

SPECIALISTS  
IN COMPLEX  
INDUSTRIAL  
ENGINEERING

WORKING COLLABORATIVELY  
TO ENGINEER, BUILD, IMPROVE  
AND MAINTAIN INDUSTRIAL  
INFRASTRUCTURE



# WE ARE SPENCER GROUP - INDUSTRIAL ENGINEERING



*Richard Green-Morgan*

**Richard Green-Morgan**  
**Off Site Construction Director**  
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I have a wide-range of experience in industrial engineering with numerous sectors, including Bulk Handling & Storage, Onshore / Offshore Oil & Gas, Power Generation and Petrochemical. I have been involved in all stages of a project's lifecycle, from concept design, through to FEED (Front End Engineering Design) and on to construction delivery and hand-back.

I firmly believe that significant value can be realised, on behalf of our clients, by adopting Spencer Group's robust, mature and highly effective ECI (Early Contractor Involvement) processes. In this way we are able to deliver optimum investment value for our clients by evolving and developing the most appropriate technical solution for their projects.

Our large in-house design team works alongside our construction professionals during the ECI period, making the overall ECI process seamless and extremely effective. ECI may include the preparation of initial engineering proposals for a range of options and then providing budget and programme data for each solution so that the most cost-effective and appropriate design is taken forward. By integrating and pooling the talents and experience of our Civils, Structural, M&E, ECI, Design Engineering and Construction professionals we are able to create the very best outcomes.

This ECI approach yields optimum cost & programme certainty and significantly reduces project risk when compared with traditional procurement routes. It also allows for mobilisation to commence much sooner through the efficient transfer of knowledge and a significantly reduced procurement period.

**SPENCER**  
British Engineering



## SECTORS

INDUSTRIAL & COMMERCIAL | PORTS & MARINE | NUCLEAR | PETROCHEMICAL | PHARMACEUTICAL | POWER GENERATION | WAREHOUSING & STORAGE | OIL & GAS | RAIL | HIGHWAYS

## CAPABILITY AND EXPERTISE

CAPITAL CIVIL ENGINEERING & MEICA PROJECTS | WAREHOUSE / STORAGE STRUCTURES – CONCRETE / STEEL | NUCLEAR NEW BUILD & DECOMMISSIONING | BIOMASS & BULK MATERIALS HANDLING & STORAGE | MARINE IMPROVEMENTS & NEW-BUILD | SUBSTATIONS | STORAGE FACILITIES – SILOS & TANKS | COLD STORES | PROCESS FACILITIES | POWER STATIONS | COLD STORAGE

## SERVICES

CIVIL ENGINEERING | MECHANICAL ENGINEERING | ELECTRICAL, INSTRUMENTATION & CONTROLS | DESIGN & ENGINEERING | ASSET SURVEYS & REPORTING | ASSET MAINTENANCE, OVERHAULS & SHUTDOWNS | NUCLEAR DEMOLITION & ASBESTOS REMOVAL | NUCLEAR DECOMMISSIONING & DECONTAMINATION | HV / LV SUPPLY & DISTRIBUTION | FABRICATION | HEATING, VENTILATION & AIR CONDITIONING | CCTV & SECURITY | PIPEWORK & RACKING | BUILDING MANAGEMENT SYSTEMS

## EARLY CONTRACTOR INVOLVEMENT

Spencer Group's Industrial team have a wide-range of experience within numerous sectors, including Bulk Handling & Storage, Onshore / Offshore Oil & Gas, Power Generation and Petrochemical. Our engineers have been involved in all stages of a project's lifecycle, from concept design, through to FEED (Front End Engineering Design) and on to construction delivery and hand-back.

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## LARGE IN-HOUSE DESIGN TEAM



*T Hopkins*

**Tony Hopkins**  
**Engineering Manager**  
 tony.hopkins1@thespencergroup.co.uk

Few contractors in the UK have their own dedicated, multi-disciplinary, in-house design capabilities such as those provided from our Head Quarters in Hull. Our unique Design & Build business model, developed over the past 30 years, enables us to tackle the most complex turnkey project across a wide-range of sectors, all over the UK.

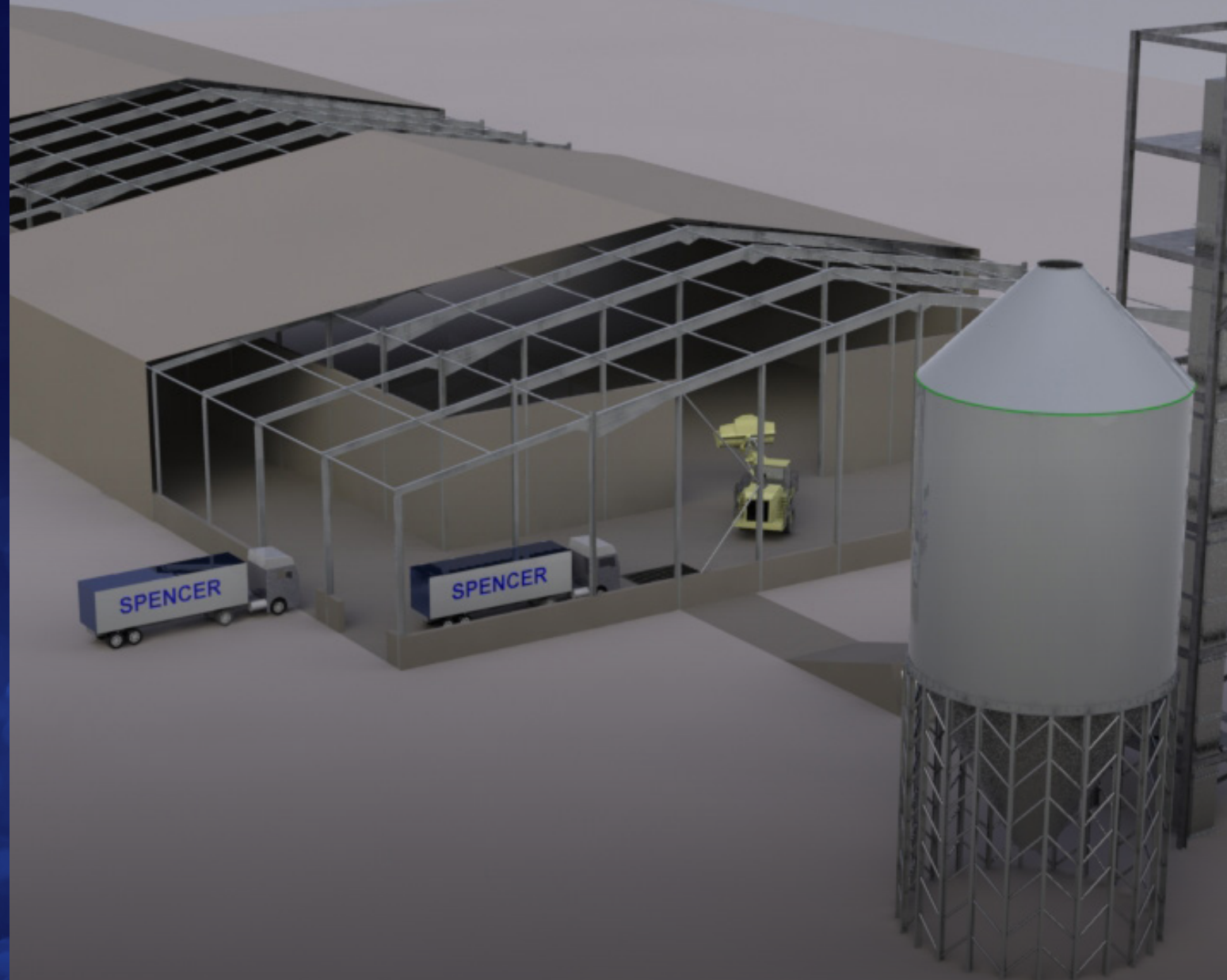
Huge benefits are borne through the efficiencies of internal collaboration between our construction professionals and our civil, structural, mechanical and electrical control system specialist design engineers. Our collaboration extends to our client teams, critical stakeholders and supply chain so that the most sensitive third parties can have ownership and involvement in the design development process.

The importance of temporary works design is often overlooked at concept stage. We develop the most efficient, buildable and appropriate temporary works designs at pre-construction stage to ensure they are compatible with our permanent works design. Our temporary works experience covers suspended access, propping and shoring in addition to other interfaces such as lifting operations.

Permanent works design is implemented in a BIM compliant, common data environment, making the sharing of information through the currency of a project, and the ultimate hand back, as smooth as possible. Our professionals have a deep understanding of all available construction materials and methodologies to enable them to deliver optimum value, is locked into the final design solution.

Our designers have in-depth knowledge and experience of dynamic and static engineered solutions to suit any process or manufacturing application. This enables our clients to source more scope and integrated services from a single point, making the outcome fit-for-purpose and extremely cost-effective.

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 British Engineering





## POWER GENERATION

Thanks to the wide range of expertise within the business, Spencer Group has been able to develop innovative solutions and deliver highly successful projects in the energy sector. Power generation is an extremely complicated field due to the complexity of linking many types of infrastructure together to create a functioning whole, but to us it's an opportunity to rise to a new challenge.

Calling on industry leading experts in fields as diverse as rail, civil engineering, M&E and materials handling, we are able to create daring solutions to the trickiest problems that our clients face. It's this depth of knowledge that allows us to self-deliver power generation projects from start to finish, complete with the complex planning that comes with designing the plant from scratch, to designing and building the access infrastructure, to commissioning the site when it's built.

We're also adept at forming part of a wider team to deliver projects. Our world-class planning team thrive on managing complex collaboration and stakeholder relationships to ensure the work gets done and maximum satisfaction is achieved. We're not afraid to break new ground and we know no project is ordinary, that's why we're constantly at work to deliver innovative solutions that save time and money. From our own £200m Energy Works project to the Port of Tyne renewable fuels terminal, we look at things differently to generate maximum value from every element of the design.





## PROJECT DETAILS

<b>Client</b>	Spencer Group Development
<b>Start Date</b>	June 2011
<b>End Date</b>	November 2015
<b>Duration</b>	53 months
<b>Location</b>	Hull

## KEY STATS

43,000 POWERING 43,000 HOMES

25 CREATING 25 PERMANENT JOBS

240,000+ TONNES REFUSE DERIVED FUEL DIVERTED FROM LANDFILL

# ENERGY WORKS

Pioneering green energy power plant to improve energy security and divert waste from landfill. A technology focussed solution to enable a cost effective, reliable and therefore investible Energy from Waste plant. Spencer Group followed the journey from idea, to procuring a suitable site, developing an investible design, securing planning permission, to funding and sourcing a suitable EPC to deliver the vision.

## PROJECT SCOPE

Spencer Group was the developer of the 25MWe Energy from Waste scheme developed on the banks of the River Hull. Key elements of Spencer Groups works included;

- Securing Site for development
- Architectural designs of plant
- Technology focused designs to create an investible concept
- Securing planning permission
- Sourcing funding including a £19.9m grant from ERDF

- Securing CfDs for electricity being exported to grid
- Securing feedstock for the plant
- Contract an EPC to deliver project to the Spencer Group visionz

## PROJECT OUTCOME

Energy Works (Hull) is a 25MWe Energy from Waste plant using fluidised bed gasification technology. The feedstock for the plant is RDF (Refuse Derived Fuel) diverted from landfill. The fuel bunker within the facility can hold up to 4 days' worth of fuel. The plant developed by Spencer Group produces sufficient baseload electricity to power the equivalent of 43,000 homes and process 240,000 tonnes of waste per year. The development also incorporates an educational "Energy Academy", providing

modern research and development facilities in collaboration with Hull University. The partnership supports two full-time PhD students and offers schools and the local community opportunities to learn about the importance of building sustainable infrastructure.



## BIOMASS HANDLING AND STORAGE

Having worked on the latest generation of biomass handling and storage facilities in the UK, Spencer Group have world-leading expertise in every aspect of their delivery – from planning and design to construction and commissioning. We have been at the cutting edge of this emerging market, pioneering new and uncharted technologies and techniques to ensure performance and safety come first. We are perfectly placed to rise to the challenge of any new project, with an in-house design team used to the demands of projects where ordinary won't do and we aren't fazed by scale or complexity.

Whether it's constructing silos through pioneering slipform techniques, designing and delivering bespoke bulk transport conveyors or modifying port facilities to make them fit for purpose, Spencer have a depth of knowledge in mechanical, civil, electrical and marine engineering to rise to any task. Our credentials extend beyond engineering and into the complex logistics of delivering the necessary port and rail connections that are essential links in the supply chain. With over 20 years' experience in marine and rail engineering, we have the depth of experience in these sectors to meet all logistical needs.

Scale isn't a problem. Large or small, our innovative approach to planning and executing projects allows us to deliver on the largest or most exacting requirements. We understand the quality and safety issues with the handling and storage of biomass and have a proven history of delivering the highest quality monitoring and recording systems to ensure safety is the highest priority at all times.

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Hull Rail Loading Facility



Drax Power Station Biomass Storage and Handling



Drax Power Station Project Phoenix



Port of Tyne Renewable Fuels Terminal





## PROJECT DETAILS

<b>Client</b>	Lynemouth Power Ltd
<b>Start Date</b>	February 2016
<b>End Date</b>	December 2018
<b>Duration</b>	35 months
<b>Location</b>	Newcastle

# LYNEMOUTH POWER STATION BIOMASS CONVERSION PROJECT

The Lynemouth Power Station Biomass Conversion Project consisted of the design and construction of a facility for the handling, storage and rail-loading of wood pellets at the Port of Tyne, Newcastle. The new facility will import 1.8million tonnes of wood pellets per year.

## KEY STATS

**1.8M** 1.8 MILLION TONNES OF BIOMASS HANDLED ANNUALLY

**365** 365 DAYS-A-YEAR OPERATION

**3 SILOS** 3 SILOS 40 METRES HIGH WITH A 45 METRE DIAMETER

## PROJECT SCOPE

The facility designed and constructed by Spencer Group will see 58,000 tonnes of bulk cargo imported to the port in vessels at any one time.

Spencer Group's automated system is capable of unloading the biomass at a rate of up to 850 tonnes per hour, to then be conveyed mechanically to one of three huge, newly-built concrete slip-formed silos. Each of the silos measure 45m in diameter and can store 25,000 tonnes of material.

The pellets can be discharged from the silos at a rate of up to 1,700 tonnes per hour, via two conveying streams to a rail-loading facility also built by Spencer Group. Six trains hauling up to 25 wagons each will be loaded daily, in a 365 days-per-year operation, to distribute the biomass to Lynemouth Power Station.

## PROJECT OUTCOME

The requirement of this biomass handling facility for Lynemouth Power was greated following the termination of coal-fired operations at the power station in December 2015. This new plant will greatly reduce the NOx, SO2 and CO2 emissions produced compared to the original coal fired operations, thus remaining in line with the UK Government's climate change targets.

Once fully operational, the biomass conversion project will produce 2.3TWh of low carbon electricity to power 700,000 households.





## PROJECT DETAILS

<b>Client</b>	Drax Power Ltd/ Associated British Ports
<b>Start Date</b>	February 2013
<b>End Date</b>	December 2013
<b>Duration</b>	11 months
<b>Location</b>	Hull

## KEY STATS

40 TRAINS UNLOADED  
IN UNDER 40 MINUTES

1KM OF NEW  
RAILWAY

1M HANDLES 1 MILLION TONNES  
OF BIOMASS A YEAR

# HULL RAIL LOADING FACILITY

Spencer Group was awarded a contract to provide a wood pellet rail loading facility for Drax Power Limited and Associated British Ports at Queen Elizabeth Dock in Hull. This multi-disciplinary design and build scheme was the second wood pellet rail loading facility for Drax Power Station constructed in the UK, contributing to the ongoing biomass conversion projects at one of Europe's largest power stations.

## PROJECT SCOPE

Spencer Group was commissioned to design, construct, install and commission a facility to enable the rail loading of wood pellets imported from North America and Europe into the Port of Hull, for their onward journey to Drax Power Station. The works included two unloading hoppers capable of unloading 25 tonne trucks in five minutes, a 50m high, 3,000m<sup>3</sup> slip-formed pellet silo, a loading system which fills 25 65 tonne rail wagons in 38 minutes, a complex system of ATEX

rated Fire, Gas and Dust detection and suppression systems, and 2km of new roads and rail sidings.

## PROJECT OUTCOME

The facility handles a million tonnes a year of biomass imported by sea from the United States and Canada in the form of wood pellets created from sustainable forestry residues and thinning. The biomass is stored in warehouses before being delivered by truck to the new facility and unloaded into feeders which take it to a 250-metre (820 ft) conveyor, carrying it to the top of the silo. Trains can be unloaded in as little as 40 minutes to the highest safety and quality standards thanks to the systems designed by the in-house Spencer team, using advanced 3D and 4D modelling.



## STRUCTURES

From marine engineering to rail and materials handling, Spencer Group's skill in the construction of structures underpins everything we do. We have industry leading specialism for the integration of buildings into our multi-disciplinary capability including control centres, rail depots, silo construction and substations. Our depth of experience in designing buildings to meet these requirements, makes us stand out from the crowd.

Our in-house design team allows for an unprecedented level of innovation in everything we do, rising to complex industry challenges, working in restricted sites, on tight possessions and at significant height.

Our design team consists a full complement of civil, structural, M&E, building services and architectural design engineers. This capacity allows us to take on any project, from adapted designs to fully bespoke packages of works, minimising the need for changes and adaptations during construction. We can deliver turnkey solutions through taking projects from conception through to project handback, considering all elements of individual projects. We pride ourselves on our blank canvas approach to problem solving, providing our clients with the most appropriate solution and end-product.

Collaboration is imperative on our projects and we have developed industry-leading processes to ensure that every stage of the project is as transparent as possible. We operate a 'one-team' approach to all of our projects.





## PROJECT DETAILS

<b>Client</b>	M+W
<b>Start Date</b>	November 2015
<b>End Date</b>	October 2017
<b>Duration</b>	23 months
<b>Location</b>	London

## KEY STATS

**43,000** POWERING  
43,000 HOMES

**25** CREATING 25  
PERMANENT JOBS

**240,000+** TONNES  
REFUSE DERIVED FUEL  
DIVERTED FROM LANDFILL

# ENERGY WORKS CIVILS

Constructed on the banks of the River Hull, Energy Works is an Advanced Gasification Energy Recovery Facility. Spencer executed a £35m sub contract to prepare and surface the ground together with provision of all of the buildings on site, including the Energy Academy and car park, a 30m x 20m high steel framed turbine hall and 70m high steel chimney.

## PROJECT SCOPE

The works involved the civil, structural and architectural engineering around the construction of a 25MWe waste to energy power station, designed to power more than 43,000 homes and to divert over 240,000 tonnes of waste away from landfill. The project demonstrated Spencer's expertise in self-delivery, involving Civil, Structural, Process, EC&I, M&E and Architectural engineering.

Working in a challenging, multi-disciplinary environment, Spencer Group planned and programmed the design and build elements of the works in sympathy with other major sub-contractors on site to aid the EPC to achieve record performance of the total build, hitting key milestones ahead of the schedule.

## PROJECT OUTCOME

Spencer brought significant innovation to all aspects of the project, including realignment and re-design of significant link and water retaining structures to improve resilience and to better integrate construction with the rest of the site. Part of the project involved the construction of waste processing and storage sheds to accommodate the 240,000 tonnes of waste to be handled by the facility each year. Spencer executed the civil engineering behind this element of the project,

from the design phase to build, and delivered the mechanical and electrical elements of the project including a moving crane. This work was also fully integrated with the rest of the site, forming part of a large and complex power generation scheme.



## PROJECT DETAILS

<b>Client</b>	London Underground
<b>Start Date</b>	September 2015
<b>End Date</b>	March 2018
<b>Duration</b>	30 months
<b>Location</b>	London

## KEY STATS

25M

25 MILLION  
PASSENGERS A YEAR

2

TWO LIFT  
SHAFTS CREATED

0

ZERO DISRUPTION  
TO RAIL SERVICES

# FINSBURY PARK PHASE IIB

Design and build contract with London Underground to complete the Finsbury Park Phase 2B works, following the successful completion of the Finsbury Park enabling works project in December 2014. This highly complex project will ensure that the Victoria and Piccadilly lines achieve step-free access at Finsbury Park in 2018.

## PROJECT SCOPE

The works at Finsbury Park consist of the building of two lift shafts alongside opening up and extending the existing but disused passageway 4, constructing an extension beneath the railway lines to link the new ground level entrance to the west of the station, creating new stairs and lobby areas coming off the new and existing passageway 4 and linking these to existing underground northbound and southbound platforms, and finally constructing a new staircase and

refurbishing an existing staircase which will connect passageway 4 to the existing passageway 3 to improve connectivity to the Network Rail area.

## PROJECT OUTCOME

The result of the works undertaken have enabled step free access from both sides of the station, from the surrounding street level to the existing London Underground Victoria and Piccadilly line platform tunnels. With Finsbury Park being one of London's oldest stations (opened in 1861) there has been no access for wheelchairs, prams or buggies. The redeveloped station will improve life for commuters and leisure travellers alike. While works have been being carried out we have minimised our

impact on service to travellers, only requiring the closure of one staircase and having one visible hoarding up that we are working behind, which has enabled it to be business as usual at one of the busiest stations outside of zone 1 for the duration of the works.



## MARINE

Marine engineering is where it all began for Spencer Group and we've been working on projects in ports and harbours since 1989. This includes works in and around the Humber Estuary, canals and rivers across the UK and Europe. Our integrated approach to each of our projects enables us to deploy multiple engineering disciplines in the most challenging marine environments and work seamlessly on complex projects to meet our clients' operational requirements. Our expertise in both civil and marine engineering allows us to offer an unrivalled ability to deliver moving structures including lock gates, barriers, swing bridges, RoRo ramps and ship lifts.

We pride ourselves on delivering innovative, daring solutions to the most complex problems, achieved through our in-house design team who prioritise buildability and keep disruption to a minimum. Our team of expert engineers represent a wide array of sectors and can deliver extraordinary solutions to lead the industry. We specialise in schemes that incorporate port infrastructure alongside structures, road and rail, and our industry-leading planning team are on hand to ensure maximum transparency in the construction process.

We want every project we build to be extraordinary, whether it's a landmark moving bridge or a rail load silo. We always start with a blank slate to ensure that every decision is tailored to our clients' needs. We aim to be world class in everything we do and our appreciation of the clients' operational requirements and multi-modal transport systems, have ensured quality delivery for a quarter of a century.

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British Engineering

Wee Hurry Quay, Troon



ABP Crane Rail Replacement



Glasgow Marine Skills Centre



Scotstoun



Clough Hole Infill





## PROJECT DETAILS

<b>Client</b>	BAE Systems Maritime – Naval Ships
<b>Start Date</b>	December 2005
<b>End Date</b>	May 2006
<b>Duration</b>	5 months
<b>Location</b>	Scotstoun

## KEY STATS

25M

25M LONG SHEET PILING

2

2 DOCKS UPGRADED

12M X 30M

HYDRAULIC LOCK GATES MEASURING 12M X 30M

# SCOTSTOUN

Spencer Group were responsible for carrying out the design, civil and structural engineering works at the BAE Systems Dry Dock. This involved remedial works to Scotstoun Dock, including the fabrication and installation of a new dock gate, marine piling, associated civil and marine engineering works, in addition to an operating and pulley systems.

## PROJECT SCOPE

As part of this works, we were required to remove the existing gate and improve the quay, by replacing seal bolts and constructing the new dry dock with a hydraulic lock gates measuring 12m in height and 30m in length. Spencer Group also conducted all the associated building and civil engineering works, in support of the upgrade to docks 2 and 3 for BAE Systems.

There were a variety of challenges faced during this project, the most prominent being converting the wet dock to a dry dock. Five sheet piled, mass filled cofferdams were used to stem the water off, to enable fabrication, piling and dredging to be conducted within the dry dock area.

## PROJECT OUTCOME

The main challenge faced during this project was the discovery of an oil and chemical sludge layer during dredging works. A cofferdam was required in order to create a watertight enclosure around this layer. Through working alongside our local specialist supply chain, we were able to safely dispose of the oil and chemical layer without any harm to marine life.

Spencer Group also collaborated with the Scottish Environment Protection Agency throughout the project to ensure correct environmental procedures were in place across site and no disruption was caused to Scottish Fisheries.



## PROJECT DETAILS

<b>Client</b>	Marine Skills Centre
<b>Start Date</b>	June 2009
<b>End Date</b>	April 2012
<b>Duration</b>	32 months
<b>Location</b>	Glasgow

## KEY STATS

**450M<sup>2</sup>** 450M<sup>2</sup> BUILDING

**43M** 43M LONG STEEL LINK WALKWAY

**PILING** EXTENSIVE MARINE PILING

# GLASGOW MARINE SKILLS CENTRE

Spencer Group were appointed to design and construct a new learning centre on the River Clyde. The Marine Skills Centre project created a world class teaching facility beside the Albert Bridge for students and staff, on behalf of Glasgow College of Nautical Studies. The project involved a number of key disciplines including design, piling and construction work within a marine environment.

## PROJECT SCOPE

Spencer Group were responsible for the design and construction of a one storey 450m<sup>2</sup> facility positioned on steel piles, raised above the River Clyde. Glulam columns and beams with a zinc cladding roof were used to form three classrooms, changing rooms and office space.

A new lifeboat launch was also constructed in the river, connected to the existing boathouse by a brow walkway accessing a new pontoon. We were also required

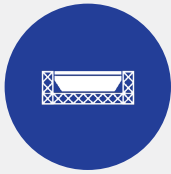
to refurbish the existing boathouse, and create a 43m long steel link walkway to provide access between the buildings.

The project required significant marine piling, with H piles and 10 No. tubular piles used to support the learning centre, in addition to 12 no. piles for the walkway, lifeboat launch structure and floating pontoon.

## PROJECT OUTCOME

Through close coordination with local stakeholders including the Environmental Protection Group, Marine Scotland and the client, we were successfully able to carry out marine piling works and the construction of steel frames, by using water barges and cranes, without disturbing Atlantic Salmon, Lamprey and Otter. This was achieved by only piling and carrying out noisy construction methods in specified safe areas under the EPG and SEPA instruction and avoiding these works during migration

periods. Spencer Group were therefore awarded a BREEAM Excellent status for our design and construction activities to minimise the adverse effects of new buildings on the environment.



## SUBSTATIONS

Spencer Group have worked on a plethora of substation projects, as standalone works or as part of larger projects such as rail depots, port upgrades and renewable energy plants. We have worked with a number of energy providers as part of this, including Northern PowerGrid, Engie, National Grid, E.ON Energy and CG Power Solutions.

As a result of our experience and multi-disciplinary capability, we are able to deliver not just the substation work itself, but also the supporting civil engineering around the site, including access, drainage, fencing and structures. This holistic approach to our work enables Spencer Group to deliver each element of work ourselves, reducing risk for the client and minimising disruption or delays on our projects.

Port of Tyne Substations



Kingeo Relocation



Kingeo Relocation



Humber Gateway Substation







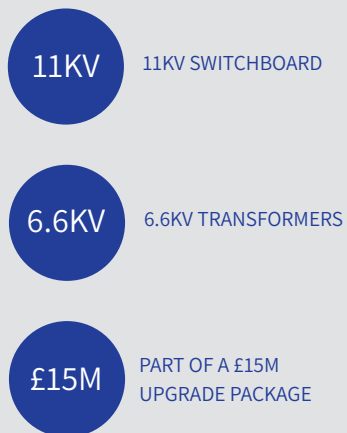
## PROJECT DETAILS

<b>Client</b>	Associated British Ports
<b>Start Date</b>	April 2015
<b>End Date</b>	August 2015
<b>Duration</b>	4 months
<b>Location</b>	Hull

# KINGEO RELOCATION

Spencer Group were awarded the project alongside three further works packages for ABP as part of a £15m upgrade to the Hull Container Terminal. This was the first of three contracts conducted by Spencer Group at the port, and ran alongside a 12,000m<sup>2</sup> paving project on the dock.

## KEY STATS



## PROJECT SCOPE

The project involved the design and construction of a new primary substation building, in addition to the transformer compounds suitable to house the selected electrical equipment. This included the installation of all foundations, floor, cable and access pits, masonry, roof (including drainage), access steps and platforms, fire compartmentation, electrics and external lighting.

The substation required both high voltage switchboards, including an 11KV and 6.6KV switchboard, 11/6.6KV transformers including ancillaries, in addition to low voltage switchboards, cabling and commissioning.

## PROJECT OUTCOME

Through careful planning and close coordination with the client, Spencer Group were successfully able to conduct these works alongside the additional paving contract, without any disruption to normal port operations.

Following our successes on this project, Associated British Ports awarded Spencer Group with a further works package to upgrade the existing crane rails at the Hull Container Terminal.



## PROJECT DETAILS

<b>Client</b>	E.ON Climate & Renewables UK Humber Wind Ltd
<b>Start Date</b>	July 2012
<b>End Date</b>	August 2013
<b>Duration</b>	13 months
<b>Location</b>	Yorkshire

## KEY STATS

2

2 SINGLE STOREY CONTROL BUILDINGS CONSTRUCTED

4

4 MAJOR STAKEHOLDERS TO COORDINATE

8KM

CONNECTED TO WIND TURBINES 8KM OFF THE YORKSHIRE COAST

# HUMBER GATEWAY SUBSTATION

Spencer Group constructed a substation for E.ON Energy, including two feeders to connect to National Grids GIS substation and cable circuits. The project was located 8km east of the Yorkshire coast, near the Humber Estuary. CG Power Solutions UK Ltd were the Principle Contractor for the works, utilising Spencer's expertise for the associated civil engineering works.

## PROJECT SCOPE

Spencer Group were responsible for all civil engineering works on site to enable the construction of two new substations and connecting feeders for E.ON Energy. We were also accountable for all the necessary piling foundations, tarmac access roads in and around the site, bunds, and transformer systems/switchgear. One of the main challenges faced within this project was maintaining close relations and communication with CG Power Solutions, E.ON Climate and

National Grid to coordinate each stage of work. The substation contains 2 No 275kv/132kv transformers and associated switchgear, plus a 33kv network fed off each SGT tertiary winding to feed static compensation and filter equipment via a 33kv GIS switchboard.

## PROJECT OUTCOME

It was imperative that Spencer Group completed all their works on time and to budget to enable CG Power Solutions to progress with their works as Principal Contractor of the job. This required careful planning and frequent meetings between the Spencer Group civil engineering team and CG Power Solutions, E.ON Climate and National Grid, to closely coordinate each stage of the project and ensure all setbacks and clashes were avoided.

Thanks to the project management expertise of the Spencer planning and design teams, this was successfully achieved and all key milestones were met on time and to budget without any conflicts.



## STORAGE FACILITIES

Ever changing needs and evolving technology mean that off the shelf solutions are no longer appropriate for the next generation of storage facilities. With a trend towards larger, more complex facilities that incorporate loading and unloading, Spencer Group have been at the forefront of change and innovation in the storage industry.

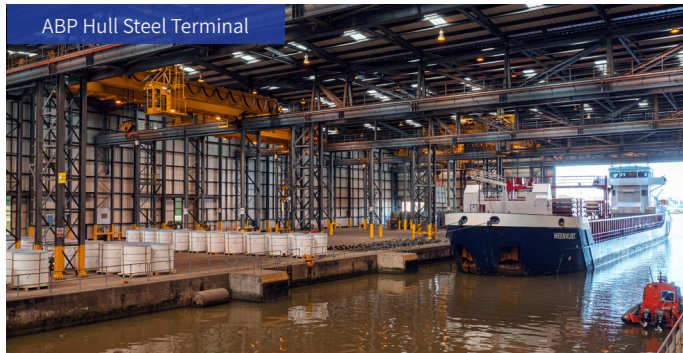
Our design team work closely with our in-house specialists in civil, mechanical, rail and marine engineering to utilise their knowledge and experience from early contractor involvement through to project completion. Our expertise enables our team to design world- leading structures utilising innovative techniques such as Slipform engineering and provide a methodology to handle the complex logistical connections required to and from site, whether by road, rail or sea.

Our portfolio of projects in the Storage market are delivered by a highly experienced team combing the skills required to design, develop, build and integrate projects supported by the competence and credentials in civil, mechanical, electrical, and structural engineering. We pride ourselves on our safety record and experience of quality systems including DSEAR and ATEX standards.

ABP Hull Finland Terminal



ABP Hull Steel Terminal



Kind George Dock Shed 22



ABP Immingham Border Control Post





## PROJECT DETAILS

<b>Client</b>	Associated British Ports
<b>Start Date</b>	October 1999
<b>End Date</b>	February 2000
<b>Duration</b>	4 months
<b>Location</b>	Hull

## KEY STATS

36,000M<sup>2</sup> 36,000M<sup>2</sup> MARINE TERMINAL

160M 160M CRANE EXTENSION

1,700M<sup>2</sup> 1,700M<sup>2</sup> CANOPY

# ABP FINLAND TERMINAL

Spencer Group were appointed by Associated British Ports to design and construct a facility capable of storing and distributing paper products at the Finland Terminal in Hull. As the EPC contractor for this project, Spencer Group were able to work with the client to find alternative design and construction solutions, to reduce the necessary site time and programme of works.

## PROJECT SCOPE

The project involved the design and construction of a 36,000m<sup>2</sup> marine terminal for the reception, storage and distribution of paper products at the Finland Terminal, on behalf of Associated British Ports. The contract included the demolition of several existing buildings and the refurbishment of two existing buildings with new doors, fire alarm installation and a 1,700m<sup>2</sup> canopy.

Spencer Group were also responsible for extending 160m of existing crane and conductor rails at the port, alongside design and installing a new Roll-on Roll-off berth. As part of the wider scheme of works, 32,000m<sup>2</sup> of external paved areas and quay strengthening works were also undertaken at the port.

## PROJECT OUTCOME

Through Spencer Group's innovative approach to design and construction projects, two weeks critical site time was saved during the construction of the Roll-on Roll-off berth, saving the client time and money, whilst enabling port operations to resume earlier than anticipated.

This was made possible through the use of a large element of pre-engineering and pre-cast components, reducing the required time on site, and disruption to port operations.



## PROJECT DETAILS

<b>Client</b>	Associated British Ports
<b>Start Date</b>	January 1997
<b>End Date</b>	September 1997
<b>Duration</b>	9 months
<b>Location</b>	Hull

## KEY STATS

10,000M <sup>2</sup>	10,000M <sup>2</sup> BUILDING CONSTRUCTED
4	FOUR 25TN TRAVELLING CRANES ERECTED
178	178 CONCRETE PILES HOLD UP THE STRUCTURE

# PORT OF HULL STEEL TERMINAL

Spencer Group were appointed as Principal Contractor for the design and construction of a 10,000m<sup>2</sup> steel framed building for Associated British Port. The building was to be used to provide a covered off-loading facility for finished steel products. Spencer Group also constructed the required rail link between the steel building and train network.

## PROJECT SCOPE

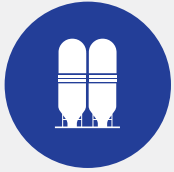
The project involved the design and construction of a 10,000m<sup>2</sup> steel framed building to provide a covered off-loading facility for finished steel products. Reinforced concrete structures were required to form the foundations because the flooded dry-dock had to be left intact should it be required to return to its original use. The facility was installed with four overhead 25tonne travelling cranes, a rail head and extensive paved external areas to allow the unloading

of a 2,000tonne vessel within 7 hours. In addition, through utilising our rail capabilities, Spencer Group were able to extend the existing rail track to link up to the steel framed building, providing efficient access. A new weighbridge and office building were also constructed to improve operational facilities.

## PROJECT OUTCOME

Through working closely with Associated British Ports, and holding regular planning meetings, we were able to construct a covered off-loading facility, which efficiently and effectively unloads the steel products within 7 hours.

Our close collaborations also enabled us to successfully maintain the original purpose of the existing dock, should it ever need to be restored to its former purpose, demonstrating our ability to find innovative solutions to suit the client and specific design requirements.



## BULK MATERIALS HANDLING AND STORAGE

With strong links between our mechanical handling and storage expertise, Spencer Group have built up an impressive portfolio of projects in the field of bulk materials handling and storage – meeting a range of strict requirements in a variety of materials sectors. From transportation to storage facilities, logistics and monitoring, we are able to service every stage of a project whatever the specifications. We aim to be world class in everything we do and we're committed to developing pioneering designs for when the ordinary just won't cut it.

Whatever a client's requirements, we approach every project with a blank-slate approach so that our in-house design team have space to innovate. We combine this approach with proven expertise in the planning and delivery of a project's logistical aspects, with connections from road to rail and marine a speciality. Our multi-disciplinary approach allows us to deploy experts in civil, rail, mechanical and marine engineering, so every aspect of a project will be covered by engineers with decades of experience in their fields.

Safety is our top priority in whatever we do and we understand the considerations involved in handling sensitive materials. We are familiar with the design and construction of many different types of storage solution and have developed pioneering designs with state-of-the-art condition monitoring systems to fully protect the material being stored. We are also familiar with the DSEAR and ATEX regulations and the importance of ensuring the operating requirements of the facility are fully considered.

**SPENCER**  
British Engineering

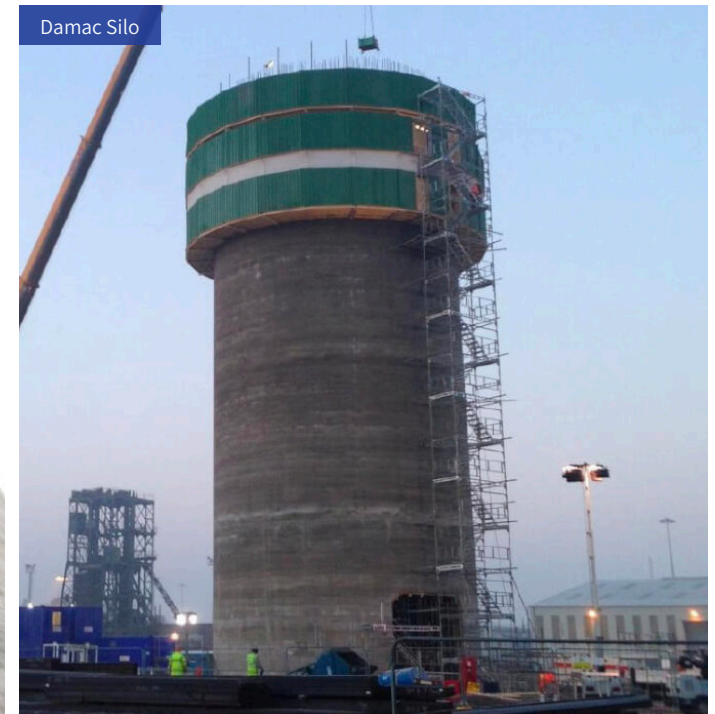
Port of Tyne



Damac Silo



Damac Silo





## PROJECT DETAILS

<b>Client</b>	Damac Transportation LTD
<b>Start Date</b>	October 2016
<b>End Date</b>	March 2017
<b>Duration</b>	5 months
<b>Location</b>	Goole, East Yorkshire

## KEY STATS

4,500M<sup>2</sup> 4,500M<sup>2</sup> OF STORAGE

8 SLIPFORMED IN 8 DAYS

46M SILO IS 46M HIGH

# DAMAC SILO

A 14m diameter, 46m high slip formed reinforced concrete bulk load out silo on the Goole docks, the silo was required to store four different types of material; white cement, grey cement, fly ash or ground granulated blast furnace slag. The project was designed to allow Damac to expand their East Yorkshire operations by increasing the capacity and flexibility of the terminal.

## PROJECT SCOPE

Spencer Group undertook the site management, piling, foundations, staircase, hand railing and roofing works on the site, all the way from design to delivery. The works included both innovative slip forming work and traditional civil engineering work to create a facility that is both innovative, and fit for purpose. Spencer constructed a slip formed Silo body with 4500m<sup>3</sup> of storage and a sloping floor with clearance to the underside of 7150 mm, the associated

supporting walls, columns and piled foundations, provision for an 18m x 3m weighbridge, access for single direction HGV passing through the silo, a steel access stair to the roof providing access to the silo interior above the silo floor, and a stair providing support for the cement blow pipes.

## PROJECT OUTCOME

Spencer Group completed the project to facilitate Damac's expansion of their East Yorkshire terminal. The expansion will allow them to load more quickly, increasing operational efficiency whilst also raising capacity and flexibility for the terminal. The design work was carried out with speed in mind and facilitated by the innovative Slipform Engineering Team, due to significant time demands by the client, who were keen to minimise downtime on the site and its associated costs.

Due to this, the silo was built within eight days, enabled by the rapid deployment of a system which is significantly faster than traditional slip forming techniques.



## SUSTAINABLE FUELS

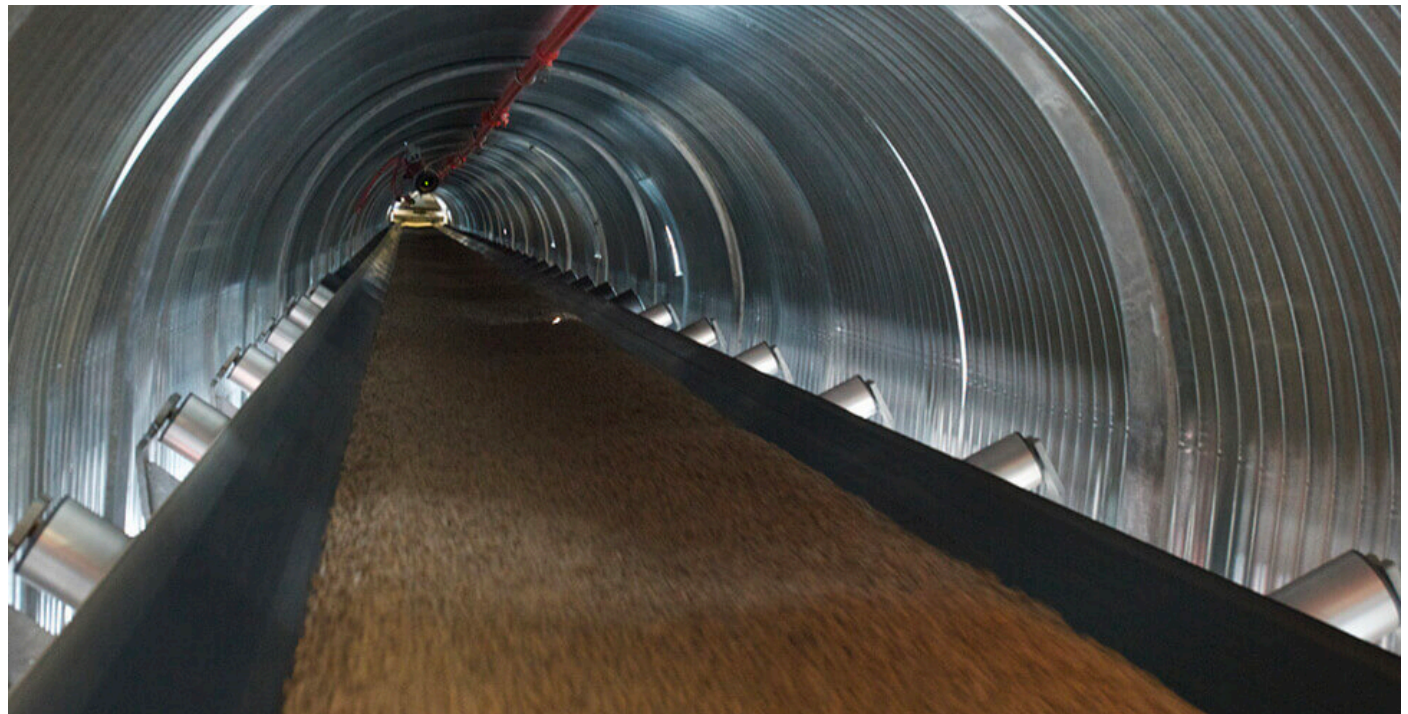
The handling of sustainable fuels is a diverse industry. Here at Spencer Group, we have experience across a vast range of applications – from bulk storage to mechanical handling, loading and unloading by rail, road and sea. We specialise in the kind of complex engineering projects required to get sustainable fuel from A to B and pride ourselves on our ability to deliver the kinds of innovative solutions that others can't.

Our biggest strength is in our depth of knowledge, from civil, mechanical and electrical engineers to our in-house design team and world-beating planners, we've got the skill to design and build whatever it takes to get the job done. We know that no two projects are the same, so we don't bring any assumptions to the table – we work with our clients' needs to design bespoke solutions that deliver the best results.

Whatever needs to be transported or stored, we have the ability to deliver the kinds of complex engineering works involving multiple sites and stakeholders that are needed to keep things running smoothly. Safety is our watchword and we have extensive experience of precision engineering and monitoring systems that ensure the cargo is retrieved, transported and stored to exacting environmental conditions. We also pride ourselves on building and managing constructive relationships with stakeholders across the supply chain and taking an open and honest approach to our work that minimises the difficulties inherent in complex projects.

**SPENCER**  
British Engineering

Drax Power Station Biomass Storage and Handling







## PROJECT DETAILS

<b>Client</b>	Drax Power Ltd
<b>Start Date</b>	March 2009
<b>End Date</b>	June 2010
<b>Duration</b>	15 months
<b>Location</b>	Selby

# DRAX POWER STATION BIOMASS STORAGE AND HANDLING

This was a technically complex project requiring in-house design and build functions combined with the requisite rail, process design and M&E capabilities. The facility was designed to facilitate the unloading of six 1100t capacity trains per day, and was constructed with minimal disruption to the existing petcoke and coal delivery lines supplying the power station.

## KEY STATS

**1,100T** FACILITIES UNLOADING OF SIX 1,100 TONNE TRAINS PER DAY

**12,000M<sup>3</sup>** SILO CAPACITY OF 12,000M<sup>3</sup>

**800M** 800M OF HIGH CAPACITY CONVEYOR SYSTEMS

## PROJECT SCOPE

Full turn-key delivery (civil, structural, mechanical, EC&I). Two bulk storage silos capable of holding 24,000m<sup>3</sup> of biomass wood pellets. These circular concrete vessels are 30m in diameter and are supported on 300 piles. The non-stop unloading of six 1,200 tonne capacity trains a day within an innovative subterranean facility, housing seven vibrating feeders and two conveyors that can deliver biomass fuel to the silos at a rate of 2,800 tonnes per hour.

A 22 metre high structure housing screening and sampling equipment, a magnetic separator and metal detector. All areas linked by 800m of high capacity conveyor systems. 8,000m<sup>3</sup> of material moved, 3,500m<sup>3</sup> of poured concrete and over 1,000 tonnes of fabricated steel. ATEX compliant

## PROJECT OUTCOME

Close collaboration with the Drax team allowed us to overcome challenges through meticulous project and design management.

We developed a continuous unloading system to transfer biomass from moving trains as opposed to the industry standard of unloading trains in a stationary position. Our value engineering design also proposed a solution to Drax that enabled the discharge of biomass in 30 minutes rather

than the stipulated 1 hour. The site presented a vast network of overhead and buried utilities and services, such as HV and LV supplies, fibre optic cables, telecoms and potable water. We developed a site specific system of work within the relevant Method Statements detailing control measures to protect the various services.



## NUCLEAR

The nuclear industry is one of the most challenging sectors for any business to operate in, requiring not only expert knowledge of the engineering challenges the work poses, but also the strict regulatory frameworks that must be adhered to. Spencer Group undertakes engineering within the nuclear industry at every stage of the project, having both the legal and regulatory insight and the multidisciplinary engineering skill to deliver world class results for any client's needs.

We know that no two projects are alike, especially in an industry as sensitive as the nuclear sector, so we always start with a blank-slate approach. Our in-house design team have sector-leading experience in disciplines including mechanical, electrical, civil and process engineering, and will deploy bespoke solutions to ensure no option is unexplored. Innovation is in our blood and we have the skill and vision to design and build the best possible scheme to deliver to specification.

Thanks to our belief in self-delivery, we can manage the project from the planning and design phase all the way through to delivery and commissioning – even decommissioning what we have delivered once the project is over. We also love puzzles and specialise in projects with restricted access and other operational challenges. Our existing experience in the nuclear sector allows us to undertake this work with a thorough understanding of the regulatory responsibilities, as well as an unwavering commitment to the utmost safety standards at all times.

Hunterston A



Hinkley A

