Concrete example of dealing with decommissioning rubble

Challenge:

Deal effectively with large quantities of concrete rubble generated by demolition activities across 17 sites

Solution:

Undertake research to analyse available technical evidence, current practices and regulations, with a view to developing protocols and guidance that will help avoid unintended environmental consequences, while reducing costs

Benefits	Ensuring value for money, environmental good practice and future guidance for industries beyond nuclear
Status	First stage of research complete
R&D driver	Informing strategy
Research organization	AECOM

Huge quantities of concrete rubble will arise all across the NDA's 17 sites as nuclear facilities are demolished following decommissioning and clean-up. Some rubble will be radioactive but the vast bulk will be conventional demolition material that could be re-used, for example as landscape material, filling in voids or as aggregate. Re-use on site has the potential to save time, costs and environmental damage by minimising the need to transport rubble for disposal elsewhere, and bring in other materials for void infill or landscaping.

However, recycled concrete-based materials, or RCM, also generate highly alkaline and metal leachate when exposed to water. Leachate can enter groundwater, drainage systems or surface water, altering the surrounding ground characteristics and in turn affecting vegetation and wildlife.

This could undermine the environmental and cost savings, potentially breaching regulatory guidelines.

The NDA has commissioned research to analyse the nature of the risks in greater detail and consider methods for treating RCM before re-use and minimising the potential for leaching.

The quantities are significant: the 10 Magnox reactor sites are estimated to generate 1.3 million tonnes of concrete in the decades ahead. Removing this for disposal at inert landfill sites will require 140,000 truck movements, travelling to and from sites. The estimated cost is almost £150 million.

Re-use of RCM is common in the construction and demolition industries, however, this tends to occur immediately after it has been generated and is used to infill very shallow voids such as roads.

On the other hand, demolishing cleaned-up nuclear facilities with deep foundations at the NDA's sites (for example, turbine halls or reactor buildings) will create large voids, while stockpiles of RCM may also be stored for decades before re-use is required.

Although the leaching risks are widely known, a range of different regulatory protocols are in use, creating uncertainty and widely varying approaches to management options. RCM is also classified as inert under EU waste legislation, which implies minimal environmental consequences.

Different leachate characteristics also result from the varied range of concrete compositions, coarseness of the rubble, level of compaction, duration of exposure to air/water and surrounding rock/soil types.

The research involved engagement with a range of industries, especially the demolition sector, as well as SLCs. Analysis of available technical literature and consultations with regulators also took place, looking at how crushed concrete rubble has previously been managed and how leachate is assessed, monitored and controlled.

The results bring together, for the first time, a comprehensive outline of the possible environmental consequences of re-using RCM in different scenarios. A series of recommendations will now be developed for SLCs to use when planning demolition projects, as well as proposals for the next steps to drafting and implementing a consistent, rigorous approach.

Further reading

This case study is part of the [Direct Research Portfolio Report 2018 to 2019]

Also available is the previous DRP Report 2017 to 2018

Academic research group builds skills for future of decommissioning

Challenge:

To carry out academic research into areas of fundamental importance to the NDA's four key decommissioning themes, building high-level expertise for the future while also developing solutions to technical challenges

Solution:

Collaborate with industry, universities and the Engineering and Physical

Research Council to invest in a range of targeted university research projects, ensuring the work has potential to address on-site needs

Benefits	Foster a new generation of technical specialists, while also developing greater understanding of challenges, new technical solutions and potential savings on time and costs
Status	Four-year programme concluding in 2022
R&D driver	Maintaining skills
Research organisations	Various universities

The TRANSCEND consortium, launched last autumn, has based its acronym on Transformative Science and Engineering for Nuclear Decommissioning and is the third joint initiative to focus on specific NDA technical priorities in the areas of radioactive waste, spent fuels, nuclear materials and site remediation.

Two earlier programmes, DIAMOND and DISTINCTIVE, ran from 2009 to 2019 and have now concluded. Many of the PhD students and post-doctoral researchers have since taken up careers that support our decommissioning mission.

TRANSCEND will build on their work as well as addressing new topics and continue developing high-level technical specialists able to contribute to the NDA's long-term clean-up mission.

The wide-ranging topics include:

- new methods of decontaminating radioactive effluent
- durability of new types of cement encapsulation
- improved understanding of solidified waste products
- corrosion of spent nuclear fuels
- predicting dose rates from buried pipelines where information is limited
- corrosion behaviour of exotic fuels in a Geological Disposal Facility (GDF)
- behaviour of stored plutonium over long timeframes

TRANSCEND brings together 11 universities and a range of industry experts. The programme is funded by a core grant of £4.6 million from the Engineering and Physical Research Council (EPSRC), with additional sponsorship from AWE, LLWR, NDA, NNL, Sellafield Ltd, RWM, TÜV SÜD Nuclear Technologies and Cavendish Nuclear. Their support is provided through funding or industrial expertise, use of facilities and guidance for the researchers.

A benefit of the consortium is to enable industry experts to work closely with UK academics and the research students, focusing directly of some of the problems in dealing with radioactive waste and other materials. Some of the challenges have long been anticipated while others emerge during decommissioning activities, and are unforeseen.

Led by The University of Leeds, the consortium includes:

Further reading

This case study is part of the [Direct Research Portfolio Report 2018 to 2019]

Also available is the previous DRP Report 2017 to 2018

Decommissioning drones take to the sky

Challenge:

To accelerate the uptake of Unmanned Aerial Vehicles (UAVs) across the NDA group

Solution:

Review of UAV technology, legislation and existing experience across the NDA group; Development of community of UAVs users within nuclear decommissioning

Benefits	Safer, faster and potentially cheaper access to external and internal spaces for a wide range of functions. These include building inspections, radiation monitoring, photography, security
Status	Completed
R&D driver	Delivering innovation
Research organisations	Wood plc.

Details

Drones range from delicate birdlike machines to heavy-duty models weighing more than 150 kg. While typically carrying cameras, they can deploy a huge array of different equipment that allows them to analyse and interact with the world around them. Flight mechanisms, navigational controls and power systems are equally varied.

Both fixed-wing or rotary blades are widely used, as well as self-navigating and pilot-controlled drones. New and improved power sources have also been developed that allow them to fly longer and carry heavier cargoes. Even shape-changing drones are being developed to allow them to fly in congested areas.

Future research will push the boundaries still further, driving down costs and extending the length and complexity of the flights they can undertake. For nuclear decommissioning, such versatility offers enormous potential to save time and costs associated with inspecting the facilities across NDA sites. Drones will also reduce risks for employees involved in activities

such as working at height or inside highly radioactive buildings.

Across the NDA group, a variety of different drones have been flown to carry out a range of different tasks. They have inspected pipelines, tall chimneys, roofs and radioactive facilities. They have collected high-quality visual images, measured the temperature of vessels, found areas of radioactivity and accurately mapped legacy facilities. The information has eliminated working at heights and radiation dose to operators. Compared to traditional manual methods, there have been savings in both time and money.

A spherical in-flight drone

Production of the report brought together users to share their experience, hear about the latest developments in technology and legislation and identify further opportunities for the use of drones. The final report has also been used to highlight the use of drones to the wider NDA group. Demand for drones is growing every week as new groups recognise they can be used on nuclear sites and that they can solve their problems.

Further reading

This case study is part of the [Direct Research Portfolio Report 2018 to 2019]

Also available is the previous DRP Report 2017 to 2018

Facilitating nuisance calls lands Cambridge director with ban

Gregory Francis Rudd (53) was the sole director of Keurboom Communications Limited. The company was incorporated in May 2014 and supplied wholesale, self-managed telecom solutions to the call centre market.

Between April 2015 and June 2016, however, the ICO received over 1,000 complaints from members of the public about nuisance calls.

Further enquiries by the ICO found that, between October 2014 and March 2016, up to 99.5 million automated marketing calls were made, through Keurboom’s lines, to people who had not provided their consent.

The calls, made over an 18-month period between October 2014 and March 2016, related to a wide range of subjects including road traffic accident claims and PPI compensation. Some people received repeat calls, sometimes on the same day and during unsociable hours.

This is a breach of Privacy and Electronic Communications regulations, which state that automated calls can only be made to persons who give prior consent to such a call from that specific caller.

The telecoms company could not provide information proving that people had consented to receive the calls, and in 2017, the ICO issued Keurboom a then-record £400,000 fine.

Following the ICO's Notice of Intention to issue the above penalty, Keurboom entered Creditors Voluntary Liquidation in March 2017, and the ICO referred Gregory Rudd's conduct as director to the Insolvency Service.

On 12 December 2019, the Secretary of State accepted a disqualification undertaking from Gregory Rudd after he did not dispute that he failed to ensure Keurboom Communications complied with its responsibilities under PECR regulations.

Effective from 2 January 2020, he cannot, without the permission of the court, be involved in the formation, promotion or management of a company, directly or indirectly, for 6 years.

Mark Bruce, Chief Investigator for the Insolvency Service, said:

"This ban is a warning to other directors, who contribute to the scourge that is nuisance calls, that there are severe repercussions for such behaviour.

I would like to thank my colleagues at the Information Commissioners Office for their hard work and co-operation in achieving this outcome."

This ban follows two other recent disqualifications secured for breaches of Privacy and Electronic Communications Regulations as a result of collaboration between the Insolvency Service and ICO.

In late September, Charlotte McKeever of Advanced VOIP Solutions received a 7-year ban, and in December, Jason Gambling of The Legend Alliance Ltd also began a 7 year disqualification.

Gregory Francis Rudd is of Cambridge and his date of birth is in February 1966.

Keurboom Communications Limited (09030006).

Mr Rudd signed a Disqualification Undertaking for 6 years on 2 December 2019, which comes into effect on 2 January 2020.

Solely for the purposes consequential to the giving of a disqualification undertaking, he did not dispute the following:

- I failed, from 1 October 2014 to 31 March 2016, to ensure that Keurboom Communications Limited ("Keurboom") complied with its responsibilities under the Privacy and Electronic Communications (EC Directive) Regulations 2003 ("PECR"):

- From October 2014 to March 2016, Keurboom permitted (as a subscriber) its lines to be used to send up to 99,535,654 (91,497,411 after 6 April 2015) automated marketing calls to subscribers without their prior consent, in breach of Regulations 19(3) PECR.

- Between 29 April 2015 and 7 June 2016, the Information Commissioner's Office ("ICO") received 1,036 complaints. The ICO's enquiries revealed that the telephone numbers, which were the subject of complaints, were allocated to Keurboom, and that it had accepted responsibility; both for the contents exchanged during the use of the numbers by its users and, generally, for complying with all legal and regulatory rules.

Disqualification undertakings are the administrative equivalent of a disqualification order but do not involve court proceedings. Persons subject to a disqualification order are bound by a range of other restrictions.

Further information about the work of the Insolvency Service, and how to complain about financial misconduct, is available.

You can also follow the Insolvency Service on:

2020 vision for north-east rail network

- Transport Secretary visits Newcastle, Durham and Blyth to highlight government's ambition for infrastructure investment and better journeys across region
- Grant Shapps sees progress on new £10.55 million Horden Peterlee station, set to provide 70,000 passengers with better connectivity
- 'Huge potential' of reopening Beeching lines, such as Ashington to Blyth passenger services as part of £500 million fund

Transport Secretary Grant Shapps committed to reinvigorating rail connections across the north-east today (6 January 2020), outlining how new investment will boost the rail network as the government looks to level up infrastructure across the country.

Visiting Horden Peterlee, a new £10.55 million project set to be finished in May 2020, Mr Shapps hailed the importance of expanding the rail network, ensuring passengers and businesses across the region have the frequent, reliable journeys they rely on.

Improving connectivity for an area currently with no station over a 20 kilometre stretch, Horden Peterlee will be served by 1 train per hour calling

at all stations between Newcastle and Middlesbrough, and has been supported by £4.4 million from the Department for Transport's New Stations Fund.

The Transport Secretary will also visit Blyth to see first-hand the potential for restoring passenger services along the Ashington to Blyth line, undoing over half a century of damage following the Beeching cuts.

The government has confirmed it will establish a £500 million fund to explore reopening former routes which could benefit communities who lost vital transport connections.

Transport Secretary Grant Shapps said:

> 2020 will be a year of action on the railways with the north sitting at the heart of the improvements.
>
> Investing in new stations like Horden Peterlee will deliver more modern, reliable services for passengers. We are also ambitious to restore connections to communities who have lost out, and the Northumberland line has huge potential to deliver that.
>
> Our focus is levelling up infrastructure across the country, ensuring passengers see the benefit of new trains, new stations and fairer fares.

In another boost to the region, London North Eastern Railway (LNER) passengers are also benefitting from a single-leg fares trial, introduced last week on journeys from London to Leeds, Newcastle and Edinburgh, giving people flexible, simpler and better value-for-money tickets. This means no more single tickets priced at £1 less than the return.