National Operational Guidance

Survival guidance

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Contents

Introduction

During an incident, people at risk may be trapped and unable to reach a place of safety due to:

- Their ability
- The location and behaviour of the incident
- Physical limitations of the environment
- Physical entrapment

There may also be situations where people at risk are able to reach a place of safety, however the actions they take and their reasons for doing this may prevent them from doing so. For example:

- Religion
- Cultural or social beliefs

During these situations, providing survival guidance may be necessary to improve their chances of survival. Survival guidance is defined as the advice and guidance given by fire control personnel to people at risk, who are directly affected by the effects of the incident and cannot get to a place of safety. All possible means of safe evacuation should be explored prior to the decision being made to give survival guidance.

Survival guidance will follow the three principles of emergency call handling to:

- Assess
- Protect
- Assist rescue

Providing survival guidance is not a linear process; fire control personnel need to use their professional judgement to continually reassess which of the three principles is relevant throughout the call.

This guidance covers the provision of single survival guidance calls in specific environments. However, the principle of survival guidance can be applied to other situations, as well as being provided to multiple callers.

Survival guidance may need to be passed on by someone else; for example, if a translation or text relay service is being used, or if the caller is relaying information to others. This will not change the advice being given; however, fire control personnel may need to tailor their call handling techniques.

During survival guidance calls where people at risk are trapped and unable to reach a place of safety or follow advice due to their ability, religion, cultural or social beliefs, fire control personnel should identify the reasons why, what their abilities and limitations are and explore alternative options with the caller to protect them and improve their chances of survival.

This guidance document should be read in conjunction with:

- Emergency call handling people at risk, which will provide guidance on evacuation, effective communication techniques and joint situational awareness
- Control room command, which will provide guidance on dynamic mobilising
- Department for Environment, Food and Rural affairs (Defra) Flood Rescue Concept of Operations , which provides detail on the national and local co-ordination of flood rescue, including local resilience forum actions
- Levels of command and control at multi-agency incidents foundation knowledge document, which provides information on tactical co-ordinating groups (TCGs)

The guidance documents below provide additional information which fire control personnel may find useful:

- Fires and firefighting, which provides additional details on fire behaviour and development
- Fires in buildings, which provides additional details on firespread and buildings that fail
- Unstable or collapsed structures, which provides additional details on signs and symptoms of structural collapse
- Search, rescue and casualty care, which provides additional details on operational search, rescue and casualty care
- Geophysical hazards, which provides additional information on geophysical hazards, including those associated with flooding
- Water rescue, which provides additional information on the hazards associated with water rescue

Hazard - Calls from or about trapped people at risk

HAZARD KNOWLEDGE

If a person is at risk due to immediate danger from the effects of an incident, there is a risk of serious injury or death.

It is likely that operational personnel will be required to rescue people at risk. Although personal protective equipment (PPE) and safe systems of work reduce the likelihood of harm, there is still a risk to operational personnel in the building.

To accurately provide survival guidance, it is important that fire control personnel have an appropriate level of understanding of the hazards of the incident and the effects they may have on the people at risk.

The less time people at risk are exposed to the effects of the incident, the greater the chances of survival are. The length of time people at risk are exposed to the effects of the incident may depend on:

- The advice given by fire control personnel
- Location of nearest appliances
- Access and egress for operational personnel
- Operational personnel being able to locate people at risk
- Location of people at risk in relation to the incident

It is likely that as the situation changes or escalates, advice may need to be amended.

Control measure - Situational awareness: Survival guidance

CONTROL MEASURE KNOWLEDGE

Situational awareness will support fire control personnel to identify the hazards and risks associated with the incident. This will enable them to share risk-critical information with operational personnel and other responding agencies, provide appropriate survival guidance and react dynamically if the incident or the situation of the people at risk changes.

Situational awareness can be gained from:

- Questioning callers
- Risk information relating to occupants and the location of the incident, for example Site-Specific Risk Information (SSRI)
- Risk information shared by other agencies
- Situational updates from operational personnel and other responding agencies
- Live footage and visual aids

Known risk information may not be accurate, therefore appropriate assessment and questioning should be carried out to determine if identified hazards and risks still apply, and if there are any additional factors to consider.

There are several factors which may affect the advice given to callers by fire control personnel, as well as the ability for operational personnel to rescue people at risk. These include:

- The immediate threat to people at risk
- The condition, number and ability of people at risk, for example:
    - Existing illness, condition or physical injury preventing them from leaving safely
    - Disorientation or unconsciousness
    - Being non-ambulant
- Location of nearest resources
- The development of the incident

To ensure there is joint understanding of risk, all relevant information gathered should be shared with operational personnel and other responding agencies.

Due to the dynamically changing situation, and potential escalation of incidents, it is vital that information gathered is continually reviewed for accuracy. A change in situation may affect the ability of operational personnel to rescue people at risk or mean that people at risk are in imminent danger.

Any change in advice being given to the caller or the situation should be communicated to operational personnel and other responding agencies immediately.

If possible, a method of contact should be maintained with the caller until people at risk have reached a place of safety or are in the care of operational personnel or other responding agencies. This contact will ensure that survival guidance can continue to be given, regular re-evaluation of the incident and the caller's situation continues throughout, and that any change of advice can be passed on to people at risk. If a call is disconnected, fire control personnel should attempt to recontact the caller if necessary. The recontacting of callers should not put the caller at any additional risk. If contact is unable to be maintained, consider informing operational personnel and other responding agencies.

STRATEGIC ACTIONS

Fire and rescue services should:

- Ensure up-to-date risk information can be accessed by fire control personnel
- Consider making risk information available to fire control personnel on the mobilising system
- Ensure inaccuracies in risk information are resolved and systems updated post incident
- Consider the use of system-based call prompts or aide-memoires to assist fire control personnel in gaining situational awareness, to allow the provision of survival guidance

- Consider the use of electronic systems to share information between the fire control room and the incident ground, to improve joint situational awareness relating to people at risk
- Consider the use of electronic systems to share information between the fire control room and other responding agencies to improve joint situational awareness relating to people at risk

TACTICAL ACTIONS

Fire control personnel should:

- Use professional judgement, call handling techniques and available risk information to gather sufficient situational awareness to provide survival guidance
- Use situational awareness to assist operational personnel to rescue people at risk
- Establish the condition, number and ability of the people who are at risk
- Identify the location of people at risk
- If possible, maintain contact with the caller until people at risk have reached a place of safety or are in the care of operational personnel or other responding agencies
- If required, establish a method of recontacting the caller to allow contact to be maintained until people at risk have reached a place of safety or are in the care of operational personnel or other responding agencies
- Continually reassess the situation and recognise the signs of potential incident escalation and amend survival guidance as required
- Use information received from operational personnel and other responding agencies to inform situational awareness and amend survival guidance as required
- Immediately inform operational personnel and other responding agencies of any change in situation which results in an amendment to the advice given to callers
- Continually exchange all relevant information between the fire control room and operational personnel to improve joint situational awareness
- Share all relevant information with other responding agencies to improve joint situational awareness

Control measure – Protect people at risk: Survival guidance

CONTROL MEASURE KNOWLEDGE

To protect people at risk, the advice given should be based on knowledge and understanding of the hazards associated with the incident.

It is important that fire control personnel confirm with the caller that people at risk have taken action and followed the advice.

The advice given may affect the tactical actions of operational personnel and other responding

agencies. Informing operational personnel and other responding agencies of the advice given and actions taken will allow an effective tactical plan to be produced.

Situational awareness gained throughout the call should continually be reassessed for accuracy, to ensure the advice being given is relevant and up to date.

STRATEGIC ACTIONS

Fire and rescue services should:

- Consider the use of system-based call prompts or aide-memoires to assist fire control personnel in providing survival guidance to protect people at risk
- Consider the use of electronic systems to share information between the control room and the incident ground about the survival guidance that is being given to people at risk
- Consider the use of electronic systems to share information between the control room and other responding agencies about the survival guidance that is being given to people at risk

TACTICAL ACTIONS

Fire control personnel should:

- Provide suitable survival guidance to protect people, based on their professional judgement
- Provide suitable survival guidance to protect people, based on their knowledge of the hazards and risks associated with the incident
- Continually reassess the conditions and alter advice where required
- Confirm that people at risk have followed each piece of advice
- Inform operational personnel of the actions taken and advice given to people at risk
- Continually exchange all relevant information between the fire control room and operational personnel detailing the actions taken and advice given to people at risk
- Share all relevant information with other responding agencies detailing the actions taken and advice given to people at risk
- Continually reassess situational awareness to ensure advice given to protect people at risk is relevant and up to date

Control measure – Assist the rescue of people at risk

CONTROL MEASURE KNOWLEDGE

People who are directly affected by an incident and unable to safely evacuate will need to be rescued by operational personnel.

Operational personnel often use four phases in a search and rescue scenario, as detailed in Search, rescue and casualty care. These are:

- Locate
- Access
- Stabilise the situation and any casualties
- Transport to a place of safety and definitive care

Fire control personnel can assist operational personnel with all stages of search and rescue. Throughout the call, fire control personnel should continually share all relevant information with operational personnel and other responding agencies, both prior to and when they are in attendance. This should include information about the incident and the casualty, to support a shared understanding of risk and to inform accurate situational awareness.

Fire control personnel share information to assist with the rescue of people, aiming to reduce the amount of time people and operational personnel are in the hazard area, which reduces the risk of harm. This information may lead to operational personnel requesting additional resources. However, this does not replace the discretion and professional judgement of dynamic mobilising applied by fire control personnel.

The following information should be gathered by fire control personnel. This information should be used to aid dynamic mobilising decisions and shared with operational personnel and where relevant, other responding agencies to assist the rescue of people at risk:

- Location of all people at risk
- A visual description of where their location is
- Age and number of people at risk
- Condition and mobility of people
- Access and egress information
- Location of the incident and the conditions people at risk are experiencing

This list is not exhaustive and the reasons why people were unable to evacuate should be considered, as this may affect access and egress for operational personnel.

Location or mapping services can be used to share information with operational personnel, to assist them in locating people at risk.

Depending on the situation and if safe to do so, people at risk should be advised to make themselves known on arrival of operational personnel or other responding agencies.

People may be advised to:

- Make noise
- Use a visual aid, such as waving an object out of the window or using a torch or phone light
- Wave to operational personnel or other responding agencies

Depending on the situation, when advising people to wave they should be advised to wave both arms and fists to indicate they are waving for assistance. This is particularly relevant if waving to

draw the attention of air support.

Animals may affect the ability of operational personnel to rescue people at risk. If safe to do so, people should be advised to restrain or move away from companion animals or move away from livestock prior to rescue.

Situational awareness gained throughout the call should continually be reassessed for accuracy to ensure advice being given is relevant and up to date.

STRATEGIC ACTIONS

Fire and rescue services should:

- Consider the use of system-based call prompts or aide-memoires to assist fire control personnel providing advice to assist the rescue of people at risk
- Consider the use of electronic systems to share information between the fire control room and the incident ground to assist in the rescue of people at risk
- Consider the use of electronic systems to share information between the fire control room and other responding agencies to improve joint situational awareness and assist in the rescue of people at risk

TACTICAL ACTIONS

Fire control personnel should:

- Pass the location of people at risk, including a visual description of the location if available, to operational personnel
- Consider the use of location and mapping services to locate people at risk and share the location with operational personnel
- Share the number of people at risk, as well as their condition and ability to operational personnel
- Share information about access and egress with operational personnel
- Use the information gathered to consider dynamic mobilising, including multi-agency resources to assist the rescue of people at risk.
- Consider advising people at risk to alert operational personnel to their location by making noise, waving or using visual aids when they arrive
- Consider advising people at risk to restrain or move away from animals, if safe to do so
- Share all relevant information to assist rescue of people at risk with other responding agencies
- Continually reassess situational awareness to ensure the information gathered and advice given to assist the rescue of people at risk is relevant and up to date

Hazard - Calls from or about people at risk trapped in or by water

This hazard should be read in conjunction with Calls from or about trapped people at risk

HAZARD KNOWLEDGE

There are many reasons why people may become trapped in water. It may be because flooding has caused a dramatic rise in normal water levels which has resulted in people being trapped in a structure or it may be because someone has purposely or accidentally entered a body of water.

It is likely that calls requiring water survival guidance will be received from people who are not in the water and the advice will require to be shared by the caller to the person at risk.

People who have entered water are at risk of submersion, entanglement, cold water shock, hypothermia or drowning.

Inhaling or swallowing even small amounts of water into the lungs is serious. Drowning can happen in a short amount of time and in as little as five centimetres of water. People who are trapped in water may become distressed, particularly if they are not confident in water. Distress can lead to rapid breathing (hyperventilation) which may cause people to inhale or swallow water.

The risks posed to people can depend on a combination of the depth, speed and temperature of water, as well as any underwater obstructions, which may not be visible.

Depth and speed

The risks posed to people cannot be determined based on the depth or speed of the water alone. Shallow water may be low risk when still or slow moving, however , 15cm of fast flowing water is enough to knock an adult off their feet and 60cm of water is enough to float a road vehicle.

Deep water may appear still or slow flowing from the surface, however there may be hidden underwater currents.

Temperature

Cold water can seriously affect breathing and movement and result in cold water shock or hyperthermia. This affect can begin at temperatures below 15^{o}C, river temperatures in the UK are often below this, usually only becoming higher from July to October.

Deep water is likely to be colder than shallow water.

Cold water shock

The term ‘cold water shock’ refers to a range of natural reactions that bodies take to protect people if they enter cold water.

There are three stages bodies go through during cold water shock:

- Initial gasp for breath followed by hyperventilation. Once people's breathing is back under control, this is the best opportunity to get out of the water before the further effects of cold water shock begin.
- Blood pressure increases as the body tries to keep blood warm by moving it towards the middle of the body; this often results in people appearing pale.
- As muscles cool, strength, endurance, and muscle control reduce to the point where people are unable to swim and can no longer rescue themselves. This is known as 'swim failure'; if people are still in the water and do not have a form of buoyancy aid, they are likely to drown.

Hypothermia

If people are exposed to cold water for 30 minutes, they are likely to become hypothermic. As well as the health risks to people, hypothermia may affect the ability of people to follow advice and communicate with fire control personnel. Hypothermia remains a risk even after people get out of the water unless they are warmed up efficiently and quickly.

The symptoms of moderate hypothermia include:

- Feeling cold
- Uncontrolled shivering
- The person feeling cold to the touch, with cold and pale hands and feet
- Loss of manual dexterity
- Mild confusion, disorientation, or irritability
- The person possibly denying having any problem and rejecting assistance

The symptoms of severe hypothermia include:

- Slurred speech and an apathetic, confused, and irrational state
- Change of colour to lips, gums or tongue, this may be a blue or grey tone dependent on people's skin colour
- Reduced consciousness,
- Shivering stopping

A baby with hypothermia may be:

- Cold to touch and have reddening of the skin
- Floppy
- Unusually quiet and sleepy and may refuse to feed

Obstructions in the water

Obstructions in the water can lead to people at risk becoming injured, entangled or submerged. Poor

water clarity will make it difficult to identify underwater objects.

There are several different types of water which can pose differing risks to people. These include:

Flat or still water

Flat or still water is defined as water that has minimal movement, except for locally induced wind currents. Examples include:

- Lakes
- Lochs
- Ponds
- Quarry pool
- Reservoirs

These forms of water are believed to be the safest open water in a natural environment however they are commonly large expanses of deep, cold water.

Quarry pools pose the greatest risk; they are often much colder than lakes and reservoirs as they can be fed by water sources that originate deep underground.

Moving water

Moving water can have strong currents, some of these are often underwater.

Moving water will erode underwater surfaces such as mud and stone. Erosion or undercutting can make riverbanks unstable, collapsing when weight is applied, this teamed with steep and slippery banks can make it difficult to get out of moving water.

The noise produced by moving water can make communication difficult, between a person in the water, members of the public and emergency responders.

Tidal waters

Tidal conditions are predictable and can be anticipated and prepared for; however, the depth of water can change rapidly as the tide turns. Some rivers, inlets and estuaries are also influenced by tides.

Tidal bores occur where the incoming tide forms a wave, or waves, of water that travels up a river or narrow bay against the direction of the river or bay's current.

Flood water

Flood water should be considered as moving water, even when the conditions appear to be still. Like tidal conditions, water levels can rise rapidly during periods of extreme weather conditions or failure of flood defences.

Flowing flood water can create a significant amount of force, this pressure can cause structural damage and potentially result in the collapse of temporary or unstable structures. It is possible for

flood water to wash away transport infrastructure such as roads, railway lines and bridges.

Flooded environments may create unexpected entrapment hazards, such as displaced drain covers and submerged street furniture.

Coastal flooding

Heavy storms or other extreme weather conditions combined with high tides can cause sea levels to rise above normal, force sea water to the land and cause coastal flooding. The Environment Agency and Scottish Environment Protection Agency (SEPA) constantly monitor sea levels and release flood warnings when required.

River flooding

This type of flooding occurs if a river bursts or overtops its banks, and floods the areas around it. Flooding is generally caused by prolonged, extensive rain or snow melt.

Flash flooding

A flash flood is a fast-moving and unexpected flood, usually due to heavy rain. While natural events may be responsible for most flash flooding, it may also occur if flood defences fail, or drainage systems are insufficient.

Groundwater flooding

Groundwater flooding can occur when water levels underneath the ground rise above normal levels approaching the surface. It is usually caused by prolonged periods of rainfall and can last for weeks or months.

The less time people at risk are in water, the chances of survival are increased. The length of time people at risk are in water may depend on:

- The conditions and type of water
- Location of people at risk in the water, for example if they are near to solid ground
- Entanglement or entrapment

As the situation changes or escalates, advice may need to be amended due to:

- Changes in the condition of the people at risk
- Change in water conditions
- Increase of water levels
- Change in weather conditions

Control measure - Situational awareness: Water survival guidance

This control measure should be read in conjunction with Situational awareness: Survival guidance

CONTROL MEASURE KNOWLEDGE

There are several factors which may affect the advice given to callers by fire control personnel, these include:

- Type of water, for example:
  - Lake
  - River
  - Flood water
- How people are trapped, such as:
  - Entanglement in water
  - Surrounded by water
  - In water
- Speed and depth of the water
- Temperature of the water
- Location of the person in the water in relation to solid ground
- How long the person has been in the water
- Condition of the person, for example if they are suffering from cold water shock or hypothermia
- Predicted weather, tidal or river level forecasts
- Confidence of the person in water and their swimming ability
- Whether the person in the water has a flotation aid, such as:
  - A lifejacket
  - A lifebelt
  - A piece of watersports equipment
- Available water rescue equipment which may be used to assist, including:
  - Life rings and other buoyancy aids
  - Throwlines

During a situation involving people at risk trapped in or by water, conditions can change rapidly. Therefore, it is important to continually reassess the situation to ensure that advice given remains appropriate.

The speed and depth of water may be difficult for people to judge without putting themselves at risk. Speed of water can be judged based on a comparison to walking speed and depth can be compared to objects in the water, for example the water level against a building. These comparisons should only be used where it is safe for people to do so.

Risk information for locations that are affected by tidal influences will assist fire control personnel to identify tidal waters and enable them to gather relevant tidal information.

Fire and rescue services should receive notification of weather warnings, tide predictions and river levels. Information may be provided by environmental agencies, the Met Office, the Rivers Agency, or local water management groups such as the Canal Trust or local drainage board; some will also be accessible via hazard manager. This information should be used to assist in building situational awareness, as well as identifying a change in situation or potential escalation of the incident.

In some areas secure throwline boxes have been installed near water courses, such as rivers and lakes. These boxes are mounted on a sign which provides instructions on how to access and use the throwlines. A code is required to access these boxes, some of which are stored by fire and rescue services. If the code is stored by fire and rescue services, the instructions will inform people to dial 999 and request the fire and rescue service. On receipt of a call, fire control personnel will be required to pass the access code to the caller.

STRATEGIC ACTIONS

Fire and rescue services should*:*

- Ensure up-to-date risk information relating to tidal influences can be accessed by fire control personnel
- Ensure arrangements are in place with external agencies to allow fire control personnel access to weather, tidal, flood and river level warnings
- Ensure fire control personnel have access to hazard manager
- Ensure information relating to throwline box locations and access details are available to fire control personnel

TACTICAL ACTIONS

Fire control personnel should:

- Identify the type of water course
- Identify the approximate depth, speed and temperature of the water
- Establish the location of people in the water and their location in relation to solid ground
- Establish and monitor the condition of people at risk and recognise any signs and symptoms they are suffering from cold water shock or hypothermia
- Establish the confidence and swimming ability of people in the water
- Identify if there are any available buoyancy aids or water safety equipment which may be used to assist
- Use available weather warnings, tide predictions and river level information to build situational awareness

- Continually reassess the situation and recognise the signs of potential incident escalation, including rise in water levels, change in temperature

Control measure– Protect people at risk: Water survival guidance

This control measure should be read in conjunction with Protect people at risk: Survival guidance

CONTROL MEASURE KNOWLEDGE

The advice and guidance given to people at risk trapped in or by water will depend on the situation they are in; fire control personnel should use their professional judgment and situational awareness to provide suitable guidance. The situation should be regularly reviewed, and advice amended if necessary.

Stay out of the water

People at risk who are not in the water at the time of call, may be in a place where they are safe to remain until they are rescued. This may include people on high ground who have become surrounded by water. In these situations, they should be advised to stay out of the water and to stay away from unguarded edges and banks, as they may collapse and allow people to fall into the water. The same advice should be given to callers who are not in the water and are sharing water survival guidance with people at risk in the water.

Free themselves

If people have become entangled or trapped in obstructions, such as strainers or siphons, they may be in a stable and relatively safe position to remain until they are rescued. If this is not the case, people should be encouraged to release themselves; this may include removing clothing that has become entangled. If people are not required to or are unable to free themselves, they should try to remain as still as possible and attempt to follow survival guidance.

Float

People who have fallen into water unexpectedly are likely to thrash around in the water; this may be due to a reaction to cold water shock or panic. Cold water shock and panic can also affect people's breathing, causing them to hyperventilate. Floating on their back will reduce the risk of their face entering water and allow them time to control their breathing.

The following methods can assist people to float:

- Laying on their back with their ears in the water and chin lifted slightly out of the water
- Gently kicking their feet will assist in lifting their legs to the surface; this can be repeated if their legs begin to sink again. It is important the kicking is sufficient to raise their legs but not too forceful that they begin to move.
- Gently moving their arms in and out

Once people have been able to control their breathing, they should locate a buoyancy aid that can be used to assist them to float until they can be rescued. Any floating object can be used as a buoyancy aid, such as a floating tree branch. When providing advice for people to locate a buoyancy aid, consideration should be given to:

- Their swimming ability
- The distance to the buoyancy aid
- The speed of the water

A call may be received reporting a person in the water or where a person in the water is unable to reach a buoyancy aid safely. A person on solid land may be able to provide the person in the water with an object to use as a buoyancy aid.

Lifebelts and other lifesaving equipment may be located near to the water; however, if these are unavailable, any object that will float can be used. The object should be thrown as near to the person in the water as possible, without hitting them and causing any injury.

Depending on the water conditions and people's ability to float, if there are no objects available to be used as a buoyancy aid, they may benefit from continuing to float on their back.

Stay warm

If people have been able to exit the water, it is important medical advice is followed to reduce the risk of hypothermia. The effects of hypothermia can be prevented or managed by taking the following actions:

- Move people indoors or somewhere sheltered as quickly as possible
- Remove any wet clothing and replace with dry clothes if possible
- If they cannot be moved indoors, protect the casualty from the ground by providing some insulation for them to lie on
- Wrap them in a blanket, sleeping bag, dry towel or similar, making sure their head is covered
- Give them a warm non-alcoholic drink and some high energy food
- Do not use a hot water bottle or heat lamp to warm them up
- Do not rub their arms, legs, feet or hands

During all survival guidance calls it is important to maintain contact with the people at risk where possible; however, if a person is potentially suffering from hypothermia this may be vital. People suffering from hypothermia may feel tired and lose consciousness; by keeping them talking it may assist in keeping them awake until emergency resources arrive.

STRATEGIC ACTIONS

There are no strategic actions for this control measure, strategic actions within the below control measures should be followed:

- Control Measure - Protect people at risk: Survival guidance should be followed

TACTICAL ACTIONS

Fire control personnel should:

- Advise people who are not in the water to remain out of the water and stay away from unguarded edges and banks
- Consider encouraging people in water to free themselves from entanglement or entrapment, if safe to do so
- Consider encouraging people in water to float on their backs
- Consider encouraging people in water to locate a buoyancy aid, if safe to do so
- Consider advising members of the public on how to safely provide a buoyancy aid to the person in the water
- Provide people who have exited the water with advice on how to keep warm
- If possible, continue talking to people who have exited from or are in the water, to encourage them to remain awake until they can be rescued or receive medical attention

Control measure – Assist the rescue of people at risk: Water survival guidance

CONTROL MEASURE KNOWLEDGE

This control measure should be read in conjunction with:

- Assist the rescue of people at risk: Survival guidance

If a call is received about a person in the water, it may be suitable to provide advice to the caller about how to assist somebody in the water. Where advice is given to a member of public to assist, it is important any action does not endanger themselves, and they should be advised to follow the instructions as detailed in Control measure - Protect people at risk: water survival guidance.

In addition to the four phases used that may be used for search and rescue incidents, water rescue incidents also follow the Talk - Reach - Throw - Go - Don't go - Helicopter principles. Fire control personnel should use these principles when providing advice to callers who may be able to assist people at risk.

Talk/Shout: People may be able to self-extricate or reach a position where they can remain until they can be rescued. This could include moving closer to solid ground or another location from where they may be more easily rescued. People who are not in the water may have a better view than people in the water and be able to direct them.

Reach: It may be possible to use an object to make physical contact with people and pull them towards safety or a location where they can remain until they can be rescued. This may be a tool designed specifically for the purpose or a found object, such as a tree branch. If possible, people should place themselves 1m to 2m from the edge of the water and get on one knee or lay on the ground to prevent them from falling into the water. People should not offer their own hand to people in the water, as this may lead to them being pulled into the water.

Throw: It may be possible to use specially designed water rescue equipment, such as throwlines or buoyant objects. These objects may be able to aid people on solid ground to pull the person in the water to a safe location or a place where they can remain until rescued. Buoyant objects may be used to assist people in floating until they can be rescued.

Where throwlines are located, people should be advised to use the following method:

- Gain the attention of the person in the water and advise them you are throwing them the line
- Place their non-throwing hand through the loop at the end of the line
- Loosen or unclip the bag so the top of the bag is open
- Pull out about an arm's length of the line from the bag
- Take hold of the plastic sleeve of the bag with your throwing hand
- Grasp the plastic sleeve of the bag and throw it underhand, beyond the person in the water
- Place themselves 1m to 2m from the edge of the water if possible and to get on one knee or lay on the ground prior to tension being applied to the line

Row: Committing trained personnel on to the water in rescue boats, sleds, or similar craft. Fire control personnel should advise members of the public not to attempt rescue from a boat, unless the boat is stable and there are competent people in control of the boat.

Go:Committing trained personnel into the water to perform a rescue. Fire control personnel should advise members of the public not to enter the water to rescue people.

Don't go: If it is deemed unsafe to perform a rescue, people should not enter the water Members of the public should always be advised not to enter the water.

Helicopter: For more information refer to Search, rescue and casualty care – Aerial resources: Helicopters for search and rescue.

If necessary, people should await rescue in areas of water where they can remain static, such as shallow or slow flowing areas.

The following information should be gathered by fire control personnel. This information should be used to aid dynamic mobilising decisions and shared with operational personnel and where relevant, other responding agencies to assist the rescue of people at risk:

- Location of all people in the water, for example how far are they from solid ground
- Description of people in the water and clothing they are wearing
- Whether the person in the water has a flotation aid, such as:
    - A lifejacket
    - A lifebelt
    - A piece of watersports equipment
- Access and egress information, for example:

    - Location of the nearest solid ground
    - If flooding has occurred, any restrictions due to damage caused by it
    - Nearby locations suitable for personnel and resources to enter the water, such as boat launch sites or jetties
- Description of the water:
    - Depth
    - Speed
    - Stability of the water, including if water levels are rising or the speed is increasing
    - Size of the water course, for example the width of a river or flood
- Any additional information on forthcoming weather conditions, river levels or tidal reports

Dynamic mobilising may include additional fire and rescue service resources as well as resources from other responding agencies. There are several other organisations that may have water rescue capabilities; if arrangements have been made, fire control personnel should consider the mobilisation of these resources to assist rescue.

Depending on the location of people at risk and access and egress routes, fire control personnel should consider mobilising resources in a dual approach, for example to both sides of the water source. The fire control room may also need to provide information about routes to avoid using.

Depending on the situation, the following advice to people at risk may prove useful in assisting the rescue:

- If there are multiple people in the water, advise them to remain together if it is possible and safe to do so
- Await instructions from emergency responders and do not attempt to board their boat or any other watercraft until instructed to do so
- If safe to do so, wave both arms and fists to attract the attention of emergency responders
- Make a noise to attract the attention of emergency responders; however, once emergency responders are aware of their location, people should remain quiet so that they can hear instructions
- Emergency responders may need to initially move away from people in the water; this is normal and will be part of their rescue plan

STRATEGIC ACTIONS

Fire and rescue services should:

- Ensure arrangements are in place with other organisations with water search and rescue capabilities
- Ensure mobilising and communication procedures are in place with other organisations with water search and rescue capabilities

- Ensure fire control personnel know how to mobilise other organisations with water search and rescue capabilities

TACTICAL ACTIONS

Fire control personnel should:

- Consider encouraging people to move to an area in the water that will assist their rescue
- Consider advising members of the public to assist people at risk to exit the water using the principles of Reach and Throw
- Provide advice to members of the public who are assisting the rescue of people at risk to stay away from unguarded edges and banks
- Advise members of public not to enter the water
- Share information relating to the depth, speed and stability of the water with operational personnel and other responding agencies
- Share information relating to forthcoming weather conditions, river levels or tidal reports with operational personnel and other responding agencies
- Identify safe access and egress to the water rescue scene of operations and communicate avoidance routes
- Consider advising people in the water to remain together where possible and safe to do so
- Consider advising people on how to attract the attention of emergency responders
- Consider advising people in the water not to attempt to board boats or other watercraft until instructed to do so by emergency responders
- Consider dynamic mobilising to assist with the incident, including dual approach, multi-agency resources and other agencies with water search and rescue capabilities

Hazard – Calls from or about people at risk trapped in or by moving water

HAZARD KNOWLEDGE

This hazard should be read in conjunction with:

- Calls from or about trapped people at risk
- Calls from or about people at risk trapped in or by water

Obstructions in the water

Rocks, branches, or other debris below or suspended in the water can cause obstructions. Where there is fast flowing water, these objects can pin people against a solid object and structures such as bridges with considerable force. They can also cause injury and entanglement if people are swept over the top of them.

Strainers allow water to pass through, but trap solid objects. These can be manmade objects, such as

fencing and drains, or natural objects, such as partially submerged trees and bushes.

Siphons are underwater gaps or holes in a barrier or structure that allows water to flow through. People can be pulled underwater or become trapped due to the force of the water flow through strainers or siphons.

Weirs

Weirs are formed when water passes over a vertical drop; this causes the water to accelerate and then recirculate downstream of the drop. It is likely people will be pulled back towards the weir and under the water and become held by the recirculating water.

Currents

People in moving water are unlikely to remain static. Currents can move people great distances from the water entry point (WEP) in a short amount of time. These currents can lead people towards further dangers such as weirs and obstructions.

Control measure - Situational awareness: Water survival guidance for people in moving water

CONTROL MEASURE KNOWLEDGE

This control measure should be read in conjunction with:

- Situational awareness: Survival guidance
- Situational awareness: Water survival guidance

There are several factors which may affect the advice given to callers by fire control personnel, these include:

- Location of people in the water in relation to:
  - High or solid ground
  - Shallow or slow flowing water
- Whether people are static or are being swept away with the current
- Have people become entrapped or entangled by obstructions
- Any hazards such as weirs and obstructions involved or further downstream
- Direction of the water flow

Gaining the direction of the water flow will allow fire control personnel to use any mapping systems to gather information on potential upcoming hazards downstream.

No area in the water should be considered a safe place; however, there are areas in moving water where people may be able to remain static until they are rescued. This may include areas of:

- High ground, such as rocks

- Slow flowing or shallow water

Eddies may provide an area of both slow and shallow water where people are able to remain until they are rescued. Eddies are formed where flowing water passes static or slow-moving water causing the area of static water to rotate in the opposite direction to the main flow. This recirculated water, or eddy, is slower than the main flow. The reduction in speed causes debris to be deposited, reducing water depth around eddies.

Moving water conditions can change quickly and without notice. Conditions should be reassessed regularly to ensure the advice to remain in place is still relevant; advice should be amended where necessary.

STRATEGIC ACTIONS

Fire and rescue services should*:*

- Ensure mapping systems available to fire control personnel show water hazards such as weirs

TACTICAL ACTIONS

Fire control personnel should:

- Establish the location of people in the water
- Establish the effects of the water people at risk are experiencing
- Establish if people are entrapped or entangled by obstructions
- Identify any known or potential hazards
- Establish the direction of the water flow
- Establish if people are in a place where they can remain until rescued
- Continually reassess the water conditions and amend advice where required

Control measure – Protect people at risk: Water survival guidance for people in moving water

CONTROL MEASURE KNOWLEDGE

This control measure should be read in conjunction with:

- Protect people at risk: Survival guidance
- Protect people at risk: Water survival guidance

People who are currently static and buoyant in the water are likely to be able to remain in that location until they are rescued. If people are forced into the moving water, it is possible they will be swept away with the current.

People will have difficulty swimming against the strong currents in fast flowing water and should be

safer to float with the flow of the water. Before advising people to float with the flow of the water, consideration should be given to any upcoming obstructions or hazards, such as weirs.

Avoid obstructions and entanglement

When floating, people should face the direction of travel, with their feet and legs raised to the surface. This will allow them to see upcoming obstructions, prevent their feet and legs becoming entangled and protect their head by allowing their feet to hit any obstructions first. When floating, people should try to use their arms to direct themselves.

Head towards a safer location

People should attempt to reach areas where they will be static until they can be rescued, such as:

- High ground or solid ground, for example rocks in a river
- Shallow water
- Slow flowing water

Water naturally flows in a straight line and should lead people to bends in the water. Water on the inside of bends should be shallower and slower flowing; this may allow people to exit the water or remain static until rescue.

People should avoid aiming towards items which may act as siphons or strainers, such as partially submerged trees or bushes.

Depending on their swimming ability, once people have reached slower flowing water, they may be able to reach a safer location by swimming.

Swim

If people are in slow moving water or they are no longer safe to float due to upcoming hazards, people may be required to swim to a safer location.

When swimming in moving water, people should swim diagonally with the flow of the current.

Before providing any advice to swim, consideration should be given to the person's swimming ability.

STRATEGIC ACTIONS

There are no strategic actions for this control measure, strategic actions within the below control measures should be followed:

- Control Measure - Protect people at risk: Survival guidance should be

TACTICAL ACTIONS

Fire control personnel should:

- Consider advising people in water to remain in their location until they can be rescued

- Consider advising people to float with the current
- Advise people who are floating to face the direction of travel with their feet and legs raised to the surface of the water
- Consider advising people in water to avoid obstructions and hazards
- Consider advising people who are floating with the current to direct themselves to calmer areas of the water
- Consider advising people to swim to calmer areas of the water, if safe to do so

Control measure - Assist the rescue of people at risk: Water survival guidance for people in moving water

CONTROL MEASURE KNOWLEDGE

This control measure should be read in conjunction with:

- Assist the rescue of people at risk: Survival guidance
- Assist the rescue of people at risk: Water survival guidance

The following information should be gathered by fire control personnel. This information should be used to aid dynamic mobilising decisions and shared with operational personnel and where relevant, other responding agencies, to assist the rescue of people at risk:

- Water entry point (WEP)
- Point last seen (PLS)
- Speed of travel
- Direction of travel
- Upcoming hazards and obstructions
- Updated location where people have been able to exit the water or reach a safer place further downstream
- If the casualty has become submerged or has remained on or above the water

If a person is moving in the water and their exact location is no longer known the WEP, PLS and speed of travel should be passed so that operational personnel can calculate the approximate location.

It is possible that contact will not be able to be maintained with people who are moving with the flow of the water. Therefore callers should be advised to recontact the fire and rescue service by dialling 999 if people at risk have been able to exit the water further downstream.

STRATEGIC ACTIONS

There are no strategic actions for this control measure, strategic actions within the below control measures should be followed:

- Control Measure – Assist rescue of people at risk: Survival guidance
- Control Measure – Assist rescue of people at risk: Water survival guidance

TACTICAL ACTIONS

- Share the water entry point (WEP), point last seen (PLS), speed and direction of travel to operational personnel and other responding agencies
- Share information on upcoming hazards and obstructions in the water with operational personnel and other responding agencies
- Share information on the updated location with operational personnel and other attending agencies if people have been able to exit the water
- Advise callers to recontact 999 and provide updated location where people at risk have been able to exit the water

Hazard – Calls from or about people at risk trapped in or by water in a building

HAZARD KNOWLEDGE

This hazard should be read in conjunction with:

- Calls from or about people at risk trapped
- Calls from or about people at risk trapped in or by water

Flooding can often lead to people becoming trapped due to water surrounding or entering buildings. Flooding is likely to affect a wide area, leading to multiple people being trapped in buildings and potential widespread interruption to power supplies.

People who have become trapped in a property may not appear to be in immediate danger. However, due to the risks associated with water and the additional risk of water in a building there is still a significant risk of injury or death.

Water can enter buildings through apertures such as doors and windows, air bricks on exposed walls and gaps in the floor. Pressure created by flooding can reverse the flow of drainage systems and pipes, causing water to back-up and enter a building through sinks, toilets, and other drainage systems.

Differences in pressure may cause water to move through semi-permeable materials, such as bricks. If water levels are over a certain height, even a building with property level protection, such as door barriers or sandbags, will start to experience some water ingress.

Water in buildings can compromise the safety of gas and electric supplies to both the building and appliances in the building, causing an increase in fire risk. Water is an excellent conductor of electricity, therefore there is a significant risk of electrocution if water has entered buildings. This may be caused by:

- Touching or operating electrical installations or appliances while standing in water
- Electrical installations or appliances being submerged in water, causing electrification of the water
- Damaged electrical installations or appliances, causing electrification of the water

Control measure - Situational awareness: Water survival guidance for people in buildings

CONTROL MEASURE KNOWLEDGE

This control measure should be read in conjunction with:

- Situational awareness: Survival guidance
- Situational awareness: Water survival guidance

There are several factors that may affect the advice given to people who are trapped by water in a building. These include:

- The condition and structure of the building, for example:
  - Hoarding
  - Number of floors
  - If it is under construction or demolition
- The water conditions affecting the property, for example:
  - Whether the water has entered the property
  - Water levels inside and outside the property
- Where the water is coming from
- Condition of gas and electrical installations and appliances in the property, for example:
  - Sockets and switches are submerged in water
  - Buoyant appliances in the water
  - Whether power supplies have been isolated
  - Signs of damaged electrical installations, including smoke or arcing
  - Power cut affecting the building
- Emergency planning group flood plans

Widespread flooding is likely to attract a multi-agency response and trigger emergency planning group flood plans. Emergency planning groups include:

- Local resilience forums (LRFs) in England
- LRFs or Resilience Forum in Wales
- Regional Resilience Partnerships (RRPs) in Scotland

- Emergency Preparedness Groups (EPGs) in Northern Ireland

If flood plans have been triggered, the plans and decisions made by emergency planning groups may dictate the advice fire control personnel pass to people at risk, as well as the communication links between agencies.

Updates from the tactical co-ordinating group (TCG) will provide up to date advice and communications strategies to be adhered to and amended as required.

Widespread flooding is likely to lead to multiple calls being received relating to people at risk. In this situation it is unlikely that fire control personnel will be able to remain on the phone to people at risk. As such, it may not be possible for information gathered to be reviewed by fire control personnel. If this is not possible it is important that people at risk are advised to monitor possible changes of situation and when they should redial 999 to receive further advice. These changes may include:

- Changes in water levels in the building
- Changes to the condition of gas and electrical installations and appliances in the property
- Deterioration of people at risk

There may be occasions when additional information received from weather, flood, river or tidal reports, emergency planning groups, operational personnel and other responding agencies means that the advice given needs to be amended. In these situations, people should be recontacted, and the change of advice passed onto them. When recontacting people at risk, any multi-agency or emergency planning group communication plans should be adhered to.

STRATEGIC ACTIONS

Fire and rescue services should:

- Ensure agreements are in place to receive regular updates to weather, flood, river and tidal reports
- Ensure available flood plans are accessible by fire control personnel
- Ensure systems are in place to provide updates to fire control personnel from the tactical co-ordinating group (TCG), which may affect their actions or the advice given to people at risk in buildings affected by water
- Ensure systems are in place to ensure relevant information from fire control personnel is shared with the tactical co-ordinating group (TCG) to improve joint situational awareness relating to people at risk in buildings affected by water
- Ensure systems are in place to recontact multiple people if there is a change to the advice initially given to them

TACTICAL ACTIONS

Fire control personnel should:

- Establish the condition and structure of the building
- Gather information on the water conditions inside and outside the building
- Identify where the water is coming from
- Establish the condition of gas and electrical installations and appliances
- Maintain contact with the caller; if this is not possible, advise the caller to recontact the fire and rescue service by dialling 999 if the situation changes
- Continuously review external sources of information relating to water and weather conditions, amending advice as required
- Use updates from the tactical co-ordinating group (TCG) relating to emergency flood plans to amend their advice and actions relating to people in buildings affected by water
- If relevant, ensure communications strategies as detailed in emergency planning group flood plans are adhered to
- Establish a method of recontacting the caller in case there is a change of advice to people at risk in buildings affected by water

Control measure - Protect people at risk: Water survival guidance for people in buildings

CONTROL MEASURE KNOWLEDGE

This control measure should be read in conjunction with:

- Protect people at risk: Survival guidance
- Protect people at risk: Water survival guidance

It should be safer for people to remain in the property and await rescue, rather than attempt to self-evacuate. However, due to the risks of water entering the property this should not be considered a safe place.

When providing advice to callers, it is important to use the situational awareness gained as well as professional judgement to decide if the advice is relevant.

Isolate power supplies

Isolating gas and electric supplies should reduce the fire risk as well as the risk of electrocution. Power should only be isolated if it is safe to do so; it is likely that this will not be possible after water has entered the building. Power should be isolated at the gas emergency control valve and the electricity fuse box. However, when providing this advice, consideration should be given as to whether these are inside or outside the property.

Due to the risk of possible gas leaks or electrocution, if water has entered the property and the gas and electric supplies have not been isolated, people should not:

- Enter the water

- Use naked flames or electrical lighting; however, torches or mobile phone lights can be used
- Attempt to operate any electrical equipment or appliances

People should not attempt to isolate the electricity when standing in water or with wet hands, or if there are signs that the electricity has already been compromised by water, such as arcing or overheating.

Block water inlets

The risk of water entering through drainage systems can be reduced by:

- Placing plugs in sinks and baths and weighing them down with sandbags or other heavy objects where possible
- Disconnecting and isolating any equipment that uses water, such as washing machines and dishwashers
- Using towels or cloths to plug water inlet pipes or other areas where water is entering

Pack a flood kit

People may be required to remain in their property for some time to await rescue. Once they have been rescued they may need essential items with them. If possible and safe to do so, people should be advised to pack a flood kit containing essential items.

Flood kits should be kept to a minimum, but may include items such as:

- Mobile phone and charger
- Phone numbers, insurance documents, bank cards and money
- Medicines and medical devices, hearing aid batteries, spectacles and contact lenses
- Essential items for children and babies such as nappies, baby food or feeding equipment
- Drinking water in a suitable container as flooding can cause disruption to the supply of clean water

Move away from the water

If water has entered buildings, people should be safer the higher they are in the property.

When advising people to move to a higher location in the property, consideration should be given to the ability for them to be rescued from that location. If possible, people should be advised to await rescue in a room where there is access to a window or other means of rescue.

If the caller is unable to remain on the phone when moving to another location, consideration should be given to:

- Advising the person to redial 999 from the new location so that water survival guidance can be continued
- Providing sufficient water survival guidance before allowing the caller to hang up the phone

If buildings only have one floor, alternative advice may need to be provided. Standing on kitchen worktops or furniture can keep people out of the water for longer, while they are waiting to be rescued. If people are forced to enter the water, survival guidance should be given in relation to the water conditions.

If it is safe to do so, people can be advised to collect valuables and move them to a higher location in the property.

Gather together

If there are several people at risk in a building, it may be advantageous for them to gather in one location for the following benefits:

- Water survival guidance can be passed from fire control personnel to a single person, who can relay the advice to others
- It may reduce the likelihood of multiple water survival guidance calls being received by the fire control room from a single location
- It supports easier and quicker rescue of multiple people from a single location
- Multiple people in a room may help them to keep warm

This guidance may not be appropriate for large, complex or tall buildings; for example, in tall buildings it may not be safe for people to move between floors or flats. People at risk should not move into one room or location if doing so exposes them to additional risk.

STRATEGIC ACTIONS

There are no strategic actions for this control measure, strategic actions within the below control measures should be followed:

- Control Measure - Protect people at risk: Survival guidance

TACTICAL ACTIONS

Fire control personnel should:

- Consider advising people in buildings affected by water to remain in their location until they can be rescued
- Consider advising people in buildings affected by water to isolate gas and electric supplies in the building, if safe to do so
- Consider advising people in buildings affected by water not to operate electrical appliances
- Consider advising people in buildings affected by water not to enter the water
- Consider advising people in buildings affected by water to block water inlets, if safe to do so
- Consider advising people in buildings affected by water to pack a flood kit
- Advise people in buildings affected by water to keep out of the water

- Consider advising people in buildings affected by water to gather together, if safe to do so

Control measure - Assist the rescue of people at risk: Water survival guidance for people in buildings

CONTROL MEASURE KNOWLEDGE

This control measure should be read in conjunction with:

- Assist the rescue of people at risk: Survival guidance
- Asist the rescue of people at risk: Water survival guidance

The following information should be gathered by fire control personnel. This information should be used to aid dynamic mobilising decisions and shared with operational personnel and where relevant, other responding agencies, to assist the rescue of people at risk:

- Location of all people in the building, for example kitchen or first floor bedroom, flat and floor number
- A description of where the location is, for example:
  - Front left window when looking from the road at the front of the building
  - First room on the right at the top of the stairs
- Access and egress information for the building if relevant, for example:
  - If the window is at the rear of the building
  - If there is a gate to gain access
- Depth and conditions of the water inside and outside the building
- Condition of the power in the property
  - If the gas and electric supplies have been isolated
  - Detail of any damage to the gas or electric supply
  - Any risk of electrification of the water
- Condition of the building, including:
  - Any known risks, such as hoarding
  - If it is under construction or demolition

For large or complex buildings, consider the use of location services to identify the exact location of people in the building.

Depending on the situation, the following advice to people at risk may prove useful in assisting the rescue:

- Remain near to the window
- Use a visual aid, such as a torch or phone light, to identify the room they are in

- On arrival of operational personnel remain in their location until advised otherwise

If people have packed a flood kit, it is important this is kept to a minimum. Large bags can become obstructions when attempting to exit a building through windows, as well as taking up space on rescue boats.

STRATEGIC ACTIONS

There are no strategic actions for this control measure, strategic actions within the below control measures should be followed:

- Control Measure – Assist rescue of people at risk: Survival guidance
- Control Measure – Assist rescue of people at risk: Water survival guidance

TACTICAL ACTIONS

- Pass the location of people at risk in buildings affected by water, including a visual description if available, to operational personnel
- Share information with operational personnel and other responding agencies about access and egress to the building affected by water
- Share information with operational personnel and other responding agencies about the water conditions inside and outside the building
- Share information with operational personnel and other responding agencies about the condition of the gas and electric supplies in the building affected by water
- Share information with operational personnel and other responding agencies about the condition of the building affected by water
- Consider advising people to remain near a window in the building affected by water
- Consider advising people to use a visual aid, such as a torch or phone light, to indicate their location in the building affected by water to operational personnel
- Advise people at risk to remain in their location on arrival of operational personnel unless advised otherwise
- Advise people to ensure any items and flood kits they take with them is kept to a minimum

Hazard – Calls from or about people at risk trapped in a road vehicle by water

HAZARD KNOWLEDGE

This hazard should be read in conjunction with:

- Calls from or about people at risk trapped
- Calls from or about people at risk trapped in or by water
- Calls from or about people at risk trapped in or by moving water

People at risk may become trapped in their road vehicles by water for several reasons. Vehicles may have entered a body of water because of an accident or have become partially submerged by rising floodwater or tides. In low levels of water, vehicles may be stable; however, as water levels rise, previously stable vehicles may become buoyant. Even larger vehicles like buses, can begin to float in low levels of water. A car entering a body of water may quickly float away from the point of entry.

Water entering a vehicle may affect its electrical systems and powered windows, although they may still work for a time, even if a vehicle is full of water. If the water is deeper than the vehicle, there is only a short time frame (around 30 seconds to 2 minutes) where the vehicle will float before the vehicle begins to submerge. Vehicles are not airtight; if a vehicle is submerged, an air bubble will not normally be created inside it.

Electric vehicles

Electric and hybrid vehicles are designed to be safe in water, even if fully submerged. However, if the high voltage systems have been damaged extreme caution should be exercised due to the risk of electrification of the water.

Vehicle safety systems

Vehicle electronics may activate without warning and for no apparent reason because water is affecting the vehicle's circuitry.

Vehicle safety systems, such as seatbelt restraints or airbags may activate and act as a hazard to the casualties and restrict the ability to exit the vehicle.

Vehicle position and stability

The heaviest point of a vehicle will submerge first; this is likely to be the engine compartment.

A vehicle's orientation to the flow will affect its movement. If the vehicle is side-on to the current the vehicle is likely to roll.

Depending on the position of the vehicle, eddies may be created. Eddies created by a vehicle in water should not be treated as an area where people can remain until they are rescued, due to the risk of the vehicle moving.

Redistribution or removal of the load from a vehicle may cause it to flip or move suddenly. Movement of people or animals in a buoyant vehicle may affect its stability.

Different types of vehicles may react differently in water due to their size and weight. Heavy vehicles are likely to sink at a faster rate, whereas lighter vehicles are likely to become buoyant at a faster rate.

Control measure - Situational awareness: Water survival guidance for people in road vehicles

CONTROL MEASURE KNOWLEDGE

This control measure should be read in conjunction with:

- Situational awareness: Survival guidance
- Situational awareness: Water survival guidance

- Situational awareness: Water survival guidance for people in moving water

There are several factors which may affect the advice given to people in road vehicles in water by fire control personnel, these include:

- Type of vehicle, including make, model and fuel type
- Condition of electrics in the vehicle, such as electric windows
- Water level outside and inside the vehicle
- Number and location of people and animals in the vehicle
- Direction of the vehicle in relation to the water flow
- Stability of the vehicle
- If the vehicle has moved, how far it has moved and how quickly
- Any damage sustained to electric vehicles, due to the effect this may have on the high voltage systems
- Any damage sustained to vehicles which has affected access and egress, for example damage preventing the doors being opened
- Stability of the water, whether the water level and flow are or likely to increase

Establishing the make and model of the vehicle will assist operational personnel in identifying where safety systems, such as airbags, are located. This will enable operational personnel to isolate safety systems if required and reduce the risk of harm from their unexpected actuation.

If there are multiple vehicles in flood water, the behaviour of other vehicles may be used to build situational awareness. For example, if other vehicles are buoyant and moving it is likely that this will happen to the involved vehicle.

Smoke and electricity arcing may indicate that damage has occurred to electrical systems in the vehicle. If there are no external signs of damage, it is important to establish if it was involved in a collision, as this may affect the ability of the casualties to exit the vehicle or emergency responders to gain access to the vehicle.

STRATEGIC ACTIONS

There are no strategic actions for this control measure, strategic actions within the below should be followed:

- Situational awareness: Survival guidance
- Situational awareness: Water survival guidance
- Situational awareness: Water survival guidance – moving water

TACTICAL ACTIONS

Fire control personnel should:

- Identify the type of vehicle in the water, including make, model and fuel type where possible
- Establish if the electrical systems of the vehicle in water are still working
- Establish the water level outside and inside the vehicle
- Establish the number and location of people and animals in the vehicle in water
- Establish the direction of the vehicle in relation to the water flow
- Establish the stability of the vehicle in water
- Consider establishing how far and quickly the vehicle has moved in the water
- Establish if there is any smoke or arcing from the electrical system of the vehicle in water
- Identify any damage sustained to vehicles in the water
- Consider using other vehicles in the water to establish situational awareness

Control measure – Protect people at risk: Water survival guidance for people in road vehicles

CONTROL MEASURE KNOWLEDGE

This control measure should be read in conjunction with:

- Protect people at risk: Survival guidance
- Protect people at risk: Water survival guidance
- Protect people at risk: Water survival guidance for people in moving water

Stable conditions

If both the road vehicle and water are stable, it could be safer for people at risk to remain in the vehicle and await rescue.

Prepare to exit

Although a road vehicle in water may appear to be stable, stability may not be retained. It is likely that if water conditions change, the vehicle may become buoyant or fill with water. Therefore, it is important to ensure people are ready to exit the vehicle if required.

In case vehicle safety systems activate, people should be advised to keep away from airbags if possible. This may be achieved by removing seatbelts and moving seats away from the dashboard. This advice will also assist with the rescue of people and should be given in all circumstances.

To maintain the stability of the vehicle it may be advisable for children to remain in their seats. However, depending on the age of the children, it may be better to release them from their child seats.

Water can affect other electrics in the vehicle, such as windows and sunroofs. Opening windows or sunroofs as early as possible will ensure that they are ready to use as an exit if required. Opening windows may allow cold air and water into the vehicle, so before giving this advice careful

consideration should be given to the:

- Position of the vehicle in relation to the direction of the water flow; if the vehicle is side-on to the current, the windows that are facing downstream (the direction the water is flowing towards) should be opened
- Ability of people to exit the vehicle; if people are unable to exit the vehicle, the risks of opening the window may outweigh any benefits
- Depth of water

Rear windows in vehicles may be difficult to use as an exit, due to the size of the window and the opening mechanisms. If people in the rear of the vehicle may need to exit through the front windows, head restraints on the front seats may restrict their route. Removing head restraints will remove this obstruction and they can be used to break a window if necessary.

If possible, people should be told to prepare any items that can be used as buoyancy aids, such as child car seats.

Stabilise the vehicle

Applying the handbrake and turning the vehicle ignition off can assist in stabilising a vehicle in water. When advising people to turn off the vehicle ignition to isolate the power of the vehicle, it is important to ensure they have taken all relevant action to prepare for exit, such as opening electric windows or sunroofs.

Movement in the vehicle may affect its stability, as weight distribution moves inside it. People should remain in their seats unless advised otherwise and restrain animals if safe to do so.

Avoid water within the vehicle

Water is likely to enter the vehicle through the door seals and start to fill the footwell in the vehicle. Lifting feet out of the water and onto the seat will allow people to keep away from the water in the vehicle for longer.

If it is believed that an electric vehicle has sustained damage to its high voltage systems, it is imperative that people keep away from the water in the vehicle.

Unstable conditions

When a vehicle is unstable it is likely to begin to submerge or move with the flow of the water. Unstable water conditions may be due to rising water levels and increased speed of water flow.

Exit the vehicle

In unstable conditions it is likely that people will be safer to exit the vehicle. There are circumstances where people at risk will need to be advised to exit the vehicle; this may be due to:

- The vehicle being swept away with the water
- The vehicle beginning to submerge

- An increase in water levels in the vehicle

It is likely that when exiting the vehicle, people will be entering an open body of water or climbing onto the roof of the vehicle. However, if the vehicle has overturned, the upper surface of the vehicle could be the floorpan or side.

Before advising people to exit the vehicle, consider:

- The speed of water flow
- The depth of the water
- The weather conditions
- The likely temperature of the water
- The physical ability of people to exit into the water or the upper surface of the vehicle

The pressure of water outside of the vehicle may prevent doors from being opened, in which case people will need to exit the vehicle through a window or sunroof.

Depending on the water levels outside the vehicle, opening a door or window is likely to cause an increase in water entering the vehicle; people should be prepared for this to occur.

If it is not possible to open the doors, windows or sunroofs, a window can be broken. Side windows are usually weaker and can be broken using a firm hard blow in the corner using a 'life hammer', heavy object or the metal part of a head restraint. Any remaining glass should be removed or covered where possible to prevent injury.

If there are multiple people in the vehicle, consideration should be taken to assisting others to leave the vehicle. Children should be assisted to leave the vehicle first, ideally being passed to a person outside of the vehicle.

If a vehicle has entered deep water, such as a lake or a quarry, or is in rising tidal waters, people should be advised to exit into the water and not onto the upper surface of the vehicle.

When exiting a vehicle, people should take any buoyancy aids, such as child seats, with them if possible; these may assist people if they need to stay in the water.

Exit onto the upper surface of the vehicle

If the water level is rising inside the vehicle, consideration should be given to advising the occupants to get onto the upper surface of the vehicle and await rescue. Before providing this advice, fire control personnel should consider:

- That the surface of the vehicle is likely to be extremely slippery, which may lead to people falling into the water
- That movement of people in or exiting the vehicle may affect its stability

If the vehicle is upright and people are exiting the vehicle onto the roof, a sunroof may be the safest route. If this is not possible, people should use a door or window to exit the vehicle.

If the vehicle is side-on to the flow of the water, people should be advised to exit the vehicle by windows or doors which are facing downstream.

To assist in maintaining the direction of the vehicle, people should be advised to remain at the opposite end of the vehicle to the engine compartment, which will help to counteract the weight of the engine. If there are multiple people in the vehicle, consideration should be taken to distribute their weight evenly.

Once on the upper surface of the vehicle, people should be advised to remain in place unless otherwise advised. If the vehicle becomes unstable while people are on its upper surface, they should consider entering the water or reaching for a tree branch or similar.

Exit into the water

There may be occasions when people will be required to exit the vehicle into open water; this may be due to:

- The vehicle becoming buoyant and moving
- The vehicle beginning to submerge or there is a risk of this happening

When advising people to exit into open water, it is important to provide advice on exiting the vehicle as well as any survival guidance relating to the type of water they are entering.

When people exit a vehicle into moving water they should exit upstream from the vehicle; this should prevent them from becoming trapped by the moving vehicle. If the flow of the water prevents doors being opened, people may need to exit the vehicle through a window.

If the vehicle is starting to submerge, or there is a risk of this happening, people should exit it at the earliest opportunity and wade or swim away from the vehicle.

STRATEGIC ACTIONS

There are no strategic actions for this control measure, strategic actions within the below control measures should be followed:

- Control Measure - Protect people at risk: Survival guidance

TACTICAL ACTIONS

Fire control personnel should:

- Provide water survival guidance based on the stability of the vehicle and the water conditions
- Consider advising people trapped in a vehicle in water to prepare to exit the vehicle
- Consider advising people trapped in a vehicle in water to stabilise the vehicle by applying the handbrake, turning off the ignition and reducing their movement
- Consider advising people trapped in a vehicle in water to stay out of the water that has entered the vehicle if possible

- Consider advising people trapped in a vehicle in water to keep away from airbags if possible
- Consider advising people trapped in a vehicle in water to exit the vehicle
- Consider advising people trapped in a vehicle in water to exit onto the upper surface of the vehicle
- Consider advising people trapped in a vehicle in water to exit into open water

Control measure - Assist the rescue of people at risk: Water survival guidance – people in road vehicles

CONTROL MEASURE KNOWLEDGE

This control measure should be read in conjunction with:

- Assist the rescue of people at risk: Water survival guidance
- Assist the rescue of people at risk: Water survival guidance
- Assist the rescue of people at risk: Water survival guidance for people in moving water

The following information should be gathered by fire control personnel. This information should be used to aid dynamic mobilising decisions and shared with operational personnel and where relevant, other responding agencies, to assist the rescue of people at risk:

- Type of vehicle, including whether it is electric or hybrid
- Number of vehicles
- Current water levels inside and outside the vehicle
- Number and location of people and animals in the vehicle
- Direction of the vehicle in relation to the water flow
- Stability of the vehicle
- If the vehicle has moved, how far it has moved and how quickly
- Any damage sustained to the vehicle
- Predicted weather forecast, tides and river levels

If a vehicle has moved and the exact location is no longer known, the water entry point (WEP), point last seen (PLS) and speed of travel should be passed, so that operational personnel can calculate its approximate location.

If they have not already done so, there are actions that people can take which will assist their rescue, including:

- Preparing to exit the vehicle by:
    - Removing seatbelts
    - Moving seats away from the dashboard

- Releasing children from child seats
- Opening windows
- Restraining any animals

- Alerting operational personnel to their location by:
  - Sounding the vehicle horn
  - Turning on hazard warning and headlights; this will also provide an indication of the water depth

STRATEGIC ACTIONS

There are no strategic actions for this control measure, strategic actions within the below control measures should be followed:

- Control Measure – Assist rescue of people at risk: Survival guidance
- Control Measure – Assist rescue of people at risk: Water survival guidance

TACTICAL ACTIONS

Fire control personnel should:

- Share information on the location of the vehicle including the water entry point (WEP) and point last seen (PLS) with operational personnel and other responding agencies
- Share information relating to the number and type of vehicles in the water with operational personnel and other responding agencies
- Share information regarding the water conditions inside and outside the vehicle with operational personnel and other responding agencies
- Share information about the number and location of people and animals in the vehicle in water with operational personnel and other responding agencies
- Share information on the position and stability of the vehicle in the water with operational personnel and other responding agencies
- Share information detailing how far the vehicle has moved in the water and how quickly with operational personnel and other responding agencies
- Share information detailing any damage sustained to vehicles in the water with operational personnel and other responding agencies
- Advise people trapped in a vehicle in water to prepare to exit the vehicle in readiness for their rescue
- Advise people trapped in a vehicle in water to turn on vehicle lights and sound the horn to alert operational personnel and other responding agencies to their location