

DSRL Dounreay

Off-Site Emergency Plan



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INTRODUCTION

The plan outlines the roles and responsibilities of the emergency services and other agencies, and summarises their expected response to an incident at the DSRL Dounreay Site.

Once an incident has developed, each agency would then refer to its own generic plan to ensure that its own area of responsibility is fulfilled.

This plan has been prepared with regard to and in compliance with the Radiation Emergency Preparedness and Public Information Regulations 2001 (REPPIR) by Highland Council Emergency Planning in collaboration with DSRL.

The following Organisations and Agencies were consulted as part of the plan creation, compilation and production process.

DSRL Dounreay
Food Standards Agency (Scotland)
Health Protection Agency – Radiation Protection Division
Highlands and Islands Fire and Rescue Service
Maritime and Coastguard Agency
NHS Highland
Police Scotland
NRTE Vulcan
Office for Nuclear Regulation
Scottish Ambulance Service
Scottish Environment Protection Agency
Scottish Government
Scottish Water

This issue of the Plan demonstrates that with progressive decommissioning of facilities on the Dounreay site and the processing of inventories to safer, less dispersible forms the previous 5km DEPZ can be contracted to a circle of radius 1.15km centered at OS Grid Ref 990672N.

SECTION 1 : AIMS AND OBJECTIVES

1.1 Aim

The aim of this plan is to set out the initial arrangements for dealing efficiently with an incident involving the release of radioactive, chemical or toxic material(s) at DSRL Dounreay.

1.2 Objectives

The principle objectives of the plan are:

- To clarify the roles of the participating agencies through defined responsibilities.
- To ensure procedures are in place and remain relevant and appropriate and, therefore, meet both the relevant regulations and responding agencies requirements in order to achieve the aim of this plan.

SECTION 2 : HAZARD IDENTIFICATION AND RISK EVALUATION (HIRE) REPORT

2.1.1 INTRODUCTION

This document is the report to the Office for Nuclear Regulation (ONR) of the hazard identification and risk evaluation undertaken for the Dounreay licensed site [2] as required under regulation 6(4) of The Radiation (Emergency Preparedness and Public Information) Regulations 2001 [1].

Section 2.1.2 gives the location and brief description of the site. Section 2.2 lists the major radionuclide inventories on site and Section 2.3 the safety controls implemented to prevent accident initiation or escalation of an accident. The accidents that could lead to a Radiation Emergency are described in Section 2.12 and the implications of such released in Section 2.14. Section 2.16 presents a summary and conclusions.

2.1.2 LOCATION AND ENVIRONMENT

The operator of the Dounreay Licensed Nuclear Site is:-

Dounreay Site Restoration Limited (DSRL)

The postal address of the premises is:-

DSRL
Dounreay
THURSO
Caithness
Scotland
KW14 7TZ

The Local Authority is:-

The Highland Council
Glenurquhart Road
INVERNESS
IV3 5NX

Dounreay is a Nuclear Licensed site [2] located approximately 12km west of Thurso. The Nuclear Licensed site is some 55 ha in area and is built on the site of a former Admiralty airfield and adjacent farmland.

The MoD Vulcan Naval Reactor Test Establishment (NRTE) is located immediately west of the Dounreay Licensed Nuclear Site. The boundaries of the Dounreay licensed site and Vulcan NRTE are as indicated in Figure 1. Nuclear hazards presented by Vulcan NRTE are addressed within its own REPPIR submission [3].

The Dounreay site has been operational since 1955.

Over the first 20 years that the site was operated, three reactors were built, namely the Dounreay Fast Reactor (DFR), Prototype Fast Reactor (PFR) and the Dounreay Materials Test Reactor (DMTR). None remain operational and all are in the process of being decommissioned.

Two fuel reprocessing facilities formerly operated at Dounreay for the recovery of fissile material from irradiated nuclear fuel. Both are now shut down, undergoing post-operational clean out in preparation for decommissioning.

Enriched uranium fuel elements are no longer manufactured at Dounreay.

Management at the site is focussed on decommissioning of the reactors, reprocessing facilities, ancillary nuclear facilities and the restoration of the environment.

Principal operations on Dounreay site include:

- Storage of irradiated fuel.
- Storage of unirradiated fuel.
- Storage of intermediate level liquid waste.
- Treatment and storage of liquid and solid intermediate level waste.
- Treatment and storage of solid low level waste.
- Conversion of enriched uranium stocks to a form suitable for long-term storage.

Other processes and facilities at Dounreay are managed to support these operations.

Aqueous discharges are via a pipeline discharging into the Pentland Firth and monitored airborne discharges are made via designated stacks. These discharges are authorised and regulated by SEPA.

The underlying bedrock at Dounreay is primarily Devonian sandstone and geology of the area is particularly stable. Dounreay is, therefore, less susceptible to significant seismic events than is the case elsewhere in the UK. A stream, the Mill Lade, flows south to north through the Dounreay site to the Atlantic Ocean. Groundwater flow is towards the Mill Lade and towards the north coast.

The prevailing wind direction is from the north-west.

With ongoing decommissioning activities, the residual radiological hazard and risk profile of the Dounreay Site is being progressively reduced.

- Radioactive material is being progressively removed from redundant facilities, reducing or eliminating the residual hazards.
- Radioactive material is being packaged or processed to intrinsically safer forms, reducing its hazard potential.

Continued processing of nuclear material on the Dounreay Site remains essential to:-

- Reduce the holdings of fissile material on-site.
- To convert radioactive waste holdings to a form suitable for long-term storage in accordance with current Nuclear Decommissioning Authority (NDA) Policy.

To define the Dounreay REPIR DEPZ, reasonably credible accident scenarios as assessed by individual facility Safety Cases have been reviewed, with current and anticipated operations taken into account. The Dounreay DEPZ is based upon a 1.15km radius circle centred at OS Grid Ref. NC990672. This 1.15km zone encompasses the 5mSv exposure contours from all reasonable credible REPIR significant radiological accidents originating on the Dounreay Site. The DEPZ of 1.15km, therefore remains unchanged from the 2005 REPIR assessment.

It is noted that in the event of a remote high consequence event, that it is not reasonably foreseeable, the Dounreay DEPZ would be extended as warranted by the accident circumstances and assessments.

2.2 RADIOACTIVE MATERIALS ON-SITE

The diverse nature of operations on the Dounreay Site has resulted in the presence of a wide range of radioactive materials, including uranium, plutonium, fission products and neutron activation products. The main parts of the site radioactive material inventory are as follows:

- Irradiated Fuel
- Unirradiated Fuel
- Solid and liquid Intermediate Level Waste
- Solid and liquid Low Level Waste

These sources of radioactivity are controlled and are stored or processed on site. Permitted discharges and waste disposals to the environment associated with the work of the site are regulated in accordance with the Radioactive Substances Act (1993) RSA93, by authorisations granted by the Scottish Environment Protection Agency (SEPA). Routine discharges are well within authorised limits.

Dounreay has an established history of nuclear operations, which will continue throughout implementation of the Dounreay Site decommissioning programme [1]. The on-site inventory will be progressively reduced as material is moved off-site for disposal, storage or processing in accordance with current NDA Policy. The current programme anticipates that this task will effectively be complete by 2023. After this time, any residual activity remaining on the Dounreay site will either be in an intrinsically safe and non-dispersible form (e.g. activated steel of reducing activity) or will have been processed and packaged to a passively safe form suitable for long-term storage/disposal.

Dounreay currently stores or processes nuclear material in quantities that exceed Schedules 2 and 3 of REPPiR [1] and the provisions of those regulations fully apply to operations on the Dounreay licensed nuclear site.

2.3 SAFETY CONTROLS

Any facility at Dounreay Safety Category 1, 2, 3 or 4 commissioned at Dounreay must be supported by a safety documentation that demonstrates:

- That the facility is safe in normal operation.
- That the design is robust enough to ensure that any departures from normal operation do not lead to accidents.
- That if accidents do occur, provisions are implemented to prevent escalation or to mitigate their consequences.

The design of the facility is based upon the fundamental requirement of radiological safety to do all that is reasonably practicable to minimise operational doses, risks and the initiation of abnormal events. The last factor requires consideration of how to prevent deviations from the planned normal operations escalating to major accidents. This is achieved by careful design including application of sound principles of redundancy, diversity and segregation of safety functions in a manner proportionate to the assessed hazards and risks. This gives assurance of defence in depth against major radiological hazards and risks such that:

- The initiating fault is detected.
- Escalation of the fault beyond safe operational limits is prevented.
- The potential to breach all containment barriers is minimised.
- The potential radiological impact of the event in terms of exposure to the workforce or general public is minimised.

The primary design concept is to contain the radioactive material and radiation at source. This includes, where appropriate, having material in a form which intrinsically retains radioactivity within the normal range of operational temperatures and environments. Extra containment barriers can be used to restrict the release of any radioactivity that does escape from its normal location. These barriers can be passive or dynamic. Standards and approved codes of practice are implemented for the design and operation of ventilation systems, decontamination systems or containment vessels. This enables work with radioactive materials to proceed without contamination of the normally manned working areas or of the wider environment. Massive barriers are used when radiation shields are required. The maintainability and fault tolerance of these safeguards is an integral part of the design process.

There are many barriers, engineered and procedural, to ensure that the release of radioactivity to the environment is kept as low as is reasonably achievable. These ensure that the equipment used is well designed, built and maintained and is operated within its safe working range. The required number of such barriers and the types of barriers implemented are determined in accordance with the assessed hazards and risks.

2.4 ENGINEERING CONTROLS

All safety critical equipment is:

- designed and built to exacting specification;
- thoroughly tested and examined before use;
- operated within carefully defined limits by trained staff; and
- maintained in compliance with an approved maintenance schedule.

The safety arguments for the equipment and its operation are prepared by suitably qualified and experienced personnel and subjected to careful review.

2.5 SYSTEMATIC ANALYSIS

The DSRL Safety Case production process provides for a systematic review process identifying the factors that could potentially lead to a radiation emergency. This provides a comprehensive schedule of initiating events and analysis of the potential consequences and probabilities of each. The Safety Case process applies to continued operation of existing facilities, modifications and new construction as well as the ultimate decommissioning of redundant facilities.

The first consideration is to do all that is reasonably practicable to avoid the initiating event occurring, or at least to minimise its likelihood. Wherever practicable, nuclear facilities and processes are designed on the basis of passive intrinsic safety, avoiding elevated pressures or temperatures and with multiple containment barriers implemented to prevent exposure. Design and construction follow a simple logical process with passive or active systems installed as necessary to anticipate and prevent potential deviations.

Having done all that is reasonably practicable to prevent the initiating event from occurring there may still be some identified events with the potential to develop into a major radiation emergency affecting offsite areas. Where practicable, augmented protection systems are provided proportionate to the risks averted.

2.6 DETECTION AND MITIGATION

DSRL is required under the Radioactive Substances Act (1993) to sample and monitor all radioactivity discharge points. Continuous monitoring of stack discharges gives additional rapid warning of abnormal operating conditions. Furthermore, there are a number of on and off-site airborne activity and radiation monitoring stations, which again assist early detection and assessment of abnormal conditions.

Radioactive aqueous activity discharges are sampled and analysed at source prior to sentencing to the site discharge system. The collected liquor is further sampled and analysed prior to discharge to sea. This gives another opportunity to detect abnormal operating conditions and to undertake appropriate remedial actions.

Most radiation emergencies will occur as a result of an identifiable event during a process where operational personnel are present. On-site emergency services and incident response teams will, therefore, mobilise rapidly in accordance with established and regularly practised on-site emergency procedures.

Following a minor on-site accident, the Dounreay incident control team may deploy an off-site radiological survey team as a precautionary measure in order to provide a better assessment of the event.

2.7 MANAGEMENT SYSTEM

All designs of and modifications to nuclear facilities are subjected to detailed safety reviews of the engineered systems and the operating/maintenance procedures. When relevant this extends to reviewing changes to organisational structures and resources. Independent expertise is used to check major changes within facilities. The whole process is scrutinised by the Dounreay Nuclear Safety Committee.

All new equipment, engineering modifications or changes in the operating envelope (including significant changes to the organisational structure) are subject to review by persons outwith the implementation project. The potential radiological hazards are identified and assessed and the levels of review and final approval escalated as appropriate, commensurate with that assessed hazard potential. On the Dounreay Site, this process is overseen by the Dounreay Nuclear Safety Committee (Site Licence Condition 13) which includes representatives of Dounreay, and from other UKAEA Group Sites, and independent members.

2.8 STAFFING

The Director is responsible for the safe operation of Dounreay, and has overall responsibility for ensuring that adequate numbers of staff are present on site to operate the facilities and ancillary plant in a safe manner, and that these staff are suitably qualified and experienced.

Each department has a team of personnel, all of whom are suitably qualified and experienced for the work which they are expected to perform. Nuclear Site Licence Condition 36 requires that changes to the structure or number of employees that are utilised by DSRL and that could impact on safety are assessed and approved by the ONR.

A continuous shift system currently operates at Dounreay although manning levels are variable commensurate with the operational requirements. Within each shift team, specific individuals are identified and trained to assume key roles in the emergency Command and Control structure to promulgate effective management and control of a radiological accident. A callout system is available to summon day staff to site as necessary to augment or relieve the on-site resources that are dealing with the emergency situation. This assures adequate staff resources at all times to operate the site safely and to provide at least initial management of any emergency situation that may arise outwith normal working hours.

Additionally there are established direct lines of communications between Dounreay emergency services and local emergency services, e.g. Fire and Rescue Services, which assures a rapid and suitably prioritised response from those agencies.

2.9 PROCEDURES

The Nuclear Site Licence requires that adequate quality assurance arrangements are implemented for all matters potentially affecting safety. These arrangements are specified in the top tier of a multi-tiered system, and define the requirements for procedures and instructions for the site as a whole.

Top tier procedures and standards apply to activities common to or involving all departments, where overall corporate or site control is required.

The top tier requirements for procedures and instructions are further developed on a departmental basis. Each head of department is responsible for the preparation and issue of sufficient procedures and instructions to adequately cover the work of their department.

Conditions for the safe operation of the facility are provided by the Safety Management Requirements, derived directly by the systematic Safety Case production process. The work needed to maintain the facility in a safe and reliable condition is specified by the maintenance schedules, which are optimised to meet the requirements demanded by the facility Safety Case.

2.10 REGULATORY CONTROL

Dounreay is subject to regulation by a number of external and independent Regulators:

- The Office for Nuclear Regulation (ONR)
- Scottish Environment Protection Agency (SEPA)
- Directorate-General Transport and Energy (DGTrEn)
- Civil Nuclear Security (CNS)

The ONR is a branch of the Health and Safety Executive and assigns a lead inspector for each licensed nuclear site. This Inspector has the right to inspect any equipment or procedure at short notice and to require the licensee to provide information. The ONR can order the shutdown of any process that it considers unsafe. The ONR require that the safety of plant and operations is considered in a systematic manner at all stages from planning, building, operating and decommissioning and that the safety case is subject to both continuous review and formal periodic review.

SEPA are focussed upon the potential impact of Dounreay operations upon the environment. SEPA agree authorised limits for routine discharges of radioactivity to the environment and agree the arrangements for sampling and monitoring of authorised discharge points. SEPA also reserve enforcement powers in respect of deviations outwith agreed constraints.

DGTrEn is an agency of the European Commission with the specific remit of regulating the safety, security and disposition of fissile and fissionable material. A specific function of DGTrEn is to safeguard against the diversion of civil nuclear material contrary to the Treaty on the Non-Proliferation of Nuclear Weapons.

CNS has been recently transferred to the Health and Safety Executive (Nuclear Directorate). CNS is the government body responsible for regulating security arrangements at nuclear establishments. This includes the physical security of those establishments as well as the promulgation of information on developing security threats to those establishments to facilitate implementation of appropriate security precautions.

2.11 EMERGENCY ORGANISATION

Dounreay has emergency plans that ensure that suitably qualified and experienced people are available at all times to respond to any events that cause the various facilities to deviate from their normal operating conditions. The provision of an on-site plan and suitably qualified and experienced staff to respond to unusual events further reduces the probability of a major release of radioactivity to the environment.

The Dounreay emergency plans are agreed with the ONR and exercised regularly. Emergency Planning is discussed internally within the DSRL at the DVOEPG group, within cross-industry forums and in consultation with government bodies, independent bodies and local government. This assures that best practice is implemented in emergency planning and communicated to all stakeholders.

2.12 POTENTIAL HAZARD SEQUENCES

The majority of potential faults which are identified cannot result in a Radiation Emergency, by virtue of the prevention and protection provisions described as above. For significant off-site radiation exposure to be possible it is necessary that there be failures in each of the protective or mitigating barriers or controls. Significant public radiation exposure is credible only when failures of engineered systems and/or of managerial controls are coincident or compounded.

2.13 RESPONSE AND REQUIREMENT FOR COUNTER-MEASURES

It is recognised that despite the careful and systematic manner in which nuclear operations are designed and conducted, there remains the remote possibility of a radiation exposure to a member of the public as a result of an accident at Dounreay.

The severity of a radiological accident depends upon its location, the quantity and isotopic composition of the radioactive material involved, its chemical and physical properties, the nature of the accident, the immediate incident response and the prevailing weather conditions.

Dounreay policy is to undertake “worst case” bounding assessments with consequences encompassing all reasonably foreseeable eventualities. Pessimistic assumptions would typically include worst case inventory, release fractions, weather and exposure directly downwind coupled with a failure to prevent escalation. Radiological consequences identified by such assessments will inevitably over-estimate reality, but are nonetheless essential to define the credible accident envelope and hence the scope of the required Emergency Plan.

In defining the Dounreay DEPZ, the exposures from REPPiR significant radiation emergencies have been reviewed on a common basis, adopting worst case bounding assumptions. The derived Dounreay DEPZ (Figure 2) is the zone within which members of the general public could credibly receive a radiation dose exceeding 5mSv, either from direct radiation or due to airborne activity following a radiation emergency at Dounreay. Assessment has indicated the potential for public exposures up to 170mSv within the Dounreay DEPZ from an assumed maximum credible criticality accident.

HSE guidance [4] adopts a cut off of risk of 1 in 10,000 as the threshold between tolerable and intolerable risks. In the context of this review, it is considered reasonable to assume a frequency of once in 10,000 years as the lower cut off frequency for REPPiR significant initiating events. This implies that naturally occurring external events, against which facilities are designed (e.g. seismic events and extreme wind) are reasonably foreseeable and these have been reviewed. In the event of a rare high consequence event, the Dounreay Emergency Plan is capable of extension as necessary. This would provide an augmented emergency response from DSRL and offsite agencies that the developing situation could demand. This would include implementation of counter-measures in areas beyond the declared 1.15km Dounreay DEPZ.

The initial and precautionary response to an accident will be based upon worst case assumptions. However it is quite likely that any offsite emergency response implemented will subsequently be scaled back in the light of reassessment following radiological monitoring, sampling and consideration of the prevailing weather conditions. Based upon the available information, the incident control team will decide on a course of action with reference to Health Protection Agency (HPA) Emergency Reference Level (ERL) criteria and the exposure that can be averted by selecting that course of action.

Health Protection Agency (ex-National Radiation Protection Board) ERL Criteria

Dose Aversion Mechanism	ERL (mSv)	
	Lower	Upper
Shelter (CED).	3	30
Evacuation (CED).	30	300
Potassium Iodate Tablets.	Not required - ¹³¹ I release not credible	

Sheltering significantly reduces exposure to both direct radiation and to airborne activity and evacuation obviously averts any further dose uptake.

By comparison with the relevant ERLs, it is apparent that following an accident, evacuation of some areas within the Dounreay DEPZ might be prudent, with sheltering advised in other areas. It is anticipated that public welfare following a serious radiological incident could be largely met by setting up exclusion zones for the worst affected areas adjacent to the site. This would be coupled with the option of advising precautionary sheltering for the limited number of residences within the Dounreay DEPZ.

The declared Dounreay DEPZ no longer encompasses a significant portion of the NRTE Vulcan Site. Following a declaration of a Radiation Emergency at Dounreay, it is anticipated that the emergency response in these areas will be adequately addressed by advice to shelter. The established close co-ordination of NRTE Vulcan and Dounreay emergency arrangements will result in the rapid promulgation of emergency advice within those areas.

It is, however, noted that exposure exceeding the 3mSv lower sheltering ERL are credible for a short distance beyond the Dounreay DEPZ and the emergency control teams retain the option of implementing counter-measures beyond the formally declared Dounreay DEPZ as a precaution. It is anticipated that intervention measures in a small area beyond the Dounreay DEPZ would be limited to advice to shelter. The promulgation of such advice to householders falls within the remit of the Local Authority, although the media may be used for wider public information.

Radiological accidents can occur over periods varying from a few seconds to several hours. A Radiation Emergency declared in the wake of an accident can reasonably be expected to persist for several hours. A default incident duration of four hours is assumed as the basis for the Dounreay Emergency Plan.

In the event that a Radiation Emergency is declared on the Dounreay Site, DSRL is obliged to assess radiological exposure to all affected persons. This includes members of the public offsite. DSRL must inform affected persons of the result of that assessment, even if the final assessed exposures do not exceed the 5mSv REPIIR threshold. This may include households beyond the Dounreay DEPZ.

2.14 BREACH OF CONTAINMENT

A major breach of containment (e.g. following a facility fire) could lead to an airborne activity release and exposure of persons downwind, primarily via inhalation.

A major breach of containment incident at Dounreay will most likely lead to steps being taken to exclude members of the general public from affected downwind areas adjacent to the Dounreay Site and, in the worst case, instructions to shelter within the DEPZ.

In the longer term following a breach of containment accident, it is possible that local produce could be subject to controls to prevent activity uptake via the food chain, including areas beyond the Dounreay DEPZ. Specific nuclides can be preferentially concentrated by some foodstuffs.

2.15 CRITICALITY

Criticality is always an issue whenever significant quantities of fissile material are handled. There is identified potential for offsite exposure exceeding 5mSv following an inadvertent critical excursion on the Dounreay Site, even when mitigating factors such as shielding by the facility fabric and other structures are taken into account.

The potential for criticality is minimised by implementation of a robust system of fissile material control and strict observance of specified limits. The limits are derived by rigorous assessment of individual areas, facilities and operations. Even so, the possibility cannot be entirely eliminated.

The energy released during an initial short duration criticality burst more often than not disrupts the critical assembly, stopping the chain reaction. This limits the radiological exposure. The immediate dose exposure that would result from a critical excursion means that no effective counter-measures can be applied to reduce the exposure. In the less likely eventuality of the criticality recurring over an extended duration, the option of implementing effective counter-measures remains.

2.16 SUMMARY

Assessments demonstrate that it is extremely unlikely that there will be a Radiation Emergency at Dounreay. The facilities on site are carefully designed, built and operated in a manner that ensures safe operation.

As discussed in this report, internal scrutiny of safety and design and operation is rigorous and robust. The ONR is a regulator with powers to demand improvements and to shutdown operations if deemed appropriate.

Even so it is considered prudent to have adequate emergency plans to protect the general public in the event of a Radiation Emergency. The scale of these plans is guided by the potential off-site consequences of reasonably credible radiological accidents.

The worst case accident reviewed results in an exposure of 5mSv at up to 460m from the site boundary fence. Assessment has demonstrated that a conservatively derived 1.15km radius circle centred at OS Grid Ref. NC990672 adequately encompasses the 5mSv exposure contours for all REPIR significant radiological accidents originating on the Dounreay Site (see Figure 2).

Emergency interventions within the Dounreay DEPZ to avert public exposure are expected to be limited to the setting up of exclusion zones in the worst affected areas adjoining the site to prevent public access and advice to shelter in some areas, e.g. NRTE Vulcan. Sheltering advice is possible in respect of the limited number of households within the Dounreay DEPZ. Extension of sheltering advice to dwellings beyond the Dounreay DEPZ remains an option as warranted by accident circumstances.

The off-site emergency plan will be maintained to ensure the timely and orderly imposition of those countermeasures that would be of benefit in the event of a radiation accident.

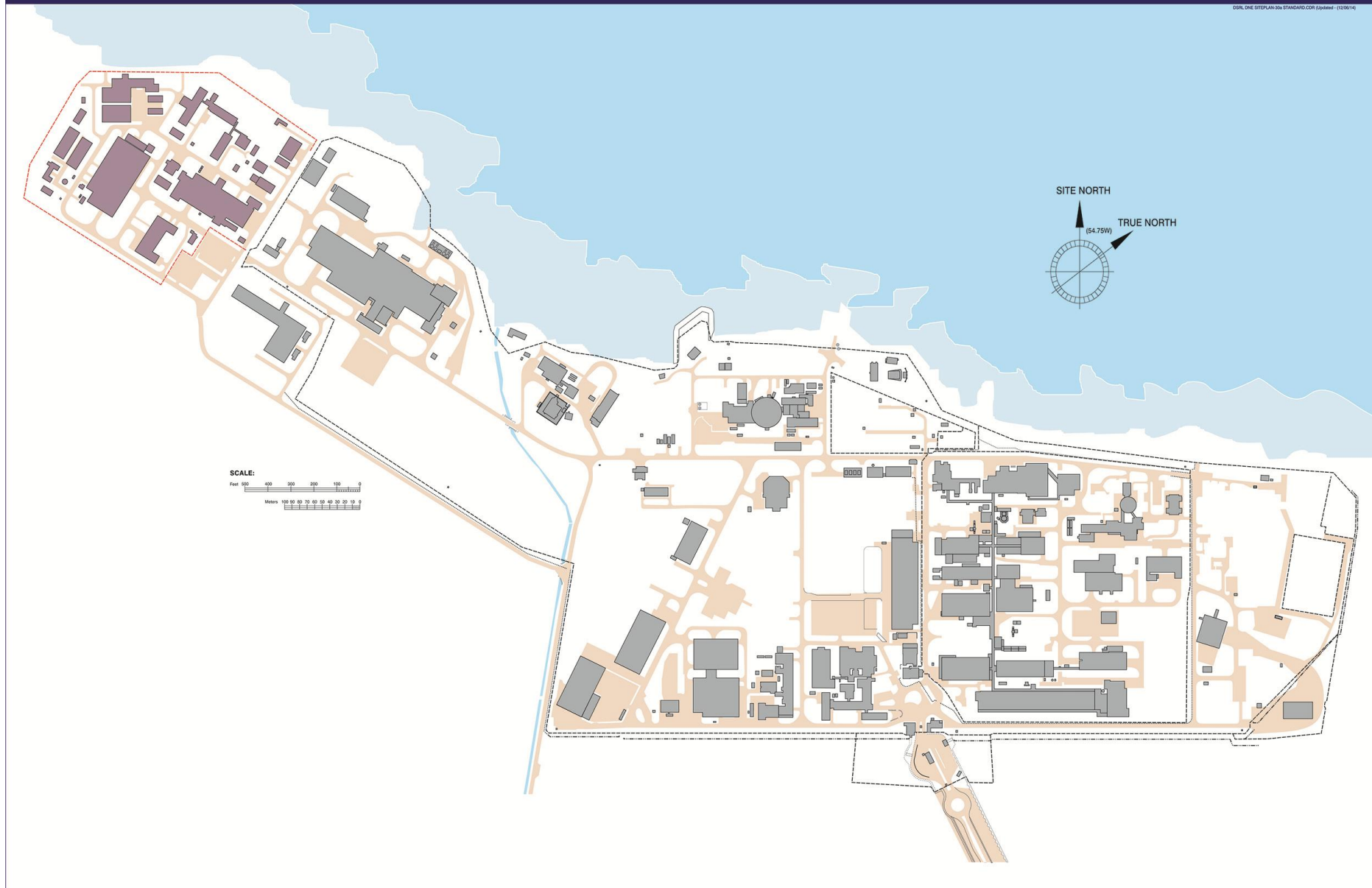
2.17 REFERENCES

- [1] Statutory Instrument 2001 No. 2975 "The Radiation (Emergency Preparedness and Public Information) Regulations 2001.
- [2] Site Licence No: Sc17 "Nuclear Installations Act 1965 (As Amended) Nuclear Site Licence United Kingdom Atomic Energy Authority Dounreay".
- [3] "NRTE Vulcan Off-site Emergency Plan". Issue 3, November 2012.
- [4] "Reducing Risks, Protecting People – HSE's decision-making process". Health and Safety Executive, ISBN 0 7176 2151 0.
- [5] Radioactive Substances Act 1993 (c.12).

Dounreay Site Plan (including NRTE Vulcan)



DSRL ONE SITEPLAN 30a STANDARD.CDR (3/20/11)



SECTION 3 : GENERAL INFORMATION

3.1 Location and Access

The DSRL site at Dounreay, Caithness, is 12 km west of Thurso, on the shores of the Pentland Firth.

Grid Ref: Digital 2985 9670
OS NC 985 670

The site is accessed from the A836 Thurso to Bettyhill road, which passes within one kilometre of the main gate, and is bordered by a high security fence with access controlled at the main gate. Security of the site is the responsibility of the Civil Nuclear Constabulary.

The nearest centres of population to the Dounreay site are the village of Old Reay at 3 km and the villages of Reay and Shebster at 4 kilometres. (See Maps at Pages 45 and 46).

3.2 Background

DSRL has been on its present site at Dounreay since 1955, having as its central task the development of fast reactor technology, pioneering the efficient use of uranium fuel in the generation of electricity. This work ended in 1994 and all three reactors on the site are now shut down and being decommissioned.

Since the Prototype Fast Reactor was closed in 1994, Dounreay has been developing innovative solutions for decommissioning and site restoration.

This Lifetime Plan is focused on the progressive reduction of hazards, and the demolition and decommissioning of plant and buildings.

In the phased approach, the highest hazards will be dealt with promptly, leaving passively safe waste for storage and disposal, and a safely restored site.

From 2011 to 2038 the plan gives top priority to the removal of the major hazards, followed by the decommissioning of the site. Major hazard reduction includes alkali metal removal/destruction, liquid ILW (raffinate) immobilisation, historic waste retrieval and treatment, and facility decommissioning.

To achieve this, a substantial amount of new construction may be required.

After the major hazards have been removed, the plan is to remove all buildings, condition all low-hazard wastes and package any remaining waste and nuclear material on site for interim storage.

The only buildings remaining on site at 2038, the Interim End Point will be stores for conditioned ILW and packaged nuclear materials, along with the infrastructure to service their safe operation. Stakeholders were consulted on the site and state. The chosen option is geared towards de-licensing up to 25% of the site area. The remaining area would contain the stores and higher levels of residual contamination, which could be managed in-situ through natural attenuation and radioactive decay.

3.3 Main Areas of Actual/Potential Danger

The principle source of hazard for the general public would be from exposure to radioactive or other toxic material contained in any external release. Fire or explosion would assist in the dispersal of such material. The likelihood of an accident, resulting in significant quantities of radioactive or toxic material being released into the environment, is remote. Nevertheless, with significant quantities of such materials used, processed and stored on site, there is always the possibility of such a release, occurring.

SECTION 4 : STATES OF ALERT

4 Dounreay Off-site Nuclear Emergency

Declaration Definitions

The following definitions apply to the different emergency states described within the emergency plan:

4.1 Dounreay Emergency

A Dounreay Emergency is declared as a result of an incident causing, or liable to cause:

- (a) an enhanced radiation field,
- (b) a release or spread of radioactive or other toxic material,

such that special precautionary measures are necessary to minimise the danger to life or health or personnel within the Dounreay licensed site boundary.

Note: a Dounreay Emergency could arise from an incident at NRTE Vulcan.

4.2 Nuclear Off-site Emergency

A Nuclear Off-site Emergency is the result of an event which gives rise to or potentially gives rise to the release of activity off-site.

Declaration of a Dounreay Emergency or Nuclear Off-site Emergency is equivalent to identifying that a Radiation Emergency has begun. A Radiation Emergency is defined in the Radiation Emergency Preparedness and Public Information Regulations 2001 (REPPIR). The REPPIR guidance states that a Radiation Emergency includes those events that have the potential to become an actual Radiation Emergency.

A Dounreay Emergency or Nuclear Off-Site Emergency must be declared before emergency doses to intervention workers is permitted under REPPIR.

4.3 Dounreay Clear

Declared when it can be shown that no further effects of the incident will take place.

SECTION 5 : COUNTERMEASURES

5.1 Introduction

The DSRL Dounreay pre-planned countermeasure zone is a circular zone extending to 1.15km around the site.

If a Nuclear Off-site Emergency centred on the Fuel Cycle Area (FCA) Plant is declared, advice relating to the safety of the public will be given from the Dounreay Emergency Control Centre (DECC) to Police Scotland.

It may be necessary to introduce temporary controls on the consumption of foodstuffs, particularly milk, produced in areas where there is contamination from the accident. The Food Standards Agency (Scotland) (FSA) has responsibility for food safety and will advise Scottish Government Rural Payments and Inspections Directorate (SGRPID) and Local Authorities on the implementation and enforcement of such controls which are likely to cover a larger area for a longer time than sheltering and evacuation measures.

Following the closure of the nuclear reactors at DSRL Dounreay, there is now no possibility of radioactive iodine being released to the atmosphere from the Dounreay site. Consequently, there is no requirement for the pre-distribution of potassium iodate tablets.

Countermeasures around DSRL Dounreay include:

- Evacuation
- Sheltering
- Control of foodstuffs and water supplies

5.2 Evacuation

If a Nuclear Off-site Emergency is received, early evacuation from around the Dounreay site is the preferred option of both the Police Scotland and The Highland Council. The decision to evacuate will be made by the Strategic Co-ordinating Group. Evacuation procedures would be implemented unless the Dounreay Emergency Control Centre (DECC) indicated the possibility of an imminent radioactive/chemical release.

Evacuation is a Police responsibility and the decision to proceed with this rests with the Chief Constable/Overall Incident Commander, on the basis of the technical and health advice received.

5.3 Notification

Members of the public within the area to be evacuated would have the necessary information relayed to them by the following means:

- **The DEPZ initial alert will be from the DECC.**
- Broadcast messages being passed by local television and radio networks – Scottish TV, BBC TV (Scotland), Moray Firth Radio 97.4 FM and 102.5 VHF, 1107 KHZ and BBC Radio Scotland 92.4 – 94.7 VHF, 810 MW.

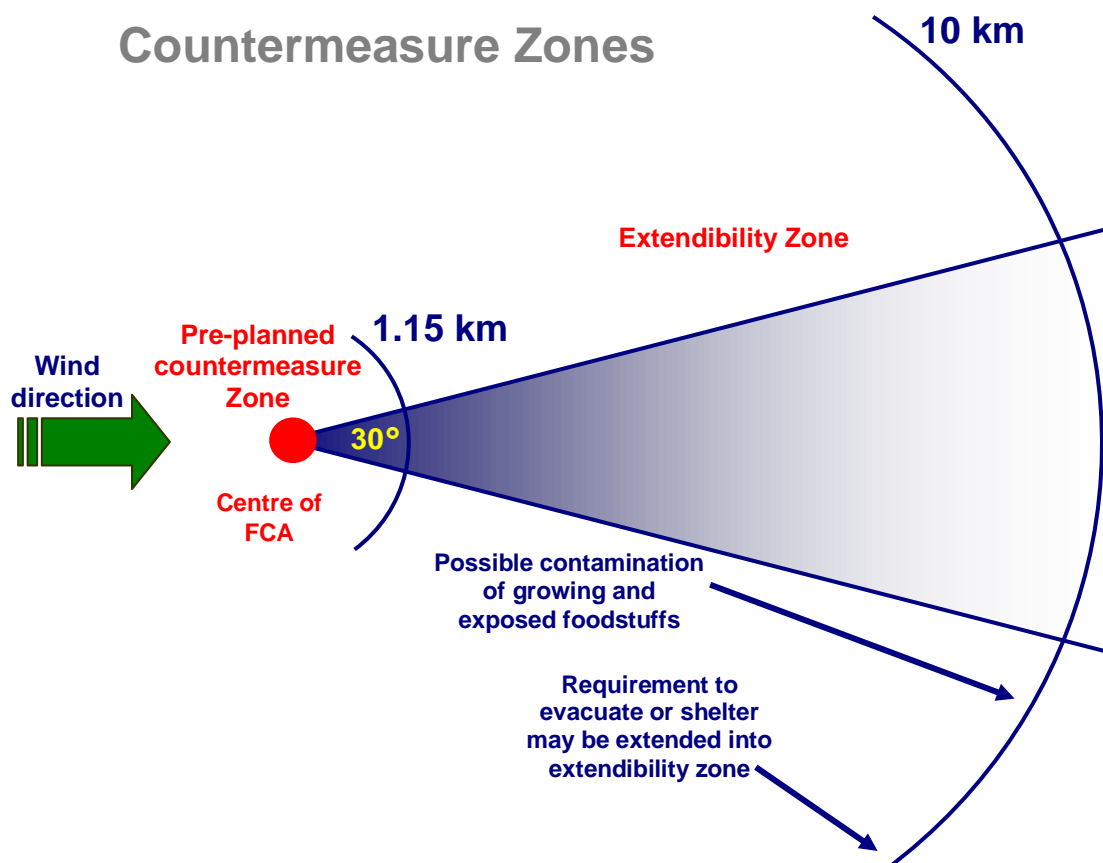
Note : Responding agencies will only deploy personnel into the areas to be evacuated if it is safe to do so.

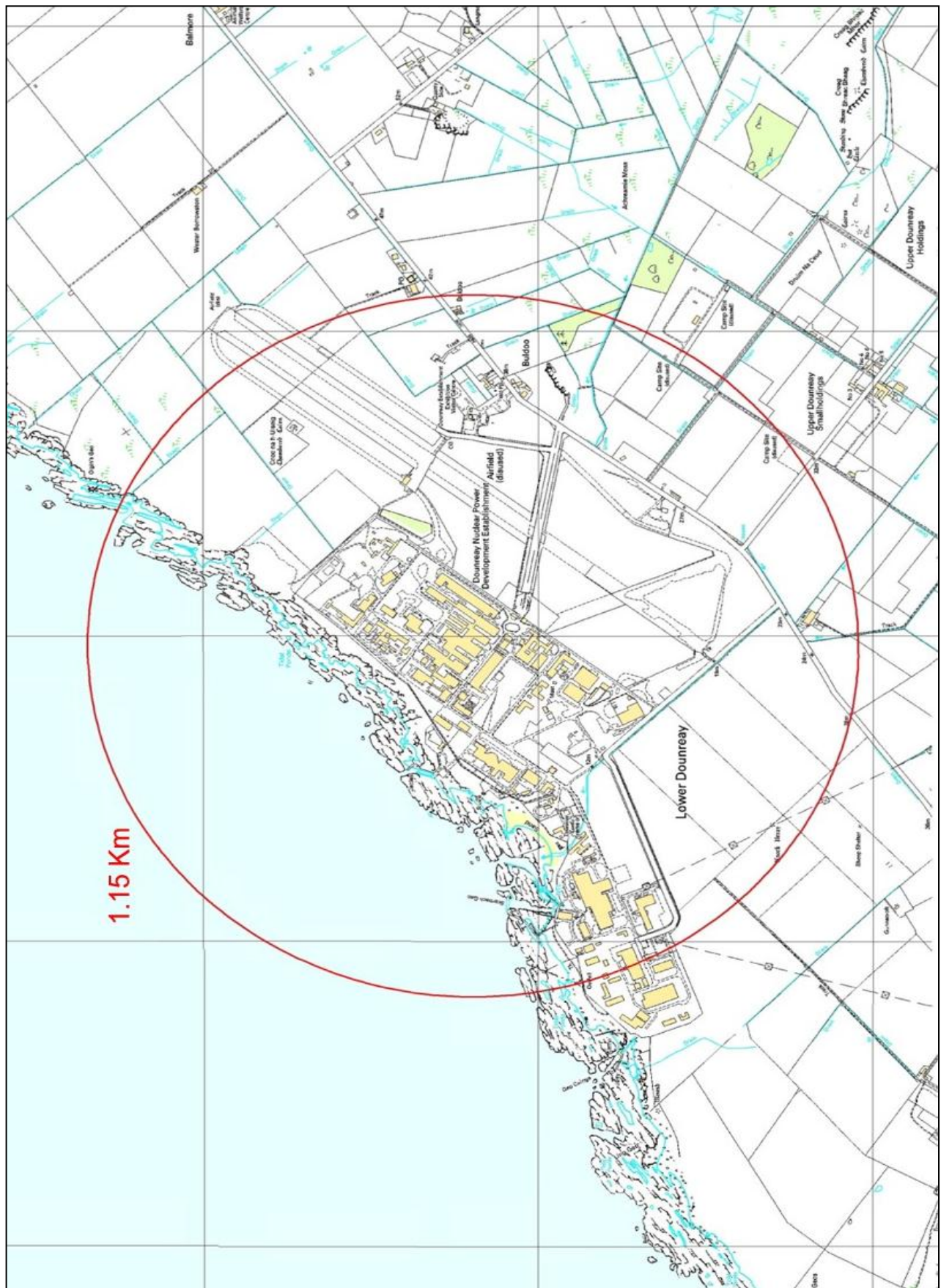
5.4 Countermeasure Zones

There are two countermeasure zones around the Site.

DEPZ extending to 1.15km around the centre of the site. Research indicates that there are clear benefits in recommending countermeasures into the pre-planned zone. This would give the opportunity to implement countermeasures before there is a confirmed off-site hazard.

Extendibility zone out to 10 km around the Site. Countermeasures within this zone are not likely to be of an immediate concern, but are more likely to be implemented as the incident develops. Planning within this zone should establish broad principles and countermeasures, such as advice in relation to foodstuffs, including milk products.





**Pre-planned Countermeasure Zone
(REPPIR)**

Countermeasures around the DSRL site include:

- Evacuation
- Sheltering
- Control of foodstuffs and water supplies

5.5 Evacuation

In any category of alert, early evacuation around the site is the preferred option of both Police Scotland and The Highland Council. Evacuation procedures would be commenced following advice from and discussion with the Emergency Controller at the Dounreay Emergency Control Centre (DECC). Evacuation protects the general public predominantly against radiation from fission products on the ground. Any sectors requiring to be evacuated are unlikely to ever extend beyond 2 km, and consequently numbers to evacuate would be relatively small.

A comprehensive information booklet is issued to all local residents within the Public Information Zone (PIZ). This booklet describes those aspects of the Dounreay emergency arrangements that apply to them as local residents. This booklet is issued under the requirements of REPPiR 2001 and explains what local residents must do in the event of an emergency and how they should prepare for an evacuation.

Evacuation is a Police responsibility and the decision to proceed with this rests with the Chief Constable / Overall Incident Commander, on the basis of technical advice received.

Members of the public within the area to be evacuated would have the necessary information relayed to them by the following means:

In the first instance residents within 1.15 DEPZ will be notified by DSRL.

Members of the public being evacuated or self evacuating would be directed to a screening unit for reassurance monitoring, and, if necessary, for decontamination.

5.6 Sheltering

When sheltering is considered appropriate, advice would be given to stay indoors with doors and windows shut and all ventilation/air conditioning shut off. This advice would be relayed to the general public by employing the following means:

- Broadcast messages being passed by local television and radio networks –Scottish TV, BBC TV (Scotland), Moray Firth Radio 97.4 FM, 102.5 VHF, 1107 KHZ and BBC Radio Scotland 92.4 – 94.7 VHF, 810 MW.

5.7 Control of Foodstuffs and Water Supplies

Contamination of exposed and growing foodstuffs may occur downwind. Though it is not likely to form an acute hazard during the first few hours there could be an ingestion hazard, for example from leafy vegetables, and countermeasures may extend over a wider area and for a longer time than evacuation or sheltering. Similarly, pasture may be contaminated downwind and efficient grazers such as cows and goats can graze a considerable area each day. Some radioisotopes (such as radioiodine) concentrate in milk so there must be arrangements to prevent the consumption of milk which is known to be, or likely to be, contaminated to a higher than acceptable level. The Food Standards Agency (Scotland) will assess any ingestion hazards and advise on necessary countermeasures and arrangements to protect the safety of the food chain.

Water Supplies: Mains water supplies are most unlikely to be affected in any way. To reassure the public, however, sampling of main services and open reservoir water supplies will be arranged by Scottish Water. In some areas, however, water is drawn from private wells, natural springs or running

water, and, therefore, there may be a risk of water being contaminated. For this reason, a general ban on the use of water in the area may have to be considered until sampling has been carried out. The responsibility for imposing a ban lies with the Director of Public Health.

5.8 Radiological Protection

Health Hazard: Everyone is exposed continuously to radiation from many sources. The average annual dose in the United Kingdom from radiation of natural and artificial origin is about 2150 microsieverts, approximately 87% of which comes from natural sources, 13% from artificial sources and 0.1% from controlled releases from the nuclear industry.

The principal harmful effect of radiation exposure is to increase the possibility of cancer in later years, but very high radiation doses can lead to short term or immediate health effects.

Radiation dose is measured in a unit called the sievert (Sv). The sievert is a large unit, and for personal monitoring purposes it can be divided into millisieverts (mSv), which is $1/1,000^{\text{th}}$ of a Sv and microsievert (μSv), which is $1/1,000,000^{\text{th}}$ of a Sv.

Radiation Protection Standards: Radiological protection in the UK is based on recommendations laid down by the International Commission on Radiological Protection. These recommendations have been endorsed by the Health Protection Agency – Radiation Protection Division, and form the basis for current legislation in this country. For the purpose of radiological protection, people are divided into two categories:

- ‘radiation workers’: adults who are exposed to radiation in their work; and
- ‘others’: individuals who are not engaged in radioactive work and children, etc.

The dose limit to the whole body for ‘radiation workers’ exposed to radiation is 20 millisieverts per year or 0.020 sieverts. For ‘others’ the dose limit is 1 millisievert per year or 0.001 sievert unless otherwise stated in individual organisations operational guidance.

Methods of Protection

Exposure Time/Distance: The intensity of radiation from a radioactive source decreases with increasing distance. A simple rule is that by doubling the distance from the source the radiation level is reduced to one quarter and by trebling the distance the radiation level is reduced to one ninth. Similarly, the shorter the time the person is exposed to a source of radiation the smaller will be the dose received.

Protective Clothing: In order to provide protection to personnel responding to an off-site incident involving a radiological hazard, adequate clothing will be required. This may include, an oversuit with integral hood, industrial gloves and wellington boots, which will provide body surface protection for the wearer.

Respirators: The standard equipment is a face mask respirator, together with individual instructions for use, which, if fitted correctly, will provide protection against the inhalation of radioactive particles.

Advice, Monitoring and Use of Equipment

Personnel from all the responding organisations will only enter a contaminated area in urgent or life threatening situations. Before entering any such area, information will be sought from the DSRL DECC and the monitoring team.

Ideally, no personnel from any organisation should enter the contaminated area unless accompanied by a member of one of the monitoring teams. Personnel leaving the contaminated area will be advised as to which radiation screening unit they should attend, along with their vehicles.

Cordon points will be well outwith any contaminated area or potentially contaminated area, and therefore personnel at or beyond these points will **not** require to wear protective clothing as a matter of routine.

SECTION 6 : ENTRY/RE-ENTRY TO CONTROLLED AREAS

6.1 PROCEDURES

6.1.1 It is essential that all personnel requiring access to the following areas are managed correctly and are not allowed unauthorized and uncontrolled access through any cordon.

6.1.2 The following authorities or groups of personnel could be expected to require access in the timescales as indicated below. It is emphasised that although personnel may require access through a cordon for official and authorised duties they may not be required to approach or enter a hazardous area. Nevertheless, full management and control procedures are required for all access through a cordon:

a. **Immediate Accident Emergency Response**

- (1) Emergency Monitoring Team.
- (2) Police.
- (3) Fire Service.
- (4) Ambulance.
- (5) Medical Staff.
- (6) Support and technical staff.

b. **Intermediate Response Phase (Hours to Days)**

- (1) Emergency Monitoring Teams.
- (2) Police.
- (3) Fire Service.
- (4) Support and technical staff.
- (5) Relevant Civil Authorities.

c. **Recovery Phase**

- (1) Radiation Monitoring Teams (All authorities).
- (2) Police.
- (3) Support and technical staff.
- (4) Relevant civil authorities.

6.1.3 The following Access Control Procedures are required to be implemented:

a. **Emergency Rapid Access**

This is required for essential emergency procedures only. eg. Firefighting, Saving of life, Radiation Monitoring, Implementation of immediate Automatic Countermeasures.

- (1) Ensure rapid access.
- (2) Personnel will be briefed at the Forward Control Point on the location of the hazardous areas (if present), the designated safe route INTO and OUT of the area and safety requirements whilst in the area. (Confirmation of all requirements may be obtained from the Health Physicist).
- (3) Personnel are to be issued with Thermoluminescent Dosimeter (TLD badge).
- (4) Personnel are to be issued with a Personal Electronic Dosimeter (PED).
- (5) Personnel are to be issued with Personal Respiratory Equipment face mask.
- (6) Personnel will require to wear suitable protective clothing.
- (7) Personnel are to be instructed to maintain communications with the required control.

- (8) Incident control, the DECC and SCC are to be informed of any access commencing.
- (9) The time of ENTRY and EXIT of all personnel to and from the area is to be recorded at the Forward Control Point.

NOTE: The Fire Service, Monitoring Teams and Ambulance Crew may attend the access cordon already in possession of pre-issued equipment and briefing. In this case ensure a rapid safety briefing is issued and allow rapid entry to the area whilst recording all required details.

b. **All subsequent authorised access.**

- (1) All entries are to be authorised by the Senior Police Officer at the Forward Control Point in liaison with the Health Physics Advisor.
- (2) A PERMIT TO ENTER CONTROL ZONE Authorisation Form, is to be completed and signed at all sections before access is authorised. The Radiation Safety information is to be obtained from the Health Physics Adviser.
This authorisation form is required to be signed by a Health Physicist, the Senior Police Officer at the Forward Control Point and the individual requiring access.
- (3) Personnel are to be briefed at the Forward Control Point on the location of the hazardous areas (if present), the designated safe route INTO and OUT of the area and all safety requirements whilst in the area.
- (4) Personnel are to be issued with Thermoluminescent Dosemeter (TLD badge).
- (5) Personnel are to be issued with a Personal Electronic Dosemeter (PED).
- (6) Personnel are to be issued with Personal Respiratory Equipment face mask.
- (7) Personnel are to be instructed to maintain communications with the required control.
- (8) Incident control, the DECC and SCC are to be informed of the access commencing.
- (9) The time of ENTRY and EXIT of all personnel to and from the areas to be recorded at the Forward Control Point.

6.2 RADIATION DOSES - LIMITS

- 6.2.1** The Health Protection Agency - CRCE recommends that for each countermeasure an Action Level is selected which is appropriate to the particular site. For each countermeasure a lower and an upper Emergency Reference Level (ERL) have been specified. Doses which have already been received through normal occupational sources, are not relevant to these considerations.
- 6.2.2** All authorities involved in a response to a nuclear accident may have pre-determined radiation dose limits stricter than those recommended in Section 5 and specific radiological protection requirements. The specific requirement of each authority is to be implemented.

6.3 RECORDS TO BE KEPT

Comprehensive records are to be kept by all authorities involved in a nuclear accident, in order that the necessary information may be available for a subsequent inquiry to the cause and effects. The records are also needed to assist in dealing with any claims which may arise in connection with loss, damage or injury attributable to the accident. In particular, the following information is requested to be kept.

- (a) Times of reports or orders being issued or received.
- (b) Times when other authorities are informed of occurrences.
- (c) Details of persons exposed to any hazard and doses possibly received in addition to their movements within affected areas.
- (d) Decisions taken and the information on which these decisions were based.
- (e) Weather conditions.
- (f) Information on the causes and effects.
- (g) Authorisation for access to controlled area.
- (h) Details of personnel entering controlled area.

Authorities are requested to forward copies of these records to Police Scotland Force Headquarters as soon as possible after the handover of control and co-ordination to the Local Authority.

SECTION 7 : COMMAND AND CONTROL

7.1 Introduction

In order to achieve a co-ordinated response to a major incident the capabilities of the emergency services should be closely linked with those of the Local Authority, Health Board and other agencies, following the principles of integrated emergency management.

The management framework should always embody the same principles irrespective of its cause or nature but remain flexible to individual circumstances. The response can be divided into three levels – Operational, Tactical, Strategic.

The requirement to implement one or more of these levels will be dependent upon the nature of the incident.

7.2 Operational Level

The scene immediately after disaster has struck is likely to be confused. To bring some order to this confusion it is important that the emergency services establish control over the immediate area and build up arrangements for co-ordinating the contributions to the response. Experience has shown that an effective response depends on the timely receipt of accurate and complete information and on sound decisions being made and appropriate actions set in train at the onset.

It is generally accepted that the first officer from an emergency service to arrive on the scene should not immediately become involved but make a rapid assessment of the scene and report to their control room.

The emergency services will concentrate on specific tasks within their areas of responsibility. Should it be necessary, consideration will be given to assigning control for a specific task or area to a designated officer of the emergency services or particular agency subsequently called to the scene.

The command of the resources belonging to any agency and applied within a geographical area, or used for a specific purpose, will be retained by that agency. Each agency must liaise fully and continually with all the others employed in the same area to ensure an effective and combined effort.

The Police will normally act as the co-ordinator of this response at the scene. These “operational level” arrangements will be adequate for the effective resolution of most minor/medium scale incidents. However, for more serious incidents which require significantly greater resources it may be necessary to implement additional level(s) of management.

7.3 Tactical Level

The tactical level of command exists to determine priority in allocating resources, to plan and co-ordinate when a task will be undertaken and to obtain other resources as required. Some agencies, particularly Local Authorities, will prefer to operate from their administrative offices and will normally send a representative to liaise with the Incident Officer.

When more than one agency is operating at the tactical level there must be consultation between the various Incident Officers. These Incident Officers should not become directly involved with the activities at the scene but concentrate on the overall general management. In order to effect co-ordination, an interagency meeting should be held at regular intervals attended by each Incident Officer. The establishment of inter-service communication links will support the running of the incident at the scene. The Police will maintain a written record and act as the co-ordinating agency.

Should it become apparent that resources or expertise beyond the tactical level of command is required or should there be a need to co-ordinate more than one incident/scene, it may be necessary to implement the strategic level of management.

7.4 Strategic Level

The purpose of the strategic level of management is to formulate the overall policy and direction of a major incident.

A strategic co-ordinating group may be established which will be involved with ensuring priorities for demands by the tactical level of command are met, as well as setting out the plans for a return to normality once the incident has been brought under control. Tactical decisions are not the responsibility of this group.

The strategic co-ordinating group will also be aware of its wider role which may encompass a central government interest, handling requests for advice and assistance from individual services and agencies and formulating a media strategy.

It will be a police responsibility to establish and chair the strategic co-ordinating group during the emergency phase of any response. The group will comprise a nominated member from each agency involved. Each person must be able to make executive decisions in respect of resources within their agency and have the authority to seek the aid of other agencies in support of the role.

The strategic co-ordinating group should be based at an appropriate pre-planned location, normally away from the noise and confusion of the scene. As it is a Police function to chair this group, the strategic level of management will normally be located at Police Headquarters, Inverness.

Strategic Co-ordinating Centre (SCC) Inverness

The Strategic Co-ordinating Centre (SCC) will be located at Inverness. The main functions of the SCC are:

- To manage the strategic level of response to the incident.
- To relieve the load on the affected site, by taking responsibility for all activities not directly concerned with rectifying the situation at the site.
- To provide a central liaison and information exchange point for relevant organisations.
- To ensure that an adequate flow of information and specialist technical advice on the incident is provided to the emergency services, local and central government and to the media and public.
- To provide technical assistance to the site and co-ordinate off-site radiological monitoring activities.

The SCC would be set up as quickly as possible after a Nuclear Off-site Emergency has been declared. All responding organisations should ensure that within their initial actions representatives from their organisation attend the SCC at Police Headquarters, Inverness, as soon as possible. The representatives should be of appropriate standing to make strategic decisions. They would normally bring their Emergency Planning Officers, or equivalent, as advisers.

All services and agencies will initially receive technical advice from the Dounreay Site Emergency Controller in the DECC. Advice will be available from the Dounreay Technical Team when they arrive at the SCC, Inverness. Once a pre-appointed Government Technical Adviser (GTA) arrives at the SCC, the GTA will become the main source of advice to the Police and responding organisations.

Agencies Located at the Strategic Co-ordinating Centre (SCC)

The following people and agencies would be located within the SCC at Inverness. A summary of their responsibilities is included.

Government Technical Adviser : The Government Technical Adviser (GTA) will provide independent advice to all the agencies, in particular the Police Incident Commander, on countermeasures required to safeguard the public. The GTA will be sent to the SCC within a few hours of the off-site emergency being declared. The Government Technical Adviser is pre-appointed by the Scottish Government.

On arrival at the SCC, the GTA will be briefed by a DSRL representative on all aspects of the emergency.

The GTA will have the following specific responsibilities;

- Giving authoritative advice to the Police, Local Authorities and Central Government on the course of the emergency, insofar as it may affect the public and the environment around the site.
- Reviewing and confirming the assessments being made of:
 - (a) The cause of the incident at Dounreay.
 - (b) The radiological consequences of any radioactivity released from Dounreay.
 - (c) The probability of any further release, of radioactivity from Dounreay.
 - (d) The need for countermeasures to protect the local population.
- Acting as the principal nuclear industry spokesperson at media conferences and briefings at the Media Briefing Centre (MBC) on the course of the accident and measures being taken to protect the public.

The GTA will not take over any executive responsibilities from the SCC Chairman. The GTA will liaise closely with the SCC Chairman and consult the DSRL team on all assessments being made at Dounreay.

The Office for Nuclear Regulation (ONR): The Office for Nuclear Regulation is the licensing authority for DSRL Dounreay. In the event of such an emergency it is the responsibility of the NII to investigate the incident and ensure that appropriate action with regard to the safety of the plant has been taken. The ONR will also act as adviser to Central Government at the SGoRR as well as the Health and Safety Executive.

The ONR has the power, if necessary, to issue directions to DSRL on specific measures to be taken in the interest of health and safety and may advise on the on-site management of the emergency and the measures to be taken to rectify the fault and to protect the public.

ONR Inspectors will investigate the circumstances leading to the emergency.

The position of the GTA will be carried out by an officer from the ONR.

Scottish Government Senior Liaison Representative: The role of the government liaison representative will be to provide a direct link with Ministers and government departments in Edinburgh. This person will normally be a senior departmental officer. The government liaison representative will also provide a direct link with the Scottish Government Emergency Room in Edinburgh. The Scottish Government Rural Payments and Inspections Directorate (SGRPID) will be represented at the SCC.

Dounreay Site Restoration Ltd (DSRL): DSRL will provide support to the GTA including health physics data and other information.

Health Protection Agency (HPA) – CRCE: The CRCE will advise government departments and other organisations on radiological protection and assessment of radiological hazards. Officers from the CRCE will liaise with their emergency control room, passing them data for predicting the outcome of the release and its consequences. The CRCE will be responsible for co-ordinating the long-term monitoring and analysis in the wider area beyond the emergency planning zone, and they will contribute to long term advice on measures to protect the public.

Food Standards Agency (Scotland): The Food Standards Agency (Scotland) (FSA) is a Non-Ministerial Government Department; a UK-wide body which in Scotland is represented by FSA Scotland, as food safety is a devolved responsibility. The Agencies responsibilities include advising on and protecting all aspects of food safety. The Agency, acting in conjunction with SGRPID and Local Authorities can exercise powers to control the production and supply of contaminated food, and to restrict the movement of foodstuffs, crops and livestock.

Police Scotland: Police Scotland will be responsible for the co-ordination of the emergency services and other organisations responding to any matters with off-site implications during the emergency phase of the incident.

Highlands and Islands Fire and Rescue Service: Highlands and Islands Fire and Rescue Service will have responsibility for all on-site fire fighting and rescue.

Scottish Ambulance Service: Scottish Ambulance Service will be responsible for the initial treatment for off-site casualties and, thereafter, transportation of casualties to the designated hospitals. Scottish Ambulance Service will assist, if requested, the Local Authority in the transportation of the disabled/elderly from an affected area in the event of an evacuation.

NHS Highland: NHS Highland are responsible for making arrangements with designated hospitals for the treatment of casualties, both irradiated and non irradiated, and the provision of radiation screening facilities and advice to the public.

The Highland Council: The Highland Council are responsible for the provision of social services, emergency transport, accommodation, feeding of the public affected and the co-ordination of the consequence management phase of the incident.

Scottish Environment Protection Agency: The Scottish Environment Protection Agency (SEPA) is a single independent environment protection agency and their responsibilities will include monitoring radioactive discharges and waste and enforcement of countermeasures. They have a special responsibility for advising water authorities on the control of potable water. They will be supported in this matter by the Radiological Incident Monitoring Network (RIMNET).

Rolls Royce: Will deploy two members of staff to provide technical and operational support to the SCC.

Strategic Co-ordinating Centre (SCC) Chairman (Supported by Staff Officer and Minute Secretary)
Role of the SCC Chairman:

The SCC Chairman will harmonise the integration of the expertise of all the agencies involved, with the object of effectively bringing the incident to a successful conclusion.

In the emergency phase of an incident at DSRL Dounreay, the Chief Constable/Deputy Chief Constable of Police Scotland, or a senior Officer nominated by him, will fulfil the role of the SCC Chairman. In the recovery phase of the incident, the Chief Executive of The Highland Council will take over the role of the SCC Chairman. The transfer of co-ordination will be by mutual agreement and will be recorded in writing.

The Chairman will be responsible for calling and chairing the Strategic Co-ordinating Group meetings in the SCC. The SCC Chairman is also responsible for ensuring that a record of any decisions is taken and displayed for the information of all agencies in the SCC. The Chairman, in consultation with the GTA, will decide which agencies will be represented on the Strategic Co-ordinating Group. Representatives from each agency should be kept to a minimum.

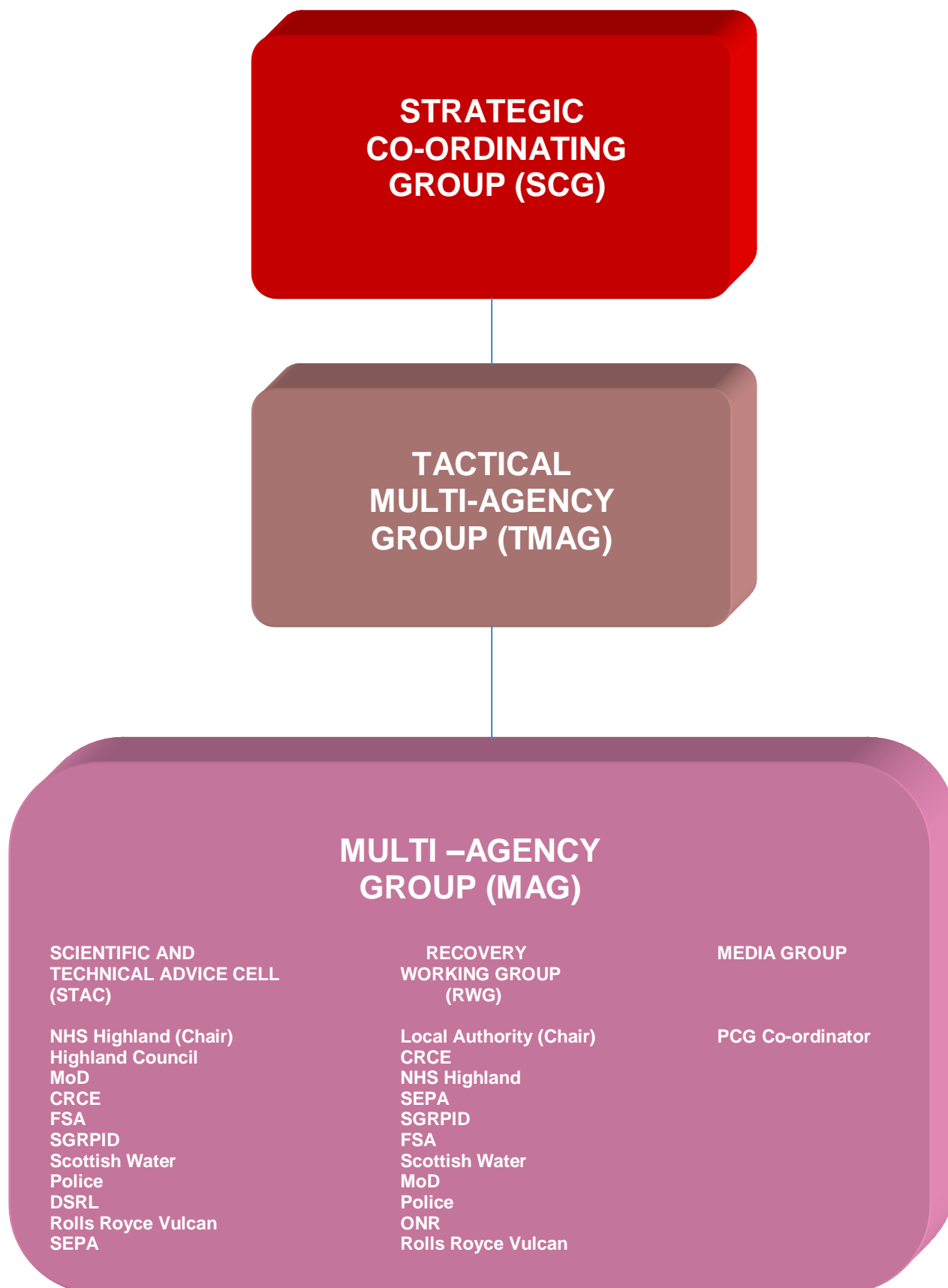
7.5 Information flow within the Strategic Co-ordinating Centre

To ensure that all strategic information passed between the agencies present within the SCC is recorded and co-ordinated a Message/Action system will be administered by the Strategic Administration Team (SAT).

The Message/Action system is paper based and agencies attending the SCC will be briefed on the use of the system. An SCC Information Booklet outlining the role of the SCC and its facilities, the role of the agencies located within the SCC, the instructions for the Message/Action system and a list of useful telephone numbers is available to all agencies.

As part of the Message/Action system the following information 'boards' are set up within the SCC, giving agencies immediate access to relevant information:

- Summary Board (copies of all Message/Actions raised)
- Press Releases Board (copies of all press releases)
- Minutes Board (copies of all minutes from the Strategic Co-ordinating Group meetings)



SECTION 8 : MEDIA MANAGEMENT

8.1 Introduction

The task of dealing with media pressure at the scene of a major incident with off-site implications, is primarily the responsibility of the Police. Media personnel will arrive at the scene of an incident at DSRL Dounreay very quickly, as they will often have heard of the disaster at the same time as the emergency services. They will expect to have access to the facilities they require and an instant response to their request for information and briefings. If these demands are not anticipated, media representatives are likely to add to the confusion.

8.2 Initial Holding Statement

The media will be provided with an initial holding statement, issued automatically by DSRL. The statement should be along the following lines:

‘An incident has occurred about (time and date) at Dounreay Site Restoration Ltd (DSRL) (give brief details, including off-site consequences). Emergency services are currently at the scene and an update will be given when further information becomes available.’

The purpose of this initial holding statement is to provide time to set up the Forward Media Information Point (FMIP) and the Media Briefing Centre (MBC).

8.3 Forward Media Information Point

The Forward Media Information Point (FMIP) at Thurso will act as a focal point for journalists, camera crews and photographers who want to get as close as possible to the site. It will offer shelter from the weather, a base from which to file copy and somewhere to receive copies of any media releases sent out from the MBC. News organisations and journalists will be advised that there will be no spokespersons available at this facility, and all enquiries should be referred to the Media Cell at the Strategic Co-ordinating Centre in Inverness.

The main functions of the FMIP are to;

- Co-ordinate the media response at a local level,
- Provide copies of all media statements,
- Provide information packs,
- Provide ‘pooling’ arrangements for on-site visits.

Following the initial press release, prior to the MBC becoming operational, organisations should, where possible, consult the Public Communications Policy Group (PCPG) Co-ordinator before issuing media statements, to ensure that clear, accurate and non-conflicting information is provided.

8.4 Media Briefing Centre

The Media Briefing Centre (MBC) for any major incident occurring at DSRL Dounreay with off-site consequences will be in Inverness. The MBC will be set up simultaneously with the Strategic Co-ordinating Centre (SCC). This will be the strategic level of response to the media.

A number of advantages are gained by setting up the MBC as soon as possible:

- It provides the media representatives with a known source for the most accurate and up to date information which the authorities can make available.
- Once spokespersons have been nominated, smooth flows of information can soon be established, compared and co-ordinated.
- Any potential conflicts in approach by partner agencies can be identified and dealt with.
- Once set up, all press conferences should take place within these premises, with appropriate personnel being transported to the MBC from the SCC by Northern Constabulary.

A MBC Manager will be appointed by the PCPG Co-ordinator, who will be responsible for the smooth running of the MBC. Close liaison will be necessary between the Strategic Co-ordinating Centre and the Media Briefing Centre, and robust communications will be essential.

Note: The Media Briefing Centre should continue to be available after the local authority takes over the co-ordinating role from the police and for as long as necessary.

8.5 Media Management

The PCPG Co-ordinator, acting under the Strategic Co-ordinating Group Chairman's authority, will be responsible for ensuring co-ordination of all media matters until there is a handover. The handover phase of a major incident will include the handover of responsibility for all media matters. A multi-agency approach to the media will be practised, with media representatives from all participating organisations based in the media cell at the Strategic Co-ordinating Centre (SCC) and the Media Briefing Centre (MBC). No statement will be given to the media without having first been vetted by the Police led media cell, in consultation with the appropriate members of the Strategic Co-ordinating Group. Media statements will be distributed to all agencies at the Strategic Co-ordinating Centre (SCC) and the Media Briefing Centre (MBC). Press statements will also be displayed at the SCC and the MBC.

Media representatives from the organisations operating within the Strategic Co-ordinating Centre will be expected to work as part of a co-ordinated team, issuing joint statements.

The timing of media briefings will be agreed by the Strategic Co-ordinating Group Chairman and will take into consideration the views of all agencies, media interest and any media deadline, eg. different time zones, which may apply.

The Strategic Co-ordinating Group Chairman and the Government Technical Adviser should, as far as is reasonably practicable, be informed beforehand of the content of any media statement.

Spokespersons at media briefings will be kept to a minimum. Spokespersons will be agreed in advance by the Strategic Co-ordinating Group Chairman and the Government Technical Adviser, as appropriate, in the light of developments and the interests of the media, and taking into consideration the views of other agencies. The Strategic Co-ordinating Group Chairman will nominate the appropriate police press spokesperson, according to the status of the emergency, and will take on that role personally, when necessary.

Efforts should be made to provide a continuous supply of information (with a spokesperson being available, as appropriate) in order to provide for the needs of the broadcast media who will be the main recipients.

SECTION 9 : ROLES AND RESPONSIBILITIES

9.1 Roles and Responsibilities of DSRL Dounreay

9.1.1 In responding to an incident at the premises of DSRL, Dounreay, the responsibilities of the staff may be summarised as follows:

- (a) Safe rescue of any casualty, casualty handling and treatment.
- (b) To safeguard the safety of personnel on the Dounreay site.
- (c) To alert the emergency services.
- (d) To liaise with the emergency services and provide technical advice and support.
- (e) To provide accurate information on the radioactive substances/chemicals currently stored in the affected area, or released to the environment.
- (f) To provide accurate information on the number of staff currently working on the premises and who have not been accounted for.
- (g) To deal with and control the incident.
- (h) Keep SCC appraised at regular intervals.
- (i) Carry out external notifications.
- (j) Draw up and implement a recovery plan.

9.2 Roles and Responsibilities of Civil Nuclear Constabulary

9.2.1 The role of the CNC Police is similar to any other Police Force, in that responding to emergencies, it is to protect life and property.

9.2.2 In responding to a site emergency at Dounreay the responsibilities would cover such area as:

- (a) Saving life, in conjunction with other emergency services.
- (b) Act as reception and co-ordinate all agencies attending Dounreay during the emergency phase.
- (c) To preserve and protect the scene of the incident.
- (d) Assist and investigate the incident with all regulatory bodies.
- (e) Assist Police Scotland in their roles of casualty information, identification of fatalities etc.
- (f) Assist DSRL Dounreay and other external bodies in restoring normality at the earliest convenience.

9.3 Roles and Responsibilities of Police Scotland

9.3.1 Responding to emergencies is a normal feature of the work of the police service. The normal roles and responsibilities of the police encompass the protection of life and property.

9.3.2 In responding to an incident at DSRL Dounreay the police responsibilities may be summarised as follows:

- (a) The saving of life in conjunction with the other emergency services.
- (b) Co-ordination of the emergency services and other organisations during the emergency phase of the incident.
- (c) To call out or place on standby essential services.
- (d) The protection and preservation of the scene.
- (e) The investigation of the incident in conjunction with other investigating bodies, where applicable.
- (f) The collation and dissemination of casualty information.
- (g) Co-ordination of the media response in the emergency phase.
- (h) Identification of the dead on behalf of the Procurator Fiscal who is the principal investigator when fatalities are involved.
- (i) Assist The Highland Council with the restoration of normality at the earliest opportunity.
- (h) To initiate the cascade call-out system to alert other organisations to either deploy or standby.

9.4 Roles and Responsibilities of Highlands and Islands Fire and Rescue Service

9.4.1 Responding to emergencies is a normal feature of the work of the Fire and Rescue Service. The normal roles and responsibilities of the Fire and Rescue Service are derived from its long experience in firefighting and rescue operations and encompass the saving of life and the protection of property.

9.4.2 In responding to an incident at DSRL Dounreay the Highlands and Islands Fire and Rescue Service responsibilities may be summarised as follows:

- (a) Liaison with co-located DSRL and other responding personnel to develop a strategy to prevent the further escalation of the incident by tackling fires, dealing with released chemicals and radioactive material and other hazardous situations;
- (b) The rescue of trapped casualties;
- (c) Liaison with the Medical Incident Officer and other medical services with regard to the provision of assistance at ambulance loading points and the priority evacuation of injured persons;
- (d) Participation in investigations as appropriate and preparing reports and evidence for inquiries;
- (e) Stand-by if necessary during the non-emergency recovery phase to ensure continued safety at and around the site.

9.5 Roles and Responsibilities of Scottish Ambulance Service

Responding to emergencies is a normal feature of the work of the ambulance service. The purpose of the Service is to provide immediate care to patients at the scene of an incident and care during transportation, to, from and between healthcare facilities. To supplement road transport, the Service operates an integrated air ambulance service using fixed wing aircraft and helicopters, controlled by the Scottish Ambulance Service Air Desk.

The ambulance service provides the Ambulance Control Point at which all NHS, and Voluntary Aid Society activity in support of the NHS, will be co-ordinated at the scene.

In responding to a major incident at any location in Scotland, responsibilities may be summarised as follows:

- The saving of life and the provision of immediate care to patients at the scene of a major incident and in transit to hospital
- The alerting of hospital services and immediate care GPs
- The management of decontamination for people affected by hazardous substances, prior to evacuation from the scene
- The evacuation of the injured from the scene in order of medical priority
- Arranging and ensuring the most appropriate means of transport for the injured to the receiving hospital
- The supply of patient care equipment to the scene of a major incident
- The transport of appropriate medical staff and their equipment to the scene of a major incident
- Alerting and co-ordinating the work of the Voluntary Aid Societies acting in support of the ambulance service at the incident site
- The provision and maintenance of communications equipment for medical staff and appropriate Voluntary Aid Society personnel at the scene of a major incident
- The prior training of medical staff/VAS personnel in the use of ambulance communications equipment
- The restoration of normality.

9.6 Roles and Responsibilities of Maritime and Coastguard Agency

9.6.1 The Maritime and Coastguard Agency is an Executive Agency of the Department of the Environment, Transport and Regions.

9.6.2 The Maritime and Coastguard Agency is responsible for:

- Minimising loss of life amongst seafarers and coastal users.
- Responding to maritime emergencies 24 hours a day.
- Developing, promoting and enforcing high standards of marine safety.
- Minimising the risk of pollution of the marine environment from ships and, where pollution occurs, minimising the impact on UK interests.

9.7 Roles and Responsibilities of the NHS Highland

9.7.1 NHS Highland, will normally be alerted to a major incident by the Police and Scottish Ambulance Service.

9.7.2 NHS Highland's Major Incident and Emergencies Plan will ensure:

- A planned and prepared response to notifications of a major incident or major emergency
- Availability of a Medical Incident Officer (MIO) to attend the incident site
- Provision of immediate health care needs of casualties
- Provision of a site medical team if appropriate
- Early notification of the incident to:
 - the Consultant in Charge of Accident and Emergency at the receiving hospital
 - the duty manager at the receiving hospital
 - the appointment of a Hospital Controller at the receiving hospital
 - an NHS Highland media advisor
 - the Director of Public Health, or his representative
 - the Chief Operating Officer or Executive on call
 - the Scottish Government Health Department.

9.7.3 Specifically in relation to a radiation/contamination incident the Director of Public Health or his representative will;

- Advise the Consultant at Raigmore Hospital, Accident and Emergency Department, of anticipated radiation exposed/contaminated casualties.
- Advise NHS Highland's Radiation Protection Advisor of known circumstances and anticipated consequences of the incident.
- Respond appropriately to the Incident alert category.
- DSRL Dounreay Nuclear Off-site alert – Proceed to Police Headquarters, Inverness to represent NHS Highland on a Strategic Co-ordinating Group.
- Establish and Chair a Scientific Technical Advisory Group (STAC).

9.7.4 Contaminated Casualties

The only NHS Highland facility capable of receiving radiation contaminated casualties, is Raigmore Hospital, Inverness, where incoming casualties should be delivered to the Radiation Decontamination Unit.

Caithness General Hospital has a limited capacity to assist with casualties exposed to radiation, and may be contacted by the Medical Incident Officer, or Ambulance Incident Officer in advance of transporting casualties to the designated hospital (Raigmore).

Where the treatment of contaminated casualties with life threatening injuries is urgent, medical personnel will take all possible measures to avoid being exposed to radiation.

9.8 Roles and Responsibilities of The Highland Council

- 9.8.1 It is likely that a number of Council Services would become involved in a major incident at Dounreay.
- 9.8.2 In responding to an incident the local authority's responsibilities may be summarised as follows:
- (a) The selection of Reception Centres and the arrangements for the transportation and reception of local residents in the event of evacuation from the area at risk. Refer to Emergency Support Centre Plan.
 - (b) To provide assistance and resources to the emergency services as requested by them.
 - (c) To liaise with the emergency services engaged at the scene.
 - (d) Co-ordination of the responding organisations during the recovery phase of the incident.
 - (e) Refer to Highland and Islands Strategic Co-ordinating Group - Recovery Guidance Document for the Highland and Islands Councils.

9.9 Roles and Responsibilities of the Scottish Environment Protection Agency

- 9.9.1 SEPA is the public body responsible for environmental protection in Scotland and has powers to prevent, minimise or reduce pollution of the environment and take action in accordance with environmental legislation.
- 9.9.2 As a Category 1 responder in the terms of the Civil Contingencies Act 2004, SEPA will co-operate with other responder organisations in supporting the response to, and recovery from, any incident or emergency.
- 9.9.3 SEPA is responsible for the regulation of the Radioactive Substances Act 1993. Under the Act SEPA is responsible for the authorisation of radioactive discharges and disposals from the site.
- 9.9.4 SEPA will formally investigate an emergency on the site (working jointly with NII as appropriate).
- 9.9.5 SEPA maintains an independent monitoring regime for radioactivity in the environment around the site and following an incident may instigate environmental sampling and monitoring in support of its regulatory function. SEPA will also provide advice on any necessary mitigation and recovery measures.
- 9.9.6 SEPA also has a regulatory role on the site in terms of The Waste Management Licensing Regulations 1994 and will provide advice on waste management issues. SEPA will regulate the disposal of any radioactive wastes and other wastes arising as a result of an incident and, if appropriate, will provide advice on the development and delivery of a decontamination strategy.
- 9.9.7 SEPA also has regulatory roles on the site in terms of The Water Environment (Controlled Activities) (Scotland) Regulations 2005, The Pollution Prevention and Control (Scotland) Regulations 2000 and associated legislation.
- 9.9.8 SEPA maintains and operates the RIMNET system in Scotland and will ensure that SEPA's monitoring data is added to the RIMNET system.

9.10 Roles and Responsibilities of Scottish Water

In responding to an incident at DSRL, Scottish Water responsibilities may be summarised as follows:

- Assess the risk of contamination of the public water supply.
- Arrange and co-ordinate sampling and analysis of public water supplies in conjunction with SEPA/Health Protection Agency.
- Assemble information on the level of contamination of public water supplies.
- Assess the risk to the public health from contaminated water supplies in conjunction with the NHS Boards.
- Take measures to minimise the risk to public health from contaminated water supplies.
- Provide advice to customers on public water supplies in accordance with the Public Health Guidelines.
- Where there is a failure in the public water supply, Scottish Water will arrange for alternative supplies of drinking water.

9.11 Roles and Responsibilities of The Scottish Government

9.11.1 The development of resilience in Scotland is based on the doctrine of Integrated Emergency Management (IEM). The aim of IEM is to develop flexible and adaptable arrangements for dealing with emergencies, whether foreseen or unforeseen. It is based upon a multi-agency approach and the effective co-ordination of those agencies. When the scale or complexity of an emergency is such that some degree of central government co-ordination or support becomes necessary, Scottish Government will activate its emergency response arrangements.

9.12 Roles and Responsibilities of the Food Standards Agency (Scotland)

The Food Standards Agency (Scotland)'s role will be to ensure that the public is protected from contaminated food following a nuclear emergency. Specific responsibilities are as follows:

- To determine the level of any contamination of the food chain.
- To take action to ensure that food contaminated to unacceptable levels does not enter the food chain.
- To provide advice and information to the public and relevant organisations.
- To take legal measures to prevent unacceptably contaminated food entering the food chain by the implementation of emergency restriction orders under the Food and Environment Protection Act 1985. Such orders are commonly referred to as FEPA Orders, and they restrict the supply, movement or sale of produce from an affected area.
- To ensure, in conjunction with relevant Scottish Government departments, Local Authorities and other relevant organisations, the enforcement of any emergency orders.
- To ensure, in conjunction with SEPA and Local Authorities, the safe disposal of contaminated food.
- To ensure that subsequent remediation takes account of food safety issues.

9.13 Roles and Responsibilities of the Office for Nuclear Regulation (ONR)

ONR's response will be led and managed by the ONR Response Centre Director.

ONR will ascertain the facts surrounding the emergency, assess the safety of the affected site, including licensee's or operator's proposed actions. Provide independent information/advice. Formulate ONR Strategy and response.

ONR Site Team will:

- represent ONR at or near the site.
- ascertain the facts on the emergency including establishing the adequacy of actions taken to secure a safe plant state and the advice given to authorities off-site,
- submit routine reports on event to the ONR Response Centre.

ONR Strategic Co-ordinating Centre Team will:

- consider all aspects of the emergency which will affect the site;
- provide advice to the Strategic Co-ordinating Centre (SCC) Management Team;
- provide advice and support to the ONR Response Centre Director.

9.14 Roles and Responsibilities of the Health Protection Agency (HPA) Centre for Radiation, Chemical and Environmental Hazards (CRCE)

In the event of a major incident at NRTE Vulcan, HPA's role and responsibilities are summarised as follows:

- Advise the GTA, STAC, RWG, TMAG and SCG on radiological protection issues and countermeasures to protect the public in both the emergency and recovery phases.
- Assess the radiological impact of the incident to the public.
- Provide support to NHS Highland in activities to monitor members of the public for radioactive contamination and radiation exposure.
- Support SEPA in its environmental monitoring role.
- Through HPA's Monitoring Co-ordination Team at its Chilton Headquarters co-ordinate off-site monitoring beyond the sites responsibilities using monitoring resources that are made available to it by other organisations.
- Provide public information on radiation, its effects and the radiological impact of the incident within the context of this plan and in co-operation with the SCC and MBC and within frameworks set out in Dealing with Disasters Together and the NEPLG Consolidated Guidance.

SECTION 10 : CONSEQUENCE MANAGEMENT

The response to most major incidents will essentially be in two phases.

10.1 Emergency Response Phase

The emergency response phase covers the actions taken to immediately minimise the consequences of the incident to the local populace and the environment. This phase will normally be co-ordinated by the Chief Constable, or his nominated deputy.

10.2 Recovery Phase

The recovery phase is harder to define due to the extensive variety of potential circumstances resulting from an incident.

It is normally defined as the extended period, beyond the emergency response phase, when actions are taken to protect the public and the environment from longer term risks and promote an early return to normal life. In certain circumstances this may not necessarily equate to a restoration of pre-incident conditions.

The boundary between the two phases cannot be rigidly defined and preparations, in the form of consequence management, for the recovery from an incident forms an integral part of this emergency response plan.

This phase will be co-ordinated by the Chief Executive, Highland Council.

10.3 Aims of Consequence Management

To initiate preparations, as an integral part of this Emergency Response Plan to mitigate the initial effects of the incident and facilitate the transition to and actions required during any recovery phase.

To protect the public and the environment from longer term risks and promote an early return to "normal" life.

TERMS OF REFERENCE FOR CONSEQUENCE MANAGEMENT

10.4 Principles of Justification and Optimisation

The principles applying to recovery activities as a result of any incident should follow these recommendations:

- (a) “the proposed intervention should do more good than harm, ie. the reduction in detriment should be sufficient to justify the harm and costs, including social costs, of the intervention, **(the justification of intervention)**”.
- (b) “the form, scale and duration of the intervention should be optimised such that the benefit of the intervention should be maximised **(the optimisation of intervention)**”.

Generally, Consequence Management should:

- propose options for consideration and prepare plans for their implementation;
- identify priorities, timescales and costs for the options being considered;
- identify a strategy for public consultation and involvement;
- advise on, and assess, recovery monitoring so as to ensure that objectives and targets are being achieved;
- identify the extent and nature of any contamination;
- identify options and strategies for clean up and disposal of wastes;
- identify where applicable, options and strategies for long term re-location/re-housing of evacuees;
- maintain records and costs of recovery actions and provide briefing and information as necessary.

10.5 Organisation of Consequence Management

During the Emergency Response Phase, the command and control of the incident will be as documented.

A Recovery Working Group (RWG) will be established during this phase to initiate actions and prepare for the longer term effects of the incident.

10.6 Liaison

The group will initially liaise directly with the command and control organisation in the SCC and prepare to continue to operate through the recovery phase where they will integrate into the consequence management organisation under the Chairmanship of the Chief Executive of Highland Council.

CHAIRMANSHIP OF THE RECOVERY WORKING GROUP (RWG)

The Group will be chaired by:

The Head of Environmental Health, Highland Council or a nominated deputy.

10.7 Membership

Composition of the Group

There will be a core membership and depending on the nature of the incident additional representatives from the optional members list will be seconded.

Core Members

Environmental Health, Highland Council
Police
NHS Highland
SEPA
Health Protection Agency (CRCE)
DSRL
ONR (HSE)
Food Standards Agency (Scotland) (FSA)

Optional Members

Forestry Commission
Health and Safety Executive (HSE)
Housing and Property Service, Highland Council
Marine and Coastguard Agency (MCA)
Ministry of Defence (MoD)
National Farmers Union (NFU)
Scotrail
Scottish Government Rural Payments and Inspection Division (SGRPID)
Scottish Natural Heritage (SNH)
Scottish Society for the Prevention of Cruelty to Animals (SSPCA)
Scottish Water
Trading Standards, Highland Council
Utilities (gas, electricity, telephone etc)
Waste Management, Highland Council

Membership of the Recovery Working Group will be kept under review, by the Chairman, as the number of organisations needing to be involved will change as work progresses.

10.8 Issues during the Recovery Phase

Issues during the recovery phase may include:

- a. Immediate concerns:**
 - (1) Areas affected.
 - (2) Number/types of properties (residential, schools, businesses).
 - (3) Identify what is the current state of play (eg shelter, evacuation, people at centres, levels of contamination, utilities affected)

- b. Priority actions:**
 - (1) At risk groups (elderly, disabled, schools, etc)
 - (2) Cordons/security/public access to contaminated areas.
 - (3) Public health issues (Health Authority)
 - (4) Media/press advice.

- c. Decontamination/clean-up issues:**
 - (1) Recovery category countermeasures options (Health Protection Agency/Cats A-C)
 - (2) Decontamination options (Health Protection Agency)
 - (3) MoD support:
 - A. Specialist plant, equipment and manpower.
 - B. Disposal of radioactive waste.
 - C. Cost control mechanisms.

- d. Relocation Issues:**
 - (1) Identification of affected properties.
 - (2) Priorities/timescales.
 - (3) Livestock and personal effects.
 - (4) Emergency housing implications (external LA support).

- e. Long-term relocation considerations:**
 - (1) Accommodation.
 - (2) LA support arrangements (benefits/counselling etc).
 - (3) Update bulletins (PR).
 - (4) Phased reoccupation priorities.
 - (5) Demolition of seriously contaminated homes (rebuild implications).
 - (6) Collation of evidence for public enquiry.
 - (7) Appeal funds.
 - (8) VIP visits/memorial services (Royals etc)

- f. **Miscellaneous Issues:**
- (1) Finance/compensation claims.
 - (2) Effects on tourism.
 - (3) Specialist helplines.

10.9 Effectiveness of Recovery Countermeasures

Health Protection Agency advice on recovery countermeasures recognises the following categories of measures:

- a. **Category A** Those measures that are moderately dose-effective, incur relatively little disruption or resource, and which can be completed soon after the accident.
- b. **Category B** Those measures that are more strongly dose-effective, but which incur significant disruption and/or resources, or can only be carried out over protracted periods.
- c. **Category C** Those measures that are either poorly dose-effective or only moderately dose-effective and incur significant disruption and/or resources.

10.10 Decontamination Measures

The effect of decontaminating a particular surface on the dose received by an individual is dependent upon the contribution of that surface to the individual's total dose. The importance of a surface in contributing to dose depends on a number of factors. These include the relative deposition into different surfaces, how fast activity weathers off the surface, where it is redistributed to and where people spend their time. Some of the measures are listed below.

- (a) **Vacuum Sweeping & Fire Hosing.** Among the lowest cost countermeasures. They also have the advantage that they could be carried out relatively quickly, with little subsequent disruption to the population.
- b) **Grass Cutting & Collection.** This is most effective following deposition under dry conditions, as a larger proportion of the deposited activity is intercepted by the grass. The effectiveness of this technique will depend on the length of the grass at the time of deposition, being less effective for recently mown grass, and on its implementation before substantial rain falls.
- (c) **Soil Removal, Ploughing, Rotovating & Digging.** This can lead to relatively large dose reductions, of the order of 40-60%. The choice of measure would depend on the size of the individual areas affected.
- (d) **Tree Felling/Shrub Removal.** This procedure can lead to some reduction in dose in the first year, following dry deposition, but is generally only potentially worthwhile in certain specific situations (ie. Where deposition has occurred in spring or summer under dry conditions and where there is a high density of trees and shrubs around buildings).
- (e) **Restricted Access Measures.** The dose-effectiveness of restricted access measures will depend upon both the potential exposure rate and the length of time individuals would spend in an area if restrictions were not imposed.

SECTION 11: SCIENTIFIC AND TECHNICAL ADVICE CELL (STAC)

- 11.1 Should a major incident require a Strategic Co-ordinating Group to be established, the Chair of that group would seek advice on health matters from a Health Advisory Group.
- 11.2 The Director of Public Health, or a nominee will be responsible for establishing and chairing a Health Advisory Group, to address any threat to public health, including communicable disease, chemical, biological, radiological or nuclear incident hazards.
- 11.3 The Chair of the Health Advisory Group will attend all Strategic Co-ordinating Group meetings, to present the Group's advice to the Chair of the SCG. This will require co-ordination of the timing and time management of each group.

- 11.4 The Core Representation on the STAC will be:

Director of Public Health, or nominate depute	- NHS Highland - Chair
Consultant in Communicable Disease Control	- NHS Highland
Environmental Health Officer	- Highland Council
Health Protection Agency – Centre for Radiation, Chemical and Environmental Hazards	
DSRL	
FSA	
SGRPID	
Scottish Water	

Additional members with particular expertise may be co-opted on to the group, to address issues arising from a specific threat.

- 11.5 The STAC will:
- (a) take advice on health aspects of the incident from a range of experts, including SCIEH
 - (b) provide advice to the Chair of the Strategic Co-ordinating Group on the health consequences of the incident, including those relating to evacuation or shelter
 - (c) agree with the Strategic Co-ordinating Group, the advice to be given to the public on the health aspects of the incident, and the method of delivery
 - (d) maintain a written record of decisions made by STAC, and the reasons for those decisions
 - (e) liaise with Scottish Government Health Department, and other Health Boards
 - (f) formulate advice to health professionals in hospitals, ambulance service and general practice
 - (g) formulate advice on the strategic management of the health service response
 - (h) instigate any health related investigation measures necessary
 - (i) participate in the consequence management phase, and take responsibility for co-ordinating more detailed assessment of an immediate health impact.



Map showing area from Strathy to the Dounreay Site



Map showing area from Dounreay Site to Thurso

PROCEDURE FOR CLAIMS FOR INJURY, DAMAGE OR LOSS

In the event of nuclear injury or damage arising during the operation of DSRL Dounreay, the following general arrangements will apply to the handling of claims or compensation:

- (a) Claims will be dealt with under the principles for nuclear injury or damage (including the sole and absolute liability of the operator) established by the Nuclear Installations Act 1965.
- (b) There is no set form for making claims. Full details of the circumstances will be required, and special instructions will be issued to the public as necessary. (Crown servants on duty should report any nuclear injury to their parent department).
- (c) Claims arising in connection with special public safety measures taken (eg. under arrangements made by representatives of Government Departments or Local Authorities in relation to milk, foodstuff, growing crops or animals), should be submitted in accordance with paragraph b. above and should be supported by detailed statements certified by the official or representative by whom instructions were issued or from whom instructions (e.g. as to disposal of produce) were received. There are statutory powers under FEPA to restrict the distribution of foodstuffs, authorised officers of Local Authorities have power under the Food Safety Act 1990 to seize food intended for sale for human consumption but unfit for such sale and to bring it before a Sheriff or Justice of the Peace who may condemn it and order it to be destroyed or so disposed of as to prevent it being used for human consumption. It might not always be possible to deal with an emergency rapidly enough under these powers, and restrictions on the use and sale of foodstuffs, etc, will if necessary, be imposed by Governmental Administration action in co-operation with various local bodies and agencies. This action is covered by the statutory power contained in the Food and Environmental Protection Act 1985 which empowers the Scottish Ministers to investigate incidents involving an escape of substances (including radioactivity) and, if there is a possibility that the safety of food may be at risk, to make emergency Orders prohibiting various activities, including the movement of food or anything from which food could be derived, in designated areas of land or sea within Scottish fishery limits. Scottish Ministers may authorise investigation and enforcement to assist him in carrying out these functions.
- (d) Director of Public Health and other local Officers may be required to act on the instructions of the Regional Representative of the relevant Government Department. In doing so, they will be regarded as the agents of HM Government in any matter of liability arising from the discharge of the duties involved.

REGISTRATION OF CIVILIANS IN AN AREA AFFECTED BY RADIOACTIVITY

If radioactivity affects areas outside DSRL's property, it may be necessary to arrange for civilians in the affected area to register so that it is possible to prove their presence in an affected area in connection with subsequent compensation claims. If it is considered that the circumstances of any particular accident warrants this step, the necessary arrangements for the forms to be made available through local post offices will be made.

When the decision to issue registration forms is taken, release of the following public announcement will be authorised:

DRAFT PUBLIC ANNOUNCEMENT FOR PRESS AND BROADCASTING IN THE EVENT OF A NUCLEAR REACTOR ACCIDENT

"There has been an accident on the DSRL Dounreay Site which has led to a release of radioactivity affecting the following areas

Radioactivity can have effects which do not always show themselves immediately, and a person who considers that he or she may have been affected as a result of the radioactivity released can make a claim within 30 years of the accident.

Any person would, of course, have to prove that they were in the affected area at the time and this might be very difficult to do many years afterwards.

A register has therefore been set up and anyone who was in the area at the time can apply to be registered. The inclusion of a name in the register will not **prove** that the person was here, but it will provide evidence that the person was, and this can be disputed only if other evidence was produced which showed that the person was not.

Anyone who was in the area between andon whether they lived there, or were there only temporarily, may apply for registration on a form, which can be obtained from any post office in the area for the next month.

The following points should be particularly noted:

- (a) A separate form should be filled in for each person who wishes to register.
- (b) Forms can be obtained only from post offices in the affected area.

The function of the post office in this matter is purely and simply that of a distributing agency.

LETTER TO ALL OCCUPIERS OF AGRICULTURAL HOLDINGS PRODUCING MILK WITHIN THE MILK PRODUCING AREA

Tel No (as appropriate)

Food Standards Agency
(Address as appropriate)

Date

Dear Sir

ACCIDENT ON THE DSRL DOUNREAY SITE – RESTRICTIONS ON THE USE OF MILK

Your farm is within the area to which restrictions on the use of milk for human consumption has been applied.

Until further notice milk produced on your farm must not be used for human consumption, nor may it be processed for butter or cheese.

Your milk may/may not be fed to livestock.

If you sell directly to a milk wholesaler or dairy company the milk will be collected as usual and all contaminated milk will be disposed of. You will be paid for it as usual.

If you produce milk for your own consumption only, then you should dispose of it by burying it in a trench specially dug for the purpose. The trench should be dug below the level of the farm buildings and sufficiently deep to provide a soakway. Care should be taken to ensure that water supplies can not be contaminated. Milk must not be discharged directly into streams.

If you normally produce and sell milk by retail directly, then SGRPID will arrange to collect and dispose of it during the period covered by the restrictions.

You will be informed by letter as soon as these restrictions can be removed. In the meantime, arrangements are in hand to import uncontaminated milk into the area for human consumption and supplies can be obtained from any milk retailer. Please notify your workers of this arrangement. Whilst the restrictions on the use of milk lasts, dairy cows must not be moved or brought to your farm without special permission from this Department.

Personnel who suffer financial loss as a result of the foregoing instructions will be informed as soon as possible of arrangements made for their compensation.

Yours faithfully

STAND DOWN NOTICE TO FARMERS

Tel No (as appropriate)

Food Standards Agency
(Address as appropriate)

Date

Dear Sir

ACCIDENT ON DSRL DOUNREAY SITE – REMOVAL OF RESTRICTIONS MILK

With reference to the restrictions on the use of milk produce on your farm given in the Departments letter of I am please to inform you that so far as your farm is concerned there is no longer any danger resulting from the recent accident and the restrictions placed on milk produced on your farm are now lifted.

Similarly, the restrictions on movement of dairy cows to or from your farm is removed.

Yours faithfully

NOTICE TO FISHERMEN AND OWNERS OF FISHING VESSELS

Tel No (as appropriate)

Food Standards Agency
(Address as appropriate)

Date:

Dear Sir/Madam

ACCIDENT ON DSRL DOUNREAY SITE – RESTRICTIONS ON FISHING CLOSURE ORDER UNDER THE FOOD AND ENVIRONMENT PROTECTION ACT 1985

I am writing to inform you that there has been an incident/accident on the DSRL Dounreay Site at (name of area or precise co-ordinates). As a consequence the Food Protection (Emergency Prohibitions) (Pollution of Fish) Order 199() came into force at () hours on (date, month, year). The landing and use in the production of food or fish taken from the designated area after one minute past midnight on (date, month, year) is prohibited.

The Order designates an area within which fishing and taking fish is prohibited and prohibits the movement of fish out of that area (see maps/charts attached). Other restrictions are imposed throughout the United Kingdom including the use or supply of fish taken from that area.

You will be informed by letter as soon as these restrictions can be removed. Please ensure that the crew(s) of your vessel(s) are advised of these restrictions.

Yours faithfully

NOTICE TO FISHERMEN AND OWNERS OF FISHING VESSELS

STAND DOWN NOTICE

Tel No (as appropriate)

Food Standards Agency
(Address as appropriate)

Date:

Dear Sir/Madam

ACCIDENT DSRL DOUNREAY SITE REMOVAL OF RESTRICTIONS ON FISHING

I refer to the restrictions on fishing brought in by the Food Protection Emergency Prohibitions (Pollution of Fish) Order 199() details of which were given in the Agencies letter of.....

I am pleased to inform you that the restrictions of the taking and landing of fish from the designated area were lifted from one minute past midnight on (date, month, year).

Yours faithfully

DOSE LEVELS FOR EMERGENCY SERVICES PERSONNEL ATTENDING AT A RADIATION INCIDENT UNDER REPPIR

Responsibility

The responsibility for authorising the use of emergency dose levels will lie with the Officer in Charge, and decisions will be taken in consultation with health and/or medical physics personnel and an authorised person from the operator.

Application

All doses received by emergency services personnel should always be as low as reasonably practicable. However, during a radiation emergency as defined by REPPIR (Regulation 15), the dose limits described in IRR99 (Regulation 11) do not apply and therefore emergency dose levels have been adopted by the emergency services as described below. The figures given are intended as upper values only.

Emergency Service workers will only be allowed to receive emergency exposures for the purposes of:

- saving life;
- helping endangered people;
- preventing large numbers of people from being exposed to ionising radiation; or
- saving valuable installations or goods.

ABBREVIATIONS

CNC	CIVIL NUCLEAR CONSTABULARY
CPHM	CONSULTANT IN PUBLIC HEALTH MEDICINE
DPHM	DIRECTOR OF PUBLIC HEALTH MEDICINE
EC	EMERGENCY CENTRE
EPO	EMERGENCY PLANNING OFFICER
ERL	EMERGENCY REFERENCE LEVEL
FCA	FUEL CYCLE AREA
FCP	FORWARD CONTROL POINT
FMIP	FORWARD MEDIA INFORMATION POINT
FSA	FOOD STANDARDS AGENCY
GTA	GOVERNMENT TECHNICAL ADVISOR
HPA	HEALTH PROTECTION AGENCY - Centre for Radiation, Chemical and Environmental Hazards (CRCE)
ICP	INCIDENT CONTROL POINT
IO	INCIDENT OFFICER
MBC	MEDIA BRIEFING CENTRE
MIO	MEDICAL INCIDENT OFFICER
PDA	PRE DETERMINED ATTENDANCE
RVP	RENDEZVOUS POINT
SCC	STRATEGIC CO-ORDINATING CENTRE
SGoRR	SCOTTISH GOVERNMENT RESILIENCE ROOM
SGRPID	SCOTTISH GOVERNMENT RURAL PAYMENTS AND INSPECTION DIRECTORATE
SEPA	SCOTTISH ENVIRONMENT PROTECTION AGENCY
SMT	SITE MEDICAL TEAM

GLOSSARY OF TERMS

Approved Dosimetry Service. (ADS)	The legally approved service for the provision and processing of personal radiation monitoring devices.
Becquerel (Bq)	Unit of quantity of radioactive material. 1 Bq = 1 disintegration per second.
Chain Reaction	A process which, once started, provides the conditions for its own continuance. In a reactor, neutrons released in the fission process cause further fission and so on.
Contamination	Deposited radioactive particles.
Decontamination	Removal of radioactive material from a person or surface.
Dose of Radiation	Radiation doses may be the “absorbed dose” which is the amount of energy deposited in a unit made by ionising radiation’s, or the “equivalent dose” in which the absorbed dose is multiplied by a radiation weighting factor which takes account of the varying degree of biological damage caused by different radiation’s.
Down Wind Sector	Normally refers to the sector 15° either side of the prevailing wind direction downwind of the site.
Emergency Reference Level (ERL)	Range of radiation doses below which countermeasures carry more risk than the dose, and above which countermeasures are always required.
Exclusion Zone	The immediate vicinity to which entry is restricted when the plant is operating.
Fission	Rupture of a nucleus into two lighter fragments (known as fission products) plus free neutrons – either spontaneously or as a result of absorbing a neutron plus energy.
Gamma Radiation	High energy electro-magnetic radiation of considerable penetrating power emitted by most radioactive substances.
Gray (Gy)	Unit of radiation absorbed dose.
Half-Life	Period of time within which half the nuclei in a sample of radioactive material undergoes decay.
IC	Incident Commander.
Iodine	As Iodine 131, biologically hazardous fission product of short half life (8 days) which tends to accumulate in the thyroid gland.

Neutron	Uncharged particle, consistent of nucleus – ejected at high energy during fission, capable of being absorbed in another nucleus and bringing about fission.
Pasquill	Weather categories.
Plume	Airborne contamination in downwind sector.
Pre-planned Countermeasure Zone	An area out to 1.15km from the site.
Radiation	Neutrons, Alpha and Beta particles or Gamma Rays which are emitted from radioactive substances.
Radioactivity	Behaviour of substance in which nuclei are undergoing transformation and emitting radiation. It is measured in the number of disintegration's per second.
Shielding	Material such as concrete, lead, special constructed polythene or water which attenuates radiation and reduces its intensity.
Sievert (Sv)	Unit of both effective dose and equivalent dose.
SLO	Site Liaison Officer.
TLD	Thermoluminescent Dosimeter - a radiation monitoring device for use by individual personnel or for monitoring the environment.
UHF	Ultra High Frequency
VHF	Very High Frequency
Whole Body Radiation Dose	The total radiation dose to the body received from all sources.