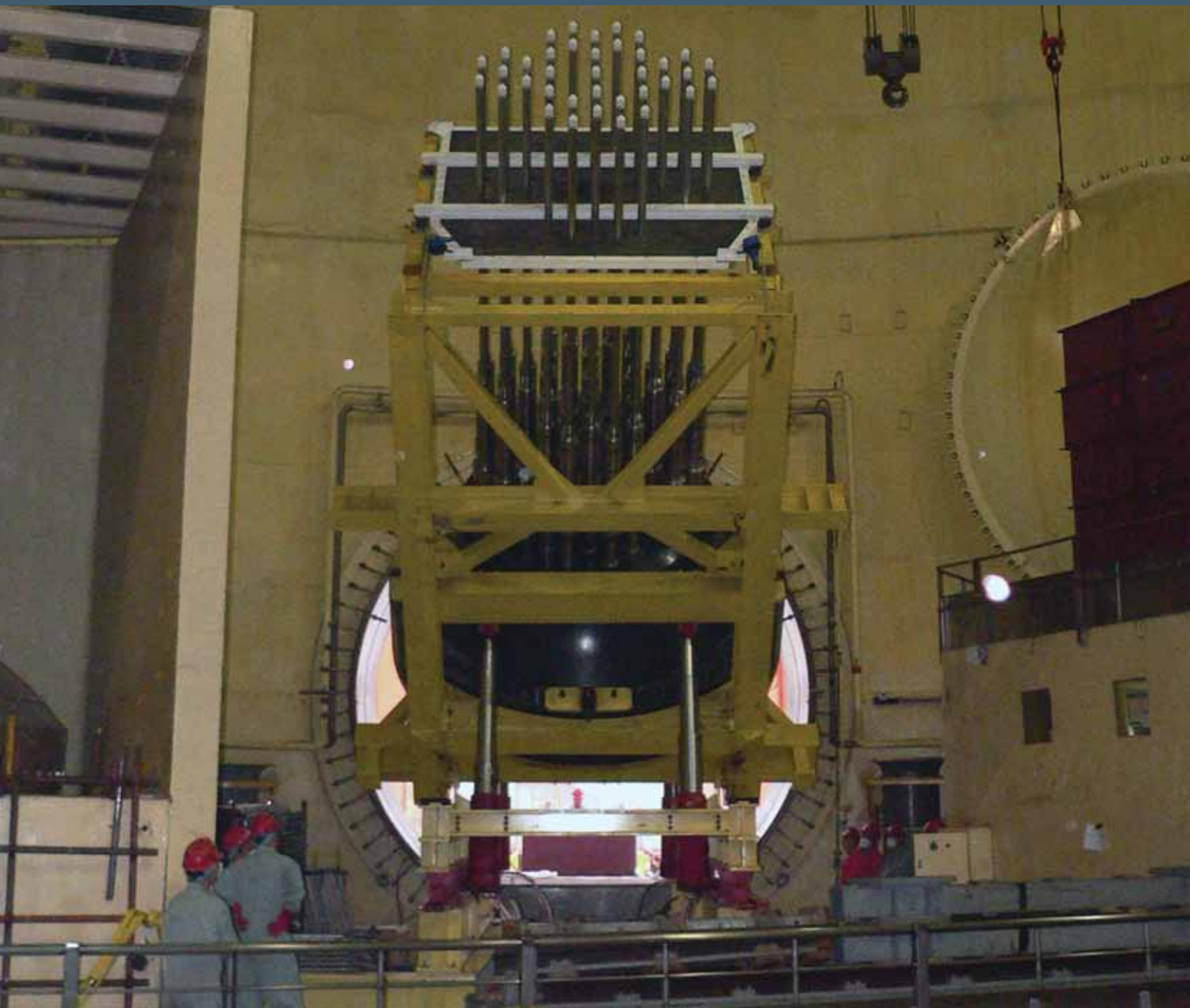
WORLDWIDE HEAVY TRANSPORTATION AND LIFTING

NUCLEAR

ALE

SMARTER, SAFER, STRONGER



Contents

Introduction

Nowhere does our reputation for safety, precision and responsibility carry more weight than in the nuclear power sector. Our understanding of the HSQE standards of the industry has enabled us to develop strong working relationships with key nuclear energy providers over the last 20 years, supporting projects ranging from the replacement of steam generators and reactor heads to the design of systems for dismantling turbines and electrical generators.

ALE has unparalleled experience working in complex environments incorporating radiation and contamination issues. Our dynamic approach to refurbishments enables plant licenses to be extended by improving the key aspects such as pressurisers, reactor heads and steam generators.

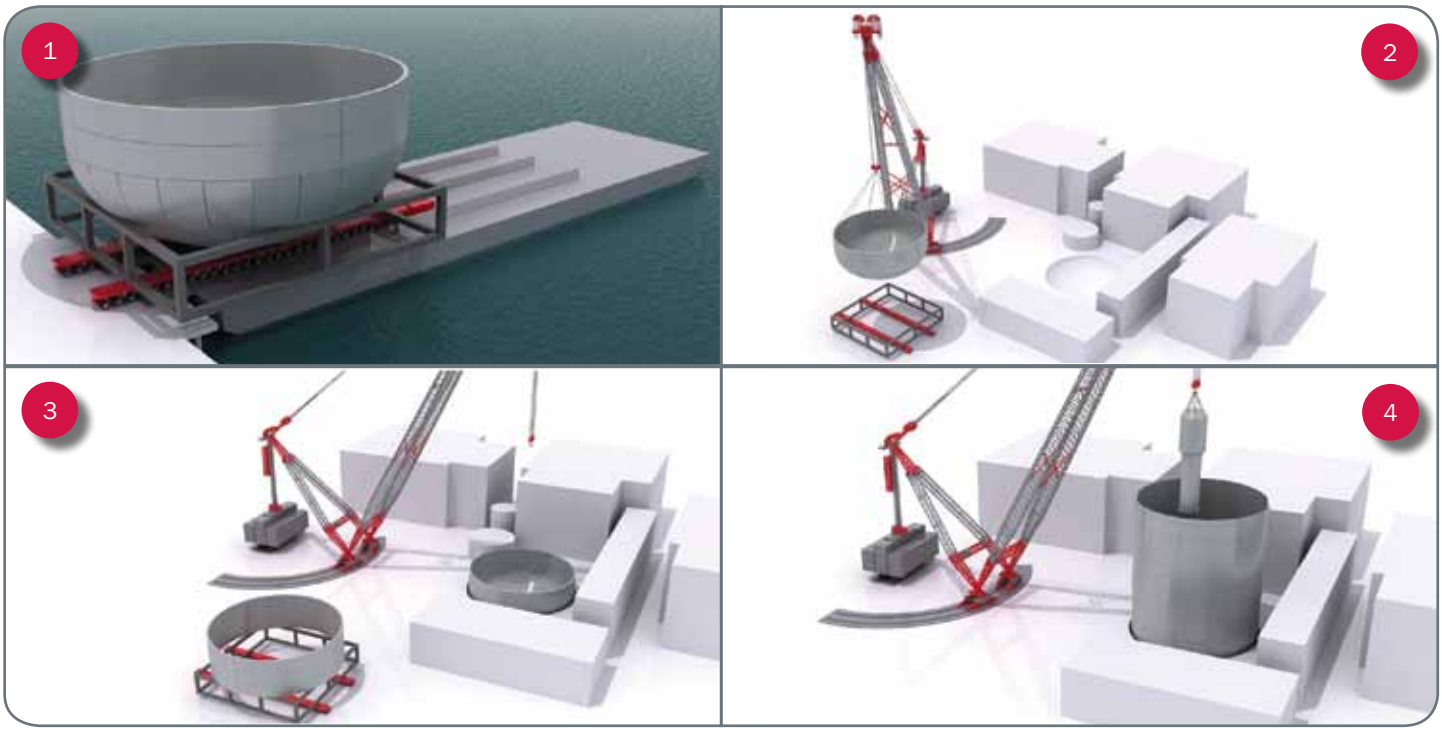
The FEED service we can offer for the nuclear industry is specific to live power plants. ALE implements innovative solutions while minimising the exposure of radiation to site personnel by designing and manufacturing specific tools.

With a pedigree in innovative engineering and an active R&D facility, ALE has always been known for developing new solutions to meet future needs. Over the years we've added to our world-class engineering skills-base through the acquisition of several successful specialist companies, and now we have more than 200 highly qualified engineers working at locations across the globe. This experience means we're well equipped to support the full FEED process, working through complex technical and logistical issues at an early stage to eliminate expensive changes later on.

Our FEED capabilities form a crucial part of the service we offer. ALE has contributed to many high profile projects that have been right at the forefront of global trends in the sector. We are able to adapt to ever-changing industry requirements, evolving safety standards and scope changes as the project gathers definition during the design process, while at the same time providing solutions which are as cost-effective and safe as possible. As a result, we're able to work closely with our clients from an early stage to establish what's required and provide practical engineering advice.

FEED services include:

- Physical route surveys to determine maximum practical equipment weight and dimension information
- Investigation of environmental conditions affecting the heavy lifting and transport discipline
- Road layout and route improvement studies
- Advice on local regulatory issues relating to the movement of large and indivisible loads to the job site
- Equipment lifting and installation studies to determine the most cost and schedule effective methods of sizing and placing equipment
- Design of rigging and lifting equipment
- Outline design of new build site construction jetties
- Selection of optimum shipping methods and identification of suitable vessels or barges
- Logistical studies to ensure that transportation and installation scope support the project schedule
- Design and input to design of transportation support steel and lifting and lashing/securing points
- Assistance in modularisation studies to determine the maximum practical extent man hours can be removed from the job site



Continuous HSQE improvements are a fundamental part of our 'Smarter, Safer, Stronger' ethos. Although extremely high, our standards in these four areas are continuously reviewed and refined so we remain at the forefront of the industry. This is overseen by a team of professionally qualified HSQE advisors who are dedicated to developing, implementing and evaluating our global polices.

ALE works to ISO 9001:2008 standards in quality management and ISO 14001:2004 standards in environmental management. Our global HSQE objectives include improving customer satisfaction and competence, and to this end we develop and implement internal training schemes based on our unique equipment, as well as delivering externally built training courses that ensure adherence to the latest industry standards. We've also established Centres of Excellence in each of our service areas to enable experienced staff members to pass on their invaluable knowledge.

Our commitment to quality management, sustainability, professionalism and safety goes a step beyond the usual focus on people and profit. Despite the scale and ambition of the projects we undertake, we've succeeded in maintaining safe and healthy working environments in remote and challenging locations around the world. The many local and global HSQE initiatives we're involved in are intended to help us maintain our excellent quality and safety record.

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STEAM GENERATORS

Case study: Change out of steam generators, Ascó, Spain

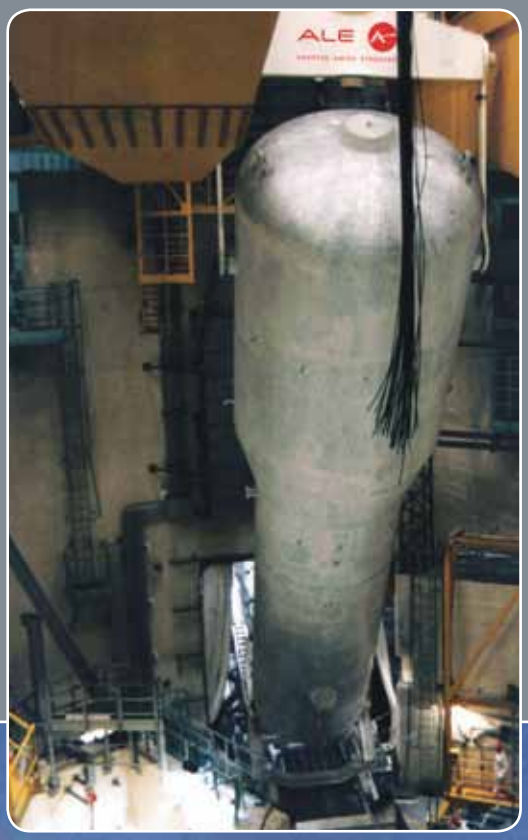
OVERVIEW: ALE was responsible for the change out of steam generators from units 1 and 2 at Ascó Nuclear Power Plant in Ascó, Spain.

SERVICES REQUIRED: Each unit required three old steam generators, weighing 320te, to be removed and replaced with three new generators. To achieve this ALE installed a temporary lifting gantry on top of the existing overhead crane. The gantry included a 500te capacity strand lifting unit, which allowed a 360º rotation around the vertical axis. This was required due to the overhead crane being limited to 300te capacity and also being too narrow to allow the generators to pass between the two girders of the crane.

Another challenge that ALE faced was the hatch opening, which the generators had to leave and come in through, having a diameter of 5.4m. With the generators having a diameter of 5.15m, this meant the available space for the tilting system, saddles and skidding system was very limited. To overcome this, ALE designed a low level tilting frame, with saddle, which was compatible with the space available.

The final limitation within the nuclear plant was the opening hatch being only 4.5m away from the biological wall of one of the steam generators. To overcome this, ALE installed a skidding system to remove the concrete dismantled from the biological wall.

Case study: Change out of steam generators, Almaraz, Spain



OVERVIEW: ALE was responsible for the change out of steam generators from units 1 and 2 at Almaraz nuclear power plant in Spain.

SERVICES REQUIRED: Due to the operating level being 14.6m and the hatch opening at ground level, it was necessary to create a temporary opening measuring 7m x 7m. This opening then allowed ALE to design a tilting frame, saddles and skidding system with no strict height limitations.

With the extraction height at this level, an external skidding frame and gantry was installed to remove and lower the generators.

POWER ISLAND

Case study: Exchange of electric generators, Slovenia

OVERVIEW: ALE performed the exchange of electric generators at Krsko Nuclear Plant in Slovenia, using a 500te capacity skidding gantry with rotational ability.

SERVICES REQUIRED: The introduction of the new generator was executed following the same sequence of manoeuvres as the removal operation but in reverse: lifting, longitudinal-transverse-longitudinal skidding, 90° rotation to access the turbine building's equipment hatchway, a longitudinal skidding to align the piece over the foundations and the lowering of the piece 15m through the hatch. Once the piece was lowered, it was loaded onto an SPMT transport platform with a 4x10 axle configuration. The generator was transported up to the storage building where it was unloaded onto its supporting frame. Both operations were executed simultaneously, optimising the planned shutdown for scheduled manoeuvres.

Case study: Replacement of electrical generators, for Unit 1 & Unit 2, Spain

OVERVIEW: ALE has successfully completed the replacement of electrical generators in Unit 1 and Unit 2 of the Almarez Nuclear Power Plant using a 500te skidding gantry with the ability to rotate and modify span.

SERVICES REQUIRED: For Unit 1 the manoeuvre consisted of the extraction of the existing generator in the following phases: lifting, skidding, a rotation of 90°, skidding and the lowering of the generator 15m through the equipment hatch onto a waiting transport platform, where a 4 point lifting system was used to install the support frame used during the transportation of the generator.

Following the extraction of the generator, ALE installed the new generator by completing the same manoeuvre in reverse. The new generator was transported to the turbine building in Unit 1, where the support frame was removed because of interference in the turbine building.

For Unit 2 the removal and introduction manoeuvres were performed using the same gantry, which is capable of changing its span from 11,450mm to 14,900mm in order to eliminate interference between the MSRs and turbines. This gantry enabled the 90° rotation of the stator for lowering through the access hatch.

The removal of the old stator was achieved in the following stages: the lifting of the stator to pass over the high and low pressure turbines, the skidding of the stator, the modification of the span, the rotation of the stator, skidding it through the access hatch, lowering it onto platform trailers, transporting it to the pre-storage area ready for the support frame to be installed, lifting it for the installation of the frame beams, and transporting it to the storage area. The manoeuvres for the introduction of the new stator were executed using the same process in reverse.

HEAT EXCHANGERS

Case study: Transportation of heat exchangers, Berkeley, UK

OVERVIEW: ALE successfully completed the jacking, skidding and transport of five redundant heat exchangers from the UK's first built nuclear power station.

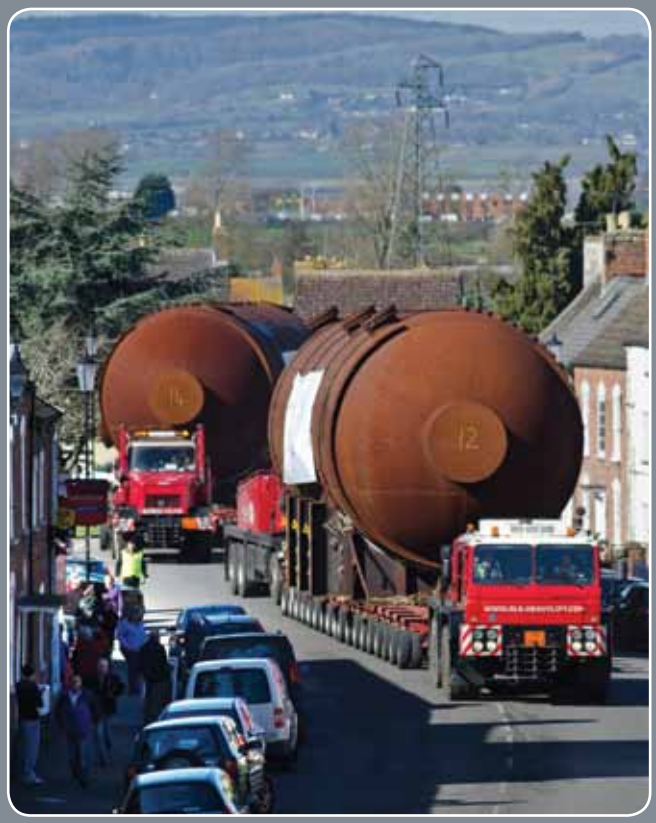
SERVICES REQUIRED: The heat exchangers weighing 300te each, measuring 22m long, and 5m wide, were transported in three separate moves from the former power station which ceased generation in 1989.

The first move involved the use of an 18 axle conventional trailer, two push-pull heavy ballast tractors and various other support and escort vehicles. Utilising a further 36 axles of conventional drawbar trailers, connected to four push pull heavy ballast tractors, ALE completed the transport of the remaining four heat exchangers two at a time.

The heat exchangers were transported four miles through Berkeley town centre to Sharpness docks, where they were rolled onto a specialist vessel which then transported them via the River Severn to Avonmouth. From Avonmouth the heat exchangers will be transported to a sea going vessel to make the final journey to Nyköping in Sweden. Once the heat exchangers reach Sweden they will be smelted at a licensed nuclear recycling facility and up to 90% of the metal will be returned for use in the UK market.

"The removal of five of the Berkeley heat exchangers *was a huge achievement for the site, ALE's expertise and experience ensured this was done safely and with minimum disruption to our local community."*

Steve McNally, Magnox, Berkeley Site Director



REACTOR HEADS

Case study: Replacement of nuclear reactor head, Ascó, NPP, Spain

OVERVIEW: ALE has successfully performed the replacement of a 75te nuclear reactor head in Tarragona, Spain during a four-day outage.

SERVICES REQUIRED: The new head was hooked, tilted, skidded, jacked and transported from the Fuel Building II to Containment I. Due to the size of the equipment hatch and to avoid the dismantling of any elements inside Containment or any CRDM bars, the head was introduced and removed by means of three 40te air cushions, with clearances less than 100mm on three points at the same time.

Case study: Replacement of nuclear reactor head at Almaraz NPP Units I & II, Spain

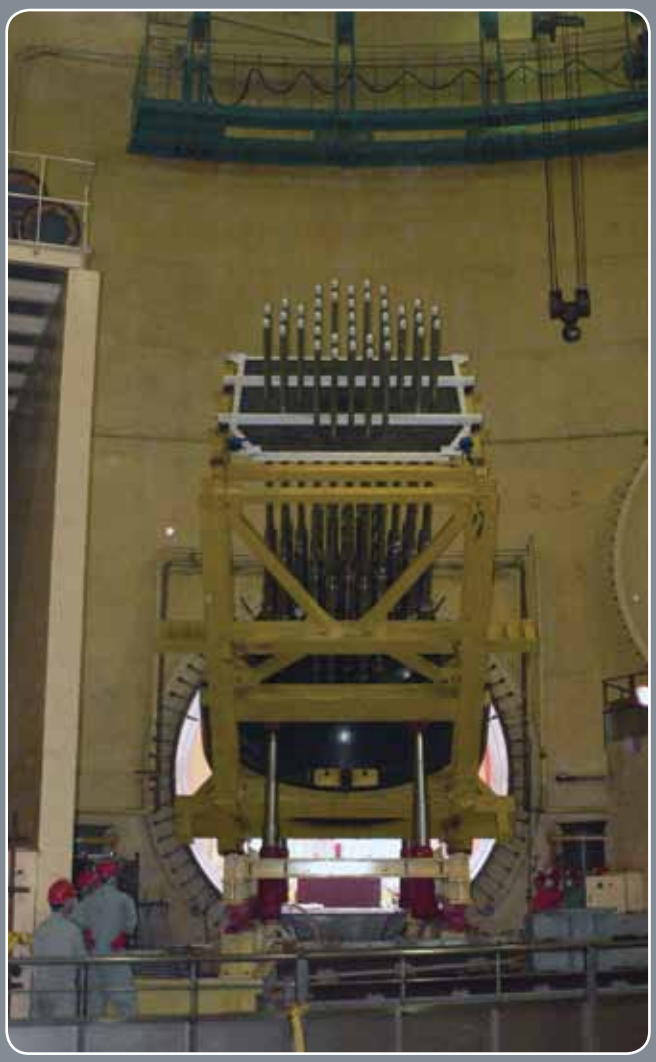
OVERVIEW: During the change out of the steam generators project, the reactor head, including CRDMs was also removed.

SERVICES REQUIRED: To achieve this ALE engineered a solution to tilt the reactor head and CRDMs to a horizontal position and then skid them out of the containment building.

Case study: Replacement of nuclear reactor head, China

OVERVIEW: ALE was appointed to replace the nuclear reactor head at the Quinshan Nuclear Power Plant in China during the critical period of the shutdown.

SERVICES REQUIRED: The new reactor head was tilted from a vertical to a horizontal position, in the turbine building, using a specially designed tilting frame driven by hydraulic jacks. Once in the horizontal position, it was able to exit the building onto a platform trailer for transportation to the containment building. The old head was removed from the containment building using a similar method and the new head was then lifted, skidded into the building and tilted into its final vertical position. The whole operation was completed in 36 hours.



Case study: Transportation, storage and replacement of new reactor head, UK

OVERVIEW: ALE was engaged to provide temporary storage for the new 100te reactor head at Sizewell B Nuclear Power Plant.

SERVICES REQUIRED: The first phase of the operation included the self-loading of the reactor from stools, its transportation inside the plant by six SPMT lines, and the unloading of the reactor at the storage building using a 4 point lifting system. The installation phase required the design and upgrade of the overhead crane in the fuel building. The reactor head was then installed using strand jacks, positioned on top of the overhead crane.

CONDENSERS

Case study: Introduction of condensers, Mexico

OVERVIEW: ALE has carried out the introduction of two condensers, with the main unit being split into 16 tubular elements, at Unit 1 and 2 of the Laguna Verde Nuclear Power Plant in Veracruz, Mexico.

SERVICES REQUIRED: Both introductions required the following manoeuvres: the tilting of the module inside the turbine building from level +18.70m up to +1.90m, the movement of the piece by means of air cushions from the hatch to the condenser pit, the lifting of the module by means of a gantry and four strand lifting units, longitudinal and transversal skidding of the piece by 25te capacity skid beams, and final jacking by means of telescopic jacks.

HEATERS

Case study: Replacement of heaters, Mexico

OVERVIEW: ALE has successfully performed the removal of four old heaters and the introduction of four new heaters at Unit 1 of the Laguna Verde Nuclear Power Plant.

SERVICES REQUIRED: Due to the difficult physical access of this plant, ALE used its own skidshoe system, with a capacity of 90te, for the removal and installation of the heaters. For the removal, ALE used 50te capacity rotation frames installed over the 25te capacity skidding system.

HVAC

Case study: Skidding of HVAC equipment, Mexico

OVERVIEW: ALE has successfully completed the installation of heating, ventilating and air conditioning (HVAC) equipment at the Laguna Verde Nuclear Power Plant in Veracruz, Mexico. The main piece of equipment installed was a 'chiller' or heat pump weighing 11te and measuring 9,915mm x 2,332mm x 2,440mm. Manoeuvres were complicated by the size of the chiller and the limited space available.

SERVICES REQUIRED: ALE's world-leading engineers designed a structure 70m long at the access walkway with a maximum slope of 1.6% and a 25te skidding system installed on top. The skidding manoeuvres were performed at an angle of 56° using two 50te turntables. Once the HVAC equipment was in position, it was jacked down using climbing jacks.

For the installation of the remaining equipment (two coils weighing 1.3te each and four ventilators weighing 2.2te each) ALE designed a bespoke rotating jib crane with a 7m outreach and a capacity of 3te to lift and rotate the pieces over a 4.2m high wall and place them on their foundations.

TRANSFORMERS AND ROTORS

Case study: Site move of transformers, South Africa

OVERVIEW: ALE completed the site move of three 300te transformers from the low level waste building to unit 2 rails at Koeberg Nuclear Power Station.

SERVICES REQUIRED: Each transformer was jacked up using four 150te self climbing jacks to allow the 24 axle lines of SPMT to receive each piece. The transformers were then transported and jacked down into position on-site.

Case study: Receiving and transporting transformers, South Africa

OVERVIEW: ALE was required to receive, handle and transport four 200te transformers from the port of Saldanha to Koeberg Nuclear Power Station in Western Cape, South Africa.

SERVICES REQUIRED: ALE received the first transformer onto 10 axle lines of SPMT. The second, third and fourth transformers were received using 14 axle lines of conventional multi axle trailers and transported to site.

Once on site the transformers were offloaded using ALE's jacking and skidding systems.

Case study: Receiving and transporting rotors, Western Cape, South Africa

OVERVIEW: ALE received and transported three 172te LP rotors from the port of Cape Town to Koeberg Nuclear Power Station.

SERVICES REQUIRED: To complete the transportation of the rotors ALE utilised 18 axle lines of conventional trailers, one prime mover and one ballasted hauler.

Case study: Removal of transformers, South Africa

OVERVIEW: ALE was contracted to remove two 180te transformers from their rails at Koeberg nuclear power station in Cape Town, South Africa.

Following the removal, ALE transported the transformers one at a time to a scrap metal company 40km away where they were offloaded. The entire project was completed within eight days.

SERVICES REQUIRED: ALE required four 60te climbing jacks for lifting the transformers onto the transport arrangement which included a prime mover, 11 axle lines of conventional trailers and a ballasted hauler. Once at the scrap metal firm ALE used a skid track system to offload the transformers onto climbing jacks which then lowered the pieces to the ground.

MSRs

Case study: Replacement of MSRs at Almarez Nuclear Power Plant, Spain

OVERVIEW: ALE has carried out the removal and replacement of four MSRs (Molten Salt Reactors) at Almarez Nuclear Power Plant in Cáceres, Spain. The old MSRs weighed 90te each and the new MSRs weighed 150te each.

SERVICES REQUIRED: ALE supervised the lowering of the MSRs onto transport saddles placed on the transport platform (a 10-line SPT) at the turbine building deck. The old MSRs were then transported to the dismantling area and placed on supports.

The next phase of the operation saw ALE move the four new MSRs from the stockage area, where they had been uploaded onto supports, to the turbine building deck. The same SPT trailers were used for the site movement of the new MSRs and, once at the turbine building deck, they were lifted to their final position under the supervision of ALE personnel.

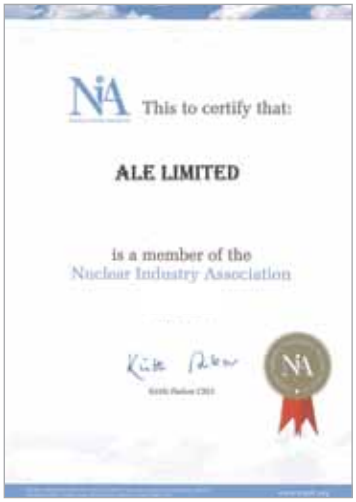
Case study: Replacement of MSRs at Ascó Nuclear Power Plant, Spain

OVERVIEW: ALE has successfully performed the unloading and internal movements of four MSRs at Ascó Nuclear Power Plant in Spain.

SERVICES REQUIRED: The new 105te MSRs were received at the temporary storage area where ALE unloaded them from the road trailers they'd been transported on using a 4 x 60te capacity climbing system and jacked them up onto temporary supports and transport beams. The four old MSRs, each weighing 90te, were removed from inside the turbine building of Unit 1 of the plant using 2 x 10 SPTs and transported to the scrap depot. The new MSRs were then moved from the storage area up to the turbine building using the same SPTs.

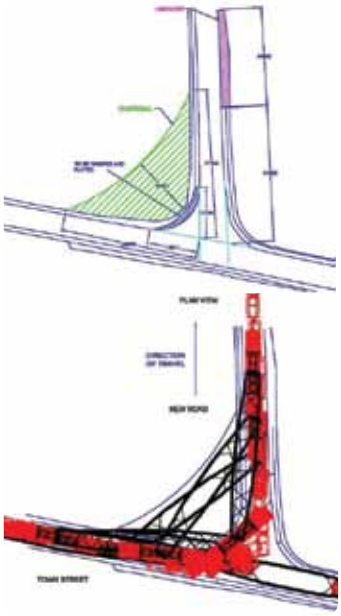
NEW BUILD

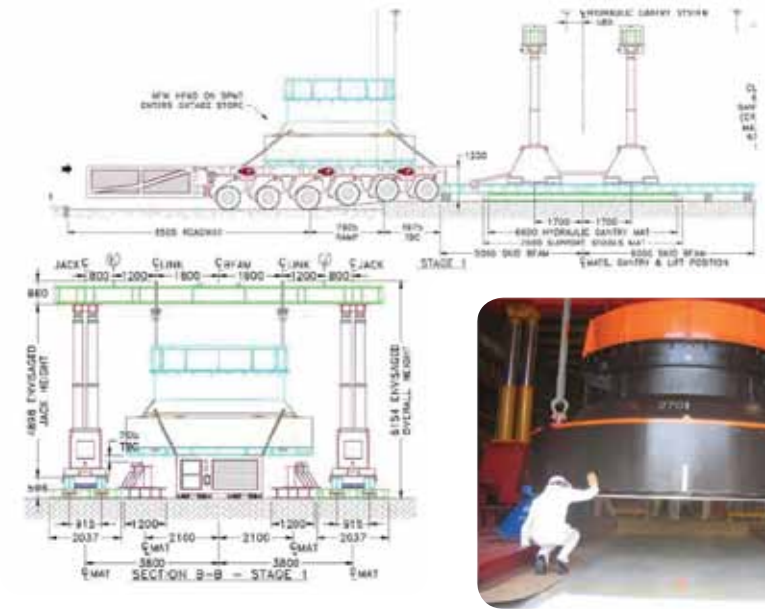
ALE's close relationships with manufacturers of nuclear island, power island equipment and relevant authorities, such as highways agencies, nuclear regulatory authorities, barging and shipping operators, as well as memberships with key associations, such as the Nuclear Industry Association (NIA), clearly demonstrates that ALE's commitment and capabilities also extend into the new build sector.



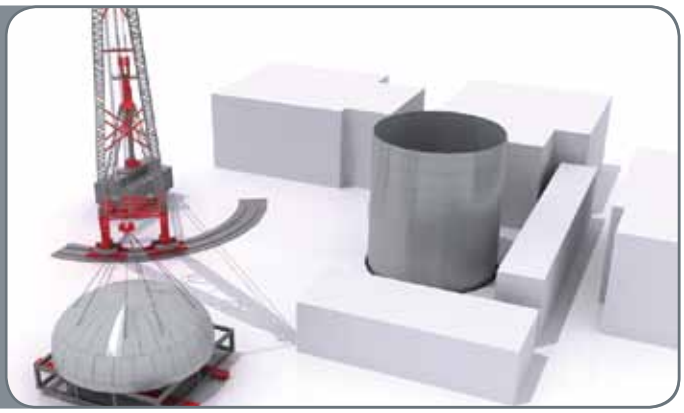
Our pedigree in innovative engineering and an active R&D facility means that ALE has always been known for developing new solutions to meet future needs. We're well equipped to support the full FEED process, incorporating FEED studies, design work, feasibility studies and routing advice, to work through complex technical and logistical issues at an early stage.

Route Work Analysis





ALE's team of highly experienced engineers, project managers and transport managers are on hand, both during the FEED phase and post contract award, to provide any support required. This extensive experience enables ALE to contribute to the engineering process and also to keep operational costs and risks to a minimum during the earliest stages of the project.



We operate a fleet of heavy cranes, including crawler cranes and pedestal cranes ranging from 200te to 5,000te capacity. Our cranes are located worldwide to provide an efficient and cost effective solution, minimising mobilisation and maximising use. Included in this fleet are the world's highest capacity land-based cranes, the AL.SK190 and AL.SK350 with capacities of 4,300te and 5,000te respectively.

In addition to the heavy lift cranes, ALE owns one of the largest fleets of heavy transportation axles and ancillary equipment in the world. Utilising SPMTs, SPTs and girder frame trailers, ALE is able to design and implement a transport solution for everything from site moves to the most challenging road routes.

ALE GLOBAL CONTACTS:

EUROPE

United Kingdom
Staffordshire, Head Office
+44 (0) 1889 272 500

United Kingdom
Middlesbrough
+44 (0) 1642 292 299

The Netherlands
+31 (0) 76 571 5240

Spain
+34 91 884 54 03

Germany
+49 (0) 211 9754889

Russia
+7 499 252 3207

Norway
+47 95 73 69 25

Belgium
+31 76 571 52 40

France
+31 76 571 52 40

Poland
+48 58 342 25 34

NORTH AMERICA

USA
+1 (0) 713 946 3125

Mexico
+52 (833) 262 01 93

SOUTH AMERICA

Brazil
+55 (21) 8306 8432

Argentina
+54 (11) 4545 9315

Venezuela
+58 212 2632576

Colombia
+57 1 610 92 34

Panama
+34 91 375 7160

Peru
+511 98847 8800

AFRICA

North Africa
+34 91 884 54 03

South Africa – Cape Town
+27 (0) 21 842 2762

South Africa – Johannesburg
+27 (0) 11 453 1946

MIDDLE EAST

Iraq
+964 7817 655 833

United Arab Emirates
+971 2 550 8741

Qatar
+974 4456 7730

Kingdom of Saudi Arabia
+966 (0) 3 3448551

ASIA PACIFIC

Indonesia
+62 21 31907912

Malaysia
+60 7 2553 202

Thailand
+66 38 893 700

Korea
+82 (0) 2 2040 7785

Vietnam
+84 64 359 7771

Australia
+61 (0) 7 333 91310

INFO@ALE-HEAVYLIFT.COM
WWW.ALE-HEAVYLIFT.COM

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