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Nuclear Stewardship

Providing bespoke end of life-cycle management solutions to the nuclear industry

About Urenco Nuclear Stewardship

Urenco Nuclear Stewardship have a leading role in providing responsible stewardship of nuclear materials through waste management, long term storage and decommissioning services. We are a wholly-owned subsidiary of the establish Urenco group, who have been a crucial part of the global nuclear industry for over 50 years.

Our workforce has demonstrable experience of providing end-of-lifecycle management solutions for the nuclear industry, developed through many years of decommissioning the UK's nuclear legacies on the Capenhurst Nuclear Licensed Site, and ongoing operational waste management for our sister companies, Urenco UK and Urenco ChemPlants. Our workforce have specialist management skills and expertise within the nuclear sector in:

- **Waste management and waste services;**
- **Storage of radiological materials;**
- **Radiological asset care;**
- **Decommissioning and land remediation;**
- **Engineering support.**

Our unique offer is formed from a combination of our established experience in end-of-life-cycle management, our extended contracts with the Nuclear Decommissioning Authority (NDA) and Ministry of Defence, our position as Urenco's centralised waste management and decommissioning function, and a convenient UK location on the Capenhurst Nuclear Licensed site, with space and opportunity to develop. Our business is built on a foundation of strong relationships with our customers, suppliers, regulators and commercial partnerships, allowing innovative solutions for the UK and global nuclear industry.

Urenco Nuclear Stewardship provide end-of-lifecycle management solutions with a waste-led perspective. Since 2021 we have delivered scope at a cost of over £260m for the NDA, two years ahead of schedule and 12% under budget. In addition, we provide safe, secure storage to the UK's uranium assets and will continue to do so for the next 90 years. With operation of a 3100 m^2 waste management facility with further opportunity for expansion, we are in a prime position to continue to serve the needs of the UK and global nuclear industry.

Radioactive waste services

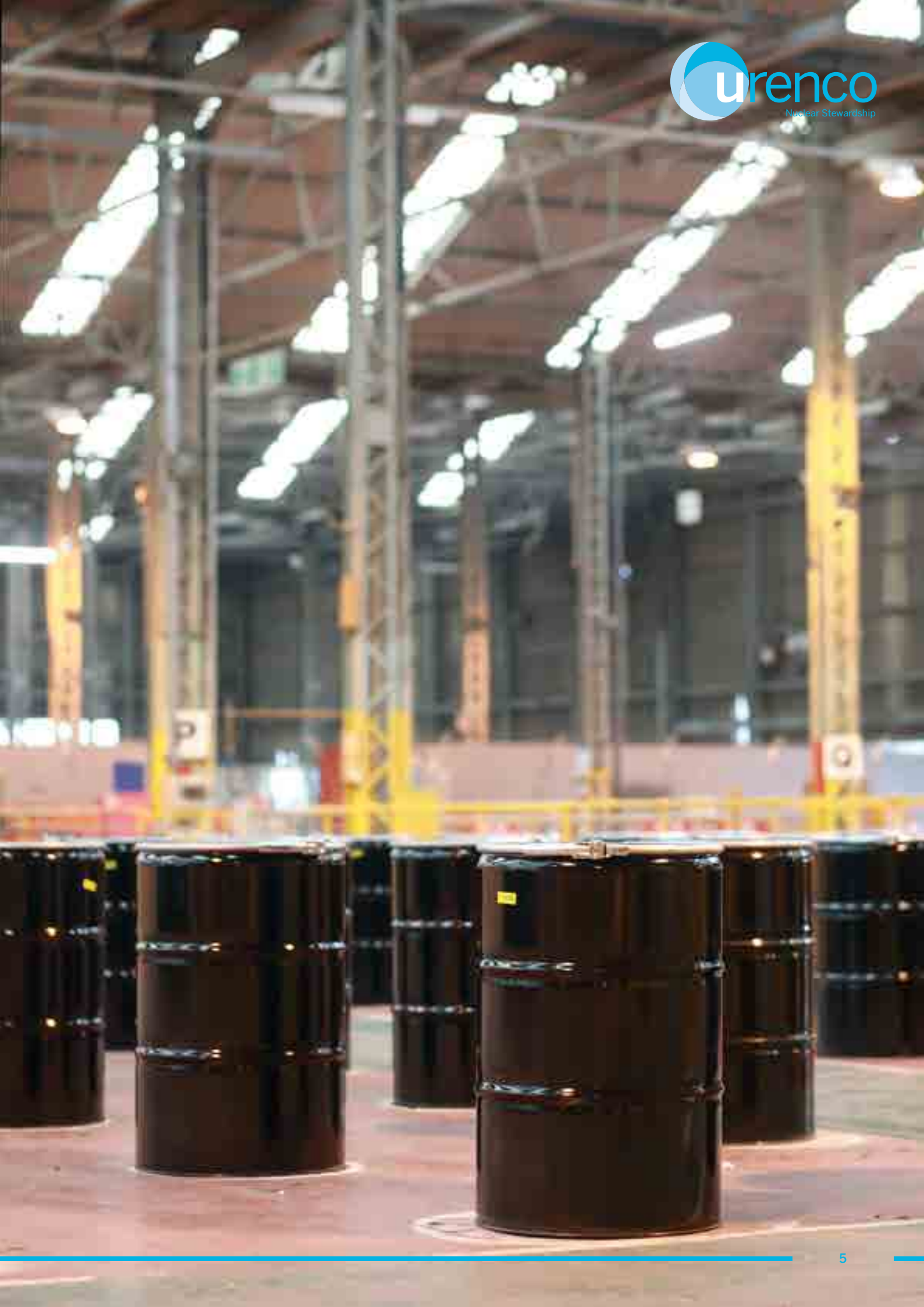
Urenco Nuclear Stewardship have a dedicated team committed to providing expert radioactive waste services to our customers. Using skills developed through decades of experience working directly on UK and international nuclear sites, our Radioactive Waste Operators and Waste Support Services can support customers' needs throughout the entire waste lifecycle of an operational plant to a decommissioning activity or project.

Urenco Nuclear Stewardship operate a purpose-built waste management facility provides optimal space for waste operations on the Capenhurst Nuclear Licensed site. With opportunity for expansion, the 3100 m^2 facility is operated by Radioactive Waste Technicians and supported by an experienced team of Radioactive Waste Advisers, Technical Specialists and Waste Coordinators.

Radioactive waste strategy and planning

Our Waste Advisers and Technical Specialists are adept at developing strategies and plans that imbed waste management into day-to-day business on waste-producing sites. We can facilitate the development of a site's Integrated Waste Strategy and provide assistance to projects at the inception phase ensuring, for example, that decommissioning is undertaken in a waste-informed and waste-led, manner.

Using the experience our experts have developed over decades of working within the nuclear waste management industry on licensed sites, we can advise waste-producers through Best Available Techniques assessments, optioneering and optimisation studies and facilitate workshops that lead to justified and substantiated decisions. Further into the project lifecycle, our radioactive waste specialists can develop waste management plans that are both comprehensive and clear, and give end-users all the information they need to manage wastes optimally and compliantly through the whole lifecycle from planning through to generation, packaging, transportation and disposal.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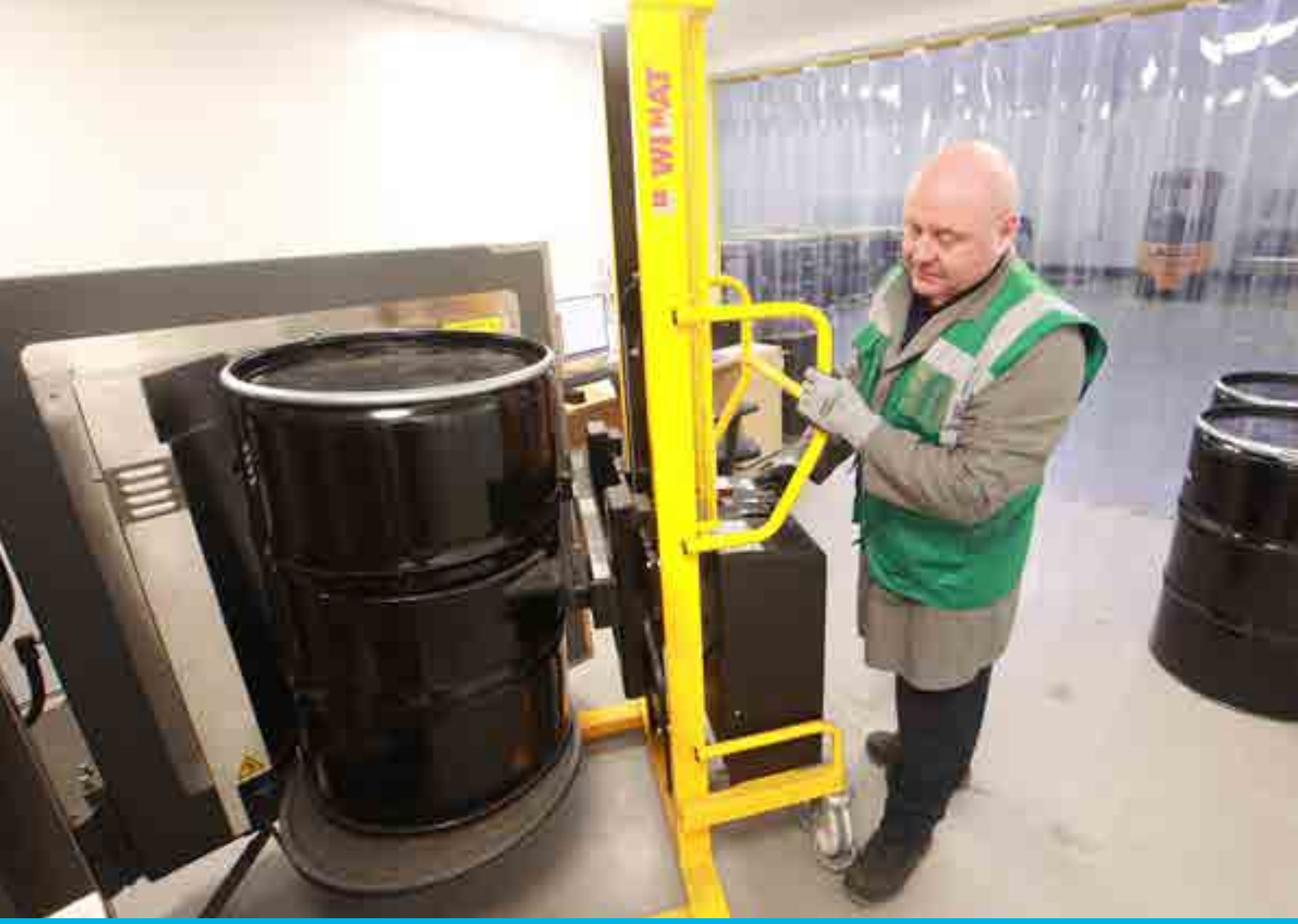


Characterisation of radioactive materials

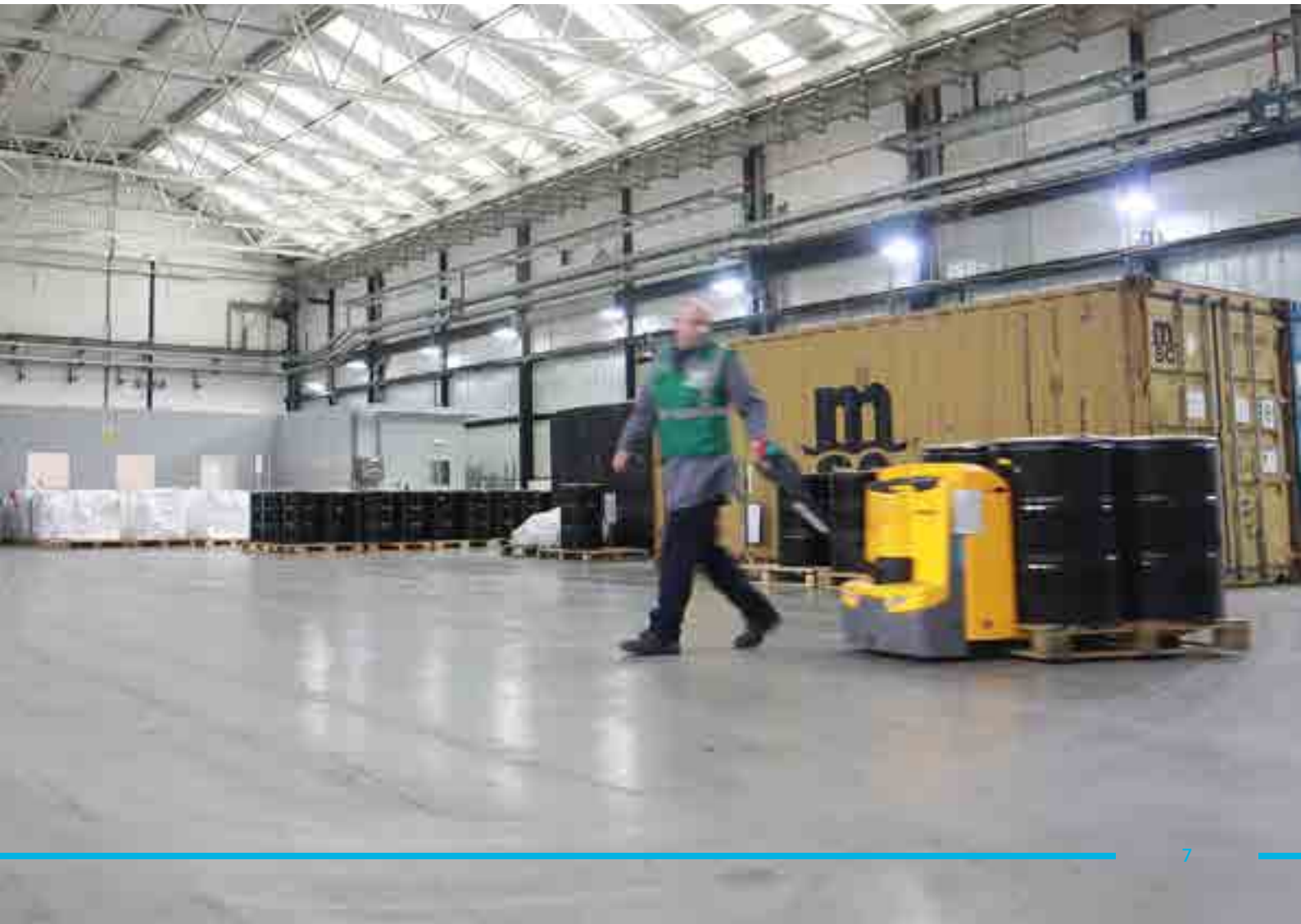
Our team are trained and experienced in the use of processes such as Data Quality Objectives (DQO), Data Quality Assessment (DQA) and supporting software Visual Sample Plan (VSP). They have extensive experience in using these tools to model areas set for demolition and choosing the optimal sampling strategy to meet the project goals, as well as applying these techniques to other more novel scenarios outside conventional sample plans. To support waste disposals, our team of operators and technical specialists use a variety of detection systems coupled with modelling techniques including: MicroShield, iSOCS or bespoke tools to suit needs and provide a Best Available Techniques (BAT) assay solution. We can also assist in developing or rationalising radiological fingerprints, clearing wastes as out of scope, and advising on the most suitable means of measuring radiological contamination in the workplace.

To support the upfront characterisation of decommissioning waste, our Waste Technicians have previously extracted samples and managed the follow up analysis. .Our team of Health Physics Surveyors can undertake a variety of radiological measurements and we also have the capability to identify heavy metals through the use of hand held XRF analyser.

A three detector high resolution gamma spectroscopy arrangement is available for the assay of drums or smaller containers. For large items, in particular decommissioning wastes placed on pallets or in flexible intermediate bulk containers, our Waste Technicians make use of portable high resolution gamma spectroscopy equipment. In conjunction with our Waste Technicians, our Waste Engineers and characterisation experts have the skill set to develop and fine tune various waste models to achieve customer requirements.

Supporting the management of compliance

Our team contains Radioactive Waste Advisers and Radiation Protection Advisers who can provide expert support on regulatory compliance. Urenco Nuclear Stewardship can assist with any application for an Environmental Permit or variation from environmental regulators. We can help develop a suitable Waste Quality Management System and prepare the necessary documentation end-users need. We can advise and assist in the development of a risk assessed audit and compliance schedule and can undertake audits of a facility's management systems and provide advice and guidance to improve a site's Waste Management operations.



On-site training support

Urenco Nuclear Stewardship are able to provide training at your site, or at an offsite location, to support your Waste Management needs. Our highly skilled Waste Advisers and Technical Specialists can provide standard courses on a range of waste management, characterisation and transport topics, or can tailor these courses so that your specific site requirements are met.

Transport and consignment of hazardous materials

Urenco Nuclear Stewardship have significant experience in the transportation and consignment of radioactive waste, built through our own decommissioning experiences. We can offer Dangerous Goods Safety Adviser (DGSA) support to your business and our team of Consignment Managers and Officers can assist with Waste Loading Plans, package approvals and consignment of waste (including trans-frontier shipments). We are highly experienced in consigning radioactive waste and other hazardous substances using the LLWR framework.

Our radioactive waste experts have vast knowledge to be able to support all LLWR documentation production, from waste enquiries through to consignment information forms. Additionally, our team work directly with the supply chain, and can provide support in accessing waste treatment services outside of the LLWR framework.

Radioactive waste handling and storage

Urenco Nuclear Stewardship Waste Operations have various material handling capabilities for varying type and weight.

Various locations exist within Urenco Nuclear Stewardship for the interim storage of material awaiting further processing or disposal. We operate a large capacity of internal and external temporary storage areas, amounting to a potential 10500 m^2 external and 26000 m^2 internal storage, dependent on demand. A material handling and lay down area within the Waste Management Facility is available for items requiring further protection from the weather. In addition to the Waste Management Facility, further temporary storage capacity in the form of raft storage (concrete hardstanding), temporary coverings, and externally positioned ISO containers are also available.

To support the characterisation of waste material, a sample store is located within the Waste Management Facility to support waste management operations. Dedicated storage locations are available for various types of sample containers. Urenco Nuclear Stewardship's Waste Technicians are practised in the handling and consignment of hazardous material (samples) from the experience gained in decommissioning projects and waste operations on various nuclear licensed sites in the UK.

Other supporting assets within Urenco Nuclear Stewardship Waste Operations consist of a certified weighbridge, capable up to 50 tonnes with a span of 18m, and smaller certified weigh scales for pallets and FIBCs.

Processing radioactive waste and radioactive waste management

Urenco Nuclear Stewardship operate a Waste Sorting Enclosure within the Waste Management Facility for undertaking further work on potentially hazardous waste material. The enclosure supports activities such as size reduction (cold or hot cutting), material segregation, sampling or re-packaging. The build of the facility means it can be set out to support the handling of a dedicated waste type for a customer. The Waste Sorting Enclosure is supported by a dry extract system.

Urenco Nuclear Stewardship can support the preparation for processing of various radioactive waste. This includes:

- **Soft waste;**
- **Incinerable liquids (including chemicals and oils);**
- **Non-compactable wastes;**
- **Waste electrical, electronic equipment (WEEE);**
- **Metallic waste.**

Our assets supporting waste processing include a large ventilated enclosure for size reduction and repacking operations, a grit-blaster for decontamination of surface contaminated metals, a range of cutting equipment and a drum crusher for size reduction and a cable stripper for the extraction of copper for recycling. But with 3100 m^2 of space within the Waste Management Facility we are in a prime position to best serve the needs to the UK and global nuclear industry through the tailored development of our facilities and expansion of processing equipment based on custom requirements.

Waste operations employees

Urenco Nuclear Stewardship's Waste Operations team consists of personnel with a wide ranging skill set developed through operations on decommissioning activities and waste operations on various Nuclear Licensed Sites around the UK. Our team are well versed in Safety Case management and development, along with nuclear operations and the transport management of hazardous material. Our Waste Technicians' expertise includes Health Physics monitoring capabilities to support operations and the off-site disposal of waste. Material handling, assay and processing are among the other capabilities provided by our team.

Storage of radioactive materials

Urenco Nuclear Stewardship is highly experienced in the storage of radioactive materials through the many years of providing this service to the Nuclear Decommissioning Authority. We are currently responsible for the safe management of over 95% of the UK's uranic Inventory, ensuring 55,000 tonnes of uranic material is secured for the next 90 years.

We operate secure storage facilities covering 36,000 m^2, providing a dry environment to store radiological material with the safe systems in place to ensure the material is protected from potential hazards. The storage area is covered by a safety case that can be extended to different materials, permitting a flexible response to customer demand.

Inspections and material management

The very nature of the material we store means it is in situ for long periods of time. This has required our team to develop excellent materials management skills to ensure the contents of the material under our stewardship is protected, hazards are reduced, and materials remain safe for the duration of their storage.

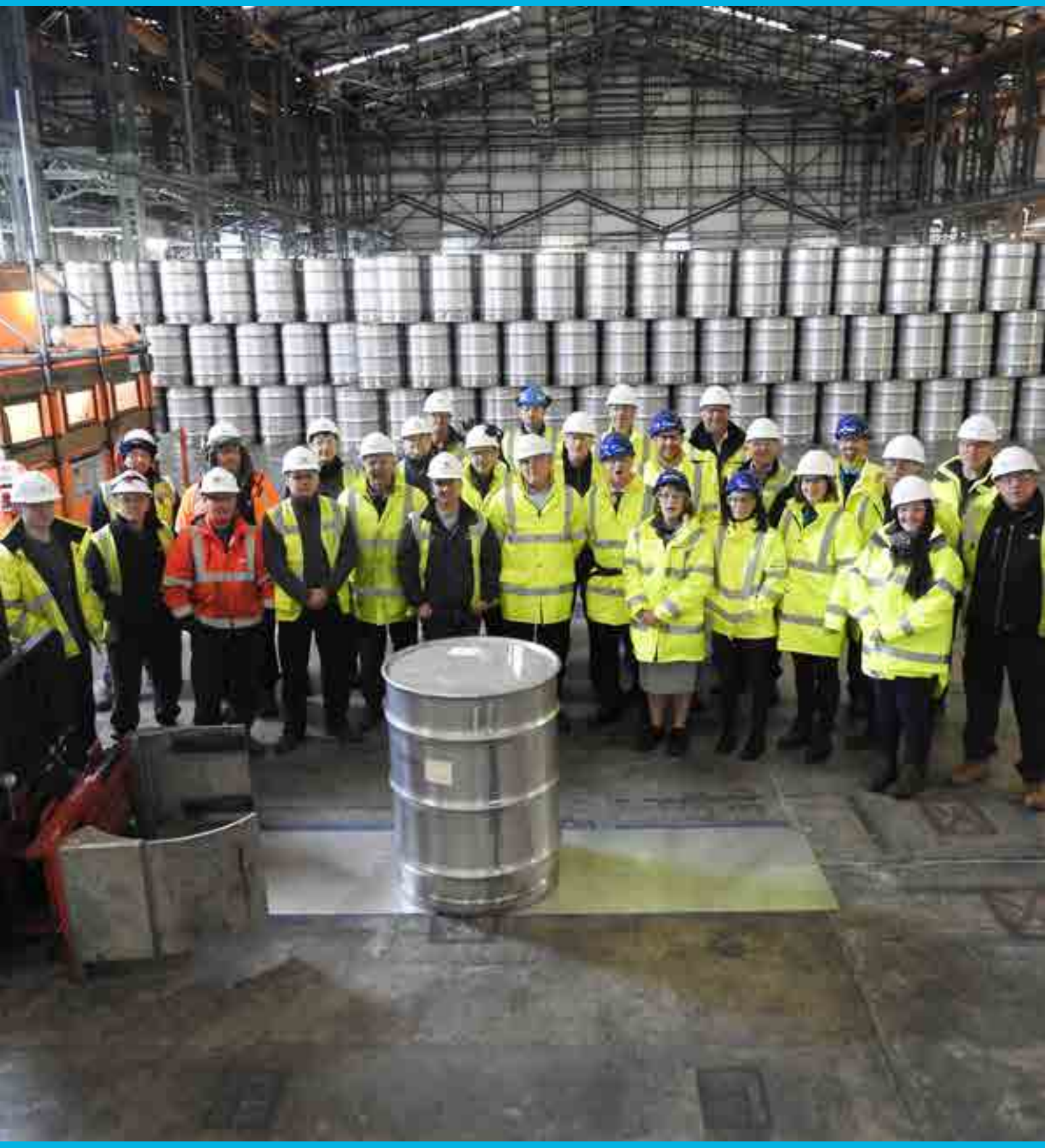
This includes a series of inspections on the 9,500 legacy cylinders, over 50,000 drums of uranic material from Magnox fuel reprocessing, and uranic materials from Urenco UK. The Storage and Asset Care team provide efficient inspections to ensure the integrity of the storage containers for all material under our stewardship is adequate and will remain that way for the course of its required lifetime. The team are experienced in supporting the development of lifetime assessments to estimate at what point containers may present structural concerns that require managing.

Some material requires closer attention and more frequent inspection. The frequency is assessed on a risk-based analysis, and our experts can perform condition remediation work where inspections have identified immediate or potential faults.

When structural concerns are identified, our team of experts work to best manage the situation. We have experience in restoring container materials as well as over-packing to ensure safe long-term storage.

Examples of our work include:

- **Preparation for the storage of nuclear-powered submarine reactor pressure vessels;**
- **Over-packing of legacy drums;**
- **Legacy cylinder management and inspection.**



Decommissioning and land remediation services

Working on the Capenhurst site, Urenco Nuclear Stewardships Decommissioning Projects team are integral to the UKs mission to safely and compliantly manage nuclear legacies. Using their many years of experience, the team are practised in finding the optimal solutions to decommissioning challenges. Our Project Managers work closely with supporting teams in waste services, engineering, and Health, Safety, Security and Environmental experts to follow a safety-conscious and waste-led approach to nuclear decommissioning.

Transitioning towards decommissioning

Our team of project managers and project delivery experts are adept at managing the transition from operations to a decommissioning and deconstruction phase of work for assorted nuclear facilities. Our team have a proven record in delivering aPost Operational Clean Out and decommissioning programme for the Nuclear Decommissioning Authority, ahead of schedule and under budget, scheduled for completion in 2023 – years before the original baseline.

Our work includes completing Post Operational Clean Out on a building that has been both part of a gaseous diffusion uranium enrichment facility and a waste management facility over its lifetime, totalling 29,000 m^2, including the isolation, removal and re-routing of building services, site communications and other systems. Our projects team have direct hands on experience of completing Post Operational Clean Out on facilities that have been progressively decommissioned over the last 30 years, ensuring that all works are completed in line with the latest legislation. The team are well versed in CDM2015, IRR2017 and CAR2012 and can develop the appropriate Safe System of Work to allow works to be executed safely.

Safety is so integral in all our decommissioning projects, our projects team take on the role of Safety Case Owner to ensure the most appropriate safety case for the works, be this to modify the existing safety case or to support the development of the decommissioning specific safety case based on a Safety case review and gap Analysis.

Decommissioning planning

Urenco Nuclear Stewardship plan delivery of their projects in line with international best practice to achieve the agreed end-state for each of the respective facilities. We have fulfilled all the duty holder roles under CDM2015, utilising the diverse, proven skill-set within the wider team to complete optioneering studies, such as Best Available Techniques (BAT) studies, demolition trials and integrated waste strategy documents to ensure that we provide a safe, robust and appropriately underpinned schedule of works.

Urenco Nuclear Stewardship deliver waste-driven decommissioning projects across the Capenhurst site, with reach-back to the wider Urenco organisation for governance and assurance on project delivery, ensuring compliance with proven project management techniques across our annual project programme. The team plan the entire works, from Operational Handover to Handover and Close-out.

Proven project management practices

Urenco Nuclear Stewardship follow a seven stage process to our project delivery. Typically, we employ Front End Loading to our projects to ensure that as much Learning from Experience and knowledge is gathered from projects previously completed and embedded early on in the project lifecycle, whilst we have the ability to successfully alter the outcome with maximum safety and cost benefit. Our experience with legacy nuclear facilities takes a risk-based approach to deliver projects in a phased manner. Through employing a dedicated Project Management Office, we have the ability to deliver complex, turn-key solutions. The team have experience with various sized projects, and are able to flex to meet the needs of the client, with experience in a multitude of hazardous environments ranging from asbestos, confined spaces, contaminated drain cleaning, working at height, mobile plant operation, concrete remediation. Some of the decommissioning projects we have undertaken in recent years include:

- **Phased demolition of a former gaseous diffusion plant;**
- **Contaminated land remediation and Re-use to a storage raft;**
- **Decommissioning of radiological and asbestos contaminated process cells;**
- **Incinerator Demolition and land remediation.**

Engineering support

We have a proven track record of maintaining Nuclear Decommissioning Authority assets and developing strategies for managing hazardous materials. Our Engineering team supports all aspects of the business and assists in ensuring that we maintain high standards in safety, quality and environmental performance.

This is delivered through four major strands of work:

- **Delivering projects in a nuclear context;**
- **Asset management;**
- **Technical authority;**
- **Continuous improvement.**

Delivering projects in a nuclear context

Challenges within the nuclear industry can be complex, and are generally either unique or have sufficient nuances to prevent a 'one size fits all' approach from being appropriate. Our Engineering team have vast experience in defining problems, formulating concept solutions and producing accurate estimates as a precursor to a project being initiated and can provide integral support to the development of bespoke solutions to the nuclear industry's radioactive waste challenges. Our engineering experts work internally and with third parties to deliver high quality designs to budget and programme. Following design, our engineers will ultimately support the implementation, commissioning and handover of these designs into operation.

Asset management

Once handed over to operations, plant assets must be appropriately managed throughout their remaining lifecycle. Our Engineering experts manage the maintenance, performance improvement and decommissioning of Urenco Nuclear Stewardships' current plant assets and can provide the same level of support to future operations developed on the Capenhurst Nuclear Licensed site.

Technical authority

The Engineering team is embedded in the delivery of all operations that Urenco Nuclear Stewardship perform. It acts as our Design Authority, provides Safety Case support and incorporates our Intelligent Customer capability. With safety as Urenco Nuclear Stewardships' primary focus, we ensure that we meet all Regulatory and other mandatory requirements, ensuring full compliance in everything we do.

Engineering personnel

Our Engineering team provide continuous training and development opportunities to their staff. Our team includes several Chartered Engineers from diverse backgrounds who possess knowledge and experience gained from many years working at multiple UK nuclear facilities and in other industries. We are always building our expertise and capabilities so that we can provide optimised solutions to both internal and external clients, and if required can also draw upon the Engineering resources of the wider Urenco Group.

The key strength of our team is their ability to react to unique challenges, able to draw on their own professional experience, historical learning and current research to provide an optimal solution that satisfies customer requirements of cost, time and quality, while not compromising on safety.

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