

Decommissioning, Fuel and
Waste (DFW) Programme



Office for
Nuclear Regulation

**Magnox & Restoration
(MAG&R) Licensed Sites**

ONR Plan for Regulation of the Dounreay Site in 2015/16



**“To provide efficient and effective regulation of the nuclear industry,
holding it to account on behalf of the public”.**

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LIST OF ABBREVIATIONS

ACoP	Approved Code of Practice
ALARP	As low as reasonably practicable
CDG	Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations
CNS	Civil Nuclear Security
COFT	Cross-ONR Fire Team
COHST	Cross-ONR Health and Safety Team
COMAH	Control of Major Accident Hazards Regulations 1999
DECC	Department for Energy and Climate Change
DFW	Decommissioning Fuel and Waste (Programme)
EA	Environment Agency
EAct	Energy Act 2013
EIADR	Environmental Impact Assessment for Decommissioning Regulations 1999
FOI	Freedom of Information Act
GDF	Geological Disposal Facility
HAW	Higher Activity Waste
HID	Hazardous Installations Directorate of HSE
HSE	Health and Safety Executive
HSWAct	Health and Safety at Work etc Act 1974
IAEA	International Atomic Energy Agency
ILW	Intermediate Level Waste
IMG	Intervention Management Group
INES	International Nuclear and Radiological Event Scale
IRRs	Ionising Radiations Regulations 1999
L&MfS	Leadership and Management for Safety
LC	Licence Conditions
LCLC	Local Community Liaison Council
LETP	Liquid Effluent Treatment Plant
LI	Licence Instrument
LLW	Low Level Waste
MAG&R	Magnox & Restoration Sites
MHSWR	Management of Health and Safety at Work Regulations
ML	Magnox Ltd
MOP	Magnox Operating Plan
MoU	Memorandum of Understanding
NDA	Nuclear Decommissioning Authority
NISR	Nuclear Industries Security Regulations 2003
NRW	Natural Resources Wales
OEF	Operational Experience Feedback
ONR	Office for Nuclear Regulation
PAR	Project Assessment Report (ONR)
PBO	Parent Body Organisation
PCSR/PCmSR	Pre-Construction/Commissioning Safety Report
REPPiR	Radiation (Emergency Preparedness and Public Information) Regulations 2001
RRO	Regulatory Reform (Fire Safety) Order 2005
RSP	Relevant Statutory Provision
RWMC	Radioactive Waste Management Case
RWML	Radioactive Waste Management Limited (part of NDA)
SBI	System Based Inspection
SEPA	Scottish Environmental Protection Agency
SLC	Site Licence Company
SNM	Special Nuclear Material
SSG	Site Stakeholder Group
TSC	Technical Support Contractor

1. INTRODUCTION

- 1.1 The Office for Nuclear Regulation (ONR) is the principal nuclear safety and security regulator in the UK; this role includes regulation of the 37 licensed nuclear sites. One of these is the Dounreay licensed site. This plan, covering the period from April 2015 to March 2016, has been developed taking into account the ONR Decommissioning Fuel and Waste (DFW) Programme Operating Strategy.

2. PURPOSE AND SCOPE

- 2.1 This document sets out our planned activities for the regulation of the Dounreay licensed site for the year 2015/16. The document focuses principally on regulation of nuclear and radiological safety on the site, which is owned by the NDA but operated on its behalf by the Site Licence Company (SLC) Dounreay Site Restoration Ltd. It also mentions the integration of other areas of ONR regulatory oversight, including nuclear security, safeguards, transport of radioactive materials and conventional safety.
- 2.2 The regulation of radioactive discharges to the environment from licensed nuclear sites is undertaken by the Environment Agency (EA) in England; National Resources Wales (NRW) in Wales, and in Scotland by the Scottish Environmental Protection Agency (SEPA). ONR co-ordinates its regulatory work with EA, NRW and SEPA in accordance with separate Memoranda of Understanding (MoU), to promote effective joint working.
- 2.3 The purpose of this document is to inform the site and other interested parties of the regulatory activity that ONR intends to undertake at the site in 2015/16 and what ONR intends to achieve through its activities.

3. ONR'S REGULATORY APPROACH

- 3.1 ONR is an independent statutory enforcing authority created under the Energy Act 2013 provide efficient and effective regulation of the nuclear a number of core regulatory functions and undertakes regulatory activities in line with internationally accepted standards, established by the International Atomic Energy Agency (IAEA), these are:

- Authorisation of, or permissioning safety and security related activities;
- Inspection and Enforcement;
- Review and Assessment; and
- Setting safety and security standards.

The expected outcomes from the above activities are: -

- A nuclear industry that has a culture of continual improvement and sustained excellence in operations.
- A nuclear industry that controls its hazards and security effectively.
- independent regulator. and

4. DFW PROGRAMME & THE MAG&R SITES

- 4.1 ONR has adopted programme working to provide a flexible and efficient approach to performing its regulatory and other activities. The DFW Programme has established

an Operational Strategy, which provides a framework for the regulatory activities on all 20 DFW sites. To manage its workload DFW is divided into three sub-programmes and this plan is aligned to the Magnox and Restoration sub-programme strategy. The MAG&R sub-programme is responsible for the regulation of safety and security at 13 licensed sites.

4.2 The other sites in the scope of the MAG&R sub-programme are the sites licensed to Magnox Ltd (ML) at: -

- Bradwell
- Berkeley
- Chapelcross
- Dungeness A
- Hinkley Point A
- Hunterston A
- Oldbury
- Sizewell A
- Trawsfynydd
- Wylfa
- Harwell
- Winfrith

Note: 1) On 1 September 2014 NDA transferred operation of the above sites to a new parent body organisation (PBO), Cavendish Fluor Partnership (CFP). Harwell and Winfrith were licensed to Magnox Ltd. on 1 April 2015

2) Responsibility for regulation of Wylfa, the only remaining operating Magnox reactor was transferred from our Civil Nuclear Reactor Programme (CNRP) to DFW. This transfer enhances efficiency of regulation across the Magnox fleet

And the site at: -

- Dounreay, licensed to Dounreay Site Restoration Ltd (DSRL).

4.3 To coordinate regulation of the licensed nuclear sites ONR appoints a lead or Nominated Site Inspector who is the principal focal point for the licensee and any other duty-holders on the site in relation to nuclear safety matters. This inspector is based in the ONR office in Liverpool and will make routine visits to Dounreay to undertake inspection and other regulatory work. The site inspector coordinates with the other regulatory functions within ONR.

4.4 The MAG&R sub-programme has developed a set of objectives which directly support the DFW operational strategy and all regulatory activities on the sites are aligned with one or more of these objectives, these are as follows: -

- Regulating safe decommissioning and dismantling of nuclear facilities to an agreed interim end-state.
- Regulating the transition of Wylfa from generation into the defueling stage of its lifecycle
- Regulating shutdown Magnox reactors in defueling safely, in preparation for transition into the decommissioning phase.

- Regulation of the safety and management of the front end fuel cycle, disposition of its bi-products and consolidation of historic fuel legacies.
- Regulating safe management of radioactive waste inventories in accordance with national and international standards.
- Undertake inspection and other activity to ensure the MAG&R licensees safely manage the hazards and activities on their sites.
- Ensure that proportionate and timely periodic reviews of safety are undertaken, assess submissions and agree action plans for implementing any reasonably practicable improvements identified by the reviews.
- Engage with stakeholders, producing reports where necessary within expected timescales, and responding to any queries raised.

5. REGULATION OF THE DOUNREAY SITE

- 5.1 This document is concerned with regulation of safety and security on the Dounreay licensed site. The DFW strategy and MAG&R objectives outlined above inform the site specific plans, including this one, to ensure that they consider the broader context when mapping out how best to secure safety and security at Dounreay. The 13 sites within the MAG&R sub-programme are considered, along with the 7 other sites in the DFW programme, to present a lower hazard when compared to some other licensed nuclear sites. The following sub-sections provide some general information related to ONR's core activities as they are applied to the Dounreay site.

Inspection (Planned and Reactive) & Enforcement

- 5.2 The inspection effort expended on the Dounreay site is considered to be proportional to the risk presented by the site and reflects the nature and magnitude of the hazards on the site, it is aimed at providing ONR with evidence that the licensee is complying with its statutory obligations and that workers and the public are protected from the hazards of the site. The inspection plan for the Dounreay site during 2015/16 is set out in Appendix A. This plan has been developed to target inspection of the
to provide the most important contribution to safety (Annex 2 provides further information). Additional reactive inspection, or inspection associated with Intervention Projects, may be appropriate and ONR inspectors may also carry out un-announced inspections at any time. In summary the baseline inspections for the site will consist of approximately 50 inspections spread across the year. Where possible these will be aligned with intervention project requirements. ONR enforces the law through a graded approach starting at verbal advice for minor non-compliances through to prosecutions in a court of law for serious breaches of the law. An enforcement management model is in place to assist inspectors in applying their judgement to any particular situation where they are contemplating taking enforcement action.

- 5.3 By definition, reactive inspection cannot be planned. However, experience suggests that around 10% of available inspection time is spent on reactive work. Reactive inspection often covers responding to any incidents or events on the site notified to
Criteria for prompting further ONR investigation are set out in Appendix B. The process for

internal guidance, found at: <http://www.onr.org.uk/operational/inspection/ns-enf-gd-002.pdf>

Intervention projects.

- 5.4 When ONR believes that circumstances have arisen that represent a challenge to has the potential to adversely affect safety, then it may secure the necessary changes that it believes will address the issue. The associated issues are overseen by internal ONR management processes until remedial action is sufficient to consider the matter to be closed to the satisfaction of ONR. A number of intervention projects aimed at addressing safety issues relevant to the Dounreay site are listed in Appendix C.

Permissioning.

- 5.5 ONR operates within Under nuclear site licence conditions (LC) ONR issues regulatory documents, which either permission an activity or requires some form of action to be taken; these are collectively termed Licence Instruments (LI). Permissions can be given through use of the powers of the licence, or through power, or other means, arrangements made under the relevant LC. a description and demonstration of how duty-holders propose to manage their risk through provision of an adequate safety case or other necessary documentation. ONR employs technical specialist inspectors who assess licensee safety cases and provide advice to the site inspectors who are responsible for issuing regulatory permissions to the site. Paragraph 5.1 below indicates permissions that are scheduled to be issued in 2015/16 and some general criteria for managing permissioning requests are set out in Appendix D.

Setting Safety Standards

- 5.6 To assist ONR inspectors undertaking compliance inspection on sites ONR produces arrangements made under LC should include and aspects of inspecting ONR inspectors in judging the adequacy of safety cases in support of permissioning, and for other activities, ONR has developed its own nuclear safety standards and guidance, in the form of its Safety Assessment Principles and accompanying technical assessment guides. The above ONR standards are compared to and reflect current IAEA and other relevant modern safety standards, setting a high benchmark for levels of safety. This suite of documents is used by ONR inspectors when undertaking their day to day regulatory work. All of the above documents are publicly available through the ONR web-site.
- 5.7 Other safety standards are available to the sites and it is ONR's expectation that these will be implemented so far as is reasonably practicable. These include ACoPs which provide the duty-holders with recommendations on how to comply with relevant regulations, such as the IRRs, REPPiR, MHSWR etc. Other industrial standards such as BS and EN are available and the nuclear community also produce codes of practice in specific areas, which licensees may adopt as relevant good practice.

Stakeholder engagement.

- 5.8 ONR has a policy of openness and transparency in its regulatory activities, including inspections and permissions, and relevant information is made available to the public on its web-site, and through responding to FOI requests or other enquiries. An ONR

inspector will usually attend the local site stakeholder meetings and ONR provides a report on its main activities on a quarterly basis for members of these meetings; these are also available through the ONR web-site.

Priorities for Regulation of Nuclear and Radiological Safety on Site

5.9 intervention priorities for this site are covered by the detail in Appendices A and B.

Site hazards and risks.

5.10 Dounreay currently is decommissioning the Dounreay Fast Reactor (DFR), the Prototype Fast Reactor (PFR) and a number of facilities within Fuel Cycle Area (FCA) associated with fuel reprocessing. Waste management activities are associated with the retrieval, treatment and conditioning of Higher Activity Wastes (HAW) to a form suitable for storage. These operations involve hazards that are considered to be capable of leading to an offsite release of radiation/contamination and to have a potentially significant impact on workers within the facilities, although the overall risk is considered to be low.

5.11 It is possible that some interventions will be led by an Inspector other than the Nominated Site Inspector, and that the relevant intervention project may include a need to carry out associated inspection. Consequently different inspection topics may be pursued during the same visit by different inspectors. Some of these inspections may also utilise specialist inspector resource where necessary. Wherever possible, inspection will be combined to avoid excessive regulatory burden on the licensee. Appendix C contains information in respect of key intervention projects.

Permissions anticipated in 2015/16.

5.12 The following permissioning activity is anticipated during the year:

- Agreement to the installation of a Mezzanine Floor in Alpha Laboratory
- Agreement to the construction of the Unirradiated Fuel Characterisation Facility (UFCF)
- Approval of the revised Dounreay Emergency Plan
- Agreement to active commissioning, Breeder Removal Facility

Longer term risk reduction.

5.13 DSRL intends to characterise and package legacy unirradiated fuels stored on site. This will make this material safe for long-term management, storage and transportation. ONR has formed a team of specialist inspectors to assess safety submissions relating to this project and support its permissioning.

5.14

been cleaned out and demolished and the radioactive waste made safe for long-term storage or disposal.

Other areas of ONR Regulatory Responsibility

- 5.15 Integrating the various inspection, assessment and enforcement functions within ONR provides an opportunity for more efficient and consistent regulation. The following text outlines the other regulatory functions undertaken by ONR and how they may affect the Dounreay site in 2015/16.

Conventional Safety (including Fire).

- 5.16 Licensed nuclear sites in the UK are subject to the Health & Safety at Work Act (HSWA) and its relevant statutory provisions and the Energy Act 2013; regulation of conventional or industrial safety on licensed sites is the responsibility of ONR. In addition, the enforcement of the Reform (Fire Safety) Order 2005 (RRO) and the Fire Scotland Act (2005) is undertaken by ONR. This legislation addresses 'general fire safety precautions' and related fire safety duties, which are needed to protect people in case of fire. ONR employs a team of Fire Safety Inspectors to assess compliance with the two statutes mentioned above, through a programme of audits covering all licensed sites in the UK, which prioritise high occupancy, high fire risk buildings and plant. Themed audits are considered to be the most effective way to directly and formally engage with licensees to confirm compliance with legislation to ensure that the licensees have appropriate management and procedural arrangements in place and t 696s4(o)-7c[(D)0(g)-8(r)-(an)14(g)-96s4(3(si)1(ha)3(em)9p)epI6-96s4()-100(o)13(f4r)-202(i)5

abroad. Approved packages are designed, manufactured and tested to IAEA safety standards; which are adopted worldwide.

- 5.22 There is one CDG compliance inspection planned for Dounreay for 2015/16. In addition Transport Inspectors are currently assessing three packages for use by the site to transport radioactive material, and are engaging with industry concerning the development of a new package design.

Nuclear Security.

- 5.23 The ONR nuclear security team is responsible for approving security arrangements within the civil nuclear industry and enforcing compliance to prevent theft of nuclear or other radioactive materials, the sabotage of nuclear or other radioactive materials or nuclear facilities, and to protect sensitive nuclear information. CNS inspectors monitor compliance against the approved Nuclear Site Security Plan, as required under the Nuclear Industries Security Regulations 2003 (NISR). This is supplemented by targeted announced and unannounced inspections on a routine basis, or as appropriate depending upon performance and risk to security. Joint safety/security emergency exercises on sites are a regular feature of joint programme working arrangements within ONR. In addition, counter terrorist agency plans in response to a security event, and are assessed by a team of security inspectors.
- 5.24 The CNS inspection programme for Dounreay for 2015/16 includes a counter terrorist exercise which will be held in April response to a security event, this will be assessed by a team of CNS inspectors.

ONR Safeguards.

- 5.25 Nuclear safeguards are measures to verify that countries comply with their international commitments not to use nuclear materials (Plutonium, Uranium and Thorium) from their civil nuclear programmes to manufacture nuclear weapons. The International Atomic Energy Agency (IAEA) and the European Commission (Euratom), and it is their independent verification and conclusions on which the role in regulating nuclear safety, security and transport. Safeguards inspections in the UK are performed by Euratom (and in some cases the IAEA). ONR does not determine their scheduling or findings, but ONR Safeguards works with the safeguards inspectorates and the UK organisations being inspected, including by monitoring inspection activities and outcomes and being in a position to intervene if necessary with Euratom, the IAEA and/or the UK organisations concerned to help ensure that safeguards obligations for the UK are met in a proportionate manner and are suitably aligned with other domestic regulatory requirements.
- 5.26 The overarching objective for the DSRL site is therefore successful safeguards implementation including suitably positive follow-up to the routine monthly site inspections performed by Euratom, as reviewed jointly with ONR Safeguards and DSRL. Specific objectives in addition to this include ensuring, with Euratom and DSRL, timely implementation of agreed nuclear material accountancy and safeguards arrangements for the proposed Unirradiated Fuel Characterisation Facility and associated material transfers; and implementation by DSRL of agreed nuclear material accountancy arrangements for supplier obligation accountancy.

6. ONR MANAGEMENT ORGANISATION

- 6.1 ONR operates a process that requires monthly performance reports of progress against delivery of this plan within the DFW programme. In addition, a Sub-Programme Management Group (SMG) exercises oversight of emergent and competing priorities and risks to the delivery of the programme and plans for all MAG&R sites. This oversight includes the consideration of feedback from operational experience. The SMG usually meets once a quarter.
- 6.2 More locally oriented Delivery Management Groups (DMGs) are also established to focus on sites of a similar nature within the MAG&R sub-programme. Significant in-year changes are accommodated as and when they arise, subject to appropriate internal ONR re-prioritisation processes. The plans are also reviewed quarterly to ensure that regulatory attention continues to match any major changes to the hazard on site or following any emerging new safety issues. The normal planning cycle is such that its re-issue and preparation for the next annual cycle starts in the Autumn each year.

Further Integration of Regulatory Responsibilities

- 6.3 By making ONR a Public Corporation the aim is to realise the benefit to be gained by combining previously separate nuclear regulatory functions within one organisation, the so- - ONR is progressively integrating the different functions to the extent practicable. Examples of this include when inspections of mutual interest are due and arrange for one inspection to cover all these interests; continuing with joint safety and security emergency exercises; and involving all regulatory functions in the ONR governance arrangements.

Charging the Licensee for our Regulatory Work

- 6.4 ONR has charged the nuclear industry for licensing related activities for many decades and the Energy Act has widened our ability to recover the majority of our costs. The costs levied on the duty-holders are in proportion to the regulatory effort that the site receives. The charging rate for inspectors varies and is determined by ONR finance department considering a number of factors. For the Dounreay Site the allocation is of 176 days from the nominated site safety inspector plus other inspectors and specialists, including TSC resource, to support both routine and reactive inspections and any necessary assessment in support of issuing permissions or where unexpected safety issues emerge.

APPENDIX A – SITE INSPECTION PLAN FOR THE DOUNREAY SITE - 2015/16

The plan below sets out the areas for ONR inspection, which each plant, or area, on site will be subject to, as well as those aspects of site-wide arrangements. In addition it sets out indicative timings, although there is a degree of flexibility in the plans that allows the Site Inspectors to perform inspection of other activities should the need arise, including reacting to any incidents or events that may have occurred on site.

In addition, planned and reactive unannounced inspections may occasionally be carried out; these inspections may include inspections outside normal working hours. It is the usual practice to advise the licensee, in the preceding month, that an unannounced inspection is due.

The extent of planned inspection is intended to be proportionate to the nature and magnitude of the hazard presented by the facilities and activities on the site.

The plan will be subject to regular review and revision, as necessary, throughout 2015/16.

Dounreay Site inspection Plan

ONR Template	A	M	J	J	A	S	O	N	D	J	F	M	
Site	LC 7	LC11	LC 12 LC 26	LC 11 LC 27 LC 28	LC 14 LC 15 LC 36	SBI 4.1	LC 4 LC 5 LC 7			LC 11 LC 19 LC 20 LC 32 LC 36	SBI 3.1		
FCA/Waste			LC 12 LC 26		LC 27 LC 28		LC 7	LC 22 LC 35	LC 23 LC 24 LC 26				
Reactors	LC 22	LC 36	LC 12 LC 26	LC 27 LC 28			LC 7	LC 22 LC 35	LC 23 LC 24 LC 26				
Other Interventions/Planned Activities	CTX	IRRs	CNS DSG	COHST COFT		CNS DSG	TRANS	CNS	DSG	CNS		ARoS DSG	

SB 3.1 RPV, Cells, ILW Vaults and Tanks, ILW packages

SB 4.1 Essential Supplies

APPENDIX B – ONR INVESTIGATION CRITERIA

The following is taken from ONR guidance to inspectors in determining whether to investigate an incident on a licensed nuclear site.

A. Incidents periodically notified to ONR inspectors.

Where inspectors receive notifications of incidents NOT falling into the categories B-D below, they should ensure that the licensee has addressed the matters raised in accordance with the arrangements made under LC7, and appropriate action in the interests of safety has been taken.

B. All incidents or events that:

- Are rated on the International Nuclear and Radiological Event Scale** (INES) at Level 1 or above by the licensee, whether deemed provisional or final; or
- Are deemed to meet the ONR Publication Criteria, and match one of the following ONR incident categories*: NS01, NS02, NS03, RS01, RS02, RS03, RS05 & RS08.

These incidents or events should be subject to a preliminary investigation on site by an ONR inspector, with the outcome being recorded in their associated report.

C. Any incident or event; where it is immediately evident or where initial enquiries or a preliminary investigation of the circumstances surrounding the incident reveal that: -

- There appears to be a significant challenge, or potentially significant challenge, to nuclear safety;
- It appears there was, or could have been a significant breach of nuclear site licence conditions or other relevant statutory provisions;
- There has been, or there was potential for, a release of radioactivity above, or that approached, the statutory reporting limits;
- There has been, or there was potential for a dose to an individual or group above, or that approached, the statutory dose limits;
- The licensee had acted knowingly in not taking conservative action; or
- There have been a number of incidents that have the same apparent cause.

These events should be the subject of a more formal investigation by ONR and a specific investigation report should be produced.

D. Incidents that do not fall within the above criteria, but give rise to political or public concern, could be subject to investigation and might also result in production of an investigation report as necessary.

ned in a guide which can be found on the website at:-

<http://www.onr.org.uk/operational/inspection/onr-opex-gd-001.pdf>

** International Nuclear and Radiological Event Scale (INES) is a tool for promptly communicating to the public in consistent terms the safety significance of reported nuclear and radiological incidents and accidents. On this scale INES 1 is an anomaly

APPENDIX C – INTERVENTION PROJECTS FOR DOUNREAY SITE - 2015/16

This Annex consists of copies on ONR project scope definition documentation used for management of those Intervention Projects that have been set up to address what ONR has identified as regulatory issues at the Dounreay Site

- MAR 001 Removal of in-DFR breeder material and transportation to Sellafield
- MAR 002 Recovery and treatment of metal coolant from DFR and PFR reactors and ancillary facilities
- MAR 004 Exotic fuels
- MAR 005 DFR and PFR Raffinate and ADU Floc Encapsulation
- MAR 007 Shaft & Silo Retrieval Project
- MAR 058 Management of Higher Activity Wastes
- MAR 066 Dounreay Improvement Programme

Further details of the site specific intervention projects listed above are contained in the following intervention project scope documents.

SECTION 1

INTERVENTION / PROJECT TASK SHEET			
Unique Document ID and Revision No:	ONR-DFW-2015/16 MAR 001 Revision 0	Trim Ref:	
Title:	DSRL removal of in-DFR breeder fuel and transportation to Sellafield		
Site/Facility/Organisation:	Dounreay Site Restoration Limited		
Operational Plan Objective / Strategy Alignment:	DFW Obj No 1. To efficiently and effectively regulate the licensed sites in the DFW Programme, in particular regulating safe decommissioning and the safe management of nuclear liability inventories in accordance with national and international standards		
Project / Task Lead:	Site Inspector		

Scope	
Background	Dounreay retains a significant quantity of legacy exotic fuel, in various forms and in various locations. This intervention concerns the retrieval, repackaging and transport to Sellafield of the remaining in-reactor breeder material from DFR. Investigation has shown that the DFR breeder material and associated furniture is damaged due to reactor operations and therefore the planned retrieval methodology and timescales are being reviewed.
Description of Work	<p>The next stage in in-reactor breeder recovery is active commissioning of plant within the DFR vault, and also of the Breeder Recovery Plant to enable it to receive breeder fuel into its active cell.</p> <p>ONR has been engaging with the licensee, environmental regulators and other stakeholders (NDA, DECC, INS, DRS) for several years and will continue to do so via routine project meetings and site visits.</p> <p>There are interdependencies with the wider materials consolidation project, led by DFW Nuclear Liabilities Regulation, and with the Sellafield, Security and Transport programmes. These are managed through routine communications and by promoting regulatory integration.</p>
Anticipated Outcomes	Implementation of a programme of inspection and other interventions to give assurance that DSRL is taking the required action to complete the hazard reduction in the required timescales. LI 515 issued for out-of-reactor work remains valid.
Assumptions / Uncertainties	<p>What do you need in place for a successful intervention?</p> <ul style="list-style-type: none"> • Access to ONR assessment specialists, to assess the relevant safety cases when they become available. • Routine site visits to inspect readiness to start commissioning and verify the adequacy of commissioning. • Routine project meetings within ONR and with external stakeholders.

Overall Duration**From:** 2015/16**To:** 2020 and beyond

Milestone / Key Deliverables	Target Date	Output
Key inputs from Duty Holder or Potential Licensee	For Planning purposes only	e.g. Assessment, IR/CR, Judgements
Site Visits	As appropriate	
Readiness inspection prior to Active Commissioning	30 June 2015	Intervention Record
Project Assessment Report, Active Commissioning	30 September 2015	PAR
Licence Instrument, Agreement to Active Commissioning	30 September 2015	LI

SECTION 1

INTERVENTION / PROJECT TASK SHEET			
Unique Document ID and Revision No:	ONR-DFW-2015/16 MAR 002 Revision 0	Trim Ref:	
Title:	DSRL Recovery and treatment of metal coolant from DFR and PFR reactors and ancillary facilities.		
Site/Facility/Organisation:	Dounreay Site Restoration Limited		
Operational Plan Objective / Strategy Alignment:	DFW Obj No 1. To efficiently and effectively regulate the licensed sites in the DFW Programme, in particular regulating safe decommissioning and the safe management of nuclear liability inventories in accordance with national and international standards		
Project / Task Lead:	Site Inspector		

Scope	
Background	There are remaining bulk quantities of NaK coolant at DFR and Na coolant at PFR that represent a significant ongoing hazard on the Dounreay site. The principal hazard is fire with associated radiological release.
Description of Work	<p>This intervention is targeted to ensure that DSRL take the required action to retrieve and neutralise the remaining significant quantities of metal coolant in a safe and timely manner. This will be achieved by routine interaction and early engagement with the licensee to gain an early understanding of its intentions and to minimise the amount of formal assessment work required.</p> <p>As part of this intervention there are likely to be international benchmarking opportunities with the French regulatory body ASN and with US regulatory bodies.</p>
Anticipated Outcomes	Implementation of a programme of inspections to gain regulatory confidence in licensee activities.
Assumptions / Uncertainties	<p>What do you need in place for a successful intervention?</p> <ul style="list-style-type: none"> • Access to ONR assessment specialists, to assess the relevant safety cases when they become available. • Routine site visits to inspect readiness to start commissioning and verify the adequacy of commissioning. • Routine project meetings within ONR and with external stakeholders.
Overall Duration	From: 2015/16 To: 2020 and beyond

Milestone / Key Deliverables	Target Date	Output
Key inputs from Duty Holder or Potential	For Planning purposes only	e.g. Assessment, IR/CR,

Licensee		Judgements
Site Visits	As appropriate	
PCSR for PFR residual sodium removal	31 January 2016	PAR & LI
PSR for DFR residual NaK Removal	30 April 2016	Letter
PCSR for KnK sodium treatment	December 2016	Letter
PSR for DFR Mortuary Hole retrieval and transfer	March 2016	Letter

SECTION 1

INTERVENTION / PROJECT TASK SHEET			
Unique Document ID and Revision No:	ONR-DFW-2015/16 MAR 004 Revision 0	Trim Ref:	
Title:	Dounreay exotic fuel		
Site/Facility/Organisation:	Dounreay Site Restoration Limited		
Operational Plan Objective / Strategy Alignment:	Regulation of the safety and management of the front end fuel cycle, disposition of its bi-products and consolidation of historic fuel legacies.		
Project / Task Lead:	Project Inspector		

Scope	
Background	<p>Dounreay retains a significant quantity of legacy exotic fuel, in various forms and in various locations. Some of the fuel is unirradiated and is Cat 1 from a security standpoint. The fuel is not all fully characterised nor suitable for long term storage without further treatment and repackaging.</p> <p>Government policy is that the exotic fuel shall be transferred to Sellafield as part of the materials consolidation project. A key component of this strategy is the proposed Unirradiated Fuel Characterisation Facility (UFCF) which is scheduled to start construction in 2015.</p>
Description of Work	<p>There are four main strands of this intervention:</p> <ol style="list-style-type: none"> 1. Transfer of whole unirradiated sub-assemblies. 2. Conditioning, repackaging and transfer of a range of exotic fuels via the UFCF. 3. Treatment of enriched uranium fuels as ILW for interim storage on site. 4. Transfer of irradiated fuels. <p>ONR has been engaging with the licensee, environmental regulators and other stakeholders (NDA, DECC, INS, DRS) for several years and will continue to do so via routine project meetings and site visits.</p> <p>There are interdependencies with the wider materials consolidation project, led by DFW Nuclear Liabilities Regulation, and with the Sellafield, Security and Transport programmes. These are managed through routine communications and by promoting regulatory integration.</p>
Anticipated Outcomes	<p>The anticipated outcomes are:</p> <ul style="list-style-type: none"> • Oversight of the start of sub-assembly repackaging and transfer. • Permissioning the construction of the UFCF.

	<ul style="list-style-type: none"> • Implementation of a programme of fuel characterisation and repackaging in the UFCF, and of management of irradiated fuels. • UFCF commissioning proposals that are fit for purpose. 	
Assumptions / Uncertainties	<p>What do you need in place for a successful intervention?</p> <ul style="list-style-type: none"> • Access to a dedicated team of ONR assessment specialists, to assess the relevant safety cases when they become available. • Routine site visits to inspect readiness to start construction and commissioning, and verify the adequacy of plant construction and commissioning. • Routine project meetings within ONR and with external stakeholders. 	
Overall Duration	From: 2011/12	To: 2020 and beyond

Milestone / Key Deliverables	Target Date	Output
Key inputs from Duty Holder or Potential Licensee	For Planning purposes only	e.g. Assessment, IR/CR, Judgements
Site Visits	As appropriate	
Construction of mezzanine floor in alpha laboratory	July 2015	LI and PAR
Construction of UFCF	September 2015	LI and PAR
Readiness inspection prior to Active Commissioning of UFCF	31 December 2016	Intervention Record
Active Commissioning of UFCF	31 March 2017	LI and PAR

SECTION 1

INTERVENTION PROJECT SCOPE / TASK SHEET		
Unique Document ID and Revision No:	ONR-DFW-2015/16 MAR 005 Revision 1	Trim Ref:
Title:	DFR and PFR Raffinate and ADU Floc Encapsulation	
Site/Facility/Organisation:	Dounreay Site Restoration Ltd.	
Operational Plan Objective/Strategy and Safety Issue	DFW Obj No 1. To efficiently and effectively regulate the licensed sites in the DFW Programme, in particular regulating safe decommissioning and the safe management of nuclear liability inventories in accordance with national and international standards- DFR and PFR raffinate and ADU Floc are currently in liquid form in ageing tanks with ageing structures and need to be immobilised into safe passive state for long-term storage (1706)	
Project / Task Lead:	Site Inspector	

Scope		
Background	A number of waste-streams resulted from reprocessing activities at Dounreay	
Description of Work	Early engagement on proposals for ADU Floc and PFR raffinate encapsulation. Proportionate assessment of safety submissions.	
Anticipated Outcome	Waste encapsulated into a passively safe state suitable for long-term storage.	
Assumptions / Uncertainties	None	
Overall Duration	From: April 2015	To: 2017

Planned Project Milestone Description	Target Date	Output / Deliverable
ADU floc PCSR submission	September 2015	
Targeted Assessment	December 2015	Release of Hold Point
ADU floc POSR submission	August 2017	Letter
PFR Raffinate PSR submission	December 2015	For information
PFR Raffinate PCSR submission	November 2016	
Assessment Complete	February 2017	Release of Hold Point
PFR Raffinate PCmSR submission	TBC	Release of Hold point

SECTION 1

INTERVENTION PROJECT SCOPE / TASK SHEET		
Unique Document ID and Revision No:	ONR-DFW-2015/16 MAR 007 Revision 1	Trim Ref:
Title:	Shaft and Silo Retrieval Project	
Site/Facility/Organisation:	Dounreay Site Restoration Ltd.	
Operational Plan Objective/Strategy and Safety Issue	DFW Obj No 1. To efficiently and effectively regulate the licensed sites in the DFW Programme, in particular regulating safe decommissioning and the safe management of nuclear liability inventories in accordance with national and international standards	
Project / Task Lead:	Site Inspector	

Scope		
Background	The shaft was used for disposal of ILW from 1959 until 1977 when a gas-phase explosion above the waste damaged the concrete covers. The wet silo was used for disposal of ILW from 1971 until 1998. The waste is not in a safe passive form and the decision was taken to retrieve the waste and condition it.	
Description of Work	Early engagement as design develops and assessment of safety submissions to determine adequacy.	
Anticipated Outcome	Waste conditioned into a passively safe form suitable for long term storage	
Assumptions / Uncertainties	None	
Overall Duration	From: April 2015	To: September 2027

Planned Project Milestone Description	Target Date	Output / Deliverable
Revised PSR Submission Scoping Assessment Complete	January 2016 May 2016	Letter
Effluent treatment Plant PSR/PCSR Assessment Complete	March 2016 June 2016	Release of hold Point
PCSR Shaft submission Assessment Complete	August 2017 March 2018	LI
PCSR Silo submission Assessment Complete	August 2017 March 2018	Release of Hold Point
PCmSR Shaft submission	July 2019	Release of Hold point/LI
PCmSR Silo submission	July 2019	Release of Hold Point

INTERVENTION PROJECT SCOPE / TASK SHEET

Unique Document ID and Revision No:	ONR-DFW-2015/16 MAR 058 Revision 1	Trim Ref:	
Title:	Management of Higher Activity Waste (Replaces ONR-DFW-2014/15 MAR 009 Revision 1 and ONR-DFW-2014/15 MAR 006 Revision 1)		
Site/Facility/Organisation:	Dounreay Site Restoration Ltd.		
Operational Plan Objective/Strategy and Safety Issue	DFW Obj No 1. To efficiently and effectively regulate the licensed sites in the DFW Programme, in particular regulating safe decommissioning and the safe management of nuclear liability inventories in accordance with national and international standards		
Project / Task Lead:	Site Inspector		

Scope	
Background	DSRL proposes to convert D3110 LLW store for interim storage of HAW and build a new store for long-term storage of shielded containers and an extension to DCP store for long-term storage of unshielded containers
Description of Work	To assess the suitability of waste packages and stores design and operation to maintain integrity of waste packages and demonstrate that they remain passively safe.
Anticipated Outcome	Accumulation of HAW in facilities suitable for long-term storage
Assumptions / Uncertainties	None
Overall Duration	From: April 2015 To: 2019

Planned Project Milestone Description	Target Date	Output / Deliverable
RHILW Strategy Accepted		
PCSR Interim Drum Store Submission	December 2015	
Targeted Assessment	March 2016	Release of hold point
PSR/PCSR DCP Store Extension Submission	March 2016	
Targeted Assessment	June 2016	Release of hold point
PSR Unshielded Store	2016	

INTERVENTION PROJECT SCOPE / TASK SHEET			
Unique Document ID and Revision No:	ONR-DFW-2015/16 MAR 066 Revision 1	Trim Ref:	
Title:	Dounreay Site Improvement Plan		
Site/Facility/Organisation:	Dounreay Site Restoration Ltd.		
Operational Plan Objective/Strategy and Safety Issue	<p>DFW Obj No 1. To efficiently and effectively regulate the licensed sites in the DFW Programme, in particular regulating safe decommissioning and the safe management of nuclear liability inventories in accordance with national and international standards.</p> <p>As part of maintaining a high standard of nuclear safety DSRL must ensure similar standards of safety culture and compliance on the site.</p>		
Project / Task Lead:	Site Inspector		

Scope		
Background	The covering letter to the issue of the PFR Tank Farm Improvement should be promulgated across site. Dounreay has appointed a Dounreay Improvement Team to facilitate cross-site improvements in conduct of operations, compliance and safety culture.	
Description of Work	L&MfS specialist support for regulatory interventions associated with the Dounreay Improvement Programme.	
Anticipated Outcome	Sustained improvements in compliance and safety culture	
Assumptions / Uncertainties	None	
Overall Duration	From: April 2015	To: March 2016

Planned Project Milestone Description	Target Date	Output / Deliverable
Interim Assessment of Progress	September 2015	File Note
Final Assessment of Progress	March 2016	File Note

APPENDIX D – PERMISSIONING RESPONSE STANDARDS FOR MAG&R SITES

Cat 1/A Mod: Normally s typically an Agreement, or an Acknowledgement if a similar proposal has been previously assessed as satisfactory and circumstances have not changed in the meantime.

Cat 2/B Mod: Subject to a derived powers LI or permission through other means following ONR assessment and guidance, or judgement, that: -

- There is some doubt over its categorisation.
- There is doubt over adequacy of licensee arrangements.
- The proposal is contentious or novel in safety terms.
- It is made under arrangements that have not been utilised for some time, e.g. if a new building is the first to commission for many years and it is considered necessary to examine the efficacy of the LC21 arrangements.

NB: A Category 2/B proposal would not normally be called-in on the basis of its safety categorisation alone.

Category 3/4 or C/D Mod Proposal: may be called-in if deemed necessary and treated like a Category 2/B modification.

Indicative ONR Response Times to Licensees' Proposed Activities

Re-licensing application:	6 months
Consent application under LC:	3 months
Approval of Arrangements under LCs	3 months
Agreement application under LCs:	3 months
Category 1/A modification proposal to Plant, Organisation or Safety	
Case - Acknowledgment/Agreement under LC Arrangements:	3 months
Notified/Specified Category 2/B Mod for Acknowledgement/Agreement	
Under LC arrangements:	3 months
Notified/Specified Cat 3/4 or C/D Mod for Acknowledgement/Agreement	
under LC arrangements :	1 month
Where ONR does not intend to examine a submission under FP arrangements	1 month
Cat 2/	In 28 Days
Periodic safety review submission:	12 months
De-licensing application:	12 months

ANNEX 1 – DFW STRATEGY & MAG&R ACTIVITIES

The table below contains information relating to the DFW Strategy and the objectives and desired outcomes which are directly relevant to the MAG&R sub-programme, with an associated commentary on the MAG&R activities contributing to delivery of these strategic outcomes.

Ref	Strategic Objective and desired outcome	MAG&R Activity
1. To efficiently and effectively regulate the licensed sites in the DFW Programme, in particular regulating safe decommissioning and the safe management of nuclear liability inventories in accordance with national and international standards.		
1.1	Definition of appropriate end-states for all DFW sites.	This will be incorporated into compliance inspection carried out against LC 35. Working with strategy colleagues to support development of interim and final end-state criteria. In addition permissioning the transition into Care & Maintenance for the defueled Magnox reactors.
1.2	Licensees develop and implement coherent strategies for decommissioning and dismantling nuclear facilities in a manner that progressively reduces hazards and is in accordance with relevant national and international standards.	This will be covered by compliance inspection informed by ONR guidance (see paras 5.7-5.10 below) and by benchmarking work through international exchange agreements with other national regulators, as appropriate.
1.3	Duty-holders maintain effective organisational capability and resilience, including strong leadership and management for safety, which encompasses effective internal challenge.	This is covered by specific intervention projects and compliance inspections using an inspection approach that is proportionate for lower hazard sites. In addition an approach developed by L&MfS specialists to focus on the importance of an effective safety culture.
1.4	Licensees have effective learning from experience processes so that good practice is promulgated throughout the industry.	Targeted intervention projects and LC7 inspections will address these aspects.
1.5	Decennial Periodic Reviews of Safety (PSR) are undertaken in a proportionate manner and in the light of reducing hazards and risks.	This will be covered for MAG&R sites through LC15 inspections and site specific and corporate interventions to provide confidence that PSR are proportionate to the stages of the lifecycle of the facilities.
1.6	decommissioning conditions including for Care & Maintenance (C&M) of Magnox reactors for the period prior to final dismantling and site clearance.	Specific intervention projects; notably engagement with Magnox and assessment of the safety case and organisational arrangements proposed to transition Bradwell into the C&M phase.
2. Regulating shutdown Magnox reactors in defuelling safely, in preparation for transition into the decommissioning phase.		
2.1	A comprehensive and systematic verification process is implemented to confirm that reactors are free from irradiated fuel.	To ensure that the successful verification and our inspections of the Chapelcross and Sizewell arrangements are applied at Oldbury.
2.2	Licensees ensure that SSC that may affect safety are maintained through changes of lifecycle phase until no longer demanded by the safety case.	Through LC 22, 27 & 28 inspections at Oldbury.
3. Regulation of the safety and management of the front end fuel cycle, disposition of its bi-products and consolidation of historic fuel legacies.		
3.2	material remaining from legacy research and reactor operations is conditioned, packaged and consolidated in a safe and	Support to the DFW project through site specific intervention projects at Dounreay and Harwell aimed at UK Materials Consolidation.

	secure manner.	
4. Influence Government, NDA and SLCs in development of strategies for safe management of nuclear liabilities (materials, spent fuel, and radioactive waste), decommissioning and contaminated land, including timely hazard reduction and the definition of end-states.		
4.1	A coherent, transparent strategy (and its implementation) for influencing and regulating the safe and secure storage, conditioning and disposition of radioactive waste inventories	Led by the Strategies sub-programme. MAG&R to provide any support where necessary and to regulate progressive safe hazard reduction at the MAG&R sites.
4.6	Effective regulatory influence of NDA and other regulatory bodies in the development of decommissioning and radioactive waste management strategies.	Support to the Strategy sub-programme and engagement as necessary with NDA representatives to ensure nuclear safety is not being unduly compromised by proposed changes in strategies.
5. Licensed nuclear sites regulated by the MAG&R sub-programme are compliant with their legal obligations and make improvements to safety where necessary.		
5.1 to 5.5	MAG&R sites are compliant with the NIA 1965; REPPiR; IRR99; EIADR; NISR2003 and the Regulatory Reform (Fire Safety) Order etc.	Addressed through delivery of the site specific integrated intervention plans.

ANNEX 2 – NOTES ON INSPECTION METHODOLOGY APPLIED FOR LOWER HAZARD SITES

1. This Annex provides further information on the way in which the inspection plans for the Magnox & Restoration sites are derived, recognising the need to be proportionate to the lower radiological risks and hazards presented by these sites.
2. A new inspection methodology was devised within the DFW programme and implemented during 2012/13. ONR has reviewed and revised its approach following feedback on its use. In addition an ONR-wide review of approaches to compliance and permissioning inspection had been completed. This Annex summarises the approach ONR has now adopted in developing the site specific inspection plans and underpins consistently proportionate and targeted regulation to the 12 decommissioning sites in the MAG&R sub-programme. The methodology for inspection seeks to achieve two things:
 - To define an approach which enables inspectors to plan and undertake proportionate inspections with a strong emphasis on outcome.
 - To provide a framework for prioritising regulatory attention and securing appropriate resource.

Potential Inspection Topic Areas

3. The inspections undertaken by ONR are aimed at providing assurance based on evidence that workers and the public are protected from any nuclear or radiological hazards at licensed sites. It is often helpful to the inspectors when seeking to judge the to undertake their inspections in certain broad topic areas. These areas provide a framework for planning inspections within which relevant Licence Conditions can be addressed on an individual or group basis. The inspections may be grouped in the following six areas;
 - Sound plant and site leadership and management, with a good safety culture across and within the whole site, including the contractors;
 - Effective management of decommissioning and radioactive waste;
 - Systems Inspections - Implementation of preventative and protective measures identified in adequate and up-to-date safety cases that ensure that the plant remains tolerant to design basis events;
 - A good reporting culture and effective OEF processes;
 - Measures for dealing with abnormalities, emergencies and beyond design basis events that are in place and routinely tested; and
 - Effective internal self-regulation and management systems.

Further information on the attributes included for examination during the above inspections can be found below.

4. The actual manner in which Licence Conditions are grouped into the thematic areas during an inspection is at the discretion of the individual inspector. However, there are certain principles that the inspector takes into account when drawing up, or modifying their plans. One aim of the plan is to inspect the following LCs usually at least once a year ie 7, 10, 11, 12, 22, 23, 24, 28, 32, 34, 35 and 36, these LC are considered, for the MAG&R sites, to represent the most significant to examine in the interests of nuclear safety. In addition there is a commitment to undertake systems inspections and to cover all the relevant systems on the site over a 5 year period; the framework for Systems Inspections is outlined in ANNEX 3 below. Finally there is a general expectation that all LCs will be subject to at least one inspection in any 5 year rolling period. The number of these inspections in any one year is dependent on the lifecycle stage that the site has reached, and the extent of the activities on the site, and ultimately when decommissioning is largely complete or a site is in care and maintenance the amount of inspection by ONR will be significantly reduced in proportion to the residual hazard.

Inspection Attributes for the 6 topic areas

- 1 Sound plant, site and SLC leadership & management with a good safety culture across and within the whole site, including the contractors, which can be judged against the extent to which the following apply:
- Managers make conservative decisions and set high standards that are both reinforced verbally and by actions during routine plant visits.
 - Workers demonstrate commitment to observing site norms and standards and are all, including contractors, treated in an equitable manner.
 - Senior managers create an environment of mutual respect and are open and honest with staff and they value the work of the safety representatives, and promote an open reporting culture to support learning from experience.
 - Roles and associated competence requirements are clearly defined and sufficient resources allocated to safety related roles.
 - Challenges and deficiencies are addressed positively, promptly and effectively and associated acquired knowledge channelled into continuous improvement at all levels in the organisation.
 - Workers are actively supported through effective training, mentoring and coaching.

Inspection of the above may include licence compliance inspection of: LC 10, LC 17, LC 26, LC 36 and MHSWR.

- 2 Effective management of decommissioning and radioactive waste, which can be judged against the extent to which the following apply:
- The licensee minimises waste accumulations on site, from operations and decommissioning activities, it adopts the established hierarchy for waste.
 - The site has an up-to-date Integrated Waste Strategy (IWS), where relevant, that reflect UK [or devolved] Government policy. Decommissioning programmes secure a progressive reduction in hazard.
 - Where applicable, effective radioactive waste management safety cases are in-place.
 - Proposals for Waste Package design, where relevant, should align with relevant good Management Directorate.
 - The licensee actively includes multi-agency dialogue on radioactive waste strategy.

Inspection of the above may include compliance inspection of LC 32, LC 34 and LC 35

- 3 Systems Inspections - Preventive and protective measures identified in adequate and up-to-date safety cases that are implemented in practice to ensure that the plant remains tolerant to design basis events, which can be judged against the extent to which the following apply:
- The fault schedule has been properly developed, relevant faults selected, and associated protective/preventive measures examined and found to be adequate (specialist expertise may be necessary for this).
 - Workers are aware of which Structures, Systems and Components (SSCs) have safety functions.
 - Plant maintenance and modification arrangements ensure that the functionality of SSCs is not compromised.

Inspection of the above usually include compliance inspection of LC 10, LC 23, LC 24, LC 27, LC 28 & 34

- 4** A good reporting culture and effective OEF processes, which can be judged against the extent to which the following apply:
- Licensee has an active reporting culture, recording and investigating and trending events and identifying and implementing corrective actions to help prevent recurrence ie an effective OEF process.
 - Staff and managers actively pursue and address organisational learning opportunities from all relevant sources.

Inspection of the above may include compliance inspection of LC 7, LC 17 & MHSWR

- 5** Measures for dealing with abnormalities, emergencies and beyond design basis events are in place and routinely tested, which can be judged against the extent to which the following apply:
- Plant operators are routinely assessed on their ability to deal with abnormal/unusual events and occurrences.
 - HIREs are in date and have been assessed by ONR as acceptable.
 - preparedness arrangements.

Inspection of the above may include compliance inspection of LC11 and REPPIR.

- 6** Effective internal self-regulation and management systems, which can be judged against the extent to which the following apply:
- A person has been allocated responsibility for the internal challenge function.
 - Site oversight of compliance is effective and the site routinely reviews its own compliance status and initiates effective remedial action when necessary
 - Considerations by the Nuclear Safety Committee and any other safety advisory group are routinely reported to ONR, and that their advice is acted upon.

Inspection of the above may include compliance inspection of LC 13, LC17 and MHSWR.

ANNEX 3 – SYSTEMS BASED INSPECTIONS - SAFETY FUNCTIONS AND SYSTEM GROUPINGS

1. Introduction

The listing below is intended to represent a summary of the key nuclear safety functions and related structures and systems identified in facility safety cases, which contribute to plant operations being carried out within identified operating limits and conditions. The systems are grouped into five areas representing the main safety functional requirements taken from the safety cases and as included in IAEA standards.

2. Safety Functional Requirements and Associated Safety Structures and Systems

Control of Reactivity (S1)

- 1) CIDAS.
- 2) Shielding/Radiation Monitoring and Operator claims and actions.
- 3) Management Controls (for non-geometrically safe plant).

Cooling (S2)

- 1) Cooling provisions for plant and equipment or stored material, including by natural circulation.

Confinement of Radioactive Material (S3)

- 1) Materials Containment - RPV, Active Cells, LLW/ ILW Vaults, LLW/ILW Tanks and LLW/ILW Waste Packages.
- 2) Gloveboxes /Modular Containment.
- 3) Civil Structures (e.g. ponds, reactor halls, fuel cycle buildings).
- 4) Furnaces / Kilns.

Safety Support Systems (S4)

- 1) Essential Supplies (eg Electrical, Compressed Air, Inert gas).
- 2) Fire Protection (Compartments, Detection & Suppression).
- 3) Heating Ventilation & Air Conditioning (HVAC) in support of containment or for plant control rooms.
- 4) Nuclear Lifting and Handling (eg Cranes, hoists, fuel/waste handling machine).

Site Wide Systems (S5)

- 1) Emergency Arrangements Equipment (eg radios, PA tannoy, vehicles, EPGMS and other monitoring instrumentation).

Notes:

1. Safety system descriptions: Safety System(S)/Grouping/System Number eg: S1.1 = CIDAS.
2. Cooling Systems S2.1 engineered process cooling systems are not generally claimed by the safety cases for Magnox & Restoration sites, however cooling of ancillary equipment or to protect persons may be needed and these are included if required by the plant safety case.