



# DOUNREAY SITE RESTORATION LTD DSG SITE RESTORATION SUB GROUP REPORT, APRIL 2022

Current as of 11 April 2022

## Introduction

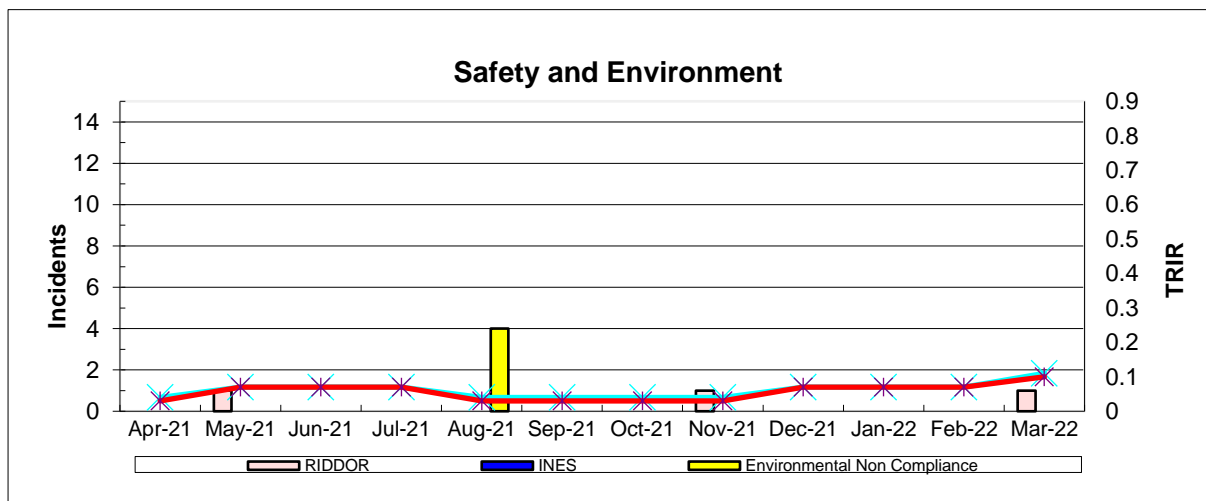
Work is progressing on the joining of DSRL and Magnox and is currently focused on the issues around licensing. Overall, the joining is being done to reduce the number of Boards to four (as per David Peattie’s 4 pillar model) and to do this Magnox and DSRL will eventually form one Board. The site licence for DSRL will also be transferred to Magnox. Dounreay will remain a distinct and separately funded entity. The Dounreay Managing Director will become a member of this ‘new entity’ Board. By the end of 2022 all internal and regulatory processes should be complete with a view to implementation on April 2023. Progress to date has been relatively smooth.

## Operations during COVID-19

Around 850 people are working on the Dounreay site as the site continues to work within the Scottish Government’s Covid guidelines. Like the county, there had been a significant rise in Covid cases. It has been predicted that in the short term these numbers are likely to increase given most of the restrictions are being lifted. However, it is hoped that numbers would stabilise within the next 3 months. The site continues to keep measures in place and to continually review the evolving situation. Other members of staff continue to work from home or from the Ormlie hub and Dounreay.com offices in Thurso.

As from 25 April the site’s mandatory controls will come to an end. This decision reflects the national deregulation of Covid-19 protection requirements from the 18 April and a shift in emphasis to personal choice and responsibility. Beyond 25 April, site will support the voluntary wearing of face coverings where someone feels the need, continue to encourage social distancing to the maintained in line with relevant signage, encourage staff with Covid symptoms not to attend any of the Dounreay work locations (site or Thurso offices), continue the emphasis to encourage good hygiene practices both personally and for equipment.

## Health, Safety, Environment, Security



- There were four environmental non-compliances confirmed in writing by SEPA during February 2022 in relation to the D2167 non-isokinetic sampling event in August 2021. SEPA has confirmed the site has returned to compliance.
- ONR issued an Enforcement Letter relating to Construction (Design and Management ) Regulations 2015 and Reporting Investigation and Learning from events (LC7). Action plans have been agreed with ONR and are progressing.
- Analysis of records relating to some material handled in a glove box identified that there was unexpected material present. Work was stopped and the material quarantined. Subsequent investigation found that there were trace quantities of an element that challenged an operating rule but for which there was a very large margin of safety to any potential for a criticality event. The investigation has completed and been forwarded to ONR.
- A test lift of equipment at the D3100 vaults found that the load exceeded the SWL of the davit provided for the task. The lift was stopped, made safe and investigated. The investigation found a number of deficiencies in the design of the equipment provided as well as some procedural compliance issues. The nature of the lift was such that risk of harm was very low in this instance, but the investigation has been taken forward at the most significant level within the DSRL arrangements and the report has been forwarded to ONR.
- Configuration issues have been identified on equipment fitted to the laundry ventilation system. The equipment has been restored to its design intent and the background investigated. SEPA have been informed.
- RIDDOR >7 day Lost Time Accident (LTA) - Individual injured their ankle during loading of Nitrogen Dewars. The Investigation noted some procedure improvements but did not establish a systemic root cause.
- The NDA group has launched its sustainability strategy. The launch is the culmination of months of work across the NDA group in gathering expertise, initiatives, good practice and plans to fashion a group-wide approach to fulfil the NDA group's ambition to be recognised as a leader in sustainability. The NDA approach to sustainability goes beyond the environmental to focus on enhancing lives in NDA site communities, creating sustainable local and regional economies, and to ensure its mission to clean up and decommission nuclear sites is done with responsibility and a focus on the legacy left behind. Click [here](#) to read the full document.
- Dounreay has approved a Sustainability Strategy, Carbon Management Plan and Sustainability Road Map. These will be refined through use.
- The Dounreay security and emergency arrangements regulatory evaluated demonstration exercise 2022 (REDE 22) will take place at Dounreay during the morning and afternoon of Wednesday 11 May. The exercise will be delivered by site staff and witnessed by the Office for Nuclear Regulation (ONR). The exercise will involve external response stakeholders including Police Scotland, and additional uniformed personnel and emergency vehicles will be seen on site.
- The site's annual bird management programme commenced in mid-March and will run until July. NBC will be carrying out the bird pest control work. The work is being carried out to control the number of birds on site which can be a nuisance due to their fouling,

nesting, roosting, scavenging and in some instances aggressive behaviour towards people.

- **Particles:**

- Owing to a higher number of particles found on the West Foreshore in February and March than expected, based on the trend of recent years, an extra survey to provide further reassurance was undertaken on 15<sup>th</sup> March where a single additional particle was found. At present, higher number of particles found this year is being attributed to the weather conditions this year, with extended high strength windy periods and unusual (for the area) marine behaviour e.g. tidal bore in Thurso River on the 8<sup>th</sup> of March. Analysis is ongoing and discussion with SEPA is anticipated at the next PRAG(D) meeting.
- Discussion with SEPA and PRAG(D) on the results of the beach monitoring trial are continuing.

### **Dounreay decommissioning update**

The Life Time Plan continues to be developed with the reactors strategy now complete providing an overview on the direction of decommissioning and supported activities such as waste and security. Engagement has continued with NDA on the Dounreay Decommissioning Strategy and Strategic Outcome Specification document with clarity on the key planning assumptions and strategic options.

### **Fuel Cycle Area (FCA)**

- A robot has successfully surveyed an underground radioactive ventilation duct in Dounreay's redundant laboratories, providing useful information that will help to solve the challenge of decommissioning it. DSRL and the Robotics and Artificial Intelligence in Nuclear (RAIN) Hub are working together to develop a robot capable of accessing areas that are inaccessible or unsafe for humans to work in. The RAIN Hub is a consortium of universities led by the University of Manchester. In 2020 a group of engineers from RAIN brought a small surveying ROV equipped with sensors, cameras and a manipulator 'arm' to Dounreay. Initial trials in an inactive building provided useful information, and a limited survey in the laboratories took place last year. As a result of this field research, a second generation robot called Lyra was developed, with an improved package of surveying measures including LIDAR (a detection system similar to radar, but which uses lasers), multiple angle cameras, radiation probes and the ability to take swabs using the manipulator arm. In February 2022, the robot returned to carry out a survey of the 140m long underfloor duct which runs under the central corridor between the laboratories.



- Dounreay has had a visit from 'Spot', a four-legged Boston Dynamics robot whose movements mimic that of a dog. Matt and Will from Createc Ltd, who is the sole UK distributor, demonstrated the technology to project managers. DSRL Innovation Manager, Gordon Tait, said: "Science fiction is now science fact, and the technology of advanced robots today has reached the point where they are now practical everyday tools." Head of Strategic Planning, Craig Brown added: "We have a great opportunity to embrace such technology advances to make our work safer and to enhance our capability" Consideration is now being given as to how best use this technology. The aim is to move from technology development to innovative technology that helps the workforce deliver safer and more efficiently. Dounreay also aims become the lead site to deliver and share lessons across the NDA Group.



- The decommissioning team in D1217 has finished separating the PIE cell dwarf walls from the outer walls after a campaign of stitch drilling 162mm diameter holes through the PIE cell walls and around the dwarf walls (small walls inside the cell that are attached to the outer walls). This will enable the team to lift and remove the outer walls once they are cut as they are now detached from the dwarf walls. The next phase of work is the diamond wire cutting of the cell inner walls into 56 blocks weighing between 7 and 11 tonnes each, which is estimated will take up to 6 months.



## Reactors



- The PFR reactor operations team is about to start dismantling 46 redundant absorber rods which have been stored in the irradiated fuel cave. The boron carbide absorber rods were used during reactor operations at PFR to control and stop the nuclear reaction through neutron absorptions and will be sentenced as intermediate level waste (ILW). For the past few months, the team has been carrying out trials in a 'clean' part of the facility on using a rig that will be used remotely inside the fuel caves, to ensure the process works effectively once the campaign begins. The absorber rods will be dismantled and the component parts conditioned, with the waste being packaged and transferred for storage via the ILW route. The absorber processing campaign is expected to take 2 years to complete.



- The DFR decommissioning team is replacing a damaged section of the crane rail and concrete supports in the sphere in order to manoeuvre the crane and lift the 5 tonne shield plates that sit above the reactor's rotating shields to access the shield drive system. Part of the rail was repaired in 2018, which had given the Goliath crane a limited arc of travel, but to lift the shield plates the crane needed to cover more area. The crane rail is no longer manufactured in the size that was originally installed in DFR, so the team had to source an alternative gauge to replace the entire circle of rail. The necessary areas beneath the rail were decontaminated and any services that were over the sleepers were re-routed and is now replacing the rail with the new modern gauge outside the current limited arc. Once complete the crane will be moved onto this rail and the rest of the rail will be replaced. Once the rail has been fully replaced, the Goliath crane will have lifting ability over the entire area of the sphere for the first time in 5 years.



- The DFR Breeder Fuel Removal project has been ongoing removing fuel from the DFR reactor and transferring to Sellafield for reprocessing since 2017 as part of the Magnox Operating Programme (MOP). The Sellafield MOP reprocessing plant is expected to cease operating this year and in line with the NDA's strategy of spent fuel consolidation the remaining Breeder Fuel will be stored on the Dounreay site in the interim with the remaining un-reprocessed inventory being transferred to and consolidated at Sellafield for safe and secure storage. It is expected that this will be complete by 2024.

### **Balance of Site**

- Legacy radioactive oils and solvents used in fuel reprocessing have been transported from site for destruction. The third and final load was taken down to waste specialist Tradebe in Southampton in January.



- An old supercompactor containment unit, which had been removed from Dounreay's Waste Receipt Assay Characterisation and Supercompaction (WRACS) facility in 2011,



has now been transported offsite for disposal in a suitably licensed landfill site in England. This is a new offsite disposal route that will enable Dounreay to dispose of large bulk items with low specific activity that are not suitable for disposal within the low-level waste vaults or for metal recycling. To make this happen, DSRL has

collaborated with Nuclear Waste Services, Cyclife UK Ltd, a strategic waste partner and Auegan, the landfill owner.

- Having sources manufactured by other companies can be expensive and time consuming. It used to be the normal practice for Dounreay to produce its own sources, but that hasn't been the case for a number of years. However, when a calibration source needed to be manufactured at short notice, the non-destructive assay (NDA) team produced it themselves. An accurate calibration blank and standard were manufactured under stringent conditions.
- **Site End State Review:** The Gate B Paper which describes the preferred site end state option will be discussed at the meeting of the NDA Senior Strategy Committee (SSC) on Thursday 14 April. Key themes of the Gate B paper are:
  - LLW Pits – have significant influence on overall site end state. The current baseline is for the Pits to be emptied, an alternative option of leaving waste in-situ is being considered and it is recognised there is uncertainties with approach. Work to develop a case for in-situ is ongoing.
  - 300 year period of monitoring and control between the Interim End Point and Final End Point – further work required to optimise (and potentially reduce) this period and to define requirements of monitoring and control.
  - Future use – dictates degree of remediation undertaken, and influences infrastructure that could be left to support the next use.
  - Characterisation – implementing the preferred option relies on characterisation data and making Environmental Safety Cases based on this data.
  - Integration with LTP – implement the preferred option through decommissioning projects across the whole of the site.

### **Staffing**

- Graeme Dunnett who has been appointed as the Head of Reactors taking over from Phil Cartwright who retired in February 2022. Graeme is an electrical engineer with a degree in electrical and electronic engineering from Robert Gordon University and has had experience of working in many different areas of site. He first came to site in 1977 as an apprentice with electrical company James Scott & Co and started at PFR when it was still operational.
- In February 2022, this years' health physics trainees were on site to begin their 2 year training programme to become health physics surveyors. Their training will consist of on-site and off-site training with the majority of it being on-the-job training at site. They will work towards a level 2 NVQ qualification in Radiation Protection.
- Meanwhile, Dounreay's latest health physics surveyor trainees who were recruited during the first year of the pandemic have now completed their 2-year training programme, co-ordinated by Health Physics Supervisor Ivor Simpson with assistance from health physics supervisors and the surveying team.
- The six decommissioning operations trainees at Dounreay have successfully completed their first placement and have all moved to new projects. The trainees are employed by Morson, Nuvia and GDES. The training course offers a blend of academic qualification and practical experience gained on site, and it is hoped that all the trainees will embark on a nuclear decommissioning VQ.

**Misc**

- At the end of March, the [Nuclear Waste and Decommissioning Research Forum](#) (NWDRF) held its Nuclear Frontiers Research conference face-to-face for the first time since the Covid-19 pandemic. The Forum is a cross industry group that aims to enhance coordination of research, development and technical programmes (R&D) across UK site restoration and integrated waste management activities. The event was held as part of a 2-day conference with the NDA PhD Research Bursaries Seminar day. This year the Research Frontiers event was co-sponsored by DSRL, reflecting the strong leadership role the site has within the NWDRF.
- Some of Dounreay's graduates recently volunteered their time and effort to assist Thurso Community Development Trust with one of their projects to improve Thurso and the wider local area to benefit the wider community. The trust recently acquired a green house complex from the Highland Council. The compound has been unused and unmaintained for several years and was in need of a significant upgrade to return it to a functional space to allow the trust to grow and sell produce in 'Socially Growing' a new zero waste shop in Thurso precinct. The project will allow the trust to train and develop skills to disadvantaged young people. On Saturday 26 February the graduates cleared out a host of old and redundant planting equipment, bags of compost, rubble, benches and general waste.
- Representatives from Dounreay's Green Network, the Next Generation Executive (NGE) and staff volunteers recently joined members of the local community to plant trees in Dunnet Forest. The trees were dedicated to the local schools and community groups as part of the nationwide Queen's Green Canopy initiative. Dounreay donated the trees and tree guards that the volunteers planted under the watchful eyes of the Dunnet Forestry Trust members. One hundred and thirty (130) trees were planted in total.



**Procurement**

- Prior to Christmas, JGC Engineering and Technical Services Ltd, were awarded a contract for the installation of pipework at PFR. This will enable the clean out of the remaining sodium in the reactor using 2 skids employing the water vapour nitrogen technique.

- G4S has been awarded a £24m contract with Magnox Ltd to provide security guarding services for the nuclear Shared Service Alliance, a consortium comprising 21 sites across the UK, including Dounreay. Dounreay's existing team of Civilian Guard Force personnel will transfer over to G4S on Tuesday 1 March to continue providing the site's security guarding services.
- Following the completion of a recent competitive tendering exercise, there is a new framework agreement in place for the provision of scaffolding services. The new framework agreement came into place on 14 March 2022 and is in place for up to 2 years until 13 March 2024. Caithness Scaffolding Ltd are part of this framework.

Dounreay Site Restoration Ltd  
11 April 2022



## 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
PIE	Post Examination Irradiation
PRAG(D)	Particles Retrieval Advisory Group (Dounreay)
PSR	Preliminary Safety Report
RAMT	Radioactive Material Transport
REDE	Regulator Evaluated Demonstration Exercise
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