

Dounreay Emergency Plan

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1 INTRODUCTION

Dounreay is a complex nuclear site comprising of a variety of nuclear facilities including reactors and reprocessing plants which are in the process of being decommissioned. There are also a variety of radioactive waste storage and disposal facilities. On average there are approximately 1500 personnel present on site each working day. An access control system restricts entry to the site to authorised personnel only.

The operation of the Dounreay site is subject to the conditions attached to the Nuclear Site Licence granted by the Office for Nuclear Regulation (ONR) under the Nuclear Installations Act 1965 (as amended). The act places an absolute duty on the licensee to prevent injury and damage in relation to nuclear matter and/or ionising radiation.

Licence Condition 11 – Emergency Arrangements - requires the Licensee to make adequate arrangements for dealing with accidents and emergencies and submit to the Executive for approval those parts of the arrangements specified by the Executive. The ONR have identified that an Emergency Plan is required for submission and that plan should give an overview of the arrangements.

The arrangements to comply with this licence condition are described in this document, the Emergency Plan, prepared by the licensee for approval by the ONR. The Emergency Plan discharges part of Dounreay Site Restoration Limited's (DSRL) obligations under the Ionising Radiations Regulations 2017 to prepare contingency plans in respect of any reasonably foreseeable accident, occurrence or incident and under the Radiation (Emergency Preparedness and Public Information) Regulations 2019 (Regulation 10) for production of an 'Operator's Emergency Plan'. In preparing this Plan

- Relevant parties were consulted (as required by REPPIR 2019 (Regulation 10)).
- Highland Council were consulted (as required by REPPIR 2019 (Regulation 13)).
- Subject matter experts, including a radiation protection advisor (as required by REPPIR 2019 (Regulation 24)), reviewed the Plan.

DSRL, along with Vulcan NRTE, has co-operated with the Highland Council in preparing their Emergency Plan, as required by REPPIR 2019 (Regulation 13).

Although this document primarily describes the arrangements for dealing with accidental events involving radioactivity, it outlines the principles to be adopted in dealing with any accident or emergency on the site. This document should be read in conjunction with the full suite of Emergency Planning documentation along with

the Counter Terrorist Contingency Plan which details the measures to be taken in a security event.

This Emergency Plan describes the arrangements for the response to an emergency at Dounreay. The plan summarises the implementation of monitoring to determine whether a spread of radioactive or other toxic materials has occurred outside the Dounreay boundary and if so the extent of that spread. The alerting and advising of external authorities and responding organisations with responsibilities for the health and welfare of the public in the event of such an incident are explained. These organisations have their own arrangements for dealing with those aspects of an emergency response appropriate to their responsibilities. As required by statute and licence conditions, Dounreay consults and discusses the required arrangements with the appropriate multi-agencies to ensure co-ordination of the Emergency Plans of those involved.

DSRL's key responsibilities in an emergency at Dounreay are:

- To protect employees and the public.
- To provide initial advice to the off-site organisations on actions and any protective actions necessary to protect the public.
- To monitor the environment to assess whether any radioactivity or other toxic material has been released and, if so, minimise and stop the release.
- To act to prevent escalation of the event.
- To safely and efficiently return facilities and equipment to a stable condition.

DSRL has taken account of lessons learned as a result of the Fukushima Dai-ichi nuclear accident in Japan that occurred in 2011. In addition to this DSRL works closely with other nuclear site licensed operators and with the Department of Business, Energy and Industrial Strategy (BEIS) through the Nuclear Emergency Arrangements Forum (NEAF) to ensure that best practice is applied. DSRL also attend the Scottish Nuclear Resilience Group meetings.

2 SCOPE OF THE DOUNREAY EMERGENCY PLAN

This Emergency Plan describes the main arrangements and basic principles of response to protect both the workforce and the public. The detailed arrangements for the implementation of this Emergency Plan are contained in the Dounreay Emergency Manual and its associated documentation plus the Highland Council Off-site Emergency Plan for Dounreay.

This Emergency Plan also covers Dounreay's response to protect its workforce in the event of an incident at the neighbouring Ministry of Defence Vulcan NRTE site which houses the Naval Reactor Test Establishment (NRTE), which is being decommissioned.

The Counter Terrorist Contingency Plan, which is a requirement derived from the Security Assessment Principles (SyAPs), details the management, site and emergency service actions and responses in the event of a terrorist related incident or threat. It also provides an essential link between CNC and the Site emergency responders and actions to ensure a clear, cohesive and robust response to a terrorist incident. It details guidance to all staff and contractors on their responsibilities and on what specific action to take.

Vulcan NRTE was responsible for evaluating the safety, reliability and performance of naval reactor plant and components of that plant, prior to introduction in Royal Navy submarines. Due to their proximity Vulcan NRTE and Dounreay responses are co-ordinated and include mutual aid.

The Dounreay Site Representative for REPIR is the Assurance Director. The Senior Manager, Resilience is responsible for liaising with the Highland Council during the preparation and/or review and revision of the Off Site Emergency Plan.

3 ACCIDENT ANALYSIS

The main potential hazard from plant at Dounreay arises from the possibility of a high external dose rate and/or release of radioactive or other toxic material to the environment, requiring action to protect employees and the public. The site holds both irradiated and unirradiated fuel as well as solid and liquid intermediate and low level waste.

Detailed safety analyses of plant and decommissioning activities at Dounreay are carried out to assess the plant hazards so that appropriate protective measures can be taken. The aim is to guard, so far as is reasonably practicable, against the possibility of a fault or failure leading to a release of radioactive or other toxic materials.

The safety analyses identify potential accident sequences in which failure or partial failure of safety controls and systems could occur. Analysis of the consequences of such potential accident sequences helps to determine the extent of the safety and protection systems, which are required to be built into nuclear plant.

In compliance with the Radiation (Emergency Preparedness and Public information) Regulations 2019 (REPIR), DSRL has prepared a Hazard Evaluation and Consequence Assessment which has been submitted to ONR. This will be reviewed and revised at least on a three yearly basis as required by Regulation 6.

The main across-site or off-site hazards to on site workers and the public identified from the referenced safety cases are:

- Aircraft crash: Inhalation of contamination arising from an aircraft impact resulting in a large fire and loss of containment.
- Security Related Events: Inhalation of contamination arising from a malicious aircraft impact resulting in a large fire and loss of containment (bounding case for security related events on site).
- External Events: Inhalation of contamination arising from a seismic event.
- Fissile Material: Radiation and airborne release as a result of a criticality.
- Liquid Alkali metal: Inhalation of contamination arising from an Alkali metal fire.
- RAM Transport Accidents: On site vehicle collision resulting in loss of radiological containment and coincident fuel fire.

4 DECLARATION DEFINITIONS

The following definitions apply to the different emergency states (including the Vulcan NRTE) 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:

- An enhanced radiation field;
- A release or spread of radioactive or other toxic material;
- Security related issue

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

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

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 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 2019 (REPPPIR). The REPPPIR guidance states that a Radiation Emergency includes those events that have the potential to become an actual Nuclear Emergency.

A Dounreay Emergency or Nuclear Off-site Emergency must be declared before emergency doses to emergency workers are permitted under REPPiR.

4.3 **Dounreay Clear**

The Dounreay Clear is declared when it can be shown that no further effects of the incident will take place.

4.4 **RADSAFE Incident**

A RADSAFE Incident is declared when a RAM Transport accident occurs off-site which requires the RADSAFE procedures to be invoked with a response required by Dounreay.

Note: A RADSAFE incident may not necessarily involve a Dounreay owned/operated vehicle.

4.5 **Vulcan NRTE Declaration States**

A **Safety Alert (SA)** is an abnormal event which poses a potential threat to, or causes serious concern for, reactor plant safety.

A **Site Nuclear Incident (SNI)** is an abnormal event giving rise to a radiological hazard or potential radiological hazard which is confined in its effects within the site boundary and which required the site/operator's response plan, or parts thereof, to be implemented.

An **Off Site Nuclear Emergency (OSNE)** is a hazardous condition which requires the implementation of urgent protective actions to protect the public.

An **Off Site Nuclear Emergency (Radiation Hazard Confirmed) (OSNE/RHC)** is an off-site nuclear emergency/nuclear transport emergency in which a radiation hazard has been detected.

An **Off Site Nuclear Emergency (Release Radioactive Material Confirmed) (OSNE/RRMC)** is an off-site nuclear emergency/nuclear transport emergency in which a release of radioactive material to the environment has been detected.

4.6 **Security Response Levels**

Normal – Routine baseline measures are to be in place to protect site and buildings containing nuclear material. Should the threat rise, additional measures that are appropriate at each location will be required.

Heightened – The heightened response level requires additional protective security actions above NORMAL to address the threat to sites and buildings.

Measures deployed should be sustainable indefinitely. They may also be applied as a precautionary measure for a specified period.

Exceptional – The exceptional response level requires implementation of high levels of protective security measures to minimise vulnerabilities. Extra measures implemented are likely to be sustained for a limited period only.

Exceptional Enhanced – ONR may require Exceptional Enhanced measures to be implemented in response to specific intelligence.

4.7 **Recovery**

The recovery phase 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 to affect a level of clean-up of areas affected by the incident.

A team will be tasked utilising using subject matter experts to establish the appropriate level of recovery management taking due cognisance of business continuity management issues.

5 **SITE EMERGENCY ORGANISATION**

5.1 **Objectives**

The objectives of the emergency organisation are:

- (a) To activate the site emergency arrangements.
- (b) To issue appropriate warnings at the correct time and ensure the safe withdrawal of all persons on site to pre-arranged assembly points.
- (c) To notify external organisations concerned with implementing remedial actions.
- (d) To assemble and deploy emergency teams to assess and minimise the consequences of the emergency.
- (e) To assess the extent of any potentially hazardous situation and ensure timely advice is given on appropriate measures to safeguard the public and that appropriate measures are taken to safeguard site personnel.
- (f) To make the affected plant safe and so minimise and then terminate any release of radioactivity.
- (g) To provide specialist advice to the Police, Local Authorities and other organisations responsible for taking the necessary action to protect the public and staff of responding organisations.
- (h) To ensure the safety of unaffected plant.

5.2 Emergency Tiered Response

Any incident at Dounreay is managed using the 'all hazards approach'. This consists of a three tier emergency response:

Operational / Bronze Level - control of the incident and the safety of personnel directly involved.

Tactical / Silver Level - control of the Dounreay site, excluding direct control of the incident.

Strategic / Gold Level - co-ordination of actions dealing with the off-site aspects of the incident.

The levels of control required are set up according to the particular incident being dealt with.

5.3 Alarms

5.3.1 Site Alert

The site alert (a high-frequency pulsed 'Peeow' tone, followed by a voice message stating 'Site Alert, move inside the nearest building') can be sounded by any person on the Dounreay site who believes that the effects of an incident may go beyond their local area. The main actions taken when the site alert sounds are:

- Personnel muster at their nearest local assembly point and personnel accountability procedures are implemented.
- Emergency facilities are staffed.
- The site is locked down if a security event is declared.

The site alert system undergoes an audibility test once a month and following any maintenance on the system. The test commences with the sounding of the 'Site Alert Test' voice message followed by the sounding of the site alert 'Peeow' tone. The test is concluded by sounding the 'All Clear' voice message.

5.3.2 SCRAM Alarm

The SCRAM alarm (a slow whooping sound) will be sounded in the event of a criticality incident occurring within certain Facilities on the Dounreay site. The SCRAM alarm is initiated by the Site Shift Manager following the activation of two or more Facility CIDAS Systems going into alarm. In the event of the SCRAM alarm being sounded personnel undertake a prompt evacuation to Criticality Evacuation Centres.

The SCRAM alarm is tested once a month to ensure its audibility within the Criticality Evacuation Zone (CEZ). The alarm is also tested following any maintenance on the system.

5.4 Site Emergency Staffing Organisation

The site emergency staff consist of individuals who have specified duties and responsibilities in response to an incident. Minimum staffing levels have been identified for these positions and these individuals are appropriately trained and appointed. The organisation is headed by the Controller of the Day who takes on the role of the Site Emergency Controller and manages the tactical level response to an emergency from the Site Emergency Command Centre (SECC). The operational level response is managed by SICC supported by the Forward Control Point (FCP).

The Site Emergency Controller and SICC Incident Controller are supported by a team of specialist technical personnel and other staff. Arrangements ensure that during normal working hours, there are always people on site capable of carrying out the actions necessary in an emergency. In silent hours, procedures ensure that a team is assembled from rostered personnel on call and the onsite shift team.

5.4.1 Site Emergency Controller

During an emergency the Site Emergency Controller has overall executive responsibility for making decisions on the Dounreay site. These responsibilities include:

- a) Ascertain the nature of the incident (Nuclear or Security) allowing an appropriate level of response.
- b) The control of all on-site activities and the safeguarding of site personnel with the exception of the incident scene, which in the first instance is the responsibility of the Incident Controller.
- c) The welfare and safeguarding of site personnel, including those in the emergency centres
- d) Manage off site co-ordinating centres including the requirement for any relief staff required.
- e) The notification of responding organisations in the event of an Off-site Emergency.
- f) The radiological monitoring outside the Dounreay boundary to a radius of 40 kilometres.
- g) Provision of information and advice on protective actions to the Strategic Co-ordinating Centre.
- h) Liaison with the CNC Force Incident Manager (FIM) at Culham in the event of a potential security incident.

- i) Briefing Police Scotland officers about the emergency and its consequences for media briefings prior to the establishment of the Strategic Co-ordinating Centre.

5.4.2 SICC Incident Controller

The SICC Incident Controller has responsibility for the incident scene. These responsibilities include:

- a) Accounting for all personnel in the incident area.
- b) The safeguarding of personnel in the incident area.
- c) Ensuring that all practical steps are taken to minimise the incident and to bring it under control.
- d) Keeping the Site Emergency Controller updated on events.
- e) Communications with the CNC Police Control and the initial crime scene management following the incident.

5.4.3 Emergency Related Positions

All post holders will take up their appointed duties.

6 EMERGENCY FACILITIES AND ORGANISATION

6.1 Emergency Facilities

All emergency facilities are maintained in a state of readiness. Each facility has the required equipment and documentation to allow post holders to carry out their duties. In the event of an emergency facility becoming untenable, post holders would relocate to an alternative location. Alternative locations have been identified both on and off-site.

The emergency organisation structure is detailed in Appendix A.

6.1.1 Forward Control Point (FCP)

Where applicable, the Forward Control Point (FCP) is set up as close to the incident scene as considered safe. All services are delivered to the incident through the Local Incident Controller at the FCP which also controls the movement of personnel in and out of the incident area. Facilities are provided for personal dose assessment and contamination control.

6.1.2 Site Incident Control Centre (SICC)

The Site Incident Control Centre (SICC), together with the FCP, provides the operational level of command and control. The team headed by the SICC Incident Controller make the safety and technical decisions on how to manage the incident.

Authorisation to re-enter the incident area is given from the SICC Incident Controller.

6.1.3 **Site Emergency Command Centre (SECC)**

SECC provides the tactical level of command and control and its main functions are:

- To manage the safety of personnel on-site (excluding incident area).
- Ensure all site personnel are accounted for.
- Keep site personnel informed of incident developments.
- Maintain the safety of plant and material where there is a potential to impact on the safety of personnel.
- Support the SICC.
- Notify responding organisations.
- Provide information to the Strategic Co-ordinating Centre (SCC) on the extent of the affects of the incident.
- Provide advice to the (SCC) on protective actions for the public.
- Develop in conjunction with Police Scotland a safe and timely evacuation plan for personnel on the Dounreay site.
- Look at potential extendibility issues and how they are managed taking account of the public, the environment and the security of personnel and the site.

In the event of a Vulcan NRTE emergency:

- DFARS maybe requested to respond to the incident.
- The Emergency Radiological Incident Centre (ERIC) would be staffed to support Vulcan NRTE.
- The staffing of SECC would be at the discretion of the Site Emergency Controller.

6.1.4 **Strategic Co-ordinating Centre (SCC)**

In the event of a Nuclear Off-site Emergency being declared, the Strategic Co-ordinating Centre (SCC) would be set at the Divisional Police Headquarters in Inverness. During the emergency phase of the incident, a Senior Police Scotland Officer would be the Chair.

The functions of the SCC are:

- To manage the strategic level of response to the incident.

- To relieve the load on the Dounreay site, by taking responsibility for all activities not directly concerned with rectifying the situation.
- To provide a central liaison and information exchange point for the multi agencies.
- 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 Strategic Coordinating Group (SCG) will review and formulate the overall strategy with regard to incident/emergency management and recovery. The Scientific Technical Advice Cell (STAC) will feed into the SCG by providing advice on what is known to have happened, have made a prognosis on how the incident may develop and provide protective actions advice.

During the recovery phase of the incident, the Chair would pass to a senior representative from the Highland Council. During this phase the SCC maybe relocated to another appropriate facility.

6.1.5 **Emergency Radiological Incident Centre (ERIC)**

ERIC co-ordinates the Health Physics support for the site and provide advice primarily to the SECC team. The main functions of ERIC are:

- Co-ordinates the Health Physics resource on site.
- Implements and co-ordinates on and off-site radiological monitoring. This includes, but not limited to:
 - Radioactivity in the air.
 - Ground deposition of radioactivity.
 - Radiation levels.
 - Collate and evaluate radiological data and information from on and off-site.
 - Assess the nature and extent of any radiological releases.
 - Provide protective actions advice to SECC.
 - Provide advice and support to the SICC.
 - Providing information for Joint Agency Modelling.

To enable off-site monitoring, dedicated vehicles are deployed with Health Physics teams to undertake air sampling, dose rate and contamination measurements at locations identified by the ERIC Health Physics assessing team.

6.1.6 Personnel Accountancy – Local Assembly Points / Personnel Accountancy Co-ordinating Offices (PACO)/ Personnel Accountancy Bureau (PAB)

Local Assembly Points (LAP) are designated areas within a building where personnel assemble in the event of an emergency. The nominal role for the building is checked and missing or surplus persons identified. When the site alert has sounded this information is sent to the identified Personnel Accountancy Co-ordinating Office (PACO) for the building.

The PACOs identify all missing and surplus personnel and pass this information to the Personnel Accountancy Bureau (PAB). The PAB is a dedicated facility. The functions of PAB are:

- To reconcile all missing and surplus persons information to identify any outstanding missing persons.
- Report accountancy information to SECC.

6.1.7 **Criticality Evacuation Centres (CECs)**

In the event of a criticality incident, personnel within the Criticality Evacuation Zone (CEZ) evacuate to a Criticality Evacuation Centre. There are two CECs on site, their main functions are:

- To manage all personnel who evacuate to the CEC's.
- Accountancy of personnel.
- Identification of exposed personnel.
- Identification of the incident site and gathering information of operations being undertaken.
- Welfare and safety of evacuated personnel.

6.1.8 **Media Briefing Centre (MBC) and Forward Media Information Point (FMIP)**

Media briefings are undertaken in Inverness at the Media Briefing Centre (MBC). The MBC provides accommodation for press conferences, radio and TV interviews, and communication facilities for journalists. The MBC is controlled and managed by Police Scotland.

6.1.9 **Force Incident Manager (FIM) at Culham Security/CNC Response**

The Force Incident Manager [FIM] is based at Culham and is the CNC Silver (tactical) Command to the site in the event of a security incident. In a security related incident there will be a Bronze (operational) Commander who will take his direction from the FIM in conjunction with the Site Emergency Controller as required.

If a terrorist incident has, or is likely to result in, a radiological incident, the Site Emergency Controller will make management decisions based on the circumstances and information available provided by the CNC. A suspected terrorist incident means that the CNC will be the lead organisation at the incident location and they will seek specialist guidance through the CoD Site Emergency Controller in the event of an incident with potential radiological implications.

Incident scene control will be formally handed over to Police Scotland at an appropriate time and in accordance with the Memorandum of Understanding between the Chief Constable CNC and the Chief Constable Police Scotland. Specialist guidance with respect to the incident scene will be sought through the Site Emergency Controller in the event of a radiological incident. A Security Advisor and CNC Liaison Officer are within the SECC to support the Site Emergency Controller as required.

At all times the Site Emergency Controller will maintain control of the site.

6.2 Specialist Services

There are a number of specialist services that support the site's emergency arrangements either directly supporting incident mitigation and recovery or in assessing the effects of the incident.

6.2.1 Dounreay Fire Ambulance and Rescue Service (DFARS)

The Dounreay Fire Ambulance and Rescue Service (DFARS) provide a full time service on site, 24 hours a day. The DFARS officers are trained and equipped to deal with a range of incidents. The DFARS uses a wide range of protective, radiation monitoring and rescue equipment. The ambulance is manned by qualified ambulance technicians who operate a range of life support equipment.

The DFARS would co-ordinate any firefighting teams provided by Scottish Fire and Rescue Service.

6.2.2 Occupational Health Department (OHD)

The Occupational Health Department (OHD) at Dounreay has trained medical staff capable of treating injuries. Nursing staff are on site during normal day working hours and are on call during silent hours.

The OHD has facilities which enable it to deal with contaminated personnel. Where a patient's clinical condition allows, decontamination in the OHD would be attempted before the patient was despatched to hospital.

If a medical practitioner certifies that a casualty has died on the Dounreay site, the Civil Nuclear Constabulary must be informed to enable the correct procedures to be invoked.

6.2.3 Civil Nuclear Constabulary (CNC)

The Civil Nuclear Constabulary (CNC) has officers on site 24 hours a day. In the event of an incident occurring, these officers would assist in implementing the on site emergency response plan.

The CNC would ensure security at Dounreay by controlling all site gates and obtaining authorisation for entry and exit of persons to and from the site via the Site Emergency Controller in the SECC.

The CNC has a Memorandum of Understanding with Police Scotland to provide assistance where resources permit.

6.2.4 Civilian Guard Force (CGF)

The Civilian Guard force (CGF) has staff on site 24 hours a day. In the event of an emergency occurring, these individuals would, under the direction of the SECC, assist in the implementation of the response plan. The main duties would be to maintain managed access and egress control at the site gates.

6.2.5 Analytical Services

Laboratories are available on the Dounreay site to provide analytical services to aid in the assessment of the radiological consequences arising from an emergency. These laboratories have sophisticated equipment for assessing both radiation and contamination levels. The laboratories can also undertake a range of analyses in support of a chemical incident.

6.2.6 Meteorological Services

Dounreay has a weather monitoring system which provides data with regard to wind direction and wind speed. Arrangements are also in place with the Meteorological Office to provide weather forecasts for the area.

6.2.7 Radiological Protection

The Dounreay site has trained radiological protection staff capable of measuring and assessing the impacts of radiological hazards in the event of an incident or emergency at the Dounreay and Vulcan NRTE sites. This information is used to provide protective action advice for both onsite personnel and offsite persons. These personnel are on site during the normal working hours and a team are on call during silent hours.

6.2.8 Dosimetry Services

Dounreay has an approved dosimetry service on site able to provide a range of internal, external and emergency dosimetry. They will provide dosimetry service support in the event of an emergency being declared at Dounreay.

6.3 Emergency Equipment

An adequate supply of emergency equipment, including breathing apparatus, protective clothing, communication equipment and Health Physics instrumentation is available to implement an appropriate emergency response.

A stock of respirators is available for use by site based personal during an evacuation, if required.

6.4 Emergency Workers and Emergency Exposures

Emergency Workers

For the Dounreay Site, emergency workers, who may be subject to an emergency exposure above the statutory dose limit in the Ionising Radiations Regulations 2017 fall into four categories.

- On Site Emergency Services (Dounreay Fire, Ambulance and Rescue Service and Civil Nuclear Constabulary)
- Off Site Emergency Services who respond to the site (Scottish Fire and Rescue Service) (informed volunteers)
- Building Staff (informed volunteers)
- Specialist Support (informed volunteers)

Emergency Exposure

Emergency exposures will be kept as low as reasonably practicable and the full exposure limits and approval route for these authorisations are given in the Dounreay Emergency Manual.

Each category of emergency worker has defined maximum radiation exposure limits.

- On site emergency services (Dounreay Fire, Ambulance and Rescue Service and Civil Nuclear Constabulary) Maximum of 500mSv (Radiation exposures above 100mSv will only be authorised for the purpose of saving life, helping endangered people, or preventing large numbers of people being exposed to ionising radiations).
- Off Site Emergency Services who respond to the site (Scottish Fire and Rescue Service).
- As per Fire & Rescue Service Operational Guidance: Generic Risk Assessment 5.5 (incidents involving radiation).
- Building and specialist support staff: Maximum of 100mSv.

6.5 Training

All DSRL personnel who hold emergency roles receive specific training covering the responsibilities of their post.

All training provides staff with the initial competencies to undertake the role. Practical opportunities are given to participate with training through a series of planned site wide exercises, local facility exercises and table top exercises to ensure competency is maintained and developed.

Learning from exercises is fed back into future training events and where appropriate emergency documentation updated and disseminated to effected personnel.

All training is recorded, and only trained personnel are appointed to emergency positions. All appointments are managed in accordance with the Site's procedures and are reviewed at regular intervals.

6.6 Exercises

Regular emergency exercises are carried out as part of the overall emergency exercise programme. These exercises allow emergency arrangements to be tested to ensure their continued applicability. Certain exercises are demonstrated formally to the Office for Nuclear Regulation.

Dounreay has a requirement to hold one Level 1 exercise annually. A Level 1 exercise demonstrates the operational/bronze and tactical/silver level of control. This exercise is aimed primarily at demonstrating that Dounreay has adequate emergency arrangements to deal with a nuclear safety event. A level 1 exercise is demonstrated to the ONR.

Dounreay has a requirement to hold an annual nuclear security event exercise. This exercise is aimed primarily to demonstrate the immediate actions associated with successfully and expeditiously resolving a site based terrorist incident in order to assure the regulator as well as DSRL that the arrangements are robust.

On occasions, the nuclear safety and nuclear security exercises maybe combined.

The Local Authority as part of its emergency arrangements requirement under REPPiR 2019 are required to hold a Level 2 exercise every three years to demonstrate their role in the Dounreay Off-site plan. A Level 2 exercise demonstrates the co-ordination at strategic level of the off-site arrangements. The Dounreay site collaborates with the Local Authority in developing the exercise and also participates in the exercise.

Dounreay has an exercise programme which incorporates the above demonstration exercises, in addition to the Vulcan NRTE exercises and plant specific exercises.

7 PROTECTIVE ACTIONS ADVICE

7.1 Detailed Emergency Planning Zones (DEPZ & OPZ)

A detailed Emergency Planning Zone (DEPZ) (Appendix B) has been determined by the Highland Council, based upon information submitted, under REPP19, by both the Dounreay and Vulcan NRTE sites. Personnel within this zone are pre-issued, by Highland Council, with information on actions that may need to be taken in the event of an incident.

The 5km Outline Planning Zone (OPZ) (Appendix B) is an area extended beyond the DEPZ where protective actions may be required to be implemented by the appropriate agencies. The OPZ distance is taken from schedule 5 of REPP19 2019.

7.2 Implementation of Protective Actions

If either the incident conditions or the assessments of the incident indicated that employees or the public were at risk, then protective actions would be implemented.

On the Dounreay site the Site Emergency Controller taking advice from the ERIC assessment team would authorise the implementation of protective actions on the site.

Protective actions for the general public would be implemented by the Chief Constable Police Scotland (or deputy) taking advice initially from the SECC and later from the SCC once operational. Protective actions for the general public would be implemented by the Chief Constable, Police Scotland (or deputy). This would initially be taking advice from Dounreay SECC until the SCC is established and operational.

7.3 Protective Actions

There are a number of different protective actions that can be implemented during an emergency dependent on the incident and the risks involved.

7.3.1 Sheltering

Personnel would be advised to stay indoors, close doors and windows, and follow the advice given. Sheltering reduces the risk from exposure to direct radiation and the inhalation of radioactive material. These protective actions are automatically implemented on the Dounreay site on the sounding of the site alert.

7.3.2 Stable Iodine Tablets (SITs)

Following the shutdown of the last operating reactor at Dounreay in 1994 and the reactor at the Vulcan NRTE in 2015, there is no requirement for Stable Iodine Tablets (SITs) to be available for personnel working on the Dounreay site.

7.3.3 **Evacuation**

The removal of personnel from site and the public from area(s) around the site reduces or removes the risk of being exposed to high external dose rates and/or radioactivity or other toxic materials which are present as an airborne hazard or deposited on the ground. Evacuation of personnel may also be as a result of a nuclear safety event and/ or a nuclear security event.

7.3.4 **Lockdown**

Lockdown is a considered position which enhances the access control measures already in place, in the event of an actual, or suspected, unlawful intrusion, or other increase in risk to security. Following an assessment of the situation, lockdown may be initiated by the CNC Bronze or Silver Commander, the Site Shift Manager or the DSRL Controller of the Day.

The purpose of lockdown is to:

- Enhance security at times of increased risk
- Optimise the safety of personnel and;
- Minimise the movement of personnel to assist in the identification of suspected intruders.

7.3.5 **Control of Contaminated or Potentially Contaminated Food Supplies**

Contaminated, or potentially contaminated, food supplies would be controlled in accordance with advice from, or under the statutory authority of, the Foods Standards Scotland (FSS), the Scottish Environment Protection Agency (SEPA), and the Scottish Government Directorate Enterprise, Environment and Innovation Directorate.

7.3.6 **Control of Contaminated or Potentially Contaminated Water Supplies**

Contaminated, or potentially contaminated, water supplies would be controlled by Highland Council and/or Scottish Water in accordance with advice from the Public Health England and/or the Scottish Environment Protection Agency.

8 RESPONDING ORGANISATIONS

8.1 Introduction

DSRL regularly liaises with the responding organisations to ensure that adequate arrangements are in place to protect the public if a Dounreay Nuclear Off-site Emergency were to be declared. The Dounreay Vulcan Off-Site Emergency Planning Group (DVOEPG) meets twice yearly and any issues which could affect the Emergency Plan are discussed.

If a Nuclear Off-site Emergency were to be declared, the site would notify Police Scotland, ONR, SEPA, Vulcan NRTE, ONR, Scottish Government, BEIS, Berkeley ADS and the NDA. Police Scotland would then be responsible for cascading the declaration status to the SCC responding organisations. The actions to be carried out by the responding organisations are detailed in the Highland Council Dounreay Off-site Emergency Plan. During the initial phases, until the SCC is established, DSRL will provide advice on protective actions to Police Scotland.

8.2 Responding Organisations

The site collaborates with the following organisations:

8.2.1 Food Standards Scotland

In the response to an emergency, the Food Standards Scotland would lead the government in Scotland's response regarding food safety issues, assessing the impact of the emergency on the food chain and implementing any necessary protective actions.

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, implementing, as necessary, restriction orders under the Food and Environment Protection Act (FEPA), 1985. FEPA orders are used to restrict the supply, movement or sale of produce from the affected area.
- To provide support, advice, information and guidance to Local Authorities, businesses and the public on the implications for food.
- To provide support and advice to the Scottish Government on request.
- To ensure that subsequent recovery arrangements take account of food safety issues.

8.2.2 Explosives Ordnance Disposal [EOD]

The EOD is a specialist regiment of the MOD who are responsible for counter terrorist Explosive Ordnance Disposal (EOD) as well as the safe recovery or disposal of conventional munitions. Should there be a requirement to utilise their services, they would be contacted to support the site by CNC. The CNC would advise on cordons required for safe distances until such time as they arrived. On arrival, EOD will be briefed by CNC supported as necessary by specialist advisors

8.2.3 Scottish Fire and Rescue Service (SFRS)

The concerns of the SFRS are the saving of life in conjunction with other emergency services, the rescue of trapped casualties, tackling fire, released chemicals or other hazards, and assisting the police and ambulance services with casualty handling and recovery of bodies. The SFRS is also normally best placed to advise on the safety of personnel of all agencies involved within the immediate incident area, and it will gather information on chemicals hazards via the UK databases, 'Chemdata' and 'Chemnet'.

If additional resources were required on the Dounreay site, the SFRS Emergency Plan would be implemented following a request from the Dounreay Fire Ambulance and Rescue Service (DFARS). Close co-operation is maintained with the SFRS, which trains and exercises with the DFARS. Arrangements exist for integrating the command structures of the DFARS and the SFRS.

8.2.4 Highland Council

The Highland Council develop and maintain the Off-site Emergency Plan. They will assist in implementing any evacuation measures, including emergency housing, food, transport and social services. The Highland Council would co-ordinate and lead the recovery phase following an off-site emergency.

8.2.5 NHS Highland Board

NHS Highland Board is responsible for the overall assessment of health care needs of the population, and for arranging for these needs to be met. NHS Highland Board have the responsibility for the provision of Reception Centres following an evacuation.

8.2.6 Maritime and Coastguard Agency

In response to an incident, the Maritime and Coastguard Agency (MCA), as co-ordinators of civil maritime incidents, including search and rescue and counter pollution/salvage, would be able to provide a communications network for working with surface vessels, coastguard units, and search and rescue aircraft. The agency

would also be able to provide maritime information, including tidal data. The MCA can be contacted through the Operations Room at Aberdeen Coastguard and can provide a Liaison Officer on scene to work with responding Authorities.

8.2.7 **Police Scotland**

Police Scotland is responsible for:

- The saving of life in conjunction with the other emergency services.
- The setting up of rendezvous points to ensure blue light responders and other essential personnel requiring access to the site are managed correctly and briefed accordingly.
- Co-ordination of the emergency services and other organisations during the emergency phase of the incident at strategic level.
- Scene management principles and the subsequent protection and preservation of the scene or scenes. [Note: Initial scene management will be established by CNC and then responsibility will be handed over to Police Scotland.]
- The investigation of the incident in conjunction with the other investigatory bodies.
- The collation and dissemination of casualty information.
- Assisting Highland Council with the restoration of normality at the earliest opportunity.
- Initiating the cascade call-out system to alert other organisations.

8.2.8 **Office for Nuclear Regulation (ONR)**

The Office for Nuclear Regulation's major function and responsibilities in an emergency is:

- Investigate the circumstances of the emergency, and be satisfied that appropriate actions are being taken.
- Consider any implications for safety at other nuclear sites.
- Provide advice and guidance to Government Departments.

ONR CNSS will seek assurance on the security of nuclear material and will consider security implications at other sites.

ONR Inspectors would be sent to the DSRL site and other locations as necessary in connection with these responsibilities.

8.2.9 **Public Health England (PHE) – Centre for Radiation, Chemical & Environmental Hazards (CRCE)**

Public Health England (PHE) will liaise with Dounreay management, government departments and the ONR, and provide advice as necessary on radiological protection.

The Centre for Radiation, Chemical and Environmental Hazards (CRCE) will be responsible for co-ordinating the long-term monitoring and analysis in the outline

planning zone and beyond (as required), and they will contribute to long term advice on measures to protect the public. They will also provide guidance on the criteria to be used in assessing the need for protective actions.

The PHE will contribute to the Scientific Technical Advice Cell (STAC), Recovery Working Group (RWG) and other sub groups as appropriate. The PHE would undertake, in conjunction with other agencies, studies on the impact of the incident in the long term.

8.2.10 **Scottish Ambulance Service (SAS)**

If additional resources were required on the Dounreay site, the Scottish Ambulance Service Emergency Plan would be implemented by the Dounreay Fire Ambulance and Rescue Service. Close co-operation is maintained with members of the Scottish Ambulance Service who train with the DFARS.

8.2.11 **Scottish Environment Protection Agency (SEPA)**

SEPA is concerned with the overall environmental impact of any radioactive or other toxic release to the environment following an emergency. Specifically, SEPA will:

- Provide SEPA representatives at the SCC and Scientific Technical Advice Cell (STAC).
- Set up and staff the SEPA Emergency Control Centre.
- Provide advice on the environmental impact of a radiological incident to relevant organisations.
- Provide information on the environmental effects of the incident where appropriate.
- Advise on appropriate disposal of radioactive waste and, if appropriate, authorise such disposals.
- Determine if a breach of site authorisation has occurred and gather relevant information if necessary

8.2.12 **Department for Business, Energy and Industrial Strategy (BEIS)**

Nuclear energy is a reserved matter. BEIS is Lead Government Department (LGD) in the event of an emergency at a civil nuclear site in England, Wales or Scotland. BEIS is the policy lead for civil nuclear, which includes onsite aspects of any response

BEIS' main function is to provide strategic national direction on policy impacts, oversee national response and manage international liaison. During a civil nuclear emergency, the Department for Business, Energy and Industrial Strategy (BEIS) would:

- Act as the Lead Government Department (LGD) for a civil nuclear emergency in England, Scotland or Wales. BEIS will work closely with Scottish Government who retain responsibility for off-site consequence management at Scottish civil nuclear sites.
- Activate its Emergency Operations Centre (EOC) in London.
- Provide accurate, timely briefing and situational awareness for UK Government Ministers and manage UK parliamentary interest.
- Coordinate national public messaging.
- Manage the Radiological Response Emergency Management System (RREMS)¹ and monitor the delivery of the Joint Agency Modelling (JAM)² process and products.
- Send BEIS personnel to the Strategic Co-ordination Centre (England and Wales) as part of the MHCLG led Government Liaison Team (GLT) to provide a communications link between central government and the local response, including requests for national support. The GLT, along with the MOD Joint Regional Liaison Officer if military assistance is required, will act as an escalation route for additional assistance needed to support the local response. BEIS would send a liaison officer to the Scottish Government Resilience Room (SGoRR) for an emergency at a Scottish civil nuclear site.
- Liaise with international organisations (International Atomic Energy Agency, the European Commission and countries with bilateral arrangements) on notification, information sharing and any offers of aid.
- Coordinate the deployment of national-level assets.

8.2.13 The Scottish Government

Scottish Government will play a key role in supporting the response at a Scottish civil nuclear site, with off-site consequence management planning, response and recovery devolved to Scottish Government.

In the event of a Scottish civil nuclear emergency, Scottish Government SG will activate its SG Resilience Room (SGoRR) arrangements to support the local response.

Upon receipt of notification the Scottish Government (SG) will notify BEIS, Cabinet Office (via the Civil Contingences Secretariat - CCS) and Scottish Resilience Partnerships on call teams. Scottish Government Liaison Officer(s) (SGLO) will be deployed to the Strategic Co-ordination Centre (SCC) and will liaise with SGoRR. A SG liaison officer will be deployed to the BEIS EOC. SG's Resilience Division will lead the operation of SGoRR. SGoRR will schedule 'officials' and 'ministerial' meetings during the response and recovery phases. Typically, SGoRR will include participants from the main affected Scottish Government Directorates including the Resilient Essential Services and Communities Unit, and representatives of relevant agencies.

During a civil nuclear emergency, Scottish Government will:

- Provide strategic national direction in respect of off-site consequence management planning, response and recovery.
- Capture and maintain off-site consequence management situational awareness of the emergency, and brief COBR and Scottish Ministers.
- Provide up-to-date information to CCS to produce the national SitRep.
- Ensure effective communication between local, Scottish and UK levels, including the co-ordination of reports on the response and recovery effort.
- Liaise with UK Government (BEIS EOC and COBR) to ensure effective information exchange.
- Work closely with BEIS to ensure the delivery of accurate, timely and consistent flow of information to the public and other key stakeholders to maintain public confidence in the response to the emergency.
- Support the response and recovery efforts as appropriate, including appropriate allocation of national resources.
- Provide the focal point on public health and NHS resilience issues at Scottish level.
- Animal welfare - provide advice and support activity to minimise the impact of radiation on food production and water supply.

When a Scientific Advisory Group for Emergencies (SAGE) is activated it will provide advice to and interact with SGoRR as well as the STAC.

The Scottish Government Rural Payments & Inspections Division (SGRPID) are a directorate within the Director General – Enterprise, Environment and Innovation but for contingency planning purposes SGRPID would be the directorate responsible (in partnership with the Food Standards Scotland (FSS)) for any agricultural implications in any nuclear incident.

8.2.14 **Scottish Water**

Scottish Water is responsible for:

- Assessing which water supply sources are at risk of contamination. This shall be on the basis of information supplied by SEPA/Public Health England.
- Arranging and co-ordinating the sampling and analysis of sources and treated supplies at risk in conjunction with SEPA/Public Health England.
- Assembling data on the level of contamination of the public water supplies.
- In conjunction with the NHS Highland assessing the risk to public health as a result of the contamination
- In conjunction with Scottish Water Emergency Teams, take appropriate measures to minimise the risk to public health.

- Provide advice to the Public Information Co-ordinator on issues relating to the public water supply.
- Provide advice to Scottish Water staff on information to be given to customers in accordance with the Public Information Guidelines.

8.2.15 **Radioactive Incident Monitoring Network (RIMNET)**

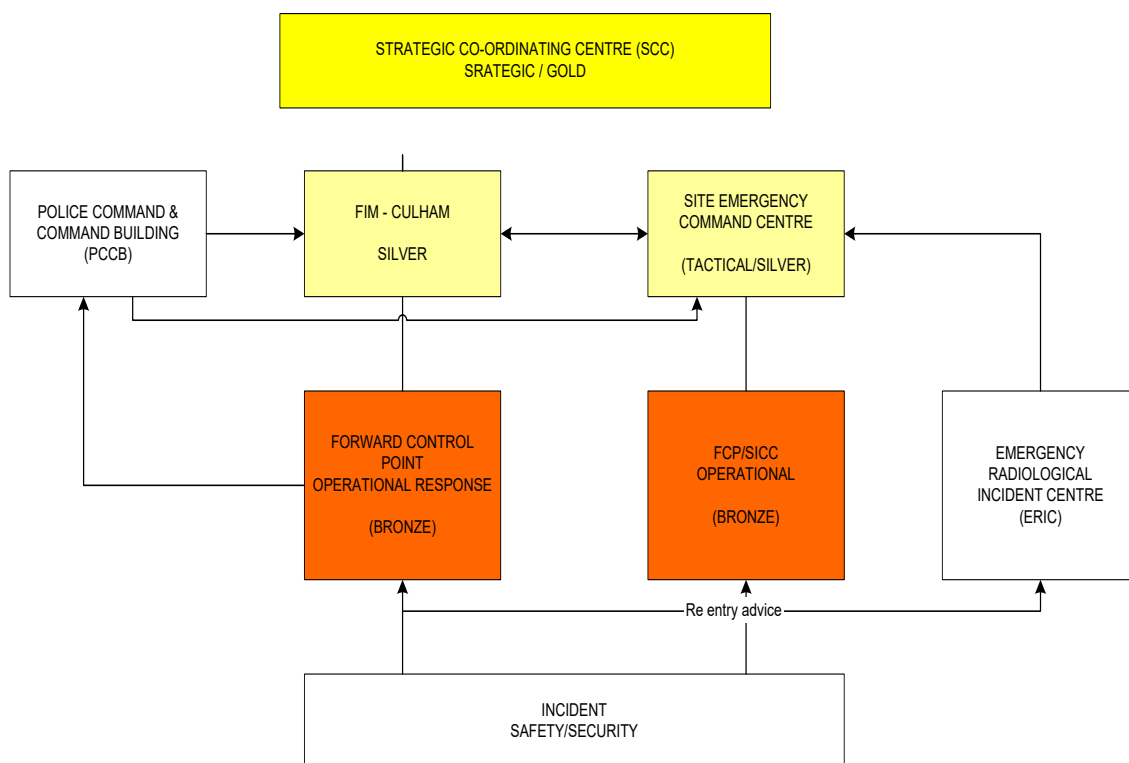
RIMNET, the Radioactive Incident Monitoring Network, is the UK radiation monitoring and nuclear emergency response system, set up as part of the National Response Plan following the Chernobyl accident. RIMNET supports all major radiological and nuclear accidents/incidents affecting the UK, including assisting the Department of Business Energy and Industrial Strategy (BEIS).

9 REVIEW AND UPDATE

The DSRL Senior manager Resilience is responsible for the preparation, issue and periodic review of the Emergency Plan. The Emergency Plan is approved by the Dounreay Site Safety Working Party and reviewed by the Dounreay Nuclear Safety and Environment Committee prior to being submitted to the ONR for approval.

The Emergency Plan shall be subject to review and where necessary revision at suitable intervals not exceeding three years.

APPENDIX A – EMERGENCY ORGANISATION STRUCTURE



PCCB have a link via AIRWAVES with Bronze & CNC Liaison in SECC

PCCB have an advisory link with FIM

SECC CNC Liaison have a link via AIRWAVES with FM & Bronze

SECC CNC Liaison keep SEC informed

APPENDIX B: DETAILED EMERGENCY PLANNING ZONE



APPENDIX C: ABBREVIATIONS

BEIS	Department Business, Energy and Industrial Strategy
CEC	Criticality Evacuation Centre
CEZ	Criticality Evacuation Zone
CGF	Civilian Guard Force
CIDAS	Criticality Incident Detection and Alarm System
CNC	Civil Nuclear Constabulary
COBR	Cabinet Office Briefing Rooms
CRCE	Centre for Radiation, Chemical & Environmental Hazards
DECC	Dounreay Emergency Centre Complex
DEPZ	Detailed Emergency Planning Zone
DFARS	Dounreay Fire Ambulance and Rescue Service
DSRL	Dounreay Site Restoration Limited
DVOEPG	Dounreay Vulcan Off Site Emergency Planning Group
ERIC	Emergency Radiological Incident Centre
FCP	Forward Control Point
FEPA	Food and Environment Protection Act
FIM	Force Incident Manager (CNC)
FMIP	Forward Media Information Point
FSS	Food Standards Scotland
HSE	Health and Safety Executive
MBC	Media Briefing Centre
MCA	Maritime and Coastguard Agency
MoD	Ministry of Defence
NDA	Nuclear Decommissioning Authority
NHS	National Health Service
NRTE	Naval Reactor Test Establishment
OHD	Occupational Health Department
ONR	Office for Nuclear Regulation
ONR CNSS	Office for Nuclear Regulation Civil Nuclear Security and Safeguards
OPZ	Outline Planning Zone
PAB	Personnel Accountancy Bureau
PACO	Personnel Accountancy Co-ordinating Office
PHE	Public Health England
RAM	Radio Active Material
REPIR	Radiation Emergency Preparedness and Public Information Regulations
RIMNET	Radioactive Incident Monitoring Network
RWG	Recovery Working Group

SAGE	Scientific Advisory Group for Emergencies
SAS	Scottish Ambulance Service
SCC	Strategic Co-ordinating Centre
SECC	Site Emergency Command Centre
SEPA	Scottish Environment Protection Agency
SFRS	Scottish Fire and Rescue Service
SGLO	Senior Government Liaison Officer
SGoRR	Scottish Government Resilience Room
SGRPID	Scottish Government Rural Payments and Inspection Directorate
SICC	Site Incident Control Centre
SITs	Stable Iodine Tablets
STAC	Scientific Technical Advice Cell