GOS ON-TRACK MACHINES (OTMs)

EUROTUNNEL REPLACEMENT MAINTENANCE EQUIPMENT

Following on from recent successful completion, certification and delivery of its first major on-track machine (OTM) project, GOS was awarded a multi-million pound, multi-year contract to design, build and deliver a total of 78 specialised maintenance modules (flat bed wagon skid mounted) and associated accessories, to replace "life expired" equipment currently in use on Eurotunnel infrastructure.

Well know for its innovative Road/Rail Vehicles (RRV's) in the world-wide supply of On Track Plant (OTP) over many years, GOS has expanded and developed its business recently into new areas of rail maintenance equipment manufacture, resulting in further investment at its Blaenavon factory site, to cater for OTM type projects.

Being totally "in-house", the GOS design/ project team was in the ideal position to work positively with the customer, fully assessing the project requirements and ensuring complete fulfilment with their specific needs. Also, being physically close to the manufacturing processes allowed unrivalled knowledge of the required 'design for manufacture'. This ensured that the design was customer pleasing and production efficient.

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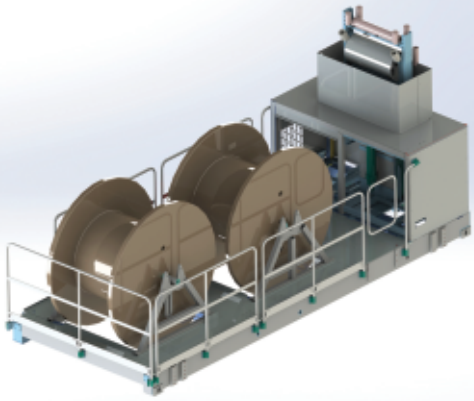
30ft ISO container "bolt-down" skid with Palfinger PA200 MEWP. PFD99 cable handler and a power generation unit providing both electrical and hydraulic power outputs.

The GOS Battery Energy Storage Unit (BESU) is mounted onto a 10ft ISO skid, allowing several to be positioned in various pre-selected places on various wagons along a train. Cable interconnections between wagons enable a single BESU to power multiple wagons/modules, if required, although normal operation shares the available battery power. Any number of BESU units can be connected, so that the time of "battery only" usage can be extended to meet the requirements of the job in hand.



20ft ISO container twin-lock skid with ZECK BM 959 twin-drum cantenary installation unit and cable handler. GOS installation includes an electric/hydraulic upgrade with the unit powred from the Micro-Drid.

KEY FEATURES

- Built in general accordance with local railway legislation, such as RIS-1702-PLT and BS EN 14033.
- Fully flexible flatbed wagon mounted modular design, allowing configuration into various "train" formations
- Modules incorporate well proven PALFINGER GMBH crane, MEWP and scissor lift technology.
- ZENK twin drum catenary cable handling system
- GOS designed Battery Energy Storage Units (BESU) providing hybrid battery power with diesel generator back up. Designed to work entirely on battery power within the tunnel.
- GOS designed/engineered innovative fully controllable/configurable control system (MICRO-GRID) allows energy transfer between modules
- Remote control operation for all modules
- GOS designed/engineered entry/exit system for safe scissor lift operation
- Crew amenity/welfare facility, with mess room, workshop, toilet and air conditioning. Designed in accordance with fire safety standard EN45545

Diesel generator back up is provided on most crane and MEWP modules, as a contingency measure in the event of electrical malfunction and to charge the battery modules as necessary. Charging can also be performed using 240 or 415Vac where such facilities exist, eg a train depot.

A cantenary train, comprising two crane wagons and a general purpose wagon fitted with the twin-drum cantenary wire modules. Each wagon includes its own dedicated battery energy storage unit.

A rail-carrying train, comprising two crane wagons and a general purpose flat wagon for the lengths of rail. Each crane wagon includes its own dedicated battery energy storage unit.

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FLEXIBILITY

A major consideration for the customer was the requirement to work seamlessly with the various stakeholders involved. Having a fully flexible project control capability, it was decided to divide the project control scope involved into four main work streams, ie Quality Control, Vehicle Product Acceptance, Vehicle Certification and Common Safety Method requirements (CSM).

As an example of the complexity and scope of the work involved, a total of seven certification personnel, both in-house and third party, were fully dedicated to the project. Another aspect was that various documents (eg the Quality Documentation) need to be produced in dual language - French and English. This ability to implement tight project control was fully recognised as representing a key component to the success of the overall project.

Another important factor was the correct selection and control of suitable "partner" suppliers for major sub-assemblies on the project. GOS has always recognised the importance of co-operative agreements and alliances regarding product innovation with major rail supply companies, including (in the case of this project) Palfinger EMEA GMBH (Cranes), Bosch Rexroth (Hydraulic systems) and Hoppecke (Battery storage units). Thus it was readily possible to ensure that the various major components were correctly specified and manufactured to meet the exacting project technical and delivery requirements.

OPERATION

All the trains require motive power to move into and within the tunnel. This is supplied by existing Eurotunnel battery/diesel locomotives, available in differing sizes to suit the train/ consist formation being used.

Compliance/ certification is on-going, through Aegis Engineering Systems Ltd. The use of a previously certified and approved flat wagon considerably aided the certification process. Overall certification is based on the BS EN 14033 series of standards, with due consideration being made to the unique operating environment of the machines.

The availability of local full scale track testing facilities at the nearby Pontypool and Blaenavon Heritage Railway (PBR) assisted in the certification process, where simulated working conditions were made available - GOS maintains a healthy working relationship with this railway, to the mutual advantage of both parties.

AMENITY MODULE

A GOS designed amenity module can be included in a train consist. It has been specifically designed to meet the often harsh working conditions encountered in a tunnel working environment, as well as complying with local railway welfare standards.

Includes:

- Fully insulated, steel skinned weatherproof cabin with doors and windows
- "Positive pressure" roof mounted air conditioning with HEPA filter
- Welfare area with seating and table for 6 persons
- Chemical toilet with hand washing facilities
- Workshop with high and low level tool storage
- LED strip lighting, fire extinguishers, 240VAC and 110 VAC sockets, first aid equipment

Please contact GOS, or scan the QR code for further information.

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CABLE MONORAIL SYSTEM HAULING - BALFOUR BEATTY ELECLINK

Balfour Beatty Power Transmission & Distribution and Prysmian Power Link formed a joint venture to supply and install a HVDC 1000MW Interconnector between the UK and France. The "ElecLink" project required a cost effective, efficient and safe method of towing the cable monorail system (CMS) into the tunnel to the required permanent position; it depended on a series of On-Track Machines (OTM), which are wagon mounted mechanical winching units, known as Hauling Units (HU), for the sole purpose of transitioning the cable.

GOS Tool and Engineering Services Ltd has an established and award-winning team that combines design, engineering and delivery expertise across all rail activities and can be trusted with the most complex and demanding of projects.

GOS is an experienced OTP provider that works collaboratively with its clients and own supply chain as a reliable partner, providing exceptional expertise and proven project delivery to the rail industry.

GOS has a proven track record for its ability to innovate and deliver, winning tenders for developing new and exciting equipment at the forefront of the rail industry.

The timescales for the project were always the biggest challenge; Balfour Beatty required a first of the type HU to be designed, built and delivered within 12 months ready to commence hauling straight away. Other manufacturers quoted a minimum timescale of 24-36 months for delivery of a project of this scale. GOS met the deadline and completed the project with a total of 5 HU's delivered in just over 18 months.

PROJECT DELIVERABLES

- Design and manufacture in line with the principles with the Common Safety Method for Risk Evaluation and Assessment (CSM RA)
- 5 HUs to be designed and manufactured
- Control system to deliver performance level d (PLd) monitoring of the cable tension
- Allow transition of the HU to the next location within the tunnel whilst maintaining constant minimal tension preventing cable sag
- Allow continuous motion of the interconnector cable when used with multiple HUs
- Provide inter-unit communication system that wirelessly (via fibre optic) sends HUs data to all other HUs and to a ground unit at the tunnel entrance

KEY FEATURES

- Two skids fitted to a single KFA wagon to form a single HU
- Control cabin including welfare facilities such as hot water, toilet and air conditioning
- 15T Utility winch with Dynema bond
- Tower gantry complete with pulley sheaves and bearings
- Bespoke fabricated hydraulically operated and retractable stabiliser legs to provide additional lateral stability in winching operation
- Automatic fire suppression system
- CCTV system to allow for additional monitoring of areas where visibility may be restricted
- LED lighting; installation of work lights, can lights, deck lights
- Radio remote control system for manual mode operation of winch and stabilisers
- On board communication system

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