ARCOPOL

Guidance and Incident Response Procedure
to adapt and integrate in Act.5: Local Authority Guide

Activity 3

ARCOPOL

The Atlantic Regions' Coastal Pollution Response

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<tr><td><u>**Version:**</u></td><td>Final</td></tr>
<tr><td><u>**Last updated on:**</u></td><td>20/12/11</td></tr>
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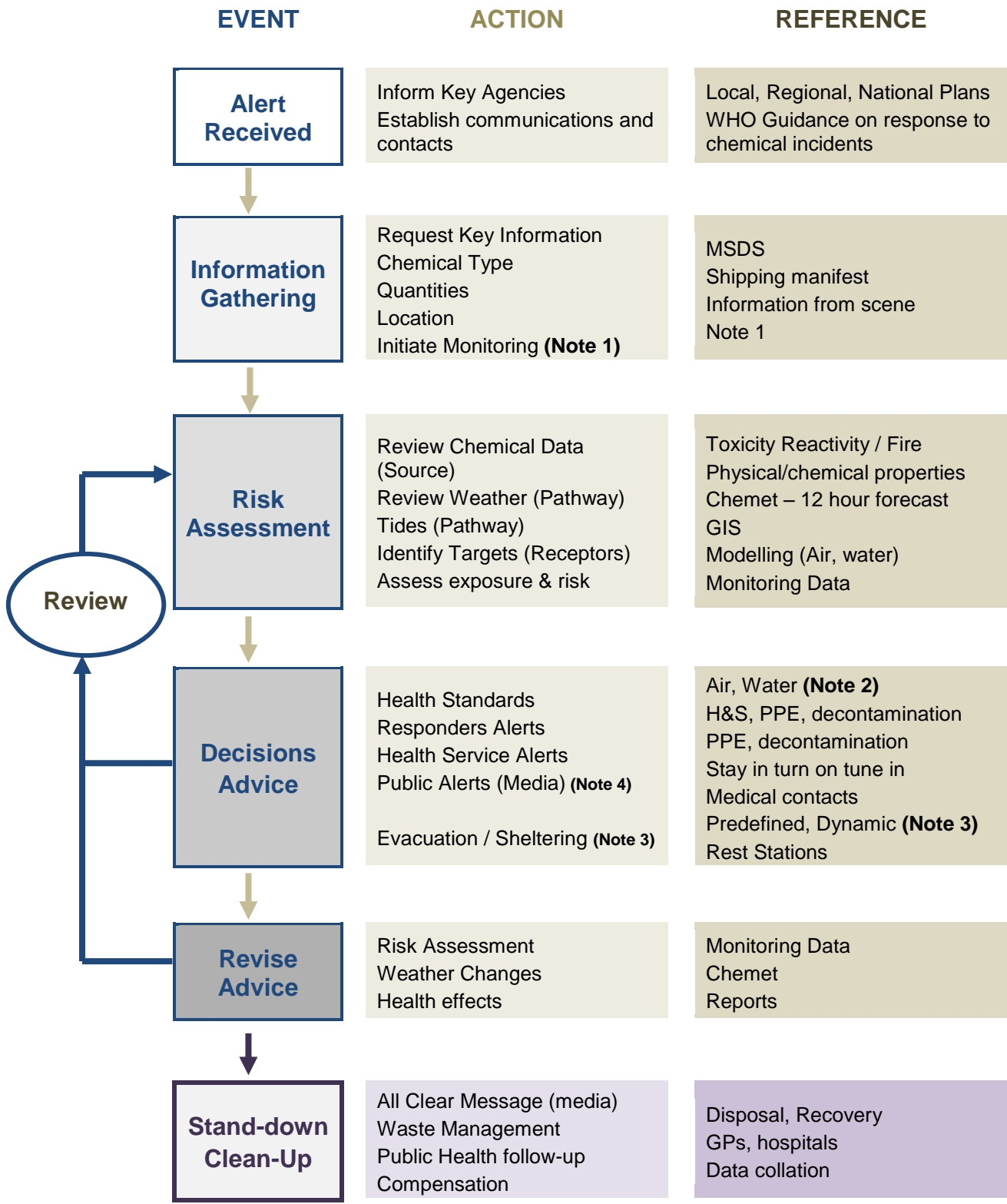</table>

The following concise report has been compiled as part of Activity 3 to integrate into the Local Authority Guidance Manual, produced under Activity 5 of the ARCOPOL project. This document links the following tasks: 3.2, 3.3, 3.4 & 3.9 of Activity 3.

The Local Authority guidance manual already encompasses a lot of information on response to both oil and HNS pollution incident; however it was felt that further information linked to human health incident response could be incorporated and adapted by responders into the guide.

The document contains very concise guidance and flowchart aimed to assist responders to make decisions quickly and efficiently, during an incident.

Comprehensive risk communication guidance and tool kit have been developed by the UK Cabinet Office and hence only key references to risk communication in an emergency are presented here.

STANDARD ACUTE INCIDENT RESPONSE PROCEDURE

EVENT	ACTION	REFERENCE
Alert Received	Inform Key Agencies Establish communications and contacts	Local, Regional, National Plans WHO Guidance on response to chemical incidents
Information Gathering	Request Key Information Chemical Type Quantities Location Initiate Monitoring **(Note 1)**	MSDS Shipping manifest Information from scene Note 1
Risk Assessment	Review Chemical Data (Source) Review Weather (Pathway) Tides (Pathway) Identify Targets (Receptors) Assess exposure & risk	Toxicity Reactivity / Fire Physical/chemical properties Chemet – 12 hour forecast GIS Modelling (Air, water) Monitoring Data
Decisions Advice	Health Standards Responders Alerts Health Service Alerts Public Alerts (Media) **(Note 4)** Evacuation / Sheltering **(Note 3)**	Air, Water **(Note 2)** H&S, PPE, decontamination PPE, decontamination Stay in turn on tune in Medical contacts Predefined, Dynamic **(Note 3)** Rest Stations
Revise Advice	Risk Assessment Weather Changes Health effects	Monitoring Data Chemet Reports
Stand-down Clean-Up	All Clear Message (media) Waste Management Public Health follow-up Compensation	Disposal, Recovery GPs, hospitals Data collation

Review

Note 1 – Monitoring

Whilst risks from chemicals can be assessed by environmental modelling of sources these are not as accurate as assessments based upon actual monitoring data (measurements). Key aspects for monitoring are summarised below:

When to monitor?

Monitoring should be established as soon as is practicable. The sooner data is obtained the better the assessment will be. On scene monitoring by Fire and Rescue Services can be extremely useful until specialist monitoring teams arrive and such monitoring is often needed for health and safety of responders.

Where to monitor?

- Monitoring locations should be sited with consideration to wind direction (air), tidal flow (water) and key receptors, as well as health and safety of teams.
- Monitoring of airborne contaminants should consider where plumes are grounding i.e. where they will result in exposure to receptors.
- Grounding of plumes and or wet deposition (rainfall) will also be useful if longer term monitoring for chronic risks is relevant – soils, vegetation etc.
- Where dense vapours are present monitoring should be undertaken in voids, confined spaces, drains etc. Similar steps should be taken where liquids may accumulate.

What to monitor for?

- Consider any specific harmful chemicals involved, potential reaction products from mixtures and whether incident involves combustion/fire. On site real-time monitoring is the preferred option, although sampling & laboratory analysis is also useful to provide specific information.
- Whilst it is ideal to obtain chemical specific data it is not always possible to have extensive ranges of equipment for this and other less specific methods may need to be used. Example: when benzene has been released into the atmosphere, it is possible to obtain indicative data using photo-ionisation detection to measure volatile hydrocarbons, if chemical specific hand held pumped tubes or portable gas chromatography equipment is not available.
- Consider other risks such as flammable and explosive environments and oxygen depletion.
- Consider airborne solids / particulates as well as gases and vapours, particularly where fires are involved or chemicals are fine powders.

Interpretation / Data Quality

- Most standards are based upon specific averaging times and these should be considered when undertaking monitoring and assessing data.
- For acute risks it is useful for monitoring to be sufficiently frequent to identify peaks as well as average concentrations.

Methods / Equipment

- Equipment should be suitably calibrated and methods suitably approved e.g. USEPA, UKHSE
- Ensure equipment is intrinsically safe where explosive atmospheres are suspected.

Note 2 – Health Standards

Guidance on health based air quality standards

There are a range of air quality standards suitable for application to chemical incidents where airborne contaminants may reach concentrations detrimental to health. These include acute exposure standards, such as AEGLs and ERPGs, occupational exposure standards such as IELVs, and standards for longer term chronic exposure, such as Air Quality Objectives and WHO Guidelines. The following provides basic descriptions of the various standards and suggestions of when to apply each type.

When to use and what to use

In the case of chemical incidents it is recommended that the following hierarchy of standards is applied (if chemical is not in first band then proceed down hierarchy):

Acute Exposure
AEGLs Acute Emergency Guideline Levels
ERPG Emergency Response Planning Guidelines
UK EAL (15 minute STEL) UK Environmental Exposure Limit
IOELVs / BOLVs (15 minute STEL) Indicative or Binding Occupational Exposure Values

Chronic Exposure
EU Air Quality Objective / Target European Directive 1999/30/EC
WHO EU Air Quality Guideline
UK EAL
IOELVs / BOLVs (8 hour TWA)

In the absence of standards or guidelines for a particular chemical then details of chemical toxicity should be reviewed using relevant toxicological sources e.g. REACH, ATSDR, WHO/JECFA, IRIS. Where chemical toxicity is uncertain exposure should be reduced as low as reasonably practicable.

Definitions

AEGLs (Developed by USEPA): Acute Emergency Guideline Levels (AEGLs) represent threshold exposure limits for the general public and are applicable to emergency exposures ranging from 10 minutes to 8 hours.

ERPG (Developed by The American Industrial Hygiene Association(AIHA)) : Emergency Response Planning Guideline Values (ERPGs) are air concentration guidelines for single exposures to agents and are intended for use as tools to assess the adequacy of accident prevention and emergency response plans.

Occupational Exposure Values (IOELVs / BOELVs developed on a European basis to be implemented as occupational / workplace exposure levels) : Whilst these limits can assess acute risks they are essentially derived for adult workers and are not necessarily protective to more susceptible receptors such as children or persons with underlying medical conditions. Indicative occupational exposure values IOELVs are derived based upon a chemical having a defined threshold, below which there will be no harm from exposure. Where there is no safe level Binding limit values are proposed (BOELV).

Environmental Exposure Levels (EALS - UK derived values for industrial regulation): EALs are calculated from occupational exposure limits to apply to the wider population by correcting the exposure time from an occupational scenario to an ambient scenario and including uncertainty factors to reflect effects to susceptible populations.

Chronic Exposure

Air - Chronic issues associated with wider public health are generally addressed by national or international policy based standards. Typically air quality standards are expressed as 24 hour average concentrations and are derived to be protective of the most vulnerable groups. In addition to legislative requirements, the World Health Organisation, provides a range of health based international air quality guideline values, derived for chronic exposure.

Water - Standards and guidelines are derived for drinking water quality based upon chronic human health risks as well as aesthetic factors. Again these are often based upon policy decisions and appear as national or international standards. In addition the WHO provides health based guidelines for water quality. Values are typically presented as milligrams or micrograms per litre of water. Standards are also derived for water as an amenity.

Land - Land contamination is again typically covered by national and international policy based upon chronic human health risks or risks to ecosystems e.g. UK soil guideline values, Dutch soil and sediment intervention values and USEPA minimal risk levels. These are typically reported as mg/kg and derived using chronic exposure models often for specific end-uses.

Ecotoxicity, Fisheries, Crops and Agriculture - Sources for health based limits for foodstuffs include WHO / JECFA, as well as those set by national food standards agencies e.g. EFSA, UK FSA. Ecological standards are available for soil, water and in some cases air. In addition data on ecotoxicity such as lethal doses to animals and data on degradation are widely available on material safety datasheets.

For further information on monitoring and the use of standards, refer to activity
3.2 report on the Arcopol website.

Note 3 - Sheltering / Evacuation

Evacuation should be seen as a last resort in view of the potential risks in moving large numbers of people in or near dangerous environments, potential for panic, issues regarding young, elderly and infirm.

Decisions on sheltering versus evacuation need to give consideration to the risks posed by the chemicals and the risks posed by moving people. It should be subject to a dynamic risk assessment and based on an assessment of Source – Pathway – Receptor and hence of potential exposure.

General guidance can be obtained from literature e.g. Emergency Response Handbook and should also be established in response plans. A quick guidance on evacuation/sheltering is provided in the sections below.

In more dynamic scenarios, reference should be made to monitoring and meteorological data and to relevant standards. Typical standards would include AEGL 2 values, flammable and explosive limits or site specific triggers where acute standards are unavailable.

In the latter case it is useful to develop a decision making algorithm as illustrated below:

Example of Public Shelter / Evacuation Algorithm developed for Particulates
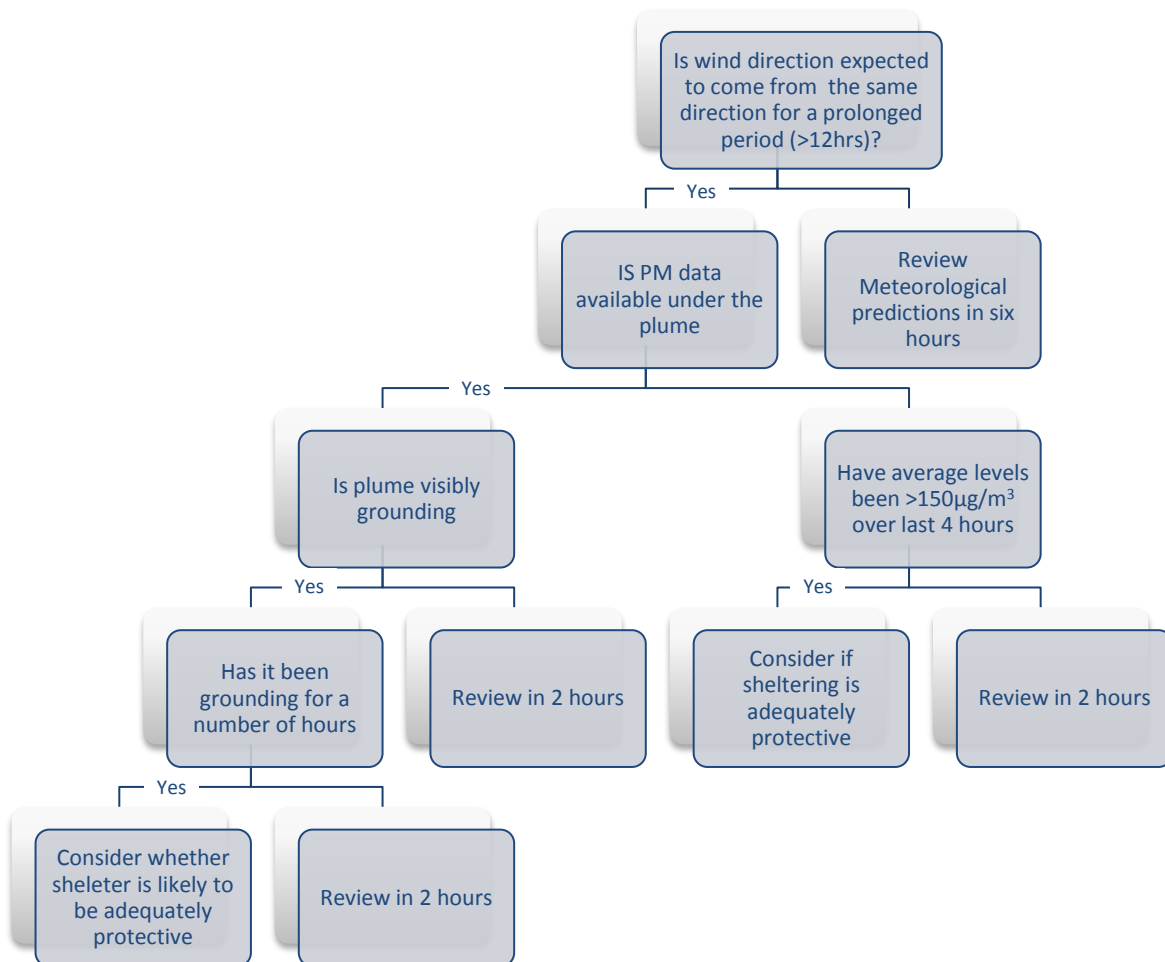
Sheltering or Evacuation: Decision Assessment Guide and Operational Guidance

EVACUATION

Here are specific instances where evacuation may be appropriate and sustained

During an incident

- ✓ Risk of imminent explosion
- ✓ Small leak of a hazardous substance likely to escalate rapidly without warning
- ✓ Release/ threatened release of chemical
- ✓ Spread of fire to members of the public
- ✓ Continuing hazard over a prolonged period of time e.g. Dense smoke, chemical etc.

After an incident

- ✓ Gross environmental contamination eg. soil following grounding of plume particulates

Generic considerations on whether or not to evacuate – dynamic risk assessment

- ➢ Area to be evacuated:
  - ▪ What is the likely number of people involved?
  - ▪ How large a zone is to be evacuated?
- ➢ How long will the decision process take?
  - ▪ the emergency services' response time
  - ▪ response time for the necessary transportation & highways management arrangements if required
  - ▪ Can responders safely work within the evacuation zone?
- ➢ Methods being chosen to co-ordinate and inform the public?
  - ▪ door-to-door
  - ▪ via loudhailers
  - ▪ radio/TV networks
  - ▪ language barriers, the need for translators
- ➢ Time constraints:
  - ▪ Is there sufficient time to evacuate?
  - ▪ The time of day (it is more difficult to warn people effectively at 4 a.m. that at 8 p.m.)
  - ▪ Time to prepare the public: to collect clothes, medication, baby supplies, pets, cheque books, credit cards etc and to secure their homes
  - ▪ Time required for the public to move
  - ▪ How quickly can emergency shelters be operational?
- ➢ The population profile:
  - ▪ Likely number of vulnerable, elderly, disabled, immobile etc.
  - ▪ Are any hospitals, residential/nursing homes, prisoner cells etc. in the affected area?
  - ▪ Any people on dialysis machines, or others at special risk?
- ➢ Transportation logistics
  - ▪ The quality of the road network and potential pinch points
  - ▪ Traffic management arrangements, including getting emergency vehicles to the scene and over-riding normal traffic management arrangements i.e. traffic lights etc.
  - ▪ Transport availability – private and public, including for special needs,
  - ▪ Safety issues for evacuation vehicles sent to scene
  - ▪ Blockage of roads – e.g. roadwork's, RTC's

- Minimum evacuation distances
- Hazardous travel conditions – e.g. chemical cloud, dense smoke, fog, flooding, ice etc.
➢ Consideration of the effects on the evacuees of:
  - outside temperature / weather conditions
  - psychological trauma/medical risk
  - short term, high level exposure risk during evacuation and mitigation measures
➢ Maintaining security in the evacuated area.

Specific considerations on Evacuation for Chemical/Smoke related incidents:

➢ Nature, behaviour & physical properties of substance(s) involved:
  - Is the substance harmful to the public?
  - highly toxic/toxic/irritant/non-irritant
  - short-term/long-term effects
  - explosive/non explosive
  - React with environment if released
➢ Modelling & Monitoring
  - Modelling of the plume or chemical dispersion
  - Real Time monitoring data demonstrate levels above safe criteria or with potential to become detrimental to health
  - Concentrations of substance in environment likely to increase
➢ Exposure
  - Will the public be exposed?
  - Is the substance contained or potential for release?
  - capable of dispersal via wind, rain, etc & are public in path of projected route
  - Distance from public, plume height, current and predicted meteorological conditions, (CHEMET info obtained?)
  - How long could the exposure last? few minutes, hours, days, months or years
  - When will the public be exposed: time of day, already exposed, imminently or not for a few hours
➢ What are the risks?
  - Possible health risk to the cordon and forward command, including the potential for wind change?
  - Will dilution factors minimise risk?
  - Will public potentially suffer acute or chronic health effects from which are detrimental

Provide standardised information leaflet to those being evacuated explaining what to do, to bring what to expect at any rest centre and contact details for ongoing advice. Risk communication

Criteria for those evacuated to be allowed to return home

  - ✓ Incident is under control and not expected to escalate
  - ✓ The residential premises are considered safe
  - ✓ Environmental sampling and analyses to provide risk assessment information in residential premises have been completed and discussed with medical toxicologist, where necessary
  - ✓ Leaflet has been provided to explain the situation and actions that should be taken on returning to the premises, such as opening windows and doors to ventilate the premises for appropriate period of time, and including a single 24hr. contact line for all manner of advice related to the incident.
  - ✓ Advice about whom to contact if any ill health effects develop, such as health agency helpline Doctors & General Practitioner, local accident and emergency department etc.

SHELTERING – ACTION TO PROTECT THE HEALTH AND SAFETY OF THE PUBLIC

Sheltering is frequently the safest option. Even in a poorly sealed house, infiltration may be reduced by a factor of 10. By sealing windows and doors with wet towels and newspapers, this factor increases by 30 to 50 fold.

GO IN, STAY IN, TUNE IN

- close windows and doors
- minimise drafts by sealing windows and doors with paper/tape or damp towels or newspaper
- turn off central heating
- turn off mechanical ventilation including air conditioning
- go to an upper floor, if possible to an interior room where ventilation is less
- avoid bathrooms and kitchens as they tend to have higher ventilation rates
- keep children and pets indoors
- breathe through a wet cloth over the face if the atmosphere inside room becomes uncomfortable
- have access to a radio and tune in to the local radio station for advice and information
- try not to use the telephone or mobile unless absolutely vital (to prevent jamming lines)

Responder considerations

- Ensure effective communication systems with the public, especially to ensure sheltering is undertaken as quickly as necessary
- Ensure effective forms of communication with other emergency services
- Provide a single help-line number for advice.
- Provide medical assistance post sheltering, especially to those incapacitated.
- Provide post sheltering advice on airing houses

Note:

Evacuation cannot be enforced except under anti-terrorism powers.

Experience from many events is that the vast majority of people will self-evacuate to a place of their choosing i.e. hotels, friends and family etc.

It is therefore essential that **timely, clear and accurate** information is provided to the local media that can be relayed on to the public to ensure that they can act in a manner that ensures they do not place themselves at continued or greater risk and do not hamper the emergency response.

Public agencies should focus their efforts upon those individuals within the community who are particularly vulnerable and unable to help themselves.

Note 4: Communicating Risks

Definition of communication:

> *"Building relationships with others, listening and understanding them, and conveying thoughts and messages clearly and congruently; expressing things coherently and simply, in ways that others can understand, and showing genuine knowledge, interest and concern; bringing these aspects together to make change happen"*
>
> *(UK Government Information and Communication Service)*

Good communication is key during the planning process as well as the response to an incident. Communication in terms of openness and transparency, understanding and engaging stakeholders, as well as providing a balanced information to allow the public to make decisions on how to deal with that risk.

Provided it is genuinely a two-way process, communication with the public can also help agencies/ organisations handle risk more effectively:

- ✓ It can help to **prevent crises/confusion** from developing
- ✓ It can lead to **better decisions** about how to handle risks
- ✓ It can help ensure **smoother implementation** of procedures to address risks
- ✓ It can help to **empower and reassure** the public
- ✓ Over time, it can help to **build trust** in Government/Responder and in the information it provides

    - *UK Cabinet Office: Communicating Risk Guidance*

What information is needed when? *UK Cabinet Office - Warning & Informing guidance*

Organisations engaged in warning and informing will need to think carefully about what information different audiences will want, and when, in an emergency. For instance, immediately when an emergency occurs, and during the first hour...

The PUBLIC NEEDS:

- ✓ basic details of the incident - what, where, when (and who, why and how, if possible);
- ✓ to know the implications for health and welfare;
- ✓ advice and guidance (eg stay indoors, symptoms, preparing for evacuation); and
- ✓ reassurance (if necessary).

The PUBLIC WANTS to know:

- ✓ other practical implications such as the effect on traffic, power supplies, telephones, water supplies, etc;
- ✓ a helpline number; and
- ✓ what is being done to resolve the situation.

MEDIA will REQUIRE:

- ✓ well-thought-out and joined-up arrangements between the emergency services, local authority and other organisations, capable of providing agreed information at speed;
- ✓ an immediate telephone contact; and
- ✓ a media rendezvous point at or close to the scene

Defining Risk Communication

- "The flow of information and risk evaluations back and forth between academic experts, regulatory practitioners, interest groups, and the general public." (Leiss, 1996)
- "At its best, risk communication is not a top-down form of communication from experts to the lay public, but rather a constructive dialogue between all those involved in a particular debate about risk." (Lofsteadt, 2006)

Risk communication in a crisis situation aims to help people deal with their feelings (including outrage) and cope effectively with serious hazards. (P Sandman, 2004)

Risk Communication and the Risk Management Process:

The diagram below shows the Strategic Risk Communications Framework developed by the Public Health Agency Canada, which demonstrates continuous involvement and communication with public and stakeholders throughout the response and during the planning & preparedness phases.
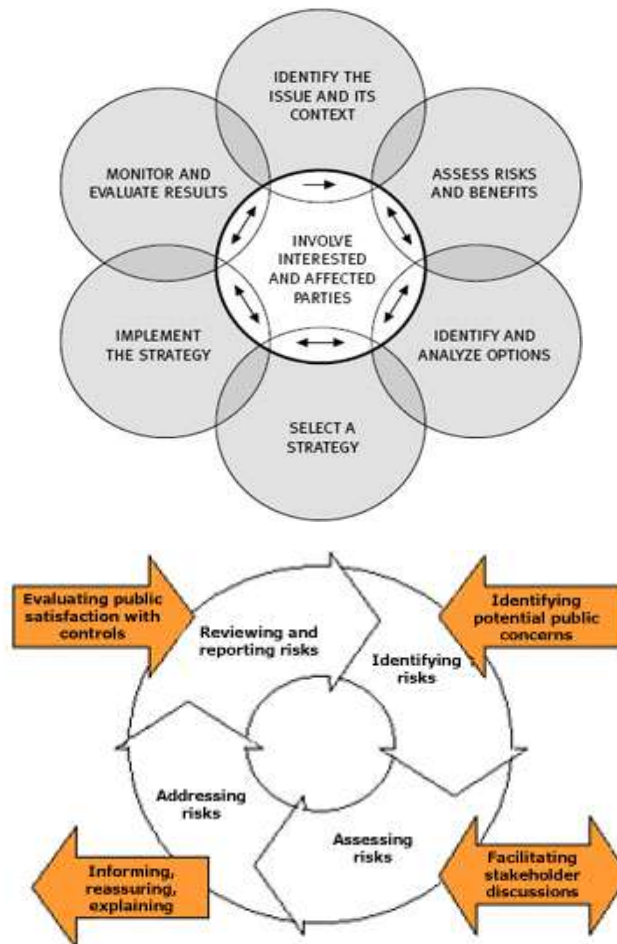
Role of Communication and directions of communication in the risk management process,
UK Cabinet Office "Communicating Risk Guidance"

Risk Communication Strategy

As with any other part of planning for response to an emergency, the communications strategy for warning and informing - either direct with the public, or via the media - should be fully integrated into the responder's emergency plans.

The function of a communication strategy is to help responders

- manage the risk.
- map out the way ahead: have a clear idea of direction, achievements and how to get there
- anticipate future problems so that responders can be prepared and deal with them quickly
- identify who to communicate with, involve, consult with
- define what needs to be found out and what to say
- decide how to reach audience including channels of communication
- identify the resources needed and manage those resources
- provide a framework for measuring progress and reviewing and evaluating effectiveness of strategy.

This risk communication strategy should be discussed and agreed upon between risk assessors, managers and agencies involved in response early in the process to ensure two-way communication. This strategy should also cover who should present information to the public, and the manner in which it will be done.

> **Note:** Confusion would be caused if more than one organisation were to plan to warn the public about the same risk at the same time to the same extent. To avoid duplication, those organisations whose functions are affected by an emergency should aim to co-operate and identify which organisation will take lead responsibility for warning and informing in regard to a particular emergency.

Organisations should test their warning and informing arrangements as they would emergency plans, through exercising and providing training to staff.

Alert Messages & Advice

Effective communication with the public during an emergency is vital to protect the community's health.

Messages are judged first and foremost not by content but by source: *who is telling me this, and can I trust them?* If the answer to the second question is "no", *any* message is liable to be disregarded, no matter how well intentioned and well delivered. *(UK Department of Health 1998)*

Acknowledge uncertainty. To be too certain may ring false. Say what you know, say what you don't know and say what you are doing to find out more. *(Sandman 2003)*

Here are some considerations when developing advisory and warning messages in relation to risk(s) posed by an emergency – (*Essex Regional Health Commission, United States*)

Communicating in an emergency is different

- In a serious incident, all affected people . . .
    - Take in information differently
    - Process information differently
    - Act on information differently
    - Perceive risk differently
- In a catastrophic event: communication is different

What the public seeks from your communication - 5 public concerns. . .

1. Gain wanted facts

2. Empower decision making

3. Involved as a participant, not spectator

4. Provide watchguard over resource allocation

5. Recover or preserve well-being and normality

What the Public Will Ask First

• Are my family and I safe?

• What have you found that may affect me?

• What can I do to protect myself and my family?

• Who/What caused this?

What the Media Will Ask First

• What happened?

• Who is in charge?

• Has this been contained?

• Are victims being helped?

• What can we expect?

• What should we do?

• Why did this happen?

• Did you have forewarning?

Initial Message

Must	**Must _Not_**
✓ Be short, simple, accurate	✗ Use jargon
✓ Be relevant	✗ Be judgmental
✓ Be based on facts	✗ Make promises that can't be kept
✓ Give positive action steps	✗ Include humor
✓ Provide a single helpline number	✗ Patronise the public

✗ **DO NOT**: Provide mixed messages from multiple experts or Release the information late

Key Considerations in Risk Communication

- ✓ Risk communication is a multidirectional process
- ✓ Understand the perspective of the public and stakeholders
- ✓ Acknowledge diversity of opinion
- ✓ Always consider concerns and complaints seriously
- ✓ Recognise the importance of trust
- ✓ Be open and transparent. Provide facts, be honest about what is known and not known
- ✓ Acknowledge uncertainty
- ✓ Don't over reassure
- ✓ Ensure dialogue and co ordination between those involved in response
- ✓ Seek specialist advice from experts in developing strategy and conveying messages
- ✓ Provide a single joint coordinated source of advice/message agreed on a multi- agency basis
- ✓ Set up a Helpline number (where required)
- ✓ Ensure key individuals are trained to speak to the media
- ✓ Work with the mass media and update media regularly

Source of further information & guidance

UK Cabinet Office:

- Communicating Risk Guidance: https://update.cabinetoffice.gov.uk/resource-library/communicating-risk-guidance

For guidance on communicating risk, refer to the document and tool kit available on the website. The document is to help responders plan communication strategies, develop their understanding of risk, improve knowledge of its likely effects, and give the confidence to deal with a crisis when things go wrong

The first four sections are intended to give background briefing on understanding risk, the importance of communication, and how the public and the media view risk. The fifth and sixth sections are designed as a tool kit to help responders plan and design their communication strategy, both as part of policy development, and deal with difficult situations when they arise.

- Warning & Informing the Public: http://www.cabinetoffice.gov.uk/content/warning-and-informing-public

World Health Organisation

- Effective Media Communication during Public Health Emergencies Handbook:
  http://www.who.int/csr/resources/publications/WHO%20MEDIA%20HANDBOOK.pdf

Health Protection Agency

- http://www.hpa.org.uk/ProductsServices/ChemicalsPoisons/ChemicalRiskAssessment/RiskAssessment/

ARCOPOL Project

- www.arcopol.eu