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The Scottish
Government
Riaghaltas na h-Alba

National Nuclear Emergency Planning and Response Guidance

Part 3 – Recovery

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1. Introduction

- 1.1. Radioactive contamination of the environment following a civil or defence nuclear emergency presents a unique challenge. To support a common understanding of what this means, Part 3 Recovery, sets out the underpinning science, the range and complexity of the issues responders will face and provides pointers to solutions. It considers what can reasonably be done to prepare and provides integrated structures to co-ordinate resources and expertise should an event occur. The delivery of a recovery strategy - with the communities affected, will help those affected adapt to new and sustainable ways of living. Part 3 provides a process to develop and deliver a recovery strategy, including what this involves, what to consider and signposts to supporting guidance.

The recovery challenge following a civil or defence nuclear emergency

- 1.2. Recovery is the process of rebuilding, restoring and rehabilitating the community following an emergency¹. The process will involve a range of actions to assist communities in returning, where feasible, to a sustainable environment in an acceptable timeframe, and to a way of living where the event is no longer dominant in their thinking. How activities to support community recovery are undertaken is critical to their success. Good recovery outcomes are more likely to be achieved where there is effective communication and engagement between the civil authorities and those affected and where the community is able to exercise a high degree of self-determination.
- 1.3. Experience from past contamination events, particularly the accident at the Chernobyl nuclear power plant, has shown that the consequences of widespread and long-lasting contamination are complex and multi-dimensional - with potential impacts on environment, health, local and national economies, as well as psychological, social and political impacts. Studies have found that the radiation releases during the Three Mile Island event in 1979 were minimal and below any levels associated with health effects from radiation exposure. However, the psychological effects on the community were pronounced - highlighting the importance of planning to support community recovery. Experience from Fukushima has also indicated that the psychological and health effects of mass evacuation and relocation may be significantly greater than the risks posed by radiation.

¹ Emergency Response and Recovery Guidance, HM Government
<https://www.gov.uk/government/publications/emergency-response-and-recovery>

- 1.4. Following an atmospheric release, deposited radioactivity will be present as surface contamination. Its distribution will be affected by the properties of the contamination and the action of environmental process such as weathering. Material may be found on the surfaces of buildings, roads, open spaces in inhabited areas, on land used for food production and in lakes, reservoirs and the marine environment. This can lead to radiation doses to people, for example – direct exposures from contaminated surfaces, breathing in contaminated dust or eating foods produced in contaminated areas.
- 1.5. In most situations, radiation exposures will be far too small to have immediate harmful effects. However, it is cautiously assumed that any exposure to radiation may increase the long term risk of cancer. People living and working in the affected area will be concerned about the potential risks to their health, businesses and lifestyle and will need clear, practical advice and support. Immediate challenges for the multi-agency recovery effort will be to:
- Support sectors of the population temporarily evacuated or permanently relocated as a result of the event;
 - Understand the extent and level of contamination based on available monitoring and sampling capability and what this means for long term radiation exposures;
 - Understand the potential long term impact on infrastructure, business activities, agriculture, food production, drinking water and leisure;
 - Identify where access to contaminated areas needs to be restricted, where remediation is necessary and where ‘doing nothing’ is the best long term option;
 - Co-ordinate remediation activities on the ground. These will include monitoring, hazard assessment, clean up, waste disposal and clearance monitoring of public and private assets;
 - Manage communications with the public, media and stakeholders;
 - Manage the expectations of the public and stakeholders;
 - Establish a decision-making process which is open, transparent and involves representatives of the affected community;
 - Establish effective processes for compensation claims; and
 - Manage the long term impacts on the local economy.
- 1.6. Responders need to be aware that decisions made and communicated in the response phase may have a profound influence on the ability to deliver recovery successfully. The implications of early decisions on future actions to support recovery should be fully explored and understood. There is also a need to ensure all relevant factors are considered - not just the radiological situation. To be efficient and sustainable, decisions to manage the consequences of radioactive contamination must take into account other dimensions of living conditions. For example, economic, social, cultural and ethical issues.

2. Recovery planning for civil and defence nuclear emergencies

- 2.1. Building on Emergency Response and Recovery² this section sets out important principles and resources for nuclear recovery planning. It highlights what we can reasonably do to prepare organisations, people and information to support recovery following a nuclear emergency.

Legal framework for recovery planning

- 2.2. The Civil Contingencies Act, 2004 (CCA) delivers a single framework for emergency planning and response and aims to improve the resilience of the UK to disruptive challenges. Although recovery is not a specific duty under the CCA, the Act is intended to ensure better preparedness to enable more effective response and recovery.
- 2.3. Guidance to support the CCA in relation to recovery is available in Emergency Response and Recovery. This describes the multi-agency framework for responding to and recovering from civil emergencies in the UK. In Scotland, Preparing Scotland guidance sets out the philosophy, principles and practices that help build resilience and readiness to deal with emergencies. [Preparing Scotland:³ Scottish Guidance on Preparing for Emergencies: Recovering from Emergencies in Scotland](#)³ examines the nature of recovery, its place in the resilience process and its management. It also explores some of the issues those managing recovery may encounter and how they can prepare for the task.
- 2.4. It is recognised that the Radiation (Emergency Preparedness and Public Information) Regulations 2001 (REPPPIR) focus on the requirements of the emergency phase of a reasonably foreseeable radiation emergency at a nuclear site. REPPPIR can also provide the basis for dealing with radiation emergencies that are not reasonably foreseeable through the concept of extendibility. Reference to recovery planning is limited and the development of recovery plans is currently not a statutory requirement under REPPPIR. However, the development of recovery plans is noted as best practice within REPPPIR Guidance.
- 2.5. For more information on the legal framework for nuclear emergency response and recovery see Annex B.

² Non-Statutory Guidance to complement Emergency Preparedness.

³ See <http://www.gov.scot/resource/doc/243492/0067754.pdf>

Principles for nuclear recovery planning

2.6. Nuclear emergencies in the UK are rare. It is important to ensure that the time, resources and effort spent on planning is effective and will make a significant difference should an event occur. The following section is intended to help focus effort and resource in preparation for recovery from a nuclear emergency. In summary, planning for nuclear recovery needs to be:

- Risk-based;
- Proportionate;
- Flexible, scalable and non-prescriptive;
- Open to lessons learned from previous events;
- Inclusive; and
- Co-ordinated.

Risk-based

2.7. Prepare for recovery issues which, if not addressed, present significant risks to health and environment.

Consider

- Contingency to temporarily relocate residents away from areas requiring decontamination.
- Providing contingency against factors which will affect the ability of the multi-agency group to support community recovery. For example, to ensure that infrastructure such as roads, rail, communications and utilities are restored as soon as possible to support on-going recovery activities on the ground.
- Plan to manage the risks to reputation and credibility. This will affect public confidence and co-operation and the ability of the multi-agency group to engage effectively with the communities and stakeholders. For example, preparation of a recovery communications plan identifying key audiences, messages and communication routes.

Proportionate

2.8. Balance resources needed in advance to establish and maintain the arrangements against the benefits for future recovery activity. This means weighing up the costs and benefits of recovery planning activities. In the recovery phase, there is more time to make decisions and implement recovery actions compared with the need for urgent decisions on measures to protect people when the emergency is on-going. There is less premium investing resources in advance to provide detailed recovery solutions.

Instead, develop frameworks and processes which can be used to deliver an appropriate response when and if required.

Examples

- Use and adapt existing arrangements to deliver support and advice to the public. For example, through local authority drop-in centres and social media rather than creating new arrangements. Develop pre-agreed public messages for use at the appropriate time by the local authority.
- A proportionate use of resource for recovery planning would be to identify the services needed during recovery, the businesses who can supply them and the process to procure them without delay. A disproportionate use of resource would be to let contracts in advance, which in the event, may not be required.
- Emergency planners should also be aware of the need for proportionate use of urgent countermeasures to account for their impact on recovery. For example, the evacuation and relocation of people creates the very significant problem of return and also may affect health and wellbeing in the community out of all proportion to the radiation risk.

Flexible and non-prescriptive

- 2.9. A guiding principle for the response to and recovery from an emergency is the need to be flexible and reflect the prevailing circumstances⁴. This means that planning for future recovery activities needs to build in scope for adaptation to a range of possible conditions, emerging issues and consequences. Consider identifying people, resources, facilities and information which will assist recovery actions - rather than laying down prescriptive arrangements.

Open to lessons learned from experience

- 2.10. It is important to take the opportunity to consider the lessons from previous events and exercises in the planning for recovery.

⁴ Emergency Response and Recovery, Non-statutory guidance to complement Emergency Preparedness, 2005

Examples

The lessons for recovery from the events at Fukushima, Japan in 2011, are emerging^{a,b}, and these should be considered for future UK nuclear recovery planning:

- Build public confidence through effective engagement on impacts of the event and options for recovery.
- Involve communities in decision-making.
- Strengthen co-ordination and liaison between central and local government.
- Balance the benefits of dose reduction with the negative impact of on-going remediation.
- Establish realistic criteria for stopping remediation which are linked to radiation exposure.
- Optimise dose reduction and minimise waste in areas where people live and work.
- Contribute to enabling more people to return to their homes outside restricted areas.

[a Final Report The Follow-up IAEA International Mission on Remediation of Large Contaminated Areas Off-Site the Fukushima Daiichi Nuclear Power Plant Tokyo and Fukushima Prefecture, Japan 14 – 21 October 2013. NE/NEFW/2013](#)

[b UNSCEAR 2013 Report Volume I Report to the general assembly. Scientific Annex A: Levels and effects of radiation exposure due to the nuclear accident](#)

Inclusive

- 2.11. Recovery planning needs to be inclusive of the people and communities affected and their diversity - including ethnicity, gender, faith and disability. Planners need to consider the wide range of issues that the multi-agency group will face, noting that decisions about what to include in planning will be risk-based and proportionate. The management of recovery is best approached from a community development perspective. It is most effective when conducted at the local level with the active participation of the affected community and a strong reliance on local capability and expertise. Recovery is not just a matter for the statutory authorities - the private sector, nuclear operator, the voluntary sector and the wider community will play a crucial role.

Co-ordination of recovery planning

- 2.12. The nuclear site operator is responsible for on-site recovery planning. The local authority is normally the lead organisation responsible for planning for the recovery of the community following any emergency. They will work

closely with other local partners and local resilience fora/partnerships.

- 2.13. As a general principle, nuclear recovery planning should be co-ordinated using existing fora where possible. However, new fora for partnership working on specific issues should be considered. For example, to prepare plans to manage disposal of contaminated milk where dairy farming plays an important part in the rural economy or, to consider initiatives to maintain public confidence in relation to tourist destinations and leisure amenities.

Developing and maintaining a recovery plan

- 2.14. A number of resources are available to support the development of recovery plans.

Generic recovery plan template

- 2.15. The Cabinet Office Civil Contingencies Secretariat (CO CSS) has produced a [Recovery Plan Guidance Template](#)⁵. This is based on existing local authority recovery plans and the experience of those affected by other major emergencies both in the UK and abroad. Depending on the scale or nature of the emergency, some parts of the template may not be relevant so it should be used flexibly. It provides generic guidance to assist in the recovery phase of emergencies and may be adapted for use on different levels.

Nuclear recovery plan template

- 2.16. The [UK Nuclear Recovery Plan Template](#)⁶ developed by the Nuclear Emergency Planning (NEP) Recovery Working Group has been based on the generic recovery plan template. It reflects the principles and structures which are being adopted nationally and draws on the latest updates of the UK Recovery Handbooks⁷. This template sets a standard for nuclear recovery planning which Local Authorities can adapt to their local circumstances.

Aim and scope

- 2.17. As well as helping Local Authorities develop effective recovery plans for UK civil and defence nuclear sites, the template is also intended to drive improvements in recovery planning in a structured way across all the nuclear sites. This will be possible because Local Authorities will be using the same model. As local arrangements are exercised and lessons are learned, the template will evolve to capture improvements in recovery planning.

⁵ See <https://www.gov.uk/guidance/national-recovery-guidance>

⁶ See https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/252750/neplg_ch_18.pdf

⁷ UK Recovery Handbooks for Radiation Incidents, Public Health England, 2015.

Added value for nuclear scenarios

- 2.18. The [UK Nuclear Recovery Plan Template](#)⁸ includes a range of tools to support effective recovery from a nuclear emergency, including:
- Planning principles relevant to radiological events, such as radiation dose limitation.
 - Best practice from existing nuclear recovery plans.
 - Structures to co-ordinate recovery effort when a nuclear emergency happens - including membership of the Recovery Co-ordinating Group (RCG) and subgroups, as well as terms of reference relevant to a nuclear scenario.
 - Signposts to reference documents which may assist nuclear recovery planning.
 - A Monitoring Group to focus, prioritise and implement radiological monitoring efforts supporting the development of a recovery strategy.
 - Clarification of organisational roles and responsibilities in the recovery phase of a nuclear event.
 - An agenda for the Recovery Co-ordinating Group reflecting the challenges of a nuclear scenario, for example the need for environmental monitoring.
 - Templates for compiling information about the area around the nuclear licensed site to assist recovery from a nuclear emergency.

How to use the Nuclear Recovery Plan Template

- 2.19. The [UK Nuclear Recovery Plan Template](#) is for guidance only. It is intended to be used flexibly and adapted to the circumstances of specific nuclear sites. The template may be used as a standalone recovery plan for a specific nuclear site or incorporated as an annex into an existing local authority generic plan. Alternatively, the materials and ideas it contains can be extracted and used to supplement or improve existing arrangements.

Getting ready for recovery from a nuclear emergency

- 2.20. The purpose of this section is to set out what can reasonably be done to prepare organisations, people and resources to support the recovery plan and recovery efforts following a nuclear emergency. Giving thought to briefing, information needs and outline arrangements prior to an incident will help to facilitate recovery efforts and contribute to better outcomes when an event occurs. Noting the principles for recovery planning discussed above, the following provides pointers to areas where planning may be beneficial and at what level. Further information is included in Chapter 4 of the Inhabited Areas Handbook⁹.

⁸ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/252750/neplg_ch_18.pdf

⁹ Part of the UK Recovery for Radiation Incidents. Public Health England, 2015.

Partners

- 2.21. Identify in advance, organisations and agencies that deal with specific recovery tasks, such as waste management and compensation. The voluntary sector can provide an extensive and diverse range of operational and support skills and services to statutory responders¹⁰. Seek to build relationships in advance and agree how you will work together during recovery.

Community engagement

- 2.22. Identify business, environment and community representatives who may need to be consulted on the recovery strategy and implementation plan.
- 2.23. Elected local authority members, parish councillors, community councillors and the voluntary sector are essential channels to the local community and play a critical role in identifying problems and vulnerabilities (including vulnerable people) that need priority attention. Consider engagement with the breadth of voluntary sector organisations including Red Cross, Salvation Army, Royal Voluntary Service as well as tenants' associations and faith groups.
- 2.24. Consider the processes you will need to allow all those who represent communities to get up to speed with the issues and involved in decision making. Seek opportunities to build relationships in advance which will help facilitate effective engagement in recovery.

People, capabilities and training

Recovery roles

- 2.25. As part of nuclear recovery planning, identify the key areas of activity that will need co-ordination and management and consider the need for specific roles to drive these activities. Be clear about the scope of recovery roles and what people will be expected to do. Consider how the need for recovery roles will change over time, so you know when to commit resource or release resource for deployment elsewhere.

Resilience

- 2.26. How will you sustain your continued support to recovery over a number of weeks and months? Do you have sufficient, capable staff to fill these roles in a protracted event? Is cover needed on a 24/7 basis or office hours only? How will you maintain other essential services?

Learning and development

- 2.27. What capabilities and knowledge do people need for their role in support of recovery from a nuclear emergency? Consider the needs of personnel assuming strategic, tactical or operational, as well as technical and public-

¹⁰ Sections 3.4.14 to 3.4.18 of Emergency Response and Recovery provides more detail on the role of the voluntary sector. See also Preparing Scotland.

facing roles. What training, familiarisation and refresh do they need to maintain their readiness? What opportunities will they have to rehearse their role? What support will they need to perform effectively? For example, communications, facilities, equipment, and administrative assistance.

Rehearsing roles

2.28. Recovery planning and management arrangements are most effective where they are supported by training programmes and multi-agency exercises.

Data and information

2.29. Identify in advance, data and information requirements to support impact assessment and facilitate the development of recovery strategies. Data and information resources for the geographical area surrounding a defence or civil nuclear site will be in a variety of formats – for example, mapping and databases. Focus on how to access the information rather than gathering and maintaining all the data. Identify the custodians of data and information and consider how you will develop, maintain and share these resources. Examples of the types of information to collate in support of nuclear recovery are highlighted in Table 1.

Table 1 Data and information to support recovery from a nuclear emergency¹¹

Topic	Data
Population	Distribution, size and demography. Identify sensitive/vulnerable subgroups based on age, health, social/ethical considerations as well as institutionalized people such as prisoners, senior citizens, hospital patients. Numbers of people relocated. Resources for temporary accommodation.
Business	For example the mix of industrial, commercial, retail, food and farming and other activities.
Types of building	Type of property and construction (multi-story, detached, etc.) in affected areas. Proportion of residential, public, industrial and commercial buildings. Presence of listed or protected buildings or places of historical or cultural significance.
Critical infrastructure	Schools, hospitals, water treatment plants, sewage treatment plants, roads, railways.
Waste disposal	Location of sites licensed to receive contaminated waste, including authorized limits.

¹¹ UK Recovery Handbook for Radiation Incidents, Public Health England, 2015.
<https://www.gov.uk/government/publications/uk-recovery-handbooks-for-radiation-incident-2015>

Topic	Data
facilities	Numbers, types and capacities of facilities. Transportation routes to disposal facilities.
Sensitive habitats	Sites of Special Scientific Interest (SSSIs), RAMSAR ¹² sites. Special Protection Areas and Special Areas of Conservation under the EC Birds and Habitats Directives.
Food production	Location of milk producers, milk supply chain, haulage companies. Location and types of meat/crop production. Prevalence of domestic production. Location of gardens and allotments. Scale and importance of gathering free /wild foods and locations.
Drinking water	Sources, abstraction points, monitoring points. Alternative supplies. For example, bottled water or bowsers.
Communication	Pre-prepared fact sheets, briefing notes, compensation details.

Preparing your approach to recovery data and information

- 2.30. It is possible to anticipate a range of issues that the RCG and its subgroups will need to address during the recovery phase of a nuclear emergency. These will be dependent on the circumstances of the event, the geographical location and the combination of land use, demography and the surrounding socio-economic landscape. For example, understanding the level and distribution of off-site contamination, how to manage disposal of contaminated agricultural products or when to handover co-ordination of recovery from the SCG to the RCG.
- 2.31. As part of your planning for recovery, consider bringing together relevant partner organisations to start the thinking on the issues you will need to address, agree the criteria, steps, process or strategy to assist the decision-making, should an event occur.

Communications and reputation management

- 2.32. Multi-agency partners should consider the following in their preparation for effective recovery communications:
- Clarify and agree communication roles and responsibilities. For example, this may be between communications specialists¹³ working at local or national level or on issues that would be the focus for partnership working.

¹² Wetlands of international importance as recognised under the RAMSAR Convention, 1971.

¹³ In some cases, the News Co-ordination Centre will be established by the Cabinet Office Communications Group.

For example, the management of compensation claims, management of radioactive waste;

- Develop a recovery top line brief;
- Identify the events and issues for which proactive and reactive messaging may be needed. For example, engagement with community representatives on options for clean up or addressing public concerns about the risks associated with radioactive contamination in the environment;
- Identify key audiences, messages, channels, information flows and activities;
- Plan to actively gauge public and media reaction through the monitoring of social media, broadcast and print media. Consider the use of social media channel to reach key audiences with recovery briefing and messaging;
- Pre-plan and produce written 'positions' as far as possible;
- Develop recovery FAQs; and
- Develop briefing and information sheets which can be adapted at short notice for particular needs.

Resources

- 2.33. Consideration needs to be given in advance to the range of resources which may be needed to support recovery. These include finance, facilities, communications, specialist contractors and suppliers as well as opportunities for mutual assistance. It should be noted in considering resources that the recovery effort may continue for a long time.

3. Co-ordination of recovery for civil and defence nuclear emergencies

- 3.1. Recovery is integral to our response to a nuclear emergency. Decisions made in the response phase may have a profound influence on the ability to deliver recovery successfully, so responders need to consider recovery from the start. This section sets out structures to co-ordinate recovery at local and national level throughout an event. This includes activation and role of the Recovery Co-ordination Group (RCG), interaction with subgroups and government as well as guidance on how to manage the handover of co-ordination¹⁴.

Co-ordination of recovery at the local level

Activation of the recovery plan and Recovery Co-ordinating Group

- 3.2. Recovery is best achieved where the recovery process begins as early as possible during the response. The local authority will convene the RCG usually following a request from the Strategic Co-ordinating Group. In reality, it may be a few hours into an event before an RCG is convened. The RCG will advise the SCG on actions to reduce the impact of the emergency and scale of recovery and will agree its priorities with the SCG. See [UK Nuclear Recovery Plan Template](#)¹⁵ for suggested RCG terms of reference.
- 3.3. Where there are two tiers¹⁶ of local government, agreement should be reached well in advance, as to which local authority will co-ordinate the activities of the RCG and its subgroups during the recovery phase. The decision should be made as part of recovery planning and captured in the relevant plans and arrangements.

Recovery strategy and objectives

- 3.4. An important part of the work of the RCG during the response phase is to develop a recovery strategy to be communicated to the SCG. Examples of strategic aims for recovery include:

¹⁴ Usually from the Police to the Local Authority

¹⁵ See https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/252750/neplg_ch_18.pdf

¹⁶ Many parts of England have two tiers of local government comprising county councils and district, borough or city councils.

- Minimise risks to people and environment;
- Assist the community in returning to a new normality as soon as possible;
- Provide reassurance and build confidence;
- Engage all communities - seek their input and recognise needs;
- Establish clear objectives for remediation and when to stop;
- Manage wastes contaminated with radioactivity;
- Provide clear governance and lines of accountability for recovery effort;
- Consider the wider impact on the area; and
- Manage compensation arrangements and cost recovery.

3.5. These strategic aims will be supported by a range of SMART¹⁷ objectives which, for a nuclear emergency, should include:

- Establish the extent and level of radioactive contamination;
- Agree what is an acceptable radiological risk for members of the public affected by radioactive contamination in the environment, noting that it may not be possible to return to conditions before the emergency;
- Agree how the level of radiological risk (dose) will be equated with measurable levels of radioactivity in the environment so we have a way of knowing when the radiation dose reductions have been achieved; and
- Agree on the other significant risks which need to be balanced against the reduction of radiation risks.

3.6. Being clear about the measures of success for strategic aims and objectives will assist future decisions about when to stand down the RCG and its subgroups. The RCG will work with the SCG to ensure that decisions in the response phase do not close out options to support medium and long term recovery. The RCG will also need to consider arrangements for standing down the efforts of the multi-agency group as part of an exit strategy.

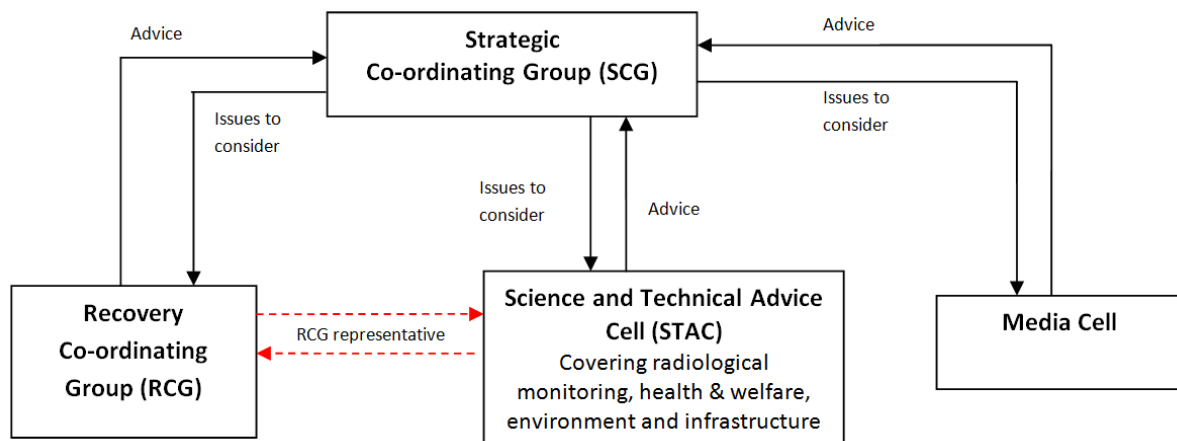
Structures to support decision-making

Organisation of recovery effort during the response phase

3.7. During the response phase of a nuclear event, the chair of the Strategic Co-ordinating Group will convene a number of subgroups. These usually include a Recovery Co-ordinating Group, a Science and Technical Advice Cell (STAC) and a Media Cell. See Figure 1.

¹⁷ Specific, Measurable, Achievable, Realistic and Timely

Figure 1 Organisation of recovery effort in the response phase



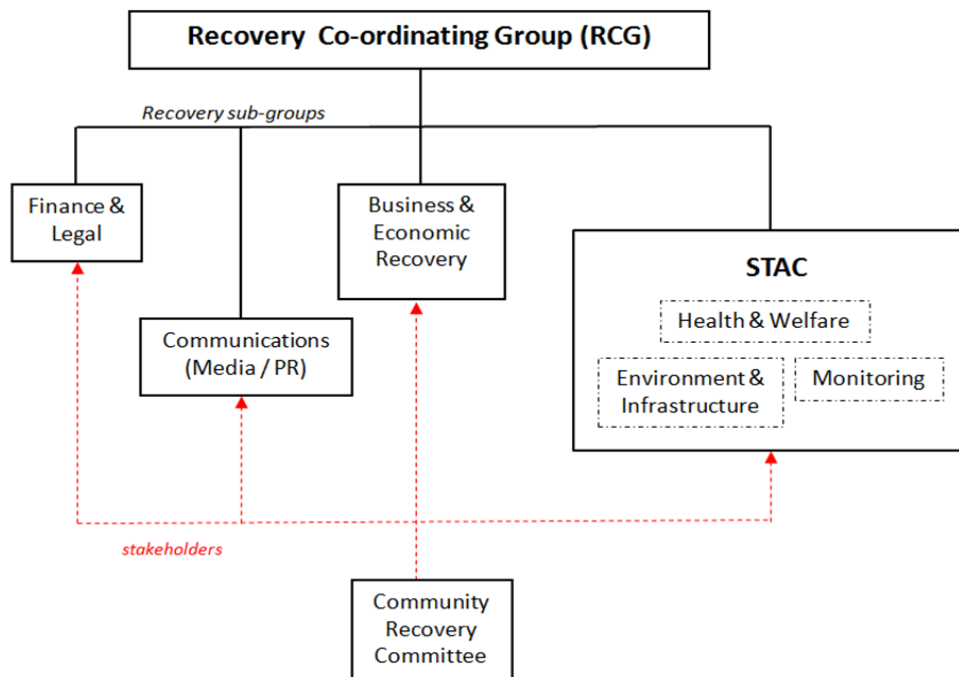
- 3.8. There is a need to schedule meetings of the SCG, STAC, RCG and the Media Cell in a way that allows representatives to brief colleagues, address actions assigned to them and to facilitate effective communications between the three groups. Responsibility for this meeting schedule - or so-called 'battle rhythm', will rest with the SCG in the emergency phase and with the RCG in the recovery phase. Where possible, the battle rhythm should account for the timing of national level meetings and on-site meetings.
- 3.9. The health and welfare of affected communities will be the prime focus of STAC during the response phase as well as the co-ordination of radiological monitoring. It is recommended that a member of the RCG is appointed to track the development of advice by the STAC to ensure that any implications for longer term recovery are identified and understood. It is also the responsibility of organisational representatives at the STAC and the RCG to ensure a consistent understanding of information and advice between the two groups. Any recovery activities recommended by the RCG will be submitted to the SCG for decision and action.

Organisation of recovery effort during the recovery phase

- 3.10. Co-ordination of the RCG and communications will transfer from the police to the local authority when mutually agreed criteria for handover have been met. This transfer of co-ordination marks the beginning of the recovery phase, although recovery activities will have been on-going from an early stage in the event.
- 3.11. The RCG should consider the on-going need for science and technical advice delivered through the STAC. This is likely in the first instance and the structure outlined in Figure 2 is recommended. As for the response phase, discussion will focus on public health, co-ordination of monitoring and the impact of the event on environment and infrastructure. The STAC Chair will be well-placed to engage with the RCG on these matters and maintain links

with the SAGE¹⁸ at national level. However, as the detail of the recovery strategy and delivery plan develop, it may be appropriate to set up a Health and Welfare Subgroup, a Monitoring Subgroup and an Environment and Infrastructure Subgroup, with subgroup leads attending RCG.

Figure 2. Organisation of recovery effort during the recovery phase of a nuclear incident



- 3.12. This structure provides a starting point for organising recovery effort in the event of a nuclear emergency and is guidance only. It is a matter for the organisations involved to decide which groups are needed for their particular situation and to flex the structure accordingly. The expectation is that subgroups will work together to ensure an overall recovery strategy and delivery plan are integrated, co-ordinated and any dependencies are understood.
- 3.13. Other participating organisations may reasonably be expected to support the local authority by co-ordinating the activities of subgroups where there is good alignment with their organisational responsibilities and expertise.
- 3.14. Table 2 has been reproduced from the Nuclear Recovery Plan Template to assist in the planning for each topic. Further information including the role of each subgroup, terms of reference, secretariat and key stakeholders and members is provided in the [UK Nuclear Recovery Plan Template¹⁹](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/252750/neplg_ch_18.pdf).

¹⁸ Science Advisory Group for Emergencies (SAGE)

¹⁹ See

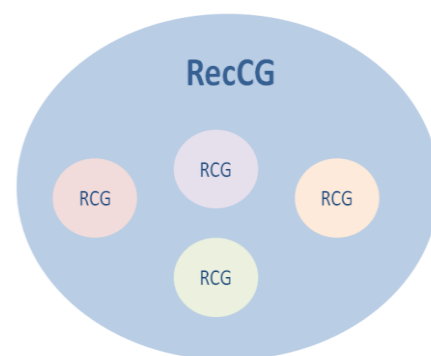
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/252750/neplg_ch_18.pdf

Table 2 Summary of recovery subgroups and their role

Topic	Objective	Lead
Monitoring	To organise monitoring and receive data in order to produce a co-ordinated overview of the radiological impact of the nuclear emergency.	Public Health England (PHE).
Health and Welfare	To ensure all health implications arising from the emergency are addressed and to co-ordinate the provision of practical assistance, support and where necessary, counselling to those affected.	Director of Public Health.
Environment & Infrastructure	To identify viable options for the restoration and clean-up of the physical infrastructure and natural environment.	Local authority.
Business & Economic Recovery	To assess and mitigate the economic implications of the emergency for local businesses.	Local authority (Economic & Business/Regeneration Team).
Communications	To ensure that the public and media are kept fully informed and consulted.	Local authority PR and Communications.
Finance & Legal	To assess the financial and legal implications of the recovery phase.	Local authority Senior Financial Manager/Solicitor.
Community Recovery	To reflect community concerns, feelings and initiatives and assist in informing the wider community.	Local Authority.

Co-ordinating a number of Recovery Co-ordinating Groups

- 3.15. A multi-Recovery Co-ordinating Group (RecCG) may be convened where recovery action is needed across a number of neighbouring RCGs who would benefit from over-arching co-ordination or enhanced support.
- 3.16. In such circumstances, the Lead Government Department (LGD) for recovery may, on its own initiative or at the request of local responders, convene a RecCG to bring together appropriate



representatives from local Recovery Co-ordinating Groups. The RecCG would normally be chaired by the LGD for recovery unless otherwise agreed. The LGD will also confirm how it will run, determine the agenda and which organisations need to be represented. If the incident primarily affects local authorities, then it may be appropriate for only local authorities to be represented at the RecCG. The LGD will circulate papers and other relevant information to committee and provide the formal record of discussions and decisions.

- 3.17. The RecCG will observe the principle of subsidiarity – recognising that decisions should be taken at the lowest appropriate level. The RecCG will not interfere in local command and control arrangements but will provide a mechanism for ensuring that local responders can be as fully informed as possible in the decisions they have to take.

Transition from the response to recovery phase at local level

- 3.18. The SCG should discuss and agree criteria for the handover of co-ordination from the SCG (usually chaired by the police) to the RCG Chair (usually chaired by the relevant local authority). This will ensure that all agencies are aware of the implications and process for handover which will mark the beginning of the recovery phase. Although this is not an immediate priority for the SCG, handover criteria should be agreed early on in the response.

- 3.19. The discussion should consider:

- Criteria to be used to assess readiness for handover from the SCG to the RCG. Criteria agreed may be:
 - Mandatory: For example:
 - The onsite incident has been contained;
 - The release of radioactivity has stopped;
 - There is no significant risk of further radiological release;
 - Urgent health protection countermeasures have been lifted; and
 - Infrastructure essential to support community recovery is functioning normally (communications, transport, utilities, health and social services).
 - Discretionary: For example:
 - Schools which were closed during the emergency have been re-opened;
 - A strategy for community engagement is in place and links with community representatives have been established;
 - Elected members have been briefed on the potential long term impacts of the event and consulted on the recovery strategy and delivery plan;
 - The process for handover;

- As part of the handover process, consider how information collated as part of the response phase is effectively, efficiently and securely handed over to those responsible for managing the recovery. Ideally, this should include report on the status of all emergency phase actions and outstanding issues, as well as and an outline of the long term impact assessment; and
- Communication with responding agencies and the community about the handover.

Factors informing the decision to hand over co-ordination of the response

3.20. As well as agreeing the protocol, process and communications for handover, the progress made on issues arising from the event will also inform the handover decision. Annex T explains how different aspects of the response will progress along the event time line. For example, the focus of radiological monitoring will shift from understanding external dose rates and air contamination early on, to understanding the levels and extent of contamination on the ground during recovery. This means response and recovery actions may occur simultaneously in the same or different geographical locations and some issues will transition to recovery sooner than others.

Handover of co-ordination from the SCG Chair to the RCG Chair

3.21. When local criteria or conditions for transfer of co-ordination are met, the handover of the incident from the SCG to RCG should be expected. The decision to handover will be a matter for agreement by the SCG chair and the RCG chair. However, the following may also be involved with the agreement of SCG:

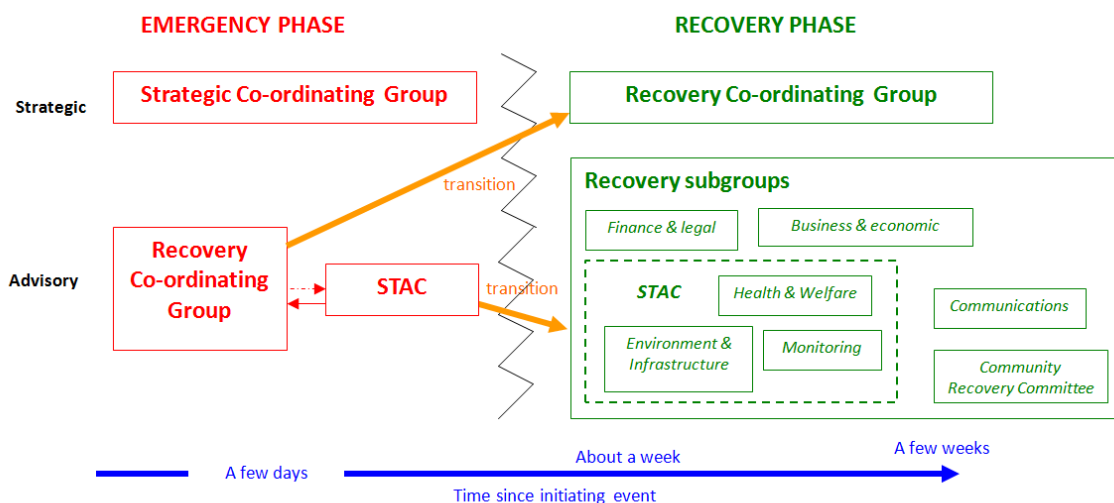
- representative from the LGD for the response phase (DECC, MOD or Scottish Government); and
- representatives from the LGD during the recovery phase including:
 - DEFRA (for an event in England);
 - Scottish Government (for an event in Scotland where it is not LGD); and
 - Welsh Government (for an event in Wales).

3.22. If possible, responding organisations should continue to be co-located, to ensure effective on-going liaison. If co-location is not possible, virtual meeting facilities, including video or teleconference capabilities and data sharing networks (Resilience Direct, TiiMs²⁰, NERIMS²¹ and RIMNET²²), should be available and utilised.

²⁰ The Incident Information Management System used by Magnox and EDF Energy in a nuclear emergency and accessible by other agencies and organisations.

- 3.23. It should be noted that the timing of transition from the response to the recovery phase may be different at local and national levels. For further information on experience of the transition from response to recovery see Annex T.
- 3.24. Figure 3 illustrates how the structures to co-ordinate recovery effort will change during the transition from response phase to the recovery phase. This is indicative of the timescales that may occur during a nuclear emergency. Actual timescales for the response and recovery phase and how the groups operate will be dependent on the circumstances of the event.

Figure 3 How structures for co-ordinating nuclear recovery may change during the transition from emergency to recovery phase



Closure of recovery phase and stand down of Recovery Co-ordination Group

3.25. The chair of the RCG, in discussion with its members will decide when it is appropriate to stand-down the group - referring to the exit strategy. Key factors in the decision will be:

- The needs of the community;
- Whether or not there is evidence to demonstrate that success criteria identified in the multi-agency recovery strategy have been met;
- Whether or not there is evidence (for example - from social media), that the community is adapting and adjusting to the impacts of the event - which are no longer dominant in their thinking; and

²¹ Nuclear Emergency Response Information Management System

²² Radiation Incident Monitoring Network

- Relevant organisations with a role in recovery have strategies in place to continue to support parts of the community where this is still needed, after the RCG has stood down.

3.26. For a nuclear emergency the following should also be considered:

- The level and extent of radioactive contamination in the environment have been broadly mapped meaning that risks to health are understood. The risks are considered within tolerable limits agreed by the multi-agency group and key stakeholders; and
- The need for advice and reassurance for the affected communities.

3.27. The RCG will be closed once there is no longer the need for regular multi-agency co-ordination and the remaining issues can be dealt with by the individual agencies as part of their normal business. Depending on the recovery issues being addressed, it may be possible for some of the RCG subgroups to close prior to the main RCG standing down.

Co-ordination at national level

Role of the Lead Government Department

3.28. For certain types of emergencies, including nuclear, the Lead Government Department for recovery is identified in advance²³. Table 3 sets out Lead Government Department responsibilities for civil and defence nuclear emergencies.

Table 3 Lead Government Department responsibilities for nuclear emergencies

	Recovery phase
England	Department of Environment, Food and Rural Affairs (DEFRA)
Scotland	Scottish Government
Wales	Welsh Government

3.29. The role of the LGD in recovery is to:

- Use its authority decisively to take whatever executive decisions and actions are needed across government to co-ordinate HMG recovery effort and to assist local responders;
- Provide senior representation to RCGs in support of local recovery efforts;

²³ <https://www.gov.uk/government/publications/list-of-lead-government-departments-responsibilities-for-planning-response-and-recovery-from-emergencies>

- Act as the focal point for communication between central government and the multi-agency local RCGs;
- Agree, across government, clear aims and objectives for the national recovery process, including the criteria for standing down national recovery mechanisms and structures;
- Produce brief, accurate situation reports feeding as appropriate into the Common Recognised Information Picture (CRIP) on the nature and scale of the recovery issues;
- Ensure that strategic recovery issues are identified and acted on during the response phase of an emergency and that there is a smooth and effective handover from response to recovery;
- Produce a handling plan as soon as possible, which should offer a clear assessment of whether the recovery issues are within the scope of the LGD or whether additional support is needed from other government departments and, if so, what degree of central co-ordination is required;
- Draw upon and apply the relevant capabilities applicable to recovery from the emergency in hand and, if required, co-ordinate the support needed from other government departments; and
- Account to parliament for the recovery process.

3.30. The LGD for recovery will ensure that government provides all the necessary on-going support to agencies involved in environmental restoration and to affected individuals and communities. It will co-ordinate the consequence management and decontamination aspects of the incident – including consequences as a result of overseas nuclear incidents. These can range from small localised incidents to catastrophic disasters. The LGD will aim to respond quickly and effectively, minimising harm to the public and environment, enabling a return to a new normality as soon as possible. Although incidents are usually handled through existing local arrangements and structures, government intervention is necessary when:

- Terrorism is involved;
- The impact is widespread and existing arrangements are overwhelmed, for example in response to the Chernobyl nuclear accident in 1986; and
- The nature of the threat is unfamiliar and requires specialist advice. For example, on decontamination.

Ministerial Recovery Group (MRG)

3.31. LGDs will consider the need to establish a Ministerial Recovery Group to oversee recovery activity. This will involve necessary government departments and appropriate devolved administrations. The group will:

- Ensure that government departments and other national bodies have a shared understanding of policies and priorities, and that they contribute fully and effectively to the recovery effort;
- Monitor progress and address barriers to progress;
- Escalate significant policy issues for resolution;
- Promote public and parliamentary confidence in the recovery process at all levels;
- Ensure that local authorities and other recovery agencies fulfil their role and that where necessary and appropriate, local issues are considered and resolved at the national level; and
- Discuss and agree funding options and arrangements for affected areas.

3.32. In support of this role, key tasks will be to:

- Build up the best possible assessment of the nature and scale of impact damage in each locality significantly affected by the event. This will include the impact on vulnerable groups, critical national infrastructure and the environment;
- Identify issues which require resolution by government departments, key nuclear stakeholders or other national or local bodies;
- Identify options, with clear recommendations, for addressing those issues quickly and effectively, drawing on the lessons of past incidents;
- Ensure that a structured programme of visits to the affected area(s) is developed and maintained reflecting government's determination to support affected communities and stay the course; and
- Ensure that inter-departmental, including Ministerial, agreement on the way forward is agreed in a timely fashion, and subsequently implemented.

3.33. The exact role is likely to vary according to the nature of the emergency, as is the membership of the group. For a nuclear emergency, membership is likely to comprise relevant government departments and national responding organisations. Non-departmental organisations, such as the Local Government Association, will be invited as appropriate. Where the emergency has affected other parts of the UK, it may be appropriate to invite the relevant devolved administrations to join the group or participate in relevant meetings.

3.34. The MRG will be supported by an Officials Recovery Group (ORG) with similar membership as above. The ORG will:

- Develop an overview of the scale and impact of the nuclear emergency;
- Oversee timely delivery of funding; identify issues needing resolution by government;
- Identify solutions to issues as they arise; and

- Ensure timely inter-departmental agreement on the way forward.
- 3.35. In Scotland, meetings will either be SGoRR(Ministerial) which are Chaired by the Minister for the Lead Department or SGoRR (Officials) where Government Officials and Partners meet to determine priorities and actions.

The role of Science Advisory Group for Emergencies (SAGE) in recovery

- 3.36. The need for scientific advice at national level in support of Cabinet Office Briefing Rooms (COBR) is likely to continue as the nuclear emergency transitions to recovery. It will be for COBR with the Lead Government Department to decide when the SAGE will stand down. The role of SAGE in recovery will be similar to that in the response phase. Initially, the recovery SAGE is likely to be a subgroup of the main SAGE, which, during the transition to recovery, would become SAGE.
- 3.37. Before transition to recovery, the recovery SAGE will raise awareness of issues and decisions that could affect or foreclose actions to support recovery of affected communities.
- 3.38. During the recovery phase SAGE will help decision-makers understand the evolving situation and potential long term impacts of the nuclear emergency. For example:
- Potential long term scenarios, their probability, the factors affecting them and implications for people and environment;
 - Scientific and/or technical solutions that can remove or mitigate the risks and/or manage the impacts, as well as the pros and cons of these. Advice on potential solutions should outline any logistical issues or limitations. These may include timing, the expertise and resources required, and the associated costs of these proposed solutions;
 - The scientific and/or technical risks and benefits of policy options identified by others;
 - The degree of consensus amongst subject matter experts. Do all the experts agree? A majority? Some? Or just a few? It is also important to understand the underlying reasons for differences in opinion, scientific, technical, or other reasons such as lack of information;
 - The degree and cause of uncertainty. For example, confidence levels, margins of error and the reasons for not being more certain; and
 - Strategic recovery issues. SAGE will have been set up during the response phase of the incident and there will be a need to discuss in the context of residual risk, what level of contamination is 'acceptable' and the priorities for decontamination using limited capabilities.

Link between national and local co-ordination

- 3.39. In England, DEFRA will deploy a Government Recovery Liaison Officer (GRLO) from the Rural Development Programme for England (RDPE) to the local Recovery Co-ordination Group to work alongside DCLG RED. This will provide a crucial local-national interface and prepare the ground for when DEFRA take over as LGD for recovery. In Scotland, the Scottish Government Liaison Officer is a member of the RCG.
- 3.40. It is important that science advice at local and national level is co-ordinated and consistent. It is recommended that the chair of SAGE should communicate regularly (by teleconference) with the RCG. This will provide an opportunity for science advisers at local level to escalate issues for which they need national support, or to highlight constraints on recovery issues where additional help is needed.

Transition at the national level

- 3.41. During the response phase, DECC, DEFRA, MOD or Scottish Government for a civil event in Scotland, Cabinet Office and other relevant departments will consult on what support is likely to be needed by local responders during the recovery phase. This will influence the national support structures put in place and will include:
- A continued presence, either physically or virtually, from a Government Liaison Officer(s) in the RCG; and
 - Establishing a Ministerial Recovery Group (MRG) supported by an Officials Recovery Group (ORG).
- 3.42. During the transition from response to recovery the Lead Government Department will have the assistance of the government liaison team to ensure a smooth handover of information, contacts and on-going actions.
- 3.43. The LGDs for both response and recovery will observe local transition arrangements. The LGD will seek assurance that the local transition to recovery occurs in a timely, measured way and that local emergency arrangements can be re-activated again, if needed. A formal handover from DECC to DEFRA, or MOD to DEFRA, in consultation with the Cabinet Office will occur when:
- The emergency is contained and there is no significant risk of resurgence;
 - Public safety measures are in place and working effectively;
 - The Ministerial Recovery Group (MRG) is established and pro-active at the national level and; and
 - The Recovery Co-ordinating Group (RCG) is established and pro-active at local authority level.

- 3.44. It is possible that emergency response and recovery activities will be undertaken simultaneously both at national and local level. At local level, this may be a factor of geography. At the national level, LGDs may, for example, need to identify resources to support emergency actions – as well as considering long-term strategies to dispose of wastes contaminated with radioactivity.

4. Developing and implementing a recovery strategy

- 4.1. This section sets out a process for managing recovery from a nuclear emergency, including what's involved, what to consider, who can help and signposts to further guidance. To make balanced, reasoned decisions at each stage, it is important that responders understand the radiological and other long-term consequences of a nuclear emergency. Supporting annexes explain how radioactivity behaves in the environment, how this leads to radiation doses to people and the long term impacts for health and environment.

Introduction

- 4.2. This chapter is intended for members of the Recovery Co-ordinating Group (RCG) at local level and the Lead Government Department for recovery.
- 4.3. For a nuclear emergency, the primary aim of the entire recovery process will be to develop a recovery strategy for returning areas affected by the emergency to a state that community representatives and stakeholders have determined is acceptable. The strategy will be agreed by the members of the Recovery Co-ordinating Group in consultation with community representatives and stakeholders.
- 4.4. Sections 2 and 3 provided frameworks for planning and preparing for recovery and a structure to co-ordinate recovery effort at local and national level following a nuclear emergency. Organisations with a role in nuclear recovery will contribute their own particular expertise to the deliberations of the RCG and its subgroups or to government led fora. However, to support their contribution it is important that all responders have a common understanding of:
- A process which will help them develop and implement an effective recovery strategy;
 - The underpinning science concerning radioactive contamination of the environment and radiation exposures to people; and
 - The range and complexity of the issues that will need to be addressed during the recovery phase and signposts for dealing with them.
- 4.5. This section is intended to provide these insights. It sets out a process for managing recovery from a nuclear emergency and what this means for the work of the Recovery Co-ordination Group. In order to implement the process effectively and to make balanced, reasoned decisions at each step, it is important that responders fully understand the radiological and other long term consequences of a nuclear emergency. For this reason, it is

recommended that responders refer to Annex T in conjunction with the process in Table 4. Annex U sets out how radioactivity behaves in the environment, how this leads to radiation doses to people, and the long term impacts for health and well-being, the food chain, business, economy and infrastructure.

- 4.6. Annexes U to A1 cover the importance of radiological monitoring in defining the problem, the framework for managing radiation exposures as well as food and wastes contaminated with radioactivity.

Managing recovery from a nuclear emergency (consequence mitigation)

- 4.7. For a nuclear emergency, the focus of the entire recovery process will be to:
- Develop and implement an agreed strategy for returning areas affected by the emergency to a state as close as possible to that existing before the release of radioactivity; and
 - Return the population to a lifestyle where the event is no longer a dominant influence.
- 4.8. The management of recovery goes far beyond the need to understand the radiological implications for people, health and wellbeing. It needs to include strategies for returning the functionality of whole communities by restoring infrastructure, business, employment and public services as well as protecting the environment. Setting priorities for recovery will inevitably involve trade-offs among many of these factors and will need the engagement and agreement of stakeholders.
- 4.9. Consideration should also be given to the provision of a full range of practical assistance, support and where necessary, counselling to those directly or indirectly affected by the emergency. Any strategy should also include how information and media management of the recovery process is co-ordinated, as well as establishing effective protocols for political involvement and liaison.
- 4.10. To help the RCG and its subgroups manage recovery following a nuclear emergency and produce an optimised strategy – the approach set out in Table 4 is recommended. Table 5 explains the importance of each step in the development of a coherent recovery strategy, what is involved and what the multi-agency group need to consider. Signposts to detailed supporting guidance are provided. The UK Recovery Handbook for Radiation Incidents²⁴ is an important reference for decision-makers managing the recovery from a nuclear emergency.

²⁴ [UK Recovery Handbook for Radiation Incidents, Public Health England, 2015.](#)

Table 4 Process to manage nuclear recovery

Recovery step	Process	What it involves
1 Define the situation		Establish a picture of what and who has been affected, to what extent. Including levels of radioactive contamination (through implementation of monitoring strategy), land use affected, (e.g. inhabited areas, leisure, commercial, food production) and impacts on people (e.g. based on population data, demographic information).
2 Assess the impacts – radiological/other		Use data and models to assess projected doses to people living in the affected area and what this means for future health. Take account of exposure scenarios, habits and prevailing environmental conditions.
3 Identify goals and options	← Remediation criteria	Engage communities in establishing recovery goals - based on radiological, economic, environmental, other criteria. Agree how radiological risk will be equated with measurable radioactivity in the environment. Options include controlling access, changing behaviours, managing food and drinking water and decontaminating of the environment.
4 Evaluate options	← Analysis	Involve local communities and stakeholders in the evaluation of recovery options. Consider effectiveness, feasibility, capacity, timescales, constraints, waste generation, worker doses, costs, impact on society, acceptability.
5 Decision-making	← Optimisation	A multi-agency responsibility – heavily reliant on the involvement of stakeholders and communities. No matter how robust the science, or valid the recovery strategy, it will fail if not accepted by stakeholders. Consider local needs, cultural and ethnic sensitivities and applicability of policies and legislation.
6 Implementation of recovery strategy		Document the rationale for recovery decisions including prioritisation of recovery options. Communicate to stakeholders including timescales, technologies to be used and success criteria. Maintain transparency throughout decision-making and implementation.
7 Monitor and evaluate		A long term monitoring programme is needed to evaluate the success of the recovery strategy. Establish and agree recovery milestones with the community. For example, short, medium term targets for projected dose; restoration of facilities, transfer of waste to storage.

Table 5 Developing a coherent nuclear recovery strategy: pointers for members of the Recovery Co-ordination Group

<p>Step 1 Define the situation</p> <p>Establish a picture of what and who has been affected, to what extent. This will include levels of radioactive contamination and land use affected such as inhabited areas, leisure, commercial, food production as well as impacts on people.</p>
<p>Why is this step important?</p> <p>An understanding of what has been affected is the basis for developing a recovery strategy. Balanced, reasoned, proportionate decisions to support community recovery need to be based on a clear understanding of the extent and levels of contamination and what this means for radiation doses to people. Defining the situation is the starting point for decisions about whether emergency countermeasures can be lifted, whether contamination has arisen from the incident and where clean up may be needed. Continuous review of the situation is important to demonstrate that actions taken have achieved the agreed levels of success or that further work is required.</p>
<p>What does it involve?</p> <p>Understanding the level and distribution of radioactive contamination deposited on the ground through the development of a monitoring strategy. This should include areas perceived to be affected by the public and official confirmation of the absence of contamination. This will need to cover inhabited areas, food and the wider environment. Establishing a picture of what has been affected in its broadest sense, including:</p> <ul style="list-style-type: none"> • People and communities; • Infrastructure; • Business and commercial activity; and • Public confidence. <p>Collating information in a way that supports a common understanding of the situation.</p>
<p>What should I consider?</p> <p><i>In preparation for recovery:</i></p> <ul style="list-style-type: none"> • Developing an outline monitoring strategy to prompt discussion within RCG Monitoring Subgroup; • Setting out roles and responsibilities for information gathering; • Interoperability of systems which allow information to be shared; • A framework to collate and share information about the contamination picture (RIMNET); and • A framework to collate information about what has been affected. <p><i>When recovery gets underway following a nuclear emergency:</i></p> <ul style="list-style-type: none"> • Develop a monitoring strategy; • Refer to data, information sources and modelling collated in preparation for recovery; and • Where to focus monitoring efforts based on characteristics of the release and measures taken to manage exposure.
<p>Who can help?</p> <p><i>Status of communities, business, infrastructure, vulnerable people:</i> Local Authorities, with Environment and Infrastructure Group.</p> <p><i>Co-ordination of radiological monitoring:</i> PHE-CRCE with the Monitoring Group</p> <p><i>Radiological monitoring:</i> PHE-CRCE, nuclear operator, Defence Science Technical Laboratory (dstl), Ministry of Defence (MOD), nuclear operators, environment agencies²⁵, Food Standards Agency (FSA), Food Standards Scotland (FSS), Atomic Weapons Establishment (AWE).</p> <p><i>Co-ordination of the information picture:</i> Lead Local Authority with the RCG.</p>
<p>Signposts NNEPR Guidance Part 3 Recovery. Annex P Radiological Monitoring. UK Recovery Handbook for Radiation Incidents, Public Health England, 2015. Inhabited areas, Section 1.9.</p>

²⁵ Environment Agency (EA) in England, Scottish Environment Protection Agency (SEPA) and Natural Resources Wales (NRW).

Step 2 Assess the impacts
Use data and models to assess projected doses to people living in the affected area taking account of exposure scenarios, habits and prevailing environmental conditions.
<p>Why is this step important?</p> <p>Establishing a comprehensive overview of the various impacts of the contamination is important for investigating and prioritising options for managing the situation and making the best use of the resources available.</p> <p>Getting an understanding of who is impacted by what, enables sensitive communities and critical infrastructure to be identified and protected in the following investigations.</p> <p>Understanding the impacts of contamination is the basis for balanced, reasoned, proportionate, decisions to support community recovery.</p>
<p>What does it involve?</p> <p>Use of data and models to assess radiological impact of the contamination on the future health and wellbeing of people living and working in the affected area. Take account of exposure scenarios, habits and prevailing environmental conditions.</p> <p>Applying nationally and internationally agreed principles and frameworks for radiological protection to determine interventions to manage exposure.</p> <p>Use of local knowledge and plans to assess non-radiological impacts of the incident on all aspects of life, including health, infrastructure, environment, business and community.</p>
<p>What should I consider?</p> <p>To assess radiological impacts, focus on doses from the exposure scenarios, not activity concentrations in products, or activity deposited on surfaces. This is because the time and effort required for removing contamination beyond certain levels from everywhere does not automatically lead to a reduction in doses and can generate unnecessarily large amounts of waste.</p> <p>Assess the level and type of damage to essential services, assets, buildings, transport, and infrastructure for health and education.</p> <p>Agree radiological criteria to determine whether interventions to manage exposure are needed. For most foreseeable situations in the UK, Reference Levels of effective dose recommended by the international community for existing exposure situations are appropriate. The value selected should reflect a balance of inter-related factors, including sustainability of social, economic, environmental and overall health of the affected populations and the views of stakeholders. Identify people most at risk using existing databases and information.</p> <p>Assess the impact of the event on:</p> <ul style="list-style-type: none"> • vulnerable individuals, establishments and businesses; • trading operations - accessibility for customers and suppliers; and • essential services for example, health related services and local authority resources.
<p>Who can help?</p> <p><i>Advice on radiological criteria to determine whether interventions are needed:</i> PHE-CRCE</p> <p><i>Assessment of radiological impact:</i> PHE-CRCE. The nuclear operator may have data and information that could assist impact assessment.</p> <p><i>Assessment of impact on infrastructure:</i> Environment and Infrastructure Group</p> <p><i>Assessment of impact on health:</i> Community recovery committee</p> <p><i>Assessment of impact on business:</i> Business and economic recovery group</p>
<p>Signposts</p> <p>NNEPR Guidance, Nuclear Recovery Plan Template and Local Authority recovery plans</p> <p>The 2007 Recommendations of the International Commission on Radiological Protection, ICRP Publication 103, 2007. Editor J Valentin.</p> <p>The Basic Safety Standards (BSS) Directive, 2013/59/Euratom.</p>

<p>Step 3 Identify the options</p>
<p>Engage communities in establishing recovery goals - based on radiological, economic, environmental, other criteria. Agree how radiological risk will be equated with measurable radioactivity in the environment. Identify options for managing recovery; options include controlling access, changing behaviours, managing food and drinking water and decontaminating of the environment.</p>
<p>Why is this step important?</p> <p>The options available for dealing with contamination in for example, an urban environment are many and varied. These may be used in isolation or in combination. Each approach will have costs (financial, resource, disruption, time to implement) and benefits (dose reductions, added improvements to local environment). Identifying feasible options is key to developing an achievable recovery strategy.</p> <p>To meet different recovery goals it may be necessary to trade different options to optimise the overall recovery strategy. For example, some options will be very effective at reducing doses but generate large volumes of waste for which no disposal route is available. Other options may be less effective but provide reassurance to the population.</p>
<p>What does it involve?</p> <p>Identification and selection of recovery options based on strategic aims of the recovery strategy. These are likely to cover inhabited areas and food production systems including drinking water supplies. Reference to clear strategic aims for the recovery of the affected community as set out by decision-makers. See Section 3 Recovery strategy and objectives.</p> <p>Strategic aims concerning the protection of people, environment and remediation will need to be supported by radiological objectives. These will be based on dose criteria and measurable levels of contamination in the environment.</p> <p>For wide area contamination involving the release of a range of radionuclides, the recovery strategy will be complex, comprising a series of options that could be implemented over a range of timescales. Other non-radiological goals are likely to focus on options that bring about improvements in public services, re-opening of utilities and infrastructure, and reinstating normal trading.</p>
<p>What should I consider?</p> <p>Options available for managing radiation exposures arising from contamination in food production, inhabited areas and drinking water are many and various.</p> <p>For any one accident scenario only a subset of options will be applicable.</p> <p>Options may include controlling access to a contaminated area, modifying individual behaviours and habits in a contaminated area, intervening in food production systems and drinking water supplies to reduce levels of contamination in the diet or by decontaminating buildings, transport systems roads and paved areas, soils, plants and trees.</p> <p>For options that generate contaminated waste, it will be important to consider a strategy for transport, storage and disposal of the waste.</p>
<p>Who can help?</p> <p><i>Overview of recovery options:</i> PHE-CRCE</p> <p><i>Identification of viable options for the restoration and clean-up of physical infrastructure and natural environment:</i> Environment & Infrastructure group.</p> <p><i>Identification of options for the production of food below intervention criteria:</i> Food Standards Agency, Food Standards Scotland, DEFRA</p>
<p>Signposts</p> <p>UK Recovery Handbook for Radiation Incidents, Public Health England, 2015. Section 3 Recovery strategy and objectives</p>

Step 4 Evaluating the options

Involve local communities and stakeholders in the evaluation of recovery options to develop an optimised strategy. Consider effectiveness, feasibility, capacity, timescales, constraints, waste generation, worker doses, costs, impact on society, acceptability.

Why is this step important?

Numerous recovery options are available for the potential range of land uses that can become contaminated following a nuclear accident. Some options will only be applicable for one radionuclide or one type of land use. Other options may generate unacceptable amounts of waste or only be effective at certain times of the year or under particular conditions. Consequently, the development of a recovery strategy will involve evaluating, selecting and combining options based on input from a wide range of stakeholders, including those with local knowledge and expertise. This optimisation process will lead to a sustainable, effective and acceptable recovery strategy.

What does it involve?

Scrutinising the key attributes of recovery options at the time of the incident to decide whether the agreed goals and timescales for recovery can be met. This should be carried out at the local level and in conjunction with stakeholders.

It is very difficult to make judgements in advance as the applicability of options will depend on the scale of the release and the radionuclides involved.

What should I consider?

Key attributes of any recovery option will include:

- Effectiveness;
- Feasibility;
- Capacity (equipment and resources);
- Timescales of implementation;
- Constraints (legal, societal and environmental);
- Waste generation - transport, storage, treatment and disposal;
- Doses to implementers;
- Environmental impacts;
- Non-radiological risks;
- Costs; and
- Acceptability to stakeholders.

To assist the comparison between options and for selecting and combining options, datasheets have been produced for each recovery option to systematically record information on key attributes.

Decision-makers will need to reconcile the costs (not only financial) and benefits of different options to meet different remediation goals and to optimise the overall strategy. For example, some options will be effective at reducing doses but generate large volumes of waste for which no disposal route is available.

The datasheets and a framework for selecting and combining recovery options are provided in the UK Recovery Handbook for Radiation Incidents.

Who can help?

Evaluation of techniques: Environment and infrastructure group

Signposts

CONDO Software for estimating the Consequences of Decontamination Options – Report for CONDO Version 2.1, NRPB-W43, June 2003.

UK Recovery Handbook for Radiation Incidents, Public Health England, 2015. Annex X Waste management following a nuclear emergency

<p>Step 5 Decision-making</p>
<p>A multi-agency responsibility – heavily reliant on the involvement of stakeholders and communities. No matter how robust the science, or valid the recovery strategy, it will fail if not accepted by stakeholders. Consider local needs, cultural and ethnic sensitivities and applicability of policies and legislation.</p>
<p>Why is this step important?</p> <p>The RCG need to be able to justify the options that will be undertaken, as there will be a number of options that have conflicting outcomes.</p> <p>It is essential that stakeholders and communities are involved in the decision making process. No matter how robust the science, or valid the recovery strategy - it will fail if it is not accepted and understood by them.</p> <p>Engaging with stakeholders and the community will ensure the recovery strategy is optimised and assist in the rebuilding of public confidence.</p>
<p>What does it involve?</p> <p>Critically reviewing all the options and making balanced decisions to determine which options are the most appropriate for the recovery of the community.</p> <p>This is a multi-agency responsibility delivered through RCG who will agree the overall recovery strategy and determine how it will be implemented.</p>
<p>What should I consider?</p> <p>Priorities, timescales and costs of the options</p> <p>Community engagement and local needs:</p> <ul style="list-style-type: none"> • Identifying community representatives and stakeholders; • How to ensure all sectors of the community have an opportunity to be involved in decision-making; • How to present options, risks and benefits to a diverse audience; • Language and cultural diversity; and • Local sensitivities. <p>Effective/co-ordinated communications – communications strategy.</p> <p>Waste management/disposal.</p> <p>Health and welfare issues.</p> <p>Relocation of the community (temporary/permanent).</p> <p>Reassurance monitoring of the public.</p> <p>Impact on businesses/ economy.</p> <p>Cultural and ethnic sensitivities.</p> <p>Applicability of policies and legislation.</p> <p>Ability to measure progress and set targets.</p> <p>Communications strategy.</p> <p>Recording the decisions made for future scrutiny. These may be adapted as more information becomes available and an audit trail will be useful.</p>
<p>Who can help?</p> <p>RCG; Specialist advisory groups and working groups; Stakeholders; Communities; Elected members</p>
<p>Signposts</p> <p>UK Recovery Handbook for Radiation Incidents, Public health England, 2015</p>

Step 6	Implementation of the recovery strategy
Document the rationale for recovery decisions including prioritisation of recovery options. Communicate to stakeholders including timescales, technologies to be used and success criteria. Maintain transparency throughout decision-making and implementation.	
Why is this step important?	
Once the recovery strategy is defined it is of little use without the means in place to be able to implement it. Implementation is the process that puts the plans and strategies into actions in order to accomplish the strategic objectives and goals, and for this to become reality it needs to be clear exactly who needs to do what and by when. To enable the strategy to be implemented successfully it is important to have a clear management structure through the RCG and clear leadership is shown through the chair of the RCG. The chair of the RCG must be able to communicate the aims and objectives of the strategy to everyone who will be involved and affected including sub groups, communities and stakeholders.	
What does it involve?	
The RCG will need to develop a recovery plan to deliver the recovery strategy. This means identifying the 'who, what, where, when and how' of reaching the goals and breaking them down into manageable projects and tasks. The RCG will then task the appropriate subgroups to progress the projects and tasks. The RCG will need to: <ul style="list-style-type: none"> • Ensure activities meet the specified needs; • Devise a workable schedule with clear goals and timescales; • Develop systems for reporting progress, and ensuring a clear management structure and lines of authority are in place; and • Monitor progress against targets and adjust when needed. A communications strategy will need to be developed to ensure transparency throughout the decision making and implementation process. As part of the communications strategy, continuous engagement with community representatives and stakeholders will be required to enable them to be updated on activities and progress and provided with explanations relating to changes and issues that have arisen.	
What should I consider?	
The recovery strategy is meaningful and the links to elements of the recovery plan (delivery actions) are clear. Include projects, tasks, outcomes, time scales and ownership of what needs to be done. The recovery plan needs to be achievable and realistic with respect to available man power, resources, time and budget. Clear leadership, co-ordination, governance and effective communications with teams involved in the implementation of the recovery plan. Ensure that staff understand that they need to stop day-to-day work activities and focus on delivery of the recovery plan. Facilities, equipment and support for staff involved in the work. Clear reporting programme and scheduled meetings for updates on progress. How to communicate with stakeholders and communities matching communication format/style to the needs of the audience. For example presentations, progress reports, surgeries and workshops.	
Who can help?	
Co-ordinated and managed by the RCG; Specialist advisory and working groups tasked with activities; Specialist contractors; Community representatives and stakeholders; Voluntary sector (including faith groups)	
Signposts	
Emergency Response and Recovery, Non-statutory guidance accompanying the Civil Contingencies Act 2004, 2013. Nuclear Emergency Planning and Response Guidance Chapter 18, Nuclear Recovery Plan template	

Step 7 Monitor and evaluate

A long term monitoring programme (environmental and public health) is needed to evaluate the success of the recovery strategy. Establish and agree recovery milestones with the community. For example, short to medium term targets for projected dose; restoration of facilities, transfer of waste to storage.

Why is this step important?

Long term, iterative, monitoring and evaluation helps the recovery process by:

- assessing whether remediation goals and targets both locally and nationally have been met;
- identifying issues and concerns that need to be addressed;
- highlight emerging issues, for example as the radiological monitoring picture develops; and
- identifying gaps in capability.

It provides the necessary feedback on the success of recovery strategies so they can be adjusted if and when required.

Engagement with other departments promotes a cross government approach.

Provides accountability and ensures that activities to support recovery remain focused and on track.

What does it involve?

Establishing measurable milestones for recovery which may include short to medium term projected radiation dose targets. These targets will provide a means of monitoring and evaluating progress and will assist when specific recovery activities can be scaled down.

Follow-up studies on psychological health impacts.

What should I consider?

Public health effects, including psychological impacts among the affected populations (includes assessing and tracking individuals beyond their exposure).

Environmental contamination.

Residual contamination in foodstuffs, infrastructures, properties, drinking water and commodities.

Volumes of waste.

Maintain effective communications with stakeholders.

Engaging with the local community to provide input and help.

Who can help?

All key government stakeholders and agencies including; GDS, PHE, HO, EA, DfT, DCLG, CO and other key recovery partners; Key recovery partners; Local community, environment and business groups.

Signposts

UK Recovery Handbook for Radiation Incidents, Public health England, 2015

Strategic National Guidance: The decontamination of buildings, infrastructure and open environment exposed to CBRN materials, January 2015.

Emergency Response and Recovery, Non-statutory guidance accompanying the Civil Contingencies Act 2004, 2013.

Nuclear Emergency Planning and Response Guidance Chapter 18, Nuclear Recovery Plan Template

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