

Inverting the waste pyramid LLWR, the first ten years

In March 2018, LLW Repository Ltd will have completed a decade of operations. *Nuclear Future* caught up with managing director **Dennis Thompson**, to reflect on LLWR's work, achievements and lessons learned over the last ten years



Dennis Thompson, managing director, LLWR

Since 2005, the Nuclear Decommissioning Authority (NDA) has been responsible for the decommissioning and clean up of the UK's civil public sector nuclear sites. Historically, low-level waste (LLW) has been stored at the UK's national repository close to Drigg in Cumbria, managed since 2007 by Site Licence Company, LLW Repository Ltd (LLWR). In April 2008, LLWR began a new stage in its journey under the ownership of UK Nuclear Waste Management (UKNWM) following

an NDA procurement to secure a parent body organisation for LLWR, the first site licence company to be competed. UKNWM took ownership of LLWR with the responsibility for managing the repository, NDA retaining the ownership of the site and the nuclear liability. LLWR has achieved much during the past ten years, transforming the way that the UK manages low-level waste. Managing director Dennis Thompson, who has been there since the start, looks back over this period of change and evolution.

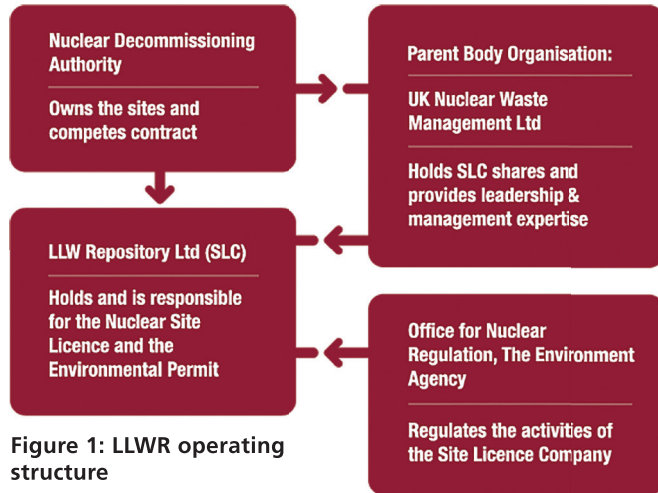


Figure 1: LLWR operating structure

LLWR and the birth of a new approach

By 2007 the nuclear industry was facing major issues in dealing with the volume of LLW, through the repository disposal route alone. Waste was coming to the repository site at a rate of approximately 1,000 half-height ISO freight (HHISO) containers a year, a volume that the site simply could not sustain. Disposal had been the modus operandi for the whole industry for decades, from generators of waste and through the supply chain. A staggering 95% of LLW was stored for eventual disposal, and only 5% diverted for treatment at this time.

With large-scale decommissioning around the corner, it was becoming clear that a new approach to the waste management hierarchy was needed. The UK Government recognised, in its national policy on the management of solid LLW, that the disposal capacity of the LLW repository would not be sufficient to meet future demand if the existing waste management practice continued. The policy identified the opportunity to manage LLW more efficiently and recognised the waste hierarchy as a central principle in LLW management. The time was ripe for a new approach, with NDA responsible for overseeing the delivery of that policy alongside. The creation of LLWR and the new parent body organisation competition were timely developments.

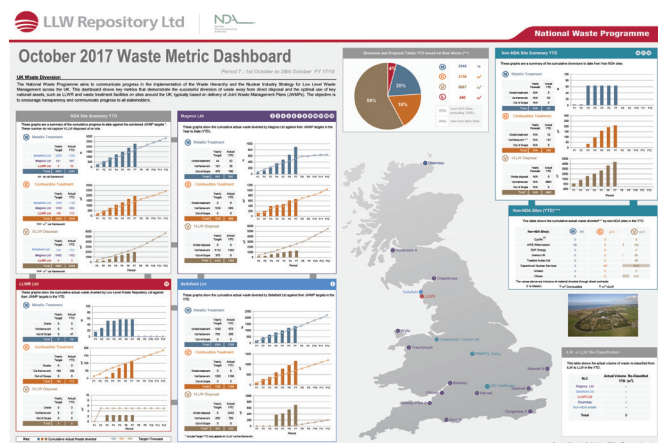


Figure 2: LLWR Waste Metric

A period of change and transformation

Thompson believes that the success of LLWR and the whole LLW management programme over the last ten years consists of four interdependent areas: the contract with the NDA, the sustainability of the waste management solution, success in transforming behaviours and continuous stakeholder engagement.

For Thompson, everything begins with the quality of the original contract, which created the right contractual structure, performance outcomes and incentives. The original contract focused on two key elements; the running of the site licence company for LLW, including the repository, and, running the national programme for LLW.

Thompson can't stress enough how important developing the right type of contract was for the overall success of the programme. It has provided the right framework to support the NDA and LLWR working well together, while the incentive regime has ensured that performance and outcomes could be delivered.

"We have a very successful contract with the NDA," says Thompson, "which aligns closely with policy and operational delivery setting clear performance criteria and incentives."

He is also keen to highlight the interdependency of the relationship between the NDA and LLWR, and explains that in those early days "a lot of time was spent on contractual alignment", noting that this was time well spent, as "there is nothing worse if I as managing director am incentivised to do something that both me and the whole organisation know is not the right thing to do".

The contract is split into three five-year terms, plus an additional two-year term and, as Thompson explains, each term has to be "earned" and is not guaranteed.

So far, LLWR has been successful in securing the second term (March 2013 - March 2018), and has exceeded performance in all areas (See Figure 2).

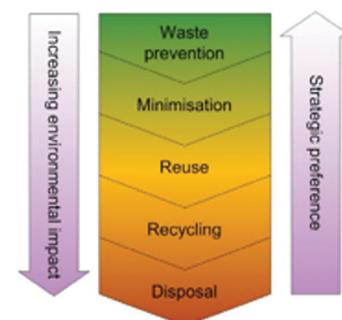
Thompson is very positive about the future and what LLWR will continue to achieve for the NDA.

A sustainable solution for LLW

The second factor in LLWR's success lies in developing a viable and sustainable LLW management solution that could be implemented across the industry to get the required outcomes for the UK.

The work of NDA and Government in 2007 highlighted the need to apply the principles of the waste management hierarchy common to the rest of industry (See Figure 3).

Guided by this, LLWR's proposition was based on incorporating many of the techniques and practices of industrial waste management for nuclear waste, in particular the practice of diversion away from storage and disposal.



LLWR has also made a huge success of the National Waste Programme (NWP), established in 2011 to lead the implementation of the

Figure 3: Waste management

changes in LLW management practices and culture needed to deliver the UK strategy. The NWP is made up of a wide range of stakeholders from across the industry including waste producers, the supply chain for waste treatment and alternate disposal services, regulators, local and national government, NDA, LLWR and the National Programme Office. Through the programme, stakeholders work collaboratively to deliver the safe, secure, environmentally responsible and cost-effective treatment and disposal of LLW in the UK, in accordance with the strategy. The programme shares good practice across the industry and facilitates access to existing and new LLW management routes.

Led by a national programme board, it has enabled a joined-up approach, a clear strategy and operating structure for the industry. This work has been vital to getting the supply chain on board over time, and ensuring that new practices are embedded across the industry.

Ten years on from the original award of the contract to LLWR, the waste hierarchy has been turned on its head, with only 11% storage/disposal and 89% diversion by 2017 compared with 95% and 5% diversion at the start of the contract (See Figure 4).

HHISO containers now number around 150 per annum, representing a radical reduction from the 2008 figure of 1,000 per annum. This reduction is even more significant given the increase in waste now produced from decommissioning operations.

More than £100 million has been invested in the infrastructure of the LLW Repository site over the past decade to maintain the facility as an important asset for the UK. Cost savings of £250 million have also been achieved in the same period, encouraged by the shift towards diversion.

The UK is regarded as world leading in its LLW practices and Thompson is clearly very proud of what he and his colleagues at LLWR and the NDA have achieved in turning the waste hierarchy on its head for LLW.

Thompson speaks regularly about the LLWR's work and LLW topics at international conferences, most recently in October this year, at the International Nuclear Symposium in Bucharest. He is also speaking at the Nuclear Institute's Integrated Waste Management Conference in April 2018.

"Many companies want to emulate what we do here in the UK," he says. The UK has created a sustainable programme, and the current waste

programme stretches to at least 2080. "What we do here in the UK," he says, "will keep on working."

Getting industry on board

Changing the way that LLW has been managed for decades represented a huge change for the whole nuclear industry and has taken time to achieve.

From 2008, LLWR started to address this from a National Programme perspective with the NDA and Environment Agency (EA), to ensure that permitting was aligned with what could be offered to industry as part of a national approach.

"We created a series of services and a strategy to manage this work [the National Programme] on behalf of the nuclear industry," says Thompson, and, "because of the complexity of the issue and the associated cost of change, this took some time to get the supply chain on board."

Services began with areas such as metal treatment, moving to other materials and techniques, such as incineration, each of which had to be rolled out and implemented.

Making disposal more of a last resort, rather than the main solution, encountered resistance in these early days, particularly as new treatment services meant new costs to waste generators.

However, LLWR worked closely with the NDA to address these issues, and by the time Thompson took over as managing director in 2012, the new processes were starting to gain momentum and adoption.

The industry participants are proud of their achievements within the National Programme framework. In 2016/17, LLWR working with many partners in the supply chain enjoyed a record year, diverting more waste from its repository than ever before. Some 3,858 tonnes of metals were diverted in 2016/17, which was more than double the previous year's total of 1,505.

In addition, 3,100m³ of waste went down the combustible route compared to 2,216m³ in 2015/16, and the volume of Very Low-Level Waste diverted also increased from 5,311m³ to 6,509m³ last year. This is testament to the success of LLWR's approach and also the strong collaborative relationships and working practices that have been developed across the industry.

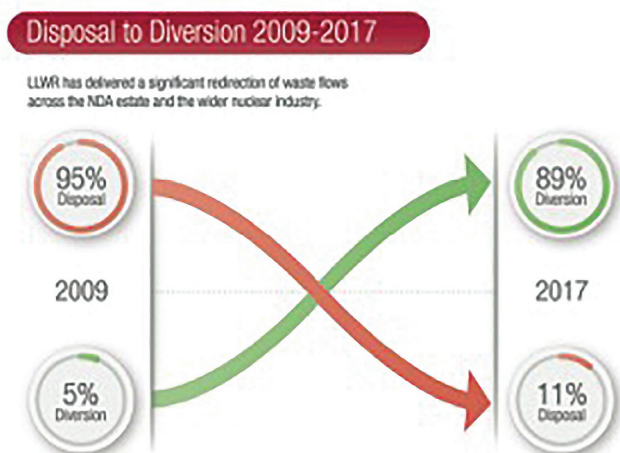


Figure 4: LLWR diversion 2009-2017

Creating an esprit de corps

Getting industry on board with a totally new approach was not the only issue that LLWR faced in 2008.

Equally challenging was the need to change behaviours internally within LLWR, from the established mentality of, "the way we have always done it round here," focused on disposal, to a way of thinking that was more courageous and questioning, more client focused, and more innovative in looking at ways to address waste issues through diversion.

Thompson wanted to tap into the latent energy he could see around him, and employees' genuine belief in what they were doing to solve these important waste management issues.

Behavioural change is clearly an area of deep interest, passion and commitment for Thompson. Influenced, he says, by his father, who has a "keen insight into human behaviour".

"I love to take on an organisation, to understand what makes it tick and how to incentivise people to change and encourage them to own

the process, and strive for success. This is what leadership is about – creating an environment where people can, and want, to succeed.”

Thompson spent his first four years at LLWR (2008-2012) involved formally in business change and transformation. This work continued more or less for the first term of the new contract (2008-2013), because this was where the emphasis needed to be within the business. His approach was proactive and hands on.

“I got to know the unions and everyone in the SLC. I started to identify good incentives – monetary and non-monetary. I got to know Sellafield and to understand where LLWR sat within the NDA Estate. We were something of a step-child and we needed to feel wanted and part of the NDA family.”

When he became managing director in 2012, he was able to take the process of business change even further. Reflecting on this process, he says he wanted to, “change the negative talk, the grumblings at the coffee machine”, into “a positive and energetic vibe. I wanted happy folk.”

Thompson has used the opportunity of the performance led nature of the contract to achieve this sense of ownership and esprit de corps internally. Three times a year he gets the whole company together (c.400 employees). He says that LLWR employees now understand their role in LLWR's success, and that he can now see that “positive energy”, which was at the outset, his primary goal.

Being a good neighbour

Thompson speaks about LLWR as having a “social licence to operate”. Given the nature of its business and impacts, public perception of how LLW is managed is very important. Ultimately it is the local community that has to engage with, and endorse, what LLWR does in the area.

In 2013, when LLWR was applying to vary its environmental permit to allow continued disposal of radioactive waste at the repository, it was critical that the local community were consulted and that they understood fully the proposals, in particular the environmental safety case. The only way to do this, says Thompson, is to “get out there and get to know people”. LLWR does this continuously, speaking with representatives of the local community every month, so that “they know where we are going and appreciate what we are doing”.

Thompson cites the project to construct Vault 9, which was a huge civils project that lasted three years. For this project LLWR ran Open Days and site tours to help people to understand what was being done. Being a “good neighbour” is of critical importance, which you can only achieve, by listening and being “transparent, open and consistent”.

Inspiring others and “connecting the dots”

Thompson describes his role as leader of LLWR as one of “connecting the dots”. Certainly this is the impression you get of Dennis Thompson – someone who sets the context, who leads from the front, inspires, facilitates, and encourages people to take responsibility and become leaders themselves within the business.

A civil engineer by background, Thompson has spent his whole career in waste management. He says that he realised early on that there were some huge issues to solve on the waste side of the nuclear industry. Back in his native America, he was the youngest ever facility manager, working at a large nuclear facility on the Savannah River, dealing with millions of

gallons of liquid waste. The challenge was how to stabilise and dispose of this nuclear waste.

This stimulated him to look at other areas of waste management. Trying to find answers to these issues was about “doing something meaningful”. When the opportunity to work on the low-level waste issues in the UK came up, he jumped at the chance. “I only came for two years,” he says, “but love what I do and have been here ever since!”

Thompson wants others to believe in the waste industry as much as he does, especially the next generation. He is particularly effusive about “the energy and talent within NIYGN”, which he calls “my favourite group”, adding: “I never say no to them when they ask me to speak! They are our future.”

LLWR also champions school outreach and engagement and has adopted three local schools to participate in the Lego League Challenge, an international initiative that has huge potential as a learning and development tool for both the youngsters and LLWR employees.

This is a five-year commitment, which involves people from across the business, working on projects in these schools. It's not only about helping to inspire the next generation, but also about demonstrating that LLWR is a “giving organisation”.

Thompson's enthusiasm for the industry and the LLWR business is palpable and infectious, and what LLWR has achieved is indeed impressive. He is a clear role model for the next generation.

Who would have thought that waste could be so interesting!

By Dr Rachel Roffe

Dennis Thompson: a short biography

Dennis Thompson has over 25 years of experience in the nuclear industry with a predominant focus on nuclear operations and low level waste management.

He started his career as a start-up (commissioning) engineer with DuPont at the Savannah River Site in South Carolina, USA. He became part of a start-up team responsible for commissioning the Saltstone facility, a facility designed to treat, immobilise, and dispose of large volumes of liquid low level radioactive waste. Once commissioned, he moved into operations and eventually became the facility manager. In addition to operations management, Thompson has moved into a variety of key management positions covering a range of disciplines including training procedures quality assurance and project management.

Thompson moved to the UK to take up the business manager role at the LLWR, responsible for finance, project controls, IT, and human resources. He was asked to extend his UK assignment by assuming the managing director role, which is the one he currently holds.

He earned a Bachelor of Science in Civil Engineering from the University of South Carolina and later earned a Masters in Business Administration from the same university.