Communities and Local Government

CFRA
CHIEF FIRE & RESCUE ADVISER

Fire and Rescue Service Operational Guidance

GRAs
generic risk assessments

GRA 2.4
Flooding and water safety

Generic Risk Assessment 2.4

Flooding and water safety

November 2011

London: TSO

TSO
information & publishing solutions

Published by TSO (The Stationery Office) and available from:

Online
www.tsoshop.co.uk

Mail, Telephone, Fax & E-mail
TSO
PO Box 29, Norwich, NR3 1GN
Telephone orders/General enquiries: 0870 600 5522
Fax orders: 0870 600 5533
E-mail: customer.services@tso.co.uk
Textphone: 0870 240 3701

TSO@Blackwell and other Accredited Agents

Published with the permission of the Department for Communities and Local Government on behalf of Her Majesty's Stationery office.

ISBN 9780117540279

Printed in the United Kingdom by The Stationery Office

ID 2467867 11/11 16668 19585

Contents

SECTION 1

Generic Risk Assessment 2.4

Flooding and water safety **5**

Scope 5

Significant hazards and risks 6

Working environment 6

- Contamination and biological/chemical hazards 6
- Weather conditions 6
- Extremes of temperature 6
- Hypothermia and hyperthermia 7
- Depth, current and flow 7
- Unstable surfaces 7
- Poor light conditions 7
- Confined/restricted spaces 7
- Electrical hazards 8
- Noise 8

Nature of the work 8

- Slips, trips and falls 8
- Falls from height 9
- Falling objects 9
- Members of the public 9
- Drowning 9
- Manual handling 9
- Musculoskeletal injuries 9
- Casualty/victim handling 10
- Lone working 10
- Entrapment 10
- Impact injuries 10
- Accidental immersion 10

Psychological effects 11
Fatigue 11
Working with other agencies 11
Large animal rescues 11
Equipment and equipment use 11
Using rescue and safety equipment 11
Systemic hazards 12
Key control measures 12
Planning 12
Training 13
Command and Control 14
Safety Officer(s) 14
Personal protective equipment 15
Safe systems of work 15
Post incident considerations 16
Specific control measures for flooding and water safety 17

SECTION 2

Summary of Generic Risk Assessment 2.4 Flooding and water safety 22

SECTION 1

Generic risk assessment 2.4 Flooding and water safety

Scope

This generic risk assessment examines the hazards, risks and controls relating to Fire and Rescue Service personnel, the personnel of other agencies and members of the public at incidents near, or in water.

The range of incident types may include:

- rescues from open water
  - rivers
  - canals
  - lakes and ponds
  - docks, locks and culverts
  - quarries
- rescues from vehicles in water
- rescues from mud, ice and unstable ground
- animal rescues
- floodwater incidents
- body recovery. (in certain circumstances).

This generic risk assessment does not cover the risks associated with fire fighting from boats.

Activities involving other specific significant hazards are covered in other generic risk assessments and should therefore be considered in conjunction with this one.

As with all generic risk assessments, this provides a starting point for Fire and Rescue Services to conduct their own assessments, produce their own standard operating procedures and written safe systems of work within the context of local conditions and existing organisational arrangements.

Significant hazards and risks

The significant hazards and risks that Fire and Rescue Service personnel face when attending water related incidents fall into a number of categories:

Working environment

Fire and Rescue Service' operations at water related incidents are undertaken in a wide range of working environments. There are the hazards associated with weather, i.e. strong winds, precipitation, temperature variants, inadequate lighting and poor surface conditions in addition to those associated with working near or in water, i.e. waterborne contaminants, the effects of depth, current and flow, and the physiological stresses that may occur as a result of difficulty maintaining appropriate body posture whilst undertaking operational tasks.

CONTAMINATION AND BIOLOGICAL/CHEMICAL HAZARDS

Biological hazards, in particular waterborne diseases, should be expected to be present at water related incidents and there are a number of infections that can be encountered, including:

- salmonella
- amoebic dysentery
- zoonoses
- tetanus
- typhoid
- polio
- hepatitis
- Weil's disease (leptospirosis).

Further guidance can be sourced in Generic Risk Assessment 5.3 and 5.4 respectively – biological and chemical hazards.

WEATHER CONDITIONS

Wind, high levels of precipitation, poor visibility, ice, heat and fog all have implications for incidents involving water.

EXTREMES OF TEMPERATURE

During fire service operations at water incidents Fire and Rescue Service personnel can be exposed to extremes of body temperature. This can be caused by the prevailing weather conditions the arduousness of the work being carried out or the type of personal protective equipment being worn.

These extremes of body temperature can lead to two opposite medical conditions.

HYPOTHERMIA AND HYPERTHERMIA

Hypothermia is a physical condition that occurs when the body's core temperature falls below a normal 98.6° F (37°C) to 95° F (35°C) or cooler. Cold water dangerously accelerates the onset and progression of hypothermia since body heat can be lost 25 times faster in cold water than in cold air, heat loss in moving cold water will be considerably faster. Hypothermia affects the body's core – the brain, heart, lungs, and other vital organs. Even a mild case of hypothermia diminishes a victim's physical and mental abilities, thus increasing the risk of accidents. Severe hypothermia may result in unconsciousness and possibly death.

Hyperthermia is an elevated body temperature due to failed thermoregulation and is defined as a temperature greater than 37.5–38.3°C (100–101°F), hyperthermia occurs when the body produces or absorbs more heat than it can dissipate.

Heat stroke is an acute condition of hyperthermia that is caused by prolonged exposure to excessive heat and/or humidity. The heat-regulating mechanisms of the body eventually become overwhelmed and unable to effectively deal with the heat, causing the body temperature to climb uncontrollably.

Personal protective equipment can contribute significantly to an increase in body temperature. This is particularly so when wearing dry suits.

DEPTH, CURRENT AND FLOW

It may often be difficult, if not impossible to accurately determine the level of depth, current and flow of any body of water. With limited knowledge and experience many sections may appear benign, while the vast majority of the hazards exist below the surface waiting to catch out the unsuspecting rescuer.

UNSTABLE SURFACES

It can be difficult to assess the level of loading a surface can withstand; particularly under time critical or certain environmental conditions. Further guidance can be sourced in Generic Risk Assessment 2.2 – Rescues – From ice/unstable ground.

POOR LIGHT CONDITIONS

Seasonal variances, protracted and night time incidents impact on individual and crew safety, as well as adding additional complexity in undertaking accurate risk management measures and tactical decision making.

CONFINED/RESTRICTED SPACES

Working in confined/restricted spaces will pose significant risks at incidents involving water. Difficult access and egress, possible entrapment, depth and flow will need to be considered at a range of incidents i.e. vehicles in water, locks, culverts and in certain floodwater situations.

Further guidance can be sourced in Generic Risk Assessment 2.1 – Rescues from confined spaces.

ELECTRICAL HAZARDS

Consideration should be given to the electricity hazards that may be present at incidents near, or in water. The proximity of power lines, particularly when using throw lines, reach poles and other associated equipment should be borne in mind when selecting systems of work.

Other risks associated with electrocution can be found at various water related incidents i.e. domestic property flooding, incidents involving machinery, and electrical installations affected by wide scale flooding.

Further guidance can be sourced in Generic Risk Assessment 5.1 – Generic hazards – Electricity.

NOISE

Noise creates additional hazards at water related incidents; it can present difficulties in communication between both rescuers and those being rescued.

Noise intensity can be significantly increased when operating in water due to flow rates and features within the water environment as well as issues created by the use of powered boats and other systems of work.

Hazards posed by noise:

- If the noise is of such an intensity that normal speech cannot be heard, personnel may not hear (or may mishear) critical safety information; this may expose them and/or others to additional hazards, or increase the level of risk to either/both from existing hazards
- Intense noise may result in hearing loss, either through conductive hearing loss, or sensory-neural (nerve) deafness. Noise induced hearing loss may be temporary or permanent, dependant upon the frequency and intensity of the noise, and the duration of exposure
- Noise generated at certain frequencies can cause tinnitus, usually described as a ringing in the ears. Tinnitus can be intermediate or continual and can lead to sleep pattern disturbances and effect concentration.

The presence of noise in darkened environments may result in disorientation and further communication difficulties.

Nature of the work

The hazards associated with the nature of the work can be present both in and out of the water; however, the risks associated with those hazards may change significantly i.e. slips, trips and falls on a level embankment may result in a minor injury, whereas within the water this may lead to an uncontrolled fall whereby the individual is accidentally immersed. Depth, current and flow will also increase the risk significantly.

SLIPS, TRIPS AND FALLS

Water edge and sub-surface conditions may vary and risks posed by a variety of surface conditions must be considered:

- underwater debris, uneven or slippery surfaces, submerged road furniture, displaced drain covers, mud, silt etc.
- poor/undercut bank conditions.

These risks can be further compounded by fatigue at protracted incidents or where levels of high activity occur.

FALLS FROM HEIGHT

There are a multitude of scenarios that might present a risk to personnel from falls from height when working near or in water i.e. steep embankments, working alongside docks and in quarries and falls through fragile surfaces.

The likelihood of falls from height can be further increased by weather conditions, fatigue and inadequate light.

Further guidance can be sourced in Generic Risk Assessment 5.10 – Generic hazards – Working at heights.

FALLING OBJECTS

The risk presented by falling objects; equipment, debris, and dislodged unstable materials affected by certain environmental and weather conditions all pose significant risks.

MEMBERS OF THE PUBLIC

Rescues from water often become high profile events and naturally attract large numbers of onlookers. Time critical incidents and levels of public expectation have led to cases where rescues have been attempted prior to suitable and sufficient management of risks being undertaken, and/or appropriate systems of work being employed – in certain cases by members of the public themselves.

Additional risks may also include aggressive or abusive behaviour from members of the public. Aggression to personnel is defined by the Health and Safety Executive as “any incident in which an employee is abused, threatened or assaulted by a member of the public in circumstances arising out of the course of his or her employment”.

DROWNING

Any situation whereby personnel enter a water hazard, either by choice or accident, possesses the inherent risk from drowning/asphyxiation.

MANUAL HANDLING

Many injuries are sustained on the incident ground due to the incorrect handling of equipment, or casualties. The additional aspect of working in restrictive personal protective equipment can also be an inhibiting factor resulting in potential increases in wearer heat stress and associated injuries.

MUSCULOSKELETAL INJURIES

Body positioning, force of movement and pace of work can all impact on personnel working within the water environment. These issues may be compounded by the range of operating temperatures, as a cold environment will make the body less flexible and more

susceptible to strains and other injury. Difficulty in adopting the correct body posture and the additional loads incurred by working within the water environment must also be considered.

CASUALTY/VICTIM HANDLING

A variety of risks can be associated with the incorrect handling of a casualty/victim. From both the physical aspects of removing a casualty from a hazardous environment and the hazards presented by the casualty themselves.

Conscious victims may exhibit panic, with counterproductive random movement such as thrashing and shouting or alternatively exhibit counter panic whereby the victim withdraws or offers little or no assistance whatsoever.

LONE WORKING

By the very nature of the hazards present at incidents involving water, the risks arising from lone working are likely to be more difficult to control. Lone working should be avoided.

ENTRAPMENT

Entrapment presents a significant risk to personnel working within the water environment. This risk is increased in moving water where flow and depth can prevent an individual from self-rescuing and result in personnel becoming trapped and dependant on others for their own rescue. Likely entrapment scenarios may include:

- hand or foot entrapment
- pinned against an immovable object i.e. vehicle, tree, road furniture
- wrapped – this is where a boat is wrapped around an immovable object, possibly trapping the person inside
- snag entrapment i.e. becoming snagged on a non-releasable tether, or by personal protective equipment/ item attached to personal protective equipment.

IMPACT INJURIES

The type of impact injuries that are most common within the water environment generally fit into one of two categories:

- where the individual makes contact with an immovable object, such as: a boulder, rock or obstacle within the flow, or
- where an object strikes the individual, such as: a boat or moving boat part, i.e. propeller/motor, or impact from floating debris.

ACCIDENTAL IMMERSION

Injuries resulting from uncontrolled entry into the water can be significant or even fatal. Entanglement, impact injuries, contact with sharp objects, cold water shock and ultimately drowning can occur.

PSYCHOLOGICAL EFFECTS

Acute stress responses or anxiety disorders can develop as a result of exposure to any event which results in psychological trauma. Sleep disorders, flashbacks and feelings of guilt, amongst others may occur post incident.

FATIGUE

Working within the water environment for prolonged periods can lead to high levels of fatigue. Protracted incidents, levels of high intensity work and the additional factor of exposure to inclement weather can create additional risks to personnel.

WORKING WITH OTHER AGENCIES

Working with other agencies has the potential to impact on Fire and Rescue Service safe systems of work, particularly where disparity exists between procedures and working practices.

It is advisable to establish operational strategies, including welfare arrangements in conjunction with all response partners.

LARGE ANIMAL RESCUES

Significant hazards can be associated with rescues of animals from near and in water. The unpredictable nature of the animal can lead to crush, impact and manual handling injuries as well as the risks associated with contamination and associated health matters.

Further guidance can be sourced in the GRA 2.5 – Large animal rescues

Equipment and equipment use

USING RESCUE AND SAFETY EQUIPMENT

Personnel will be required to use a variety of rescue and safety equipment. Some items such as a throw line or inflatable hose are relatively simple to operate. Others, such as boats and rescue sleds etc are more complex.

General hazards will include:

- moving parts
- powered motors and propellers
  compressed air
- hydraulic systems
- heavy or awkward loads
- restrictive clothing, and
- exposure to sharps.

Risks include:

- entrapment in machinery
- slips, trips and falls

- manual handling injury
- collision injury
- cuts and bruises
- hearing and sight damage (see above).

In addition, some rescue situations can present scenarios that are outside the normal operating parameters for standard equipment and procedures. For example the use of ropes and lines for access, improvised rescue craft etc. This can heighten the risk presented to operators and should only be allowed in the most extreme rescue situations.

SYSTEMIC HAZARDS

The degree of risk presented by a failure in the management system can involve equipment provision, including supply, testing and maintenance, inadequate training or supervision or unsatisfactory policies and procedures.

The water environment is among the most challenging that the Fire and Rescue Service could face and safe systems of work underpinned by an effective safety culture are essential elements of this activity.

Key control measures

Planning

Planning is key to enhancing the safety of firefighters and others likely to be affected by Fire and Rescue Service's operations. Each Fire and Rescue Service's integrated risk management plan will set standards and identify the resources required to ensure safe systems of work are maintained.

Each Fire and Rescue Service should assess the hazards and risks in their area relating to this generic risk assessment and site-specific plans should be considered for locations where these are significant. This assessment should include other Fire and Rescue Service's areas where "cross border" arrangements make this appropriate.

Such site specific plans should include:

- levels of response
- reference to relevant standard operating procedures
- tactical considerations, including rendezvous points, appliance marshalling areas and access points.

Planning is underpinned by information gathering, much of which will be gained through intelligence provided by Fire and Rescue Service staff – for example, information covered by section 9 (3) (d) of the *Fire and Rescue Services Act 2004*.

Information should also be gathered and used to review safe systems of work, etc from sources both within and outside the Fire and Rescue Service, including:

- site specific risk information
- incident de-briefs
- health and safety events
- local authorities; and
- local resilience fora.

Involving others in planning is also an effective way to build good working relations with partner agencies and other interested parties, such as site owners.

Fire and Rescue Services should ensure systems are in place to record and regularly review risk information and to ensure that new risks are identified and recorded as soon as practicable.

Fire and Rescue Services must ensure that the information gathered is treated as confidential, unless disclosure is made in the course of duty or is required for legal reasons.

Fire and Rescue Services should consider the benefits of using consistent systems and formats to record information from all sources. Consideration should also be given to how timely access will be provided to information to support operational decision-making.

Information needs and the capacity of Fire and Rescue Service staff to assimilate information will vary, in proportion to the nature and size of incident and what stage the operational response has reached, therefore, arrangements need to be flexible and may be based on more than one system.

Training

When formulating a training strategy Fire and Rescue Services should consider the following points:

- Fire and Rescue Services must ensure their personnel are adequately trained to deal with hazards and risks associated with working in or near water
- The level and nature of training undertaken should be shaped by informed assessment of operational and individual needs in accordance with the Fire and Rescue Service guidance on the integrated personal development system, national occupational standards and any internal training plan
- Training and development should follow the principles set out in nationally agreed guidance documents. Training and development programmes should generally be structured so that they move from simple to more complex tasks and from lower to higher levels of risk

- Training and development will typically cover standard operational procedures as well as ensuring knowledge and understanding of equipment and the associated skills that will be required to use it
- Training and development programmes need to consider the need for appropriate levels of assessment and provide for continuous professional development to ensure maintenance of skills and to update personnel whenever there are changes to procedure, equipment etc
- Training outcomes should be evaluated to ensure that the training provided is effective, current and meets defined operational needs as determined by the Fire and Rescue Service's integrated risk management plan.

Site specific tactical exercises should be undertaken with other agencies or staff likely to assist at an actual incident.

Training and exercise venues should be risk assessed prior to use.

Command and control

The Incident Commander should follow the principles of the current national incident command system. Prior to committing personnel to any hazard area the Incident Commander must take into account all known relevant factors before selecting the most appropriate safe system of work.

A thorough safety brief including all known or perceived hazards and water related safety issues must be carried out prior to deployment of personnel within the hazard zone.

Safety Officer(s)

The early appointment of one or more Safety Officer(s) will assist in ensuring that risks are either eliminated or reduced to an acceptable level.

A safety decision-making model should be used to brief Safety Officers regarding the nature of the incident, the allocated task and prevailing hazards and risks. The Incident Commander should confirm that the Safety Officer understands:

- their role and area of responsibility
- allocated tasks; and
- lines of communication.

Those undertaking the Safety Officer role should:

- be competent to perform the role
- ensure personnel are wearing appropriate personal protective equipment
- monitor the physical condition of personnel and/or general or specific safety conditions at the incident, in accordance with their brief
- take any corrective action required to ensure safety of personnel

- update the Incident Commander or Safety Sector Commander regarding any change in circumstances; and
- not be engaged in any other aspect of operations, unless this is required to deal with a risk critical situation.

A Safety Officer can be any role, but the complexity of the task, size of the incident and scope of responsibility should be considered by the Incident Commander when determining the supervisory level required.

Safety Officers should wear nationally recognised identification to indicate they are undertaking the 'Safety Officer' role.

Fire and Rescue Services should ensure that training and other measures (such as aide-memoires) are in place and available to support those staff liable to undertake this role.

Note: This role should be considered in addition to the role of upstream spotter (where appropriate) as part of the safe systems of work.

Personal protective equipment

Fire and Rescue Services must ensure that any personal protective equipment provided is fit for purpose and meets all required safety standards. When choosing suitable protective garments, the standard of clothing worn beneath the specialist personal protective equipment should also be taken into account. Consideration should also be given to the selection of suitable sizes of personal protective equipment.

Personal protective equipment should also take account of the need for rescuers to be visible against the operational background including night working and for the Incident Commander and other managerial and functional roles (defined in the national incident command system) to be distinguishable.

All personnel must use appropriate levels of service provided personal protective equipment as determined by the safe system of work.

Due consideration should be given to the compatibility of different items of personal protective equipment in use at the same time, to ensure their effectiveness is not compromised.

Safe systems of work

All of the above-mentioned control measures will contribute to the creation of safe systems of work. There are a number of other factors that may need to be taken into account.

Water incidents, in particular major flooding events are likely to involve joint agency working; safe systems of work should take into consideration operating procedures of those agencies involved and although the Police Service will have overall primacy consideration should be given to ensuring the safety of other agencies on the scene as far as is reasonably practicable.

A memorandum of understanding between responding agencies will help establish both levels of expectation and assist in sharing resources and information to minimise duplication of effort and ensure consistency in the management of emergency incidents.

Fire and Rescue Services should ensure that arrangements for dealing with abusive and/or aggressive behaviour are in place.

Post incident considerations

The following measures should be considered to help eliminate or remove risks after an incident, as appropriate to the nature and scale of the incident.

- Any safety events; personal injuries, exposure to hazardous substances or near-misses should be recorded, investigated and reported in line with legislative requirements such as the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) etc
- As appropriate, occupational health support and surveillance follow up
- Conduct a de-brief to identify and record any 'lessons learned' from the incident. De-briefs will range in complexity and formality, proportionate to the scale of the incident and in line with individual Fire and Fire and Rescue Service procedures. Consider any changes required to safe systems of work, appliances or equipment in the light of any lessons learned from debriefs or from safety events
- Consider the need to review existing information held on a premises or location, or the need to add a new premises or location into future planning e.g. by adding to visit or inspection programme
- Consider the need to refer to other agencies any concerns or issues that are identified at an incident e.g. referral of vulnerable person to social services, referral of possible environmental health problems at a premises serving food to the local authority, etc When sharing information, due regard must be paid to the need for confidentiality and the legal requirements arising from the *Data Protection Act*
- Staff should be supported and monitored to identify whether they are experiencing any adverse affects and to check whether they would benefit from accessing counselling and support services
- Consideration should be given to arranging for staff to make a contemporaneous written record of their actions. This information may be used to assist in any internal or external investigations or enquiries that follow any incident e.g. coroners court, public enquiry, etc.

Specific control measures for flooding and water safety

Working environment

CONTAMINATION AND BIOLOGICAL/CHEMICAL HAZARDS

- Where possible limit the number and time that personnel are exposed to these hazards
- Ensure disinfectant hand gel is available on all appliances, personnel must use the gel after working in the hazard area and before eating, drinking or smoking
- Wearing of surgical gloves limits the exposure to any contaminants. Where the individual has cuts or abrasions on their hands. disinfectant gel must still be used
- All personnel to have received water awareness training and understand the symptoms of listed infections above
- Ensure decontamination of equipment is carried out after use in the hazardous area.
- If contamination of the water is suspected fire and rescue services should consider requesting the Environment Agency to provide a water analysis
- Fire and rescue services should consider an appropriate programme of inoculation for personnel who may be exposed to biological hazards.

WEATHER CONDITIONS/EXTREMES OF TEMPERATURE

- when planning for these types of incident fire and rescue services should consider providing suitable shelter for operational crews
- ensure the correct level of personal protective equipment is available for personnel
- contact the appropriate agency for weather conditions reports that could affect the incident.

HYPOTHERMIA AND HYPERTHERMIA

- Individuals should be aware of the signs of hypothermia and be able to recognise symptoms that include: shivering, slurred speech, lack of co-ordination and, the skin will be cold to the touch. In order to reduce the risk, personnel should avoid getting wet but if this does occur wet clothing should be removed and personnel should be moved to a warm dry area as soon as practicable, i.e. fire appliance cab
- Rotation of teams at the incident is essential, especially teams working in full water personal protective equipment: dry suits, helmet, buoyancy aid, gloves and boots, the work they will carry out is hot and arduous, and individuals can easily suffer the symptoms of hyperthermia

- During protracted incidents crews awaiting deployment should, where it is safe to do so, remove any personal protective equipment that contributes to heat build up.

DEPTH, CURRENT AND FLOW

- if possible avoid entry into the water
- site specific risk information should be collected and be available to fire and rescue service personnel prior to deployment, to include; access points, rendezvous points, depth of water, locally known names and owners details
- ensure suitable control zones are set up as soon as possible
- before entry into the water a safe attempt in gauging the depth must be carried out
- only Module 2 and 3 trained personnel to enter water, dressed in full water rescue personal protective equipment
- ensure up-stream spotters and multi levels of down stream back up are deployed on arrival of the fire crews.

UNSTABLE SURFACES

- establish the hot, warm and cold control zones on arrival of the fire crews
- minimise the amounts of personnel in the risk area.

POOR LIGHT CONDITIONS

- lighting the area with maximum effect immediately on arrival
- use of scene lighting – appliance mast lighting, portable scene lighting/personal torches
- teams to work in minimum of pairs, all personnel should wear high visibility vest under life jackets/buoyancy aid and carry minimum of one radio per team
- communication checks with all teams regularly during the incident.
- where appropriate individual torches/lamps should be issued to personnel working in areas of poor visibility.

CONFINED/RESTRICTED SPACES

- suitable safe systems of work must be established for teams working in any confined space.

NOISE

- all teams must receive a briefing on arrival at the incident of all known and possible hazards
- communications must be established and team communication checks maintained regularly, throughout the incident
- consider the use of hand signals, radios and ear plugs/defenders
- regular rotation of teams in the noise hazard area should be maintained.

Nature of the work

SLIPS, TRIPS AND FALLS

- provision of suitable lighting as deemed necessary
- identify as early as possible areas where erosion of the water bank may or has occurred and ensure these areas are checked by Module 3 personnel
- use of barrier tape to mark trip hazards
- establish the hot, warm and cold control zones on arrival of the fire crews
- only Module 2 and 3 trained personnel are to enter and traverse through water, adopting the method of wading with wading poles, checking for underwater hazards
- if falling in water ensure the safe swim position is adopted immediately:
  - feet up, pointing in the direction of travel, do not attempt to regain control by putting feet down at any time
  - use arms to help direction and floatation.

FALLS FROM HEIGHT

- safe systems of work must be established for teams working in the hot and warm zone, where possible falls from height may occur
- all teams must receive a briefing on arrival at the incident to include working at height restrictions
- a pre-determined rescue plan should be established.

FALLING OBJECTS

- suitable safety helmets should be worn in areas where falling objects are likely
- ensure fire helmet chin straps are unfastened to avoid neck injury if sudden immersion occurs when working near water.

MEMBERS OF THE PUBLIC

- use of barrier tape to restrict entry into the risk area
- ask for the attendance of the police
- establish the hot, warm and cold control zones on arrival of the fire crews
- establish a booking in point for personnel entering the warm and hot zone
- safe systems of work must be established for teams working in the hot and warm zone
- all teams must receive a briefing on arrival at the incident of all known and possible hazards
- where families are present set up an area for them so they do not become involved with any rescues or recoveries.

DROWNING

- establish the hot, warm and cold control zones on arrival of the fire crews
- establish a booking in point for personnel entering the hot and warm zone
- to reduce the risk of drowning safe systems of work to be set up for work undertaken in the hot and warm zones and only appropriately trained personnel to enter the water, when above waist height or fast flowing
- all personnel to wear life jackets when in the risk area
- all teams must receive a briefing on arrival at the incident of all known and possible hazards.

MANUAL HANDLING/MUSCULOSKELETAL INJURIES

- ensure sufficient personnel are available for all manual handling tasks
- when undertaking manual handling appropriate lifting techniques should be adopted
- where available, mechanical aids should be used to assist with manual handling activities.

CASUALTY/VICTIM HANDLING

- see manual handling/musculoskeletal injuries above.

LONE WORKING

- all teams must receive a briefing on arrival at the incident of all known and possible hazards
- communications must be established and team communication checks maintained regularly, throughout the incident
- personnel to work in minimum of pairs, all personnel to wear high visibilty vest under life jackets/buoyancy aids and carry minimum of one radio per team.

ENTRAPMENT

- identify as early as possible where areas of; erosion of the water bank may, or has occurred, overhanging branches in the water are creating a strainer, in flooding fence lines are identified before teams work in those areas, limit the Module 3 trained personnel in these areas where possible
- establish the hot, warm and cold control zones on arrival of the fire crews
- only Module 2 and 3 trained personnel are to enter and traverse through water, adopting the method of wading with wading poles, checking for underwater and unseen hazards
- if falling in to water ensure the safe swim position is adopted immediately:
  - feet up, pointing in the direction of travel, do not attempt to regain control by putting feet down at any time
  - use arms to help direction and floatation.

IMPACT INJURIES

- ensure up-stream spotters and multi levels of down stream back up are deployed on arrival of the fire crews
- where entry into the water is required, safe systems of work must be set up and only appropriately trained personnel to enter the water.

ACCIDENTAL IMMERSION

- as per the control measures for slips, trip and falls and entrapments
- throw lines available on the banks/edge of water
- use of life jackets by all personnel in risk area
- minimum number of personnel in hazard area
- use of cordons.

PSYCHOLOGICAL EFFECTS

- critical incident stress debriefing sessions available to personnel.

FATIGUE

- regular rotation of crews throughout the incident, to reduce the effect of fatigue.

Equipment and equipment use

USING RESCUE AND SAFETY EQUIPMENT

- personnel to be competent to use the specialist equipment deployed when working on or near water.

SYSTEMIC HAZARDS

- fire and rescue services should provide specific training and equipment when their risk planning process identifies that their personnel will be required to carry out operational activity near or on hazardous water areas.

Technical references	
1	Fire and Rescue Services Act 2004
2	Civil Contingencies Act 2004
3	Personal Protect Equipment Regulations 1992
4	Manual Handling Operations 1992
5	Workplace, Health Safety and Welfare Regulations 1992
6	Control of Noise at Work Regulations 2005
7	HSE, 8/91 Violence to staff: Leaflet IND(G) 69(L)
8	Fire Service Manual Volume 2 Fire Service Operations Safe Working near, on or in water
9	Fire and Rescue Service Manual Volume 2 Fire Service Operations Safe Work at Height
10	Fire and Rescue Service Manual Volume 2 Fire Service Operations Incident Command

SECTION 2

Summary of Generic Risk Assessment 2.4

Flooding and water safety

TASK – Pre incident

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
1	Planning for Operations involving water and flooding	Inadequate preparedness for operational incident type (systemic failure)	Fatality Major injury	Fire and Rescue Service Staff Members of the public Other agencies	**Organisational risk control** Fire and Rescue Service to identify, risk assess, plan, train and adequately control all reasonably foreseeable types of operational incident where working near, on or in water can be expected Fire and Rescue Service to gather record and make available appropriate information to support safe system of work Fire and Rescue Service to ensure appropriate arrangements for capability management exist, including: standards and provision of realistic training, continuation training and continuing personal development, quality assurance and asset management Fire and Rescue Service to ensure that crews and supervisors are adequately trained and competent; ensuring they undertake regular training and exercises for generic and specific risks within their area Fire and Rescue Service to ensure operational guidance and standard operating procedures are in place

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
					Fire and Rescue Service to ensure that adequate systems are in place to provide advance notice of inclement weather to personnel i.e. heavy rainfall, strong winds, ice Fire and Rescue Service to ensure the provision of appropriate equipment to support safe systems of work, including effective procurement programme Fire and Rescue Service to ensure that appropriate pre-determined response procedures are in place, including appropriate levels of supervision Fire and Rescue Service to ensure that an equipment management system is in place to comply with relevant legislation Fire and Rescue Service to ensure effective liaison between other agencies Fire and Rescue Service should consider a programme of inoculations for personnel, ALMA will provide advice on the most suitable Fire and Rescue Service should provide appropriate information, instruction and training on how to deal with moral pressure at incident scenes.

TASK – Initial stages of the incident

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
2	Attendance at incidents involving water	Failure to establish a safe system of work	Fatality Major injury	Fire and Rescue Service Staffl Members of the public other agencies	Fire and Rescue Service to ensure sufficient, suitable and competent resources are mobilised to this type of incident Fire and Rescue Service to ensure information gathered is available to responding personnel Incident Commander to establish the appropriate levels of the incident command system and suitable risk management arrangements Incident Commander to adopt a default defensive mode until suitable safe system of work is established Incident Commander to provide safety briefing on known/anticipated hazards and control measures prior to deployment and at appropriate times throughout the incident Where applicable the Incident Commander to deploy upstream spotters and appropriate down stream safety measures Incident Commander to consider deploying additional safety officer/s Incident Commander to give consideration to establishing cordons and ensuring appropriate supervision of zones.

Task – As theincident develops

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
3	Attendance at incidents involving water	Slips, trips and falls	Minor injuries Major injuries	Fire and Rescue Service Staff Members of the public Other agencies	Incident Commander to ensure continuous use of incident command systems and risk assessment procedures including safety briefings Incident Commander to adopt a default defensive mode until suitable safe system of work is established Incident Commander to ensure crews use appropriate procedures and equipment (especially personal protective equipment) in accordance with their training and organisational policies Incident Commander to ensure that safe access and egress to and from the incident area is established and maintained, particular attention should be paid to conditions underfoot, lighting levels and terrain Incident Commander to ensure crews are properly supervised in accordance with their training and level of competence.
4	Attendance at incidents involving water	Falls from height	Fatality Major injury	Fire and Rescue Service Staffl Members of the public Other agencies	Incident Commander to ensure that hazard zones and exclusion zones are established and controlled as necessary All persons in the hazard zone must be fully briefed and correctly protected with appropriate personal protective equipment (including work at height equipment) Pre-determined rescue plan to be established.

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
5	Attendance at incidents involving water	Falling objects	Fatality Major injury Minor injury	Fire and Rescue Service Staff Members of the public Other agencies	Incident Commander to ensure that hazard zones and exclusion zones are established as required including access and egress routes and any equipment or object that is required to be hauled aloft or lowered is adequately secured Incident Commander to ensure appropriate management of operations taking place above other areas of work i.e. use of edge protection All persons in the hazard zone must be fully briefed and correctly protected with appropriate personal protective equipment Pre-determined rescue plan to be established.
6	Attendance at incidents involving water	Manual handling	Major injury Minor injury	Fire and Rescue Service staff Members of the public Other agencies	Appropriate assessment of task and/or load Correct level of supervision Appropriate level of resources Suitable personal protective equipment Appropriate level of training Suitable and sufficient lighting.

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
7	Attendance at incidents involving water	Adverse weather conditions Exposure to extremes of temperature Hypothermia Drowning/asphyxiation Entrapment Confined/restricted spaces Impact injuries Psychological effects Noise Lone working Casualty/victim handling Fatigue Electricity	Fatality Major injury Minor injury	Fire and Rescue Service staff Members of the public Other agencies	Incident Commander to ensure continuous use of incident command systems and risk management procedures Incident Commander to ensure crews use appropriate procedures and equipment in accordance with their training and competence levels Incident Commander to ensure appropriate personal and scene lighting Incident Commander to ensure nature and condition of work areas are adequately assessed to ensure commensurate level of safety is applied and maintained Incident Commander to ensure crews are properly supervised in accordance with their training and competence Minimum personnel commensurate to the task within hazard area All personnel within the hazard zone must be fully briefed and correctly protected with appropriate personal protective equipment Constant monitoring of individuals Incident Commnder to monitor environmental conditions Welfare support i.e. appropriate reliefs, refreshment arrangements and rotation of crews. Incident Commander to consider requesting ambulance on standby Appropriate welfare provisions including post incident considerations i.e. counselling, critical incident debriefing Pre-determined rescue plan to be deployed.

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
8	Attendance at incidents involving water	Exposure to hazardous substances (biohazard or chemical)	Fatality Major injury	Fire and Rescue Service staff Members of the public Other agencies	Incident Commander to ensure continuous use of incident command systems and risk assessment procedures Incident Commander to ensure crews use appropriate procedures and equipment in accordance with their training and competence levels Incident Commander to ensure crews are properly supervised in accordance with their training and competence Incident Commander to ensure that hazard zones and exclusion zones are established as required Minimum personnel commensurate to the task within hazard area All personnel within the hazard zone must be fully briefed and correctly protected with appropriate personal protective equipment Monitoring of individuals including post incident Incident Commnader to consider suitable infection control measures including where necessary identification of contaminant Incident Commander to establish suitable de-contamination and clinical waste procedures Incident Commander to consider **immediate** referral to Accident and Emergency or occupational health in cases of contamination by human blood due to potential exposure to blood borne viruses.

Task – Post incident

Ref. No.	Activity	Hazard	Risk	Persons at risk	Control measures
9	Post incident review	Identified through Post incident review process	Identified through Post incident review process	Fire and Rescue Service Staff	Review any safety event information review debrief information health surveillance if necessary use information to develop/refine standard operating procedure use information to review and update competency strategy review nature and frequency of water incidents and review and update prevention strategy.