function of the UCC is to:

- Support the affected fire and rescue service incident commander
- Provide leadership and management for the USAR group response

The role of the UCC is to act as a focal point for all USAR operations, to support the management of the incident. It will be staffed by the TacAds from the units attending, but can be supplemented by the wider national USAR tactical adviser cadre if necessary.

All information relating to USAR operations will be held in the UCC, including:

- Plans
- Worksite information
- Copies of risk assessments
- Unit fact sheet (personnel accountability)
- Assignment or tasking information

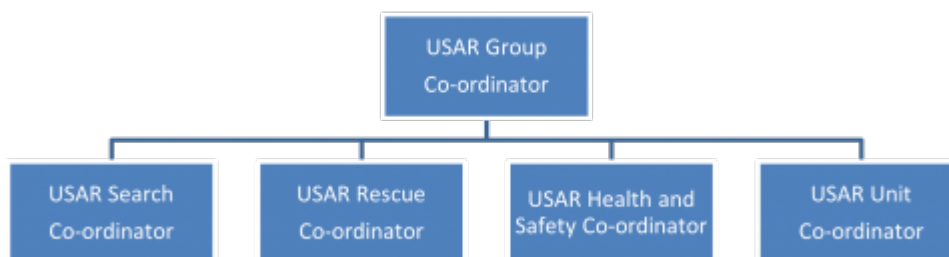


Figure: Diagram showing the USAR co-ordination cell structure

Strategic actions

National Resilience should:

- Provide USAR guidance material and supporting documentation for completion by specialist responders

Tactical actions

Specialist responders should:

- Report to the rendezvous point, strategic holding area or multi-agency strategic holding area and book in
- Receive the initial plan of action, and agree a USAR Tactical Work Plan with the incident commander prior to deploying
- Support the management of the incident by implementing a USAR co-ordination cell (UCC) if required



Control measure - National Resilience: Urban search and rescue work plan

Control measure knowledge

To manage the delivery of the USAR function on behalf of the incident commander, a USAR TacAd should liaise with the incident commander to develop a USAR work plan. This level of support will increase with any escalation of the incident unless or until a USAR co-ordination cell (UCC) is implemented.

The urban search and rescue (USAR) tactical adviser (TacAd), unit leaders or UCC should develop and implement search and rescue strategies and tactics. These are detailed in a USAR work plan

and recorded on 'USAR 02 Tactical Work Plan Form'. The USAR work plan should be discussed and agreed with the incident commander, and be consistent with the overall incident objectives and action plan to ensure:

- There are suitable arrangements to ensure the safety of all personnel, including the deployment of structural monitoring and its results and nomination of a USAR safety officer.
- Prioritisation of rapid casualty extrications where possible
- Effective management and co-ordination of USAR operations
- Effective and documented dynamic and analytical risk assessment
- Improved use and co-ordination of USAR resources and specialist personnel
- Provision of a clear overview for all responding agencies
- Assistance from other agencies, such as structural engineers, is incorporated into the USAR response
- The provision of simultaneous 24-hour multiple-site search and rescue operations

The USAR work plan is used to identify the operational objectives for a work period, including the number of operational sectors and work sites to which USAR resources will be deployed. USAR operations will be conducted by using the assessment, search and rescue (ASR) levels as a framework, with the addition of specific objectives if required.

The USAR unit leader or group response co-ordinator should advise the incident commander when each of the objectives of the plan has been carried out. However, it is likely that ASR levels may run concurrently across multiple sectors, dependent on the size and scale of the incident.

ASR levels are a key element of the USAR co-ordination methodology, being a means of clearly identifying and defining every level or type of work needed during a major USAR response. This can range from the initial assessment through to body recovery or site clearance.

ASR levels are primarily used by USAR teams to define operational levels and needs for specific worksites, allowing the UCC to manage planning and tasking of USAR team workloads, and logistical and relief requirements. The implementation of ASR levels, as USAR becomes more embedded in the incident, will support the incident command structure while working through the six stages of rescue.

Strategic actions

National Resilience should:

- Provide USAR guidance material and supporting documentation for completion by specialist responders

- Provide resources to facilitate simultaneous 24-hour multiple-site search and rescue operations
- Maintain a register of other agencies that may be able to assist with USAR operations
- Request assistance from other agencies if required, using agreed protocols

Tactical actions

Specialist responders should:

- Liaise with the incident commander to develop a USAR work plan
- Advise the incident commander when each of the objectives of the plan has been carried out



Control measure - National Resilience: Carry out urban search and rescue logistics management

Control measure knowledge

USAR initial logistics area

Due to the potentially protracted nature of an incident involving urban search and rescue (USAR) operations, large amounts of specialist modules and equipment are required to support activities. To facilitate this, a USAR initial logistics area will need to be established in order to enable the prompt availability of tools, equipment and consumables. The incident commander should be advised of this USAR requirement, along with an estimate of the size of area that will be needed.

In the early stages of an incident, the establishment and management of a USAR initial logistics area will be carried out by the first USAR units to arrive at the affected fire and rescue service, through liaison with the incident commander. The USAR initial logistics area consists of a series of demounted USAR modules and air shelters that provide a principal point for the management of equipment being checked into and out of the area.

USAR personnel are trained to carry out procedures relating to equipment issue, tracking and retrieval, as outlined in the USAR Guidance Note: Logistics and Accountability (which is available on the National Resilience website). Two technicians will be appointed as the initial logistics team; this will allow a basic function to be established at local or cross-border incidents. However, for national incidents involving a single or double group response, a USAR logistics management team (LMT) will be deployed from an unaffected USAR group.

USAR logistics team

The USAR LMT are mobilised on request and as part of a USAR group response. They will take responsibility for the overall management and co-ordination of USAR equipment being deployed to and retrieved from the scene of operations, and are primarily responsible for:

- Establishing the main logistics area
- Providing a personnel accountability system to support the USAR unit co-ordinator in the USAR co-ordination cell (UCC)
- Identifying any missing inventory items on USAR modules as they arrive within the main logistics area
- Recording information about missing inventory items on the inventory hard copy list
- Co-ordinating and tracking the movement of specialist tools between worksites and sectors, using a logging system; for information about worksites refer to National Resilience: Carry out a sector assessment (ASR level 2)
- Ensuring pre-use checks are carried out before equipment is released
- Monitoring equipment use and the condition of safety-critical parts; these will be repaired or replaced as required
- Cleaning and checking equipment for any damage before it is returned to storage on the relevant module
- Collating information on all items used, damaged, lost or remaining at the scene of the incident, and reporting this to the UCC
- Liaising with:
 - The National Resilience Assurance Team (NRAT) operations recovery support cell (ORSC), via the UCC if established
 - The prime contractor
 - Equipment maintenance and repair centre (EMRC)
 - Mobile maintenance units (MMUs)
 - The USAR group co-ordinator, to ensure the security of the forward logistics area

The USAR LMT normally has a minimum of two operators per shift. However, this will depend on the geographical spread of the incident and the number of worksites and sectors in use, and may require additional operators.

Strategic actions

National Resilience should:

- Provide USAR guidance material and supporting documentation for completion by specialist responders

Tactical actions

Specialist responders should:

- Establish and manage a USAR main logistics area
- Manage and co-ordinate the USAR equipment being deployed to and retrieved from the scene of operations
- Clean and check USAR equipment
- Update USAR equipment inventories



Control measure - National Resilience: Urban search and rescue post-incident response

Control measure knowledge

Equipment

At large-scale urban search and rescue (USAR) incidents, equipment will be managed by the USAR logistics management team. However, prior to demobilisation, specialist responders should ensure that all USAR equipment is checked and re-stowed onto the appropriate modules. Items used, lost or damaged should be identified and reported.

The prime contractor may be sited at the incident or the repatriation site to replenish, repair or replace equipment as part of the long-term maintenance contract.



If equipment needs to remain at the scene of the incident, for example due to continuing operations, contamination or ongoing investigative work, USAR units may need to return to their own fire and rescue service without it. In this situation the fire and rescue service may require the assistance of the NRAT operations recovery support cell (ORSC).

The ORSC, in consultation with the NRAT, USAR-hosting fire and rescue service and, if necessary, the USAR capability lead, will agree any necessary temporary inventory changes caused by equipment being left at the incident. Any resultant reduction in the ability to respond to further incidents should be communicated to the NRFC.

Equipment recovery

Equipment and modules that have been left at an incident must be returned to the USAR-hosting fire and rescue service in a clean and serviceable condition, accompanied by a certificate of cleanliness and a completed inventory check sheet noting any discrepancies.

Criminal investigations

The police service may:

- Impound fire and rescue service assets as part of their incident investigation
- Gather material evidence from fire and rescue service personnel
- Take statements from fire and rescue service personnel

Post-incident activity

Other issues that should be considered post-incident include:

- Record keeping and document management
- Critical incident stress management (defusing) of crews in line with individual fire and rescue service welfare procedures
- Debriefing, subject to police guidance

Other issues may be addressed by a recovery working group if established for the incident.

Strategic actions

Fire and rescue services should:

- Keep a record of any USAR resources that are affected by equipment shortages, where it may impact on the ability for them to respond to further incidents

Tactical actions

Specialist responders should:

- Carry out a full inventory check of all USAR units
- Restock USAR units for redeployment
- Release National Resilience (NR) equipment to the police for investigation purposes if required
- Provide evidence and statements to the police if required



Hazard - Lack of co-ordinated search plan: Modes of transport

Hazard Knowledge

If a co-ordinated search plan is not carried out in a timely and structured way, the casualty may not be located and their condition could potentially deteriorate. However, it may be difficult to obtain information about the number or location of passengers involved in the incident, which may contribute to delays in locating them. Consideration should be given to the presence of drivers or crew in public transport.

The type and structure of the mode of transport may make it difficult to locate passengers. It is also possible that people may be hiding or concealed in a mode of transport.

Passengers in any mode of transport involved in a collision may be thrown clear from it or trapped under it.



Control measure - Primary search: Modes of transport

Control measure knowledge

Surveying the scene

An initial survey can provide an understanding of the type and structure of the mode of transport and the factors and restrictions that need to be considered when searching for casualties, as well as the hazards that may affect emergency responders and casualties.

Inner survey

An inner survey allows closer examination of the mode of transport. This is carried out by walking adjacent to the mode of transport, checking the immediate area for casualties and any hazards. Looking around and under the mode of transport can help to identify:

- That there are no casualties under it
- Access and egress points
- Any weak areas of the mode of transport caused by accident damage that will require additional stabilisation
- The presence of any fuel or oil
- If the mode of transport uses alternative fuels
- The presence of vehicle safety systems
- Any other situation requiring attention, for example, the position of catalytic converters

Outer survey

This is carried out by walking completely around the mode of transport while remaining a safe distance from it. The survey includes looking in towards the mode of transport and out to the perimeter of the scene, checking for casualties, obstructions, and any potential hazards.

If there are still people unaccounted for, further checks of the mode of transport should be carried out, even if they lack any sign of containing passengers.

All information gathered from the inner and outer survey should be shared with relevant emergency responders.

Searching

The interior of larger modes of transport, such as a crashed aircraft or derailed train, will be unfamiliar, especially when damaged. This may result in disorientation for passengers and personnel.

Personnel should be aware of the benefits of a structured and co-ordinated approach when searching in modes of transport. The involvement of specialist resources should be considered,

such as urban search and rescue (USAR) teams, or for aircraft, an airport rescue and fire fighting service. For further information refer to [Specialist resources: Search](#).

The layout of the mode of transport should be considered when co-ordinating a search plan. This should include a thorough check of voids, even those not designed for passengers. If there could be people hiding or concealed in the mode of transport, police support should be requested.

Voids can include:

- Under seats
- Sleeping compartments
- Luggage compartments
- Toilets
- Cargo or luggage areas

It may be necessary to request specialist resources to assist in searching voids. USAR should be contacted through the nearest tactical adviser (TacAd) for initial advice and mobilisation options. For more information refer to [Request National Resilience resources: Urban search and rescue](#).

Strategic actions

Fire and rescue services should:

- Maintain access to transport industry information regarding the design and construction of modes of transport, and provide to personnel

Tactical actions

Incident commanders should:

- Ensure an inner and outer survey of the mode of transport search area is carried out
- Develop a co-ordinated plan to search for casualties in or around the mode of transport, and communicate this to personnel
- Consider the potential for people hiding or being concealed in the mode of transport and request police support if required
- Co-ordinate search activity of the mode of transport, including voids and compartments



Control measure - Review passenger or cargo information

Control measure knowledge

If possible, passenger lists should be reviewed to determine the number of people involved. This will not be possible for some modes of transport, such as local buses or trains with a transient and variable number of passengers. In the case of public transport, details of drivers and crew should be included.

If a list of passengers is available, this should be used to reconcile the number of casualties:

- Who have self-extricated from the mode of transport
- Located in a search of the mode of transport or surrounding area
- Who were taken to hospital before the fire and rescue service arrived

If applicable, cargo and load manifests should be checked for any potential hazards to casualties and emergency responders.

In the absence of passenger lists, the driver may be able to provide information about the number of passengers at the time of the incident. For commercial modes of transport, the operating company may be able to provide passenger or cargo information. This may be available to them through closed-circuit television (CCTV) on-board the mode of transport or at the boarding point, to which they may have remote access.

Seating and standing capacities

Confirming the seating and standing capacities of the mode of transport may provide an estimate of the number of people involved. This information is usually displayed inside the mode of transport. However, the mode of transport may not have been full at the time of the incident, or could have been carrying more passengers than permitted.

The method used when searching in larger modes of transport should allow for subsequent teams to assist or continue with the search. The use of seat counting and simple laminated charts depicting seat layouts can be useful in identifying casualties, and as a reference point for subsequent teams.

Strategic actions

Fire and rescue services should:

- Have arrangements in place to obtain passenger or cargo information from transport operating companies

Tactical actions

Incident commanders should:

- Gather and appropriately use information about passengers and cargo in the mode of transport
- Consider gathering information contained in CCTV systems about passengers and cargo
- Consider counting the seats, or referring to the displayed passenger capacity, to estimate the number of casualties; include drivers and crew for public transport



Hazard - Casualty on unstable ground

Hazard Knowledge

People may become trapped, buried, or injured as a result of accessing unstable ground, or from an area of ground becoming unstable, sometimes without warning.

The hazards that may impact on the condition of a casualty who has become trapped on unstable ground include:

- Exposure, which can lead to hypothermia or heat illness
- [Crush injuries](#)
- Asphyxiation from water or a free-flowing solid such as sand or mud

The situation may be worsened by the response of the casualty or the activities of emergency responders. The casualty may be numbed if they are trapped in mud at a low temperature,



resulting in them being unable to feel the impact of any tools being used to extricate them. Any injury to the casualty caused by digging may not be immediately recognised.

Through knowledge and information sharing between various agencies and local emergency planning groups, fire and rescue services should be aware of specific areas within their service boundaries where there is a risk of people needing to be rescued from unstable ground.

Rescues from unstable ground may require assistance from specialist teams, such as urban search and rescue (USAR), technical rescue, other emergency services or appropriate resources.

For further information about incidents that involve bodies of water refer to Operations - [Working near water or other liquids](#).



Control measure - Rescue of a casualty from unstable ground

Control measure knowledge

If carrying out a rescue on or near unstable ground, including mud flats, the provision of rescue paths for access and egress need to be carefully planned and implemented.

A safe system of work, which is capable of recovering casualties and emergency responders, should be put in place. An example of this is a recoverable system using rope equipment, but that may not be appropriate in all circumstances.

Specialist resources may be required to provide or advise on the equipment and safe systems of work appropriate to the type of unstable ground, to support a safe and effective rescue.

Spread the load

Applying pressure to unstable ground will increase the likelihood of collapse. It may also result in a casualty, emergency responder, equipment or appliance sinking or becoming engulfed. The greater the pressure, the higher the likelihood.

If movement on unstable ground cannot be avoided, consider spreading the load, reducing weight and pressure. This can be achieved using specialist equipment or by taking simple actions, such as removing unnecessary equipment, sitting down or leaning back.

Spreading the load may prevent or slow the movement of unstable ground and can be used to stabilise a casualty's position before rescue.

Equipment to assist with spreading the load includes:

- Mud mats
- Inflatable rescue paths
- Salvage sheets
- Inflatable hose
- Ladders
- Sleds

Stabilise and extricate the casualty

The stabilisation of a casualty should be prioritised before rescue activities commence. This is to prevent further deterioration of the casualty and the incident from the actions of personnel. Stabilisation may include the use of:

- Life jackets
- Throwlines
- Weight distribution devices
- Mud mats
- Reach devices

Mud and other unstable ground creates suction on a trapped person; as they attempt to move a vacuum can be created. Pulling a casualty trapped in mud without having taken prior action to reduce the effects of this vacuum, such as digging out, lubricating or diluting the substance, may cause additional harm.

Excessive mechanical force should not be used to extricate casualties from entrapment in unstable ground due to the required force to release them. Technical rescue teams should be requested at the earliest opportunity, to provide expertise and equipment to release a casualty. As the casualty may be numbed, for example in cold mud, when digging close to them considerable care should be taken.

Before extricating the casualty from unstable ground, check that they are not entangled below the surface. Their limbs should be checked, to ensure they are not in an unexpected position. Failure to do these checks before moving or lifting the casualty could result in further injury to them.

In all but the most minor cases, the casualty should not be allowed to walk out, as sudden release and attempts to stand may induce post-rescue collapse. The casualty should be evacuated in as near a horizontal position as possible and handed over to medical responders for treatment.

Strategic actions

Fire and rescue services should:

- Consider providing appropriate specialist equipment for rescuing casualties from unstable ground
- Identify areas where unstable ground may be present and make this information available to personnel
- Hold and maintain contact details for people or organisations who can provide specialist resources or specialist advice

Tactical actions

Incident commanders should:

- If carrying out a rescue on or near unstable ground, plan and implement rescue paths for access and egress
- Ensure personnel working around an unstable surface are secured using an appropriate safe system of work
- Consider requesting specialist resources to provide equipment and safe systems of work appropriate to the type of unstable ground
- Use appropriate equipment to access and extricate a casualty from unstable ground
- Consider spreading the load to reduce the risk of unstable ground
- Consider stabilising a casualty before commencing rescue activities
- Ensure that caution is exercised when using tools to extricate a casualty from unstable ground



- Check the casualty for entanglement or unexpected limb positions prior to extrication from unstable ground
- Consider preventing the casualty from standing or walking after extrication from unstable ground, and their need for medical attention