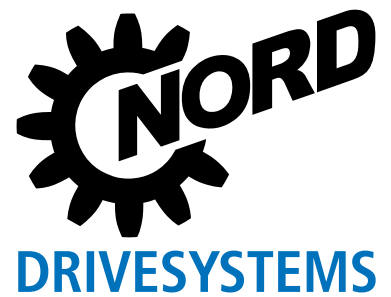


# DRIVE SYSTEMS FOR ACCESS SHAFTS

CASE STUDY: ELECTROMECH



## Sewer Tunnel Construction

Located in Abu Dhabi



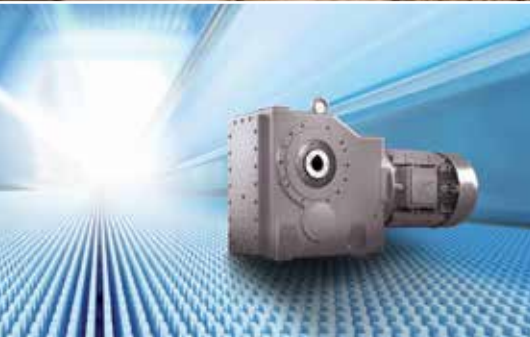
## Hoist Systems

Engineered for synchronization



## Safety Within Access Shafts

With secure utility platforms



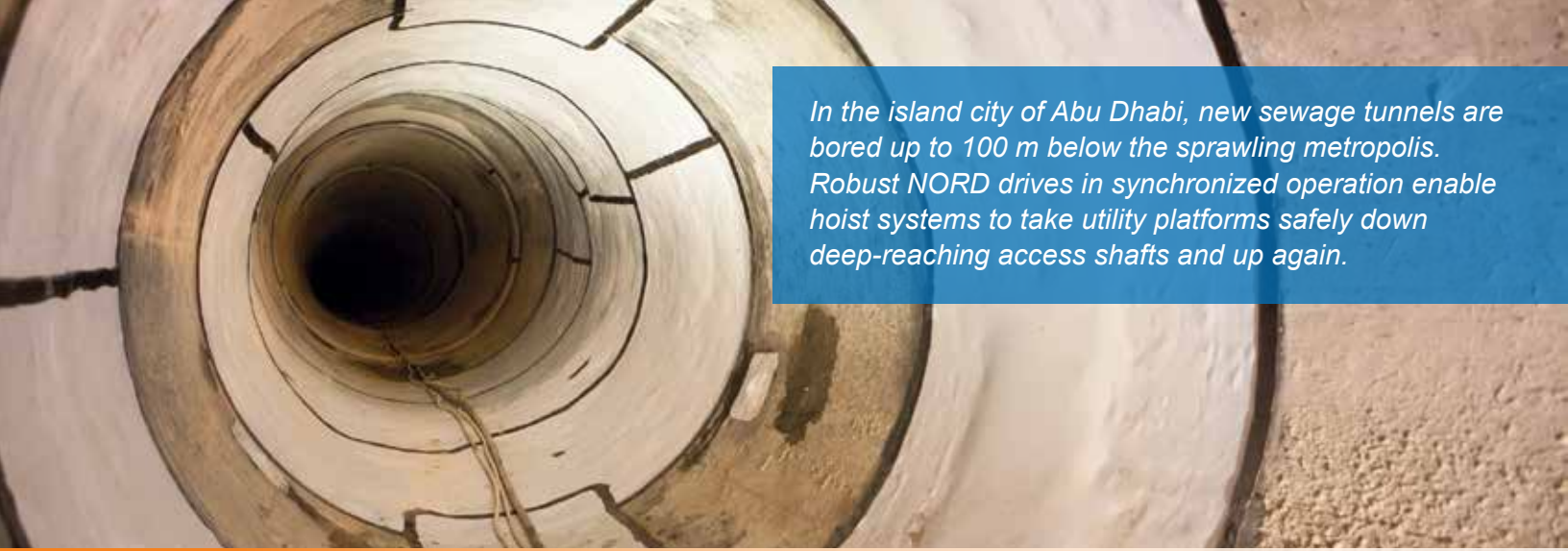
## NORD Helical-Bevel Gearmotors

Powerful right-angle units



## NORD AC Vector Drives

SK500E family drives



*In the island city of Abu Dhabi, new sewage tunnels are bored up to 100 m below the sprawling metropolis. Robust NORD drives in synchronized operation enable hoist systems to take utility platforms safely down deep-reaching access shafts and up again.*

## PROJECT CHALLENGE



**Tunnel Construction**  
Hoist systems



**Geared Motors**  
Helical-bevel  
gear units



**AC Vector Drives**  
Cabinet mounted  
AC vector drives

Water consumption in the Emirate of Abu Dhabi equates to a staggering 550 liters per person per day. With its population rising by leaps and bounds, the growing metropolis recently began the construction of an all-new, state-of-the-art sewage and wastewater recycling system with a large increase in capacity. A gravity-driven system based around the idea of new tunnels deep underground collecting wastewater and delivering it to a large-scale pumping and filtering station near the coast.

**From darkness to the light of day** – The tunnels that reside beneath the highly developed urban area are constructed via trenchless excavation. The Indian crane manufacturer ElectroMech was contracted to manufacture and install large gantry crane systems at a number of access shafts, where utility platforms can be lowered and lifted to move personnel, machinery, and material into the tunnels and out again.

**Hoists in lockstep** – Given a tunnel boring phase of at least two years from start to finish, these hoists call for powerful drive solutions that can be relied on and operate with minimal maintenance requirements. Several drives that are assigned to the same crane must perform with perfectly synchronized operation. In order to carefully take people, material and tools for long commutes up and down tunnels on a moving platform, geared motors, working in pairs, need to ensure that the platform remains level at all times. In addition to this crucial functional requirement, the climate of the Persian Gulf region, featuring exceptional heat, is another environmental factor to consider. All drive technology used needs to be tenacious enough to endure while operating in these extreme conditions.

## FOCUS ON THE CUSTOMER



ElectroMech Material Handling Systems (India) Pvt. Ltd. was founded in 1979. The engineering company has seen rapid growth

in recent years and is now the largest crane systems manufacturer in India with a commanding market share. ElectroMech offers suitable solutions for a wide range of applications in manufacturing plants and infrastructure projects. Based in Pune, the company manufactures an expansive range of hoist and crane systems.





*"We greatly appreciate both the pre-sales and after-sales services rendered by NORD, and we trust in their proven level of excellence."*

**TUSHAR MEHENDALE,  
ELECTROMECH MANAGING DIRECTOR**

## APPLICATION SOLUTION

ElectroMech and NORD DRIVESYSTEMS have co-engineered drive solutions based around helical-bevel gearmotors for both the main and auxiliary hoist applications in Abu Dhabi. The gear units work at an efficiency level of more than 95 percent. These geared motors are supplied with UNICASE™ cast-iron housings which are exceptionally resilient and provide remarkable protection against the harsh outdoor conditions.

**Dynamic duo** – Each crane powers two hoisting drums. Each of these is equipped with a gearmotor that is connected to and controlled by an AC vector drive. These heavy-duty helical-bevel geared motors provide 110 kW of rated power and 1,200 Nm of torque. The entire system has been automated in order to achieve perfectly synchronized operation of the hoist's drums using encoder feedback. They must work precisely in lockstep with one another to ensure that the utility platform may be lifted and lowered without ever tilting to one side.

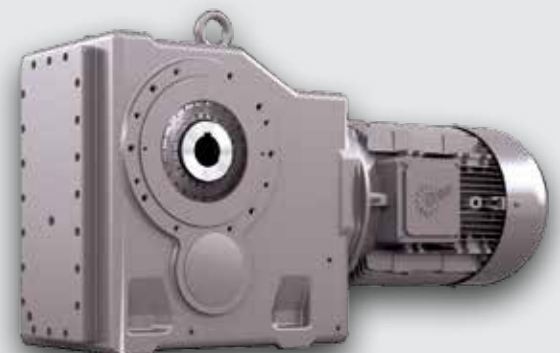
**Joint solutions** – Proper operation within a mere  $\pm 5^\circ$  of tilt is ensured by NORD AC vector drives that feature technology that provides constant speeds during operation with changing loads and very high torques during start-up. This solution comprised of two-stage helical-bevel gearmotors and AC vector drives is the latest development in a series of projects undertaken by NORD and ElectroMech. Over the course of the last several years, the two partners have designed and implemented a substantial number of application-specific solutions for a wide range of various hoist systems.



**Perfect balance.** – Synchronized hoist drives keep platforms riding in the shaft at a level position.

## FOCUS ON THE PROJECT

In this tunnel construction project, the precisely synchronized operation of NORD's drive system pairings is absolutely vital, since ElectroMech's gantry cranes must take platforms down a considerable distance of 90 m at several of the access shafts. Measuring 4 to 5.5 m across, the main tunnel for the Gulf Emirate's "Strategic Tunnel Enhancement Programme" (STEP) extends for about 40 km beneath the city and its environments. Once completed, the new sewage system will be able to dispose of 800,000 m<sup>3</sup> of wastewater each day.





## MORE REFERENCES AND CASE STUDIES MAY BE FOUND AT :

▪ [www.nord.com/references](http://www.nord.com/references)



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### Global Vision, Local Support

NORD makes its wide product range easily available through a global network that includes representation in over 60 countries. By providing all of our customers with prompt delivery, and expert support services, we are firmly committed to exceeding customer expectations and being responsive to the ideas and specifications of every customer, anywhere in the world.