

# Dounreay Report

## May 2018

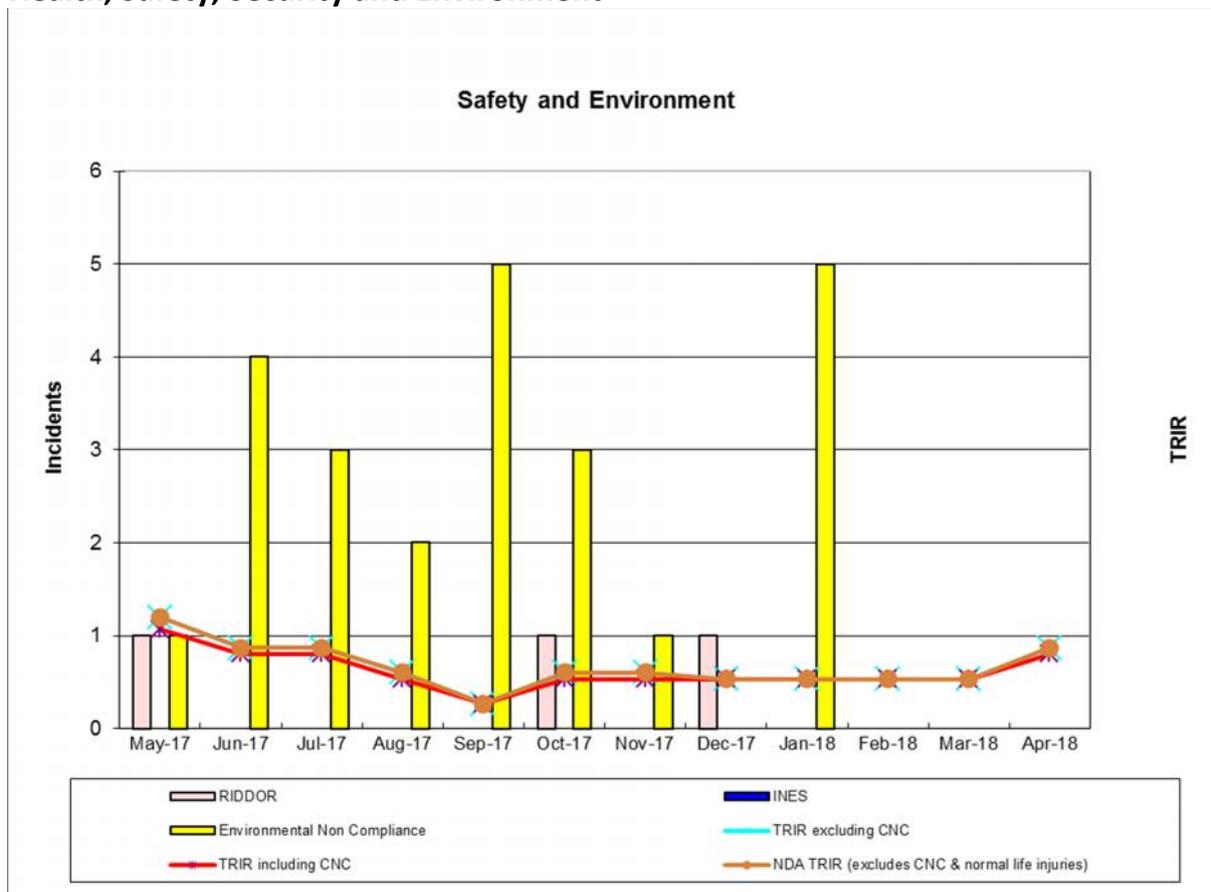
DSG(2018)P010

### Site decommissioning programme

During the remainder of the 2017/18 financial year, the site’s delivery priorities continued to be the exotics programme, breeder removal and improved resource utilisation – always ensuring that work is undertaken in a safe, secure and environmentally responsible manner. Work continues to develop a revised lifetime plan for the remainder of the programme taking account of the prioritisation and additional scope for the exotics programme. Submission to the Nuclear Decommissioning Authority (NDA) is planned for the summer, with approval expected later in the year. The new plan will facilitate production of a single credible programme which the site can get behind and deliver.

NDA has provided Dounreay with additional funding of £30M for 2018/19 providing an annual site budget of around £205M. Following completion of the un-irradiated exotics programme funding is expected to return to the planned assured funding (the level specified in the contract) of around £176M/year (not including inflation).

### Health, Safety, Security and Environment



- )] At the time of going to print, it has been more than 200 days since a lost time accident and the site's total recordable incident rate is 0.13.
- )] During December a noise was heard from a crane used to support breeder removal from Dounreay Fast Reactor. The area was made safe and, following an investigation involving alignment checks, a 1 metre crack in a crane rail was identified. This has been reported to regulators as a RIDDOR Dangerous Occurrence. A Level 3 investigation was convened. Since then, a significant work has been undertaken to repair and replace parts, with the crane expected to be back in service very soon.
- )] As reported to the last DSG meeting, in February an individual undertaking routine personal monitoring when exiting an area of the site detected some contamination. The individual underwent decontamination procedures by Occupational Health where the dose was assessed as low. The regulator was informed, the individual was able to return to work and has no level of detectable contamination. An investigation is being undertaken.
- )] SEPA has confirmed there were no environmental non-compliances for February 2018, however in January 2018 a routine weekly sample of effluent taken from a milliscreen returned a suspended solids resulting in a breach of limit. In March 2018 DSRL received a warning letter from SEPA related to the way a specific repair was undertaken on an extraction system. Such events are taken very seriously and, as it relates to an event in mid-2017, steps have already been taken to address the situation.
- )] SEPA's 2016 end of year compliance assessment report was published and reported in the media. The overall score for Dounreay represents the culmination of all the individual reports and non-compliances that have been reported via the Dounreay Stakeholder Group. A substantial amount of work has been undertaken by the site team during the last year and considerable progress has been made. While SEPA has not yet published its scores for 2017, it is understood that scores have improved (vaults rating moved up 4 steps to excellent, while the main site has also improved from 'at risk' to 'broadly compliant'). There remains more work to do and more investment has been committed during 2018/19.
- )] Commitments made to SEPA to carry out walk downs of all site ventilation ducting/systems and identify any areas of concern were completed ahead of schedule.
- )] The site has received a British Safety Council international safety award with merit.
- )] The annual review of safety and security took place in March 2018 and ONR made positive comments about the progress being made.

- ) The site received a positive response from ONR relating to the emergency response, policing and guarding interventions and CNC response model testing which was undertaken by ONR recently.
- ) CNC (Civil Nuclear Constabulary) has launched Project Servator both on site and in the local community. Presentations have been provided to the Dounreay Stakeholder Group and the site's workforce. Project Servator is designed to deny, detect and deter hostile activity while providing a reassuring presence for workforce and local community. Primarily introduced by the City of London Police in 2014, the aim is to develop a network of vigilance amongst the workforce, members of the public, local community businesses and retailers within the surrounding area raising aware of how to report any suspicious activity.

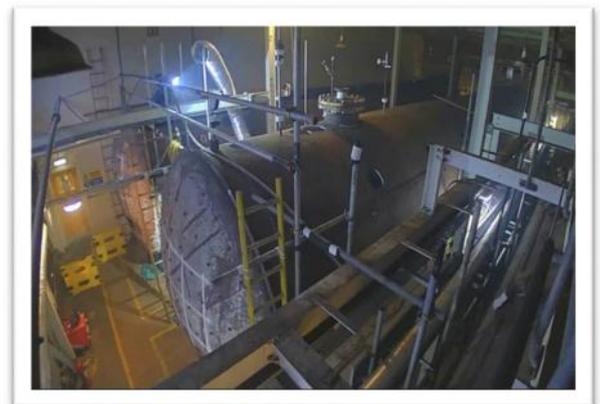
### Site performance

Appendix 1 provides information of the key project milestones for 2017/18 and also provides the project milestones for 2018/19. Specific performance achievements are outlined below.

### Reactors

- ) Active commissioning for the processing of PFR raffinate has been successfully completed. This is the highest single hazard that remains at the site, and starting to immobilise that liquid waste is the result of two years of work for the team since they completed processing DFR raffinate. Read more: <https://dounreay.com/2018/03/solid-success-dounreay-team>.

- ) Four of the PFR sodium tanks are now undergoing decommissioning. The first two, each 18 m long, have now been cut up and removed. After removing the high hazard residual sodium, the steel plates were then size reduced using gas burning cutting techniques. The 50 tonnes of steel were then removed from site and recycled. This work was carried out by Nuvia, with sub-contractors JGC, Donn's and Gunns.



- ) Trials continue for in-reactor tooling for PFR with tool 6 testing completed. In January, a fuel element carrier grab has been designed and manufactured to enable the removal of 37 carriers that are within PFR. This was the 4<sup>th</sup> reactor dismantling tool to be designed, delivered and successfully trialled during last financial year. The image shows the tool during final trials at the PFR cell 2 trial facility.



- ) An 84" flask was transferred to its adaptor value at the primary cold trap loop (PCTL) within PFR using a 125-tonne crane. Once the seals have been successfully tested, the PCTL basket will be raised into the flask for the next stage of decommissioning.
- ) At DFR, decommissioning the pond continues with a further 7 blocks now removed from the second row while preparations for review of the removal project and design of the improved block equipment underway. The BPM has been completed and approved.
- ) Around a decade ago, work started to pull apart a host of support facilities associated with Dounreay's oldest reactor (DMTR). The radioactive facilities included a cooling pond, storage compound and examination cells which support the Dounreay Materials Test Reactor during its operational life. All have now been safely stripped out, culminating in the support building itself being removed from the landscape. The final demolition included removal of a 27-tonne crane and several hundred pieces of cladding. Work to dismantle the inside of the structure saw remotely operated Brokks being deployed as well as a mobile crane which lifted 26 tonne shielded doors out through the roof.

### **Fuel Cycle Area**

- ) During February, the FCA took part in a progress review with representatives from the parent body organisation. The review team recognised the significant decommissioning activities achieved by the workforce and also discussed the opportunities and challenges going forward.
- ) **D1204:** The D1204 team has safely completed the removal of the medium active cell and shielding.
- ) **D1217:** The loading bay access doors and hatches have all been removed, with the inlet HEP filter banks also removed. The internal walls have also been demolished. The electrical services have been relocated and space extract ventilation now installed.
- ) **D2001:** The design for the new access cover for the Carbon Bed Filter has now commenced.

### **Fuels**

- ) Good progress continues to be made to remove nuclear fuel from the site. Advice has been provided to community representatives that they may see a strong security presence before and during the next phase of transports. This is normal for nuclear materials with a high security rating. We apologise for any temporary inconvenience caused by these planned measures.

### **Waste**

- ) The BPM (Best Practical Means) for the LLW pits is currently being updated. SEPA has indicated this is a requirement to allow them to review how DSRL proposes to improve

the radionuclide containment as required by the Site RSA Authorisation. An updated LLW Pits monitoring plan will be submitted to SEPA shortly.

- ) With regards to the new low level waste facilities, an updated Operational Management Plan for D3100 is being submitted to SEPA and DSRL are currently updating the Monitoring Plan.
- ) During March 2018 710 drums of low level waste were size-reduced, further reducing the backlog of drums to be conditioned.
- ) The area intended to be reused to construct a store extension has now been capped. This follows a number of activities relating to the groundworks including the pouring, spread and levelling of concrete by local contractor, Gunns.
- ) A contractor was on site during March presenting the findings of a feasibility study for a proposed new waste handling facility in a waste-led workshop. They revisited a number of areas across the site and considered opportunities for optimisation of low level waste, and the management of bulk metals to accelerate decommissioning. The workshop will produce a case for change for approval.
- ) Initial scoping of the works required to confirm the physical and radiological characterisation of 'historical' and 'legacy' containerised wastes currently stored in D3110 Low Level Waste (LLW) store commenced at the end of April.



### **Shaft and silo**

- ) A technical note and proposed programme for upgrades for the shaft groundwater monitoring has been submitted to SEPA and further discussions have taken place. The technical specification is now being prepared in support of tendering for the work.

### **The Interim End State Delivery Team**

- ) The Environmental Closure and Demolition (ECD) department has been renamed and is now called The Interim End State Delivery team (IESDT) to reflect the role of the team in supporting all projects prepare for a compliant end state.
- ) The Phase 3 planning application is being processed and the council is reviewing consultation responses. The application is on schedule and it is expected that the council will make a decision in June 2018. Planning meetings with the council and SEPA are ongoing while the application is processed. The NDA is developing a UK wide planning strategy for final site end states and DSRL is providing support.
- ) Following an internal workshop to identify opportunities to optimise the site end state where over 100 potential, high level, opportunities were identified a paper reflecting the outcome of the workshop was presented to an internal committee for review. Subject



to some minor amendments the NDA endorsed the paper and associated implementation programme. In addition, a presentation was provided to SEPA in March on the work undertaken, to date, to refine the Dounreay end state. Two reports have been submitted to SEPA seeking comments on the developed Environmental Reference Concentrations for Groundwater.

- ) Primary legislation is required to facilitate the Proportionate Regulatory Control of Nuclear Licensed sites. As a result of Brexit, there may be delays in passing the requirement legislation through Parliament.
- ) As previously reported, SEPA's GRR Guidance Requirements for Release of Nuclear Sites from Radioactive Substances Regulation will not now be published in December 2017 as previously believed. It is understood that the current publication is now May 2018.

### **Particles**

- ) In November, DSRL's Environmental Review Committee considered a report on existing work and data relating to the particles project. This report will feed into the BPEO review and recommendations will be identified via the BPEO. The Committee concluded that whilst the report contained good analysis it may not have fully captured/considered all previous work undertaken or taken full account of technical discussions between DSRL and PRAG(D) during the off-shore particle recovery projects. DSRL is therefore collating and reviewing this additional information and further internal discussions are continuing which will result in an update to the document.
- ) Since 1 December 2018 to 31 March 2018 particles were detected and removed from:
  - o Sandside Beach (1 relevant)
  - o Dounreay Foreshore (7 significant, 3 relevant).
- ) There had also been coverage in the local media about the reporting of particles. Addressing the legacy of particles is an important part of the ongoing programme. The article had been written because data relating to a particular isotope was included in reports for Sandside beach, which ensured consistency with the level of data already published for the nearby Dounreay foreshore. The isotope in question, Americium-241, has always been part of the analysis of particles with levels always near, or below detection limits. There was no regulatory requirement to report this additional information, but it was published to ensure full transparency and consistency.

As previously reported, a particle was found on the Dounreay foreshore in December 2016 that was not similar to the particles normally detected and removed. SEPA requested that the particle be sent to Stirling University for further examination and they have now completed their work and returned the particle to site. DSRL has recently received proposals for micro-destructive chemical analysis of this particle and will be selecting a preferred proposal in consultation with SEPA.

### **Heritage**

- ) The Dounreay Heritage Strategy was published in 2010 and is managed by the DSRL Heritage Officer with advice from a panel of external experts from Historic Environment

Scotland, National Museums Scotland, Caithness Horizons, Highlife Highland & the Nuclear Decommissioning Authority. The Heritage Advisory Panel held its 8<sup>th</sup> meeting on 17 November 2017 in Inverness.

- ) Fourteen objects were donated to the Caithness Horizons museum in Thurso during 2017/18 with an additional 17 heritage objects collected throughout the year. The star attraction at the Caithness Horizons museum continues to be the original control room from the Dounreay Materials Testing Reactor (DMTR). The reactor went critical 60 years ago on 24 May 1958.



- ) Four Dounreay apprentices have been working with Caithness Horizons and the V&A Dundee museum, on the Scottish Design Relay project to create a prototype for display in the museum. <https://www.vandadundee.org/news-and-blog/news/vanda-dundee-launches-the-scottish-design-relay>. The Dounreay team created designs for a travel app called “WilderNess”, which would provide access to a bank of local attractions, including secret beaches, places to eat and historic sites; enabling users to create their own personal trip. The app would link to social media accounts like Facebook, so notifications from nearby businesses could be accessed during the adventure.

- ) A number of recordings and transcripts were handed over to the Caithness Archive at Nucleus. These were recorded by James Gunn, Heritage Officer, over the last 6 years and feature former Dounreay employees and members of the public. All have recording agreement forms signed by each interviewee. Historians and researchers have already started to use the recorded information for their studies. A process to capture the memories of those leaving the site is in place and 17 forms were completed and returned.

- ) Past and present employees, plus members of the public were interviewed by BBC Radio Scotland for a social history programme called “Our Story”. It covered current impressions and past memories of the impact that Dounreay had on Caithness.

- ) The University of the Highlands and Islands has two on-going doctoral studies that cover Dounreay and the nuclear industry. The thesis titles are: *“The Dounreay Nuclear Establishment and its impact on the Northern Highlands of Scotland”* and *“Archiving a nuclear past: exploring the nuclear energy industry and its community impact in Britain.”*

- ) A number of NDA, Dounreay and local stakeholders attended the official opening of Nucleus by Her Royal Highness the Princess Royal. The event was hosted by NDA Chief Executive David Peattie.



## Commercial

- ) A number of contracts have been awarded including:
  - o ICT Systems Maintenance and Services
  - o Framework agreement for minor design services

- Manufacture of Applications Tools for PFR
- Framework agreement for scaffolding

) A number of major procurements are presently running including the construction of the DCP store extension, DMTR demolition, and decommissioning services framework. These are currently going through the procurement process. The site will be holding a supplier's day in May 2018 for those on framework contracts to meet with site project managers.

## General

### Staffing (as at end of March 2018)

	FTE Target	FTE Actual /Forecast
<b>Current - DSRL</b>	1,061 (LTP)	1,169.0
<b>Current – ASW</b>	N/A	117

March 2018: 2 new starts

) **Voluntary redundancies:** The programme of voluntary redundancies continues. By the end of June, 121 volunteers are expected to have left the organisation with a further 23 following during the next 12 months. Knowledge transfer plans are being developed and transition support for leavers is being offered.

) **Transition board:** A transition board was established in late 2017 to provide governance overview of the impact of the organisational changes and voluntary redundancies, including risk assessments and vulnerabilities assessment as well as ensuring the Management of Change process is correctly followed. The Board continues to oversee the changes, ensuring that the Management of Change process is followed and that suitable arrangements are in place within individual directorates to ensure work is either able to be stopped or has been re-allocated. Moving forward into the next phase of projects this programme is enabling a number of opportunities to be offered internally and some new people, with specialist skills, will join the organisation.

) Dounreay recently celebrated 10 years of collaboration with the National Skills Academy for Nuclear (NSAN). Jillian Bundy, Skills Manager received a certificate from NSAN Chief Executive Jo Tipa at an event held in the House of Lords.



) Recruitment activities are now complete for the intake of engineering apprentices and graduates for 2018/19. Advertisements were published in local papers and other media. In addition, adverts have also been published for business and administration apprenticeships.

) Changes to the senior management team continue with Ken Heider, former Reactors Director, retiring last month. Phil Cartwright has been appointed to the role. Alastair

MacDonald has been named interim Security and Resilience Director, replacing Matt Fox who has left the company to take up a new role in the security sector. An advert will soon be published for the role.

- ) Gordon Steven and Danny Mackay have now completed their NVQ Level 2 diplomas in Process Industries Operations. A total of 14 fuels team operatives have now achieved this award.



- ) Ashleigh Fenton, one of the site's graduates, was shortlisted in the scientific graduate of the year category for the National Skills Academy for Nuclear awards in Manchester. Executive Support Manager Fiona Bruce, was also recently a Champion of the Year finalist at the Women in Nuclear UK awards. This was one example of a big effort by many on the site in the last year to ensure equality, diversity and inclusion was at the centre of the organisation.

- ) **Dounreay Women's Network:** The network continues to grow with membership increasing month on month. In order to achieve the ambitious goal of being recognised as the leading NDA site for employing women in leadership roles, the focus has been on enabling activities that help build confidence and identify new opportunities amongst members. Mentoring has been a key focus area with the development of a new group mentoring programme that is tailored around common themes.



- ) **Equality, Diversity and Inclusion (EDI):** A significant amount of work has been carried out to raise awareness about EDI across the site and the wider NDA. The Dounreay site took part in the NDA estate-wide EDI survey and recently published its first annual gender pay gap report with a median pay gap of 10.29% (the UK average is 18.4%).

- ) STEM activities continue to be an important part of the organisation's socio-economic activity, with almost 90 ambassadors now supporting the programme. During March, a Dounreay team also took part in the Caithness International Science Festival family fun day.



- ) The site has hosted a number of visits during this period, including:
- NDA Chief Executive
  - NDA Directors
  - BEIS representatives
  - Chair of NDA Board Safety and Security Sub-committee with independent safety consultant.

- **Lord Duncan, Cabinet Undersecretary of State for the Scotland Office**, paid a visit to Caithness in April and while here visited the Dounreay site to hear about the decommissioning progress and meet some of the staff.
- **Japanese delegation:** Dounreay welcomed visitors from the Japan Atomic Energy Agency at the end of April. They were interested in the silo project to see if the technology can be applied to their sites in Japan.
- **Benchmarking visit with members of the Magnox site team.** A number of good practices were identified to allow them to implement these on the Magnox sites.



### ) **Consultations:**

- **Integrated authorisation framework:** As part of the Better Environmental Regulation Programme, the Scottish Government and SEPA are working together to develop an integrated authorisation framework. The aim of this is to integrate the authorisation, procedural and enforcement arrangements relating to radioactive substances, water, waste management and pollution prevention and control. A consultation has been published on the draft Standard Conditions and views are being sought. The consultation closes on 20 June 2018 and the consultation document, draft Standard Conditions and other supporting documents can be found on our website here: <https://consultation.sepa.org.uk/radioactive-substances-unit/consultation-on-draft-standard-conditions-for-radi>.
- **Regulatory framework for nuclear decommissioning:** BIES has recently issued an email providing information on a stakeholder workshop on regulation of nuclear sites in the final stages of decommissioning and clean-up to be held in Edinburgh on the 6<sup>th</sup> June. The consultation has now opened (and closes on 5<sup>th</sup> July). Documents can be found at: <https://www.gov.uk/government/consultations/the-regulation-of-nuclear-sites-in-the-final-stages-of-decommissioning-and-clean-up>

## APPENDIX 1: PROJECT MILESTONES FOR 2017/18

Area	Milestone	Due Date	Status
Waste	Restart waste operations at D3100 Vaults and D2179 Encapsulation Plant	June 2017	√
Reactors	Loading of first flask with breeder elements	Jul 2017	Completed Aug 17
FCA	DMTR D1251 demolition complete	October 2017	Completed Dec 2017
Reactors	Complete removal of pond east wall liner	December 2017	√
FCA	D1200 ventilation installed and commissioned	Dec 2017	√
FCA	D1204 medium active cell decommissioning preparatory works complete	Dec 2017	√
Reactors	Design, manufacture and trial four tools for reactor dismantling	Jan 2018	√
Waste	DCP operations - PFR raffinate active commissioning complete	Jan 2018	Completed on 7 <sup>th</sup> February 2018.
FCA	Complete Phase 1 Cell Wall removal in D1217	March 2018	Milestone not expected until October 2018 due to challenges in removal of the final in cell waste packages and unknown asbestos (pipe lagging) discovered in inaccessible areas of the wall.

### Key:



On target to deliver  
At risk  
Missed  
Achieved



## PROJECT MILESTONES FOR 2018/19

*Milestones yet to be signed by either party.*

Area	Milestone	Due Date	Status
Fuel Cycle Area	D1204 mixer settle boxes	Sept 2018	
Waste	Shaft and Silo borehole monitoring	Sept 2018	
End State	NDA Gate A paper for redefining the end state	Sep 2018	
Fuel Cycle Area	D1200 Lab 79 decommissioned	Nov 2018	
Waste	Waste verification checks of D3110 wastes	Dec 2018	
Reactors	Manufacture complete for skid set A and DFR skid set	Dec 2018	
Fuels	Breeder fuel 6 flask	Jan 2019	
Fuel Cycle Area	First block cut from cell walls in D1217	Jan 2019	
Reactors	Design, manufacture & trials of 4 tools for PFR reactor dismantling.	Jan 2019	
Waste	Shaft and Silo HAZOP 2 studies	Mar 2019	

### Key:



On target to deliver  
At risk  
Missed  
Achieved

## GLOSSARY

Abbreviation	
BCP	Baseline Change Proposal
DACR	Days Away Case Rate
DCP	Dounreay Cementation Plant
DFR	Dounreay Fast reactor
DIT	Dounreay Improvement Team
DMR	Dounreay Modification Report
DMTR	Dounreay Materials Test Reactor
DPF	Dounreay Planning Framework
DSRL	Dounreay Site Restoration Ltd
EIA	Environmental Impact Assessment
ES	Environmental Statement
IFBS	Irradiated Fuel Buffer Store
IFC	Irradiated Fuel Cave
INF	Incident Notification Form
LLLETP	Low Level Waste Effluent Treatment Plant
LLW	Low level waste
LTA	Lost Time Accident
mSv	milli Sieverts
NDP	NaK Disposal Plant
OJEU	Official Journal of the European Union
ONR	Office for Nuclear Regular
PBO	Parent Body Organisation
PCP	Project Control Procedure
PFA	Pulverised Fly Ash
PFR	Prototype Fast Reactor
PFR	Prototype Fast Reactor
PSR	Preliminary Safety Report
RAMT	Radioactive Material Transport
RIDDOR	Reporting of injuries, Diseases & Dangerous Occurrences Regulations.
RSA	Radioactive Substances Act
SEPA	Scottish Environment Protection Agency
SID	Sodium Inventory Destruction Plant
STA	Sample Tank Annex
TRIR	Total Recordable Incident Rate
WRACS	Waste, Receipt, Assay, Characterisation and Supercompaction