



## Upgrade challenge

Over a decade ago, Amarith supplied ten super-duplex API 610 VS4 pumps with atmospheric pressure single lip seals to ADNOC for closed drains systems. Recently, ADNOC was upgrading its giant Bab onshore field, located 160 km southwest of Abu Dhabi city and one of its largest onshore producing assets, and was investigating whether it could redeploy the original API 610 VS4 pumps. However, it found there was higher concentrations of hydrogen sulphide ( $H_2S$ ) in the oil at the new location than when the original pumps were ordered.

## Plan 71 seals required

Archirodon, the EPC awarded to build the facilities and infrastructure required to sustain the long-term crude oil production capacity of the field at 485,000 bpd, therefore approached Amarith to assess whether new pumps would be required or the existing pumps could be updated and integrated into the oil train.

To contain dangerous  $H_2S$  gas requires a different seal support arrangement than the pumps had been supplied with. Amarith reviewed the original design and proposed that the seal support systems be changed to Plan 71 nitrogen seals, which would be suitable for the higher concentrations of  $H_2S$ , and that the pumps be fully refurbished and certified for use in the upgraded facility.

## Three-way cooperation

It was agreed that the upgrade and refurbishment would be completed in 27 weeks from purchase order to commissioning as a longer shutdown would mean ADNOC losing £1M per day in new production capacity. It also had to be completed during the global Covid-19 pandemic and lockdowns.

A three-way cooperation was formed between Amarith, Archirodon and ADNOC to tackle this fast-track logistical challenge, overseen by Amarith's Head of Technical Engineering.

## Multi-site working

Amarinth first organised with Archirodon and ADNOC for the pumps to be collected from around the large Bab site and then crated and transported to its local engineering and service centre in Abu Dhabi, UAE.

Once the pumps were at its service centre, Amarith undertook a strip and report for each of the ten pumps detailing what could be reconditioned (such as motors and shafts) and what needed replacing.

The company then organised the acquisition and shipping from the United Kingdom of all necessary components, including the new Plan 71 seal support systems, couplings, pipework, and instrumentation panels, for the refurbishment and update of the pumps to be completed in Abu Dhabi.

The upgraded pumps were then fully tested and their performance revalidated along with updated documentation for the new as-built status.

Finally, full witness testing of the upgraded pumps was carried out at the Abu Dhabi facility before the pumps were returned to site with a new 18-month warranty.

Amarinth engineers accompanied the pumps to the Bab facility and worked alongside Archirodon to oversee the installation, commissioning, and factory acceptance tests of the upgraded pumps into the new oil train.

## Meeting the deadline

Despite the engineering and logistical challenges, compounded by the Covid-19 pandemic, Amarith was able to have the upgraded pumps commissioned within the deadline enabling Archirodon and ADNOC to keep the Bab upgrade project on-track.



## Abu Dhabi National Oil Company (ADNOC)

ADNOC is a leading diversified energy and petrochemicals group wholly owned by the Emirate of Abu Dhabi. The organisation's objective is to maximize the value of the Emirate's vast hydrocarbon reserves through responsible and sustainable exploration and production to support the United Arab Emirates' economic growth and diversification.

ADNOC operates across the entire hydrocarbon value chain, through a network of fully-integrated businesses, with interests that range from exploration, production, storage, refining, and trading to the development of a wide range of petrochemical products.

## Archirodon

Archirodon is a large diversified international contracting organisation established in 1959 as a joint venture between Archimidis, Greece's foremost marine contractor at the time, and Odon & Odostromaton, a road construction specialist group.

*"We were impressed with Amarith's partnership approach, flexibility, and technical abilities that enabled these pumps to be upgraded and refurbished successfully to meet the tight deadline and keep the overall project on-track."*

**Massimo Zanaboni**  
Project Manager  
Archirodon