

The drive behind the climb to the top



A radical new type of Climbing Platform powered by Control Techniques servo-drives controlling long reach actuators has been designed by Delta International, the UK's leading chimney contracting company.

When Delta could not find a suitable proprietary modular Climbing Platform for their on-site engineers strengthening the 94 metre refinery chimney at BP Coryton, their solution was to design their own. The result was a fast-climbing, ultra-safe modular system that can be adapted to suit most chimney contracts.

The specification had to meet demanding criteria – a 3 tonne uniformly distributed service load, ease of operator use, anti-skewing features, automatic expansion and contracting to adapt to different structures and compliance with all UK and European codes of practice.

Knowing the importance of the BP Coryton contract and the scale of the task involved, Delta's Senior Engineer, Nigel Matthews, spent six months planning, designing and fabricating the Electronic Climbing Platform, the most advanced ever seen in the construction industry.

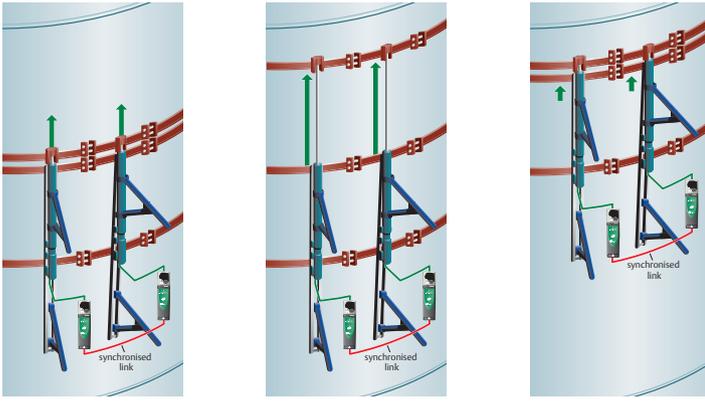
"We realised that the success of this depended on the accuracy and reliability of the drive / actuator combination," says Nigel Matthews, "so we took a lot of care in researching the market. We chose linear actuators from Industrial Devices of Shrewsbury and they recommended Control Techniques drives as being the best to provide the level of control, communications and on-board programming that we needed."

KEY BENEFITS

- EASE OF OPERATOR USE
- ANTI-SKEWING FEATURES
- FAST CLIMBING
- ULTRA-SAFE MODULAR SYSTEM
- 3 TONNE UNIFORMLY DISTRIBUTED SERVICE LOAD



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The climber comprises a lower scaffolding ring supported on a manually clamped steel ring. An upper boarded section is also supported on a clamped steel ring. Between the two layers are electrically driven lead screw actuators, locked to the upper and lower structures. Depending on the diameter of the chimney, there can be up to 20 actuators; the refinery chimney at BP Coryton needed 15.

To climb, the upper clamping band is released and is pushed up 1.2 metres by the actuators working in unison, re-clamped and the lower ring is released. The actuators then contract, smoothly pulling up the lower platform, which is re-clamped. The process is reversed for the descent. This means that the whole platform is raised and lowered in one piece, rather than in sections, like conventional climbing platforms, creating a far safer working environment.

Each Industrial Devices 25 kN rated ACME thread actuator is driven by a 0.55 kW braked motor, with encoder feedback, and controlled by a 0.75 kW Control Techniques Unidrive SP AC drive, working in servo mode and fitted with an applications module to provide powerful on-board programming. Each actuator has a maximum reach of two metres and maximum speed of 60 metres/minute. One Unidrive SP acts as master and 14 as slaves, all drives communicating using Control Techniques' own high speed drive-to-drive network, CT Net.

The Unidrive SP AC variable speed drive range spans 0.75kW right up to 1.9MW. Unidrive SP is the world's most advanced 'solutions platform' AC drive, configurable into five operating modes – open and closed loop, vector, servo and regenerating modes - connectivity to most industry standard networks and accepting 14 position feedback protocols. With a range of plug-in module options, its on-board PLC can be supplemented, as in this case, with programmable modules.

The purpose of the software for the Climbing Platform, written by Control Techniques software engineers, is to provide anti-skew control to ensure that when the master linear actuator's position is changed in auto-mode, all the other actuators on the system follow its position. It is also possible to change the position of any actuator in manual mode, without affecting the others. When changed back to auto-mode, the actuator continues to mimic the master from its new position.

The master constantly monitors the status of the slaves, and if any actuator is prevented from operating, perhaps because of an obstruction, this error is reported and the whole operation is stopped.

The software is identical in each applications module and automatically configures itself to the correct settings based on CT Net node number. Other system features include fully adjustable and independent speed of raising or lowering and the future option of an Ethernet link for remote diagnostic purposes.

The Climbing Platform is run off a generator supply since its use is intermittent, keeping on site costs to a minimum.

"The new Delta Climbing Platform has two exciting advantages over the old style platforms," says Nigel Matthews. "Firstly, it's self-supporting and doesn't require any physical fixings to the chimney itself. Secondly, it climbs as a single unit, creating a much safer working environment and can be used on virtually any chimney or stack for any purpose where scaffolding would be used. I am convinced that this will become the industry standard – not just because it is so advanced, but because it was designed and built by engineers who actually work on site."

The new Delta Climbing Platform is currently being used on a 12 month contract at BP Coryton in Essex, for the jump shutter concrete cladding of a 94 metre furnace chimney. This BP refinery processes over 172,000 barrels of crude oil per day, producing petrol and diesel, including new greener fuels, aviation fuels, LPG, fuel oils and bitumen.

Delta International dominates the market in the inspection, modification, maintenance and piecemeal demolition of chimneys and tall structures throughout Europe.



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