COVER STORY

Bye bye TO PORT BOTTLENECKS

Sanjeev Mathur, Bedeschi S.p.A., Italy, explains how the supply chain logistics of coal can be improved through offshore transhipment.

The coal industry has grown phenomenally over the last two decades. With the rapid industrialisation in China, Korea, Taiwan, India, and other developing countries, the demand for power has steadily increased, thus increasing the coal demand. Not many countries are blessed with deepwater ports but that has not deterred many from becoming the leading coal producing and exporting countries in the world. An example which comes to mind is Indonesia, which, despite not having large ports to support the demands of vast amounts of coal exports, has shown the world that it can still be the world's largest exporter of coal, as a result of the various offshore transhipment facilities operating in the Indonesian waters today.

The world has recently witnessed a large growth in this niche area of offshore transhipment in recent years. Bedeschi has led from the front by way of innovativeness and has raised the bar of

creativity and performance. The array of work undertaken by Bedeschi in this field is largely impressive, and that is precisely the reason why various discerning clients have selected Bedeschi over alternative players in the field.

The various factors which have contributed to the success of Bedeschi in the field of offshore transhipment include:

- Acknowledging that client's requirements are most important.
- Innovativeness is the key – how to remain ahead of the competition.
- In-house design and production of key components.

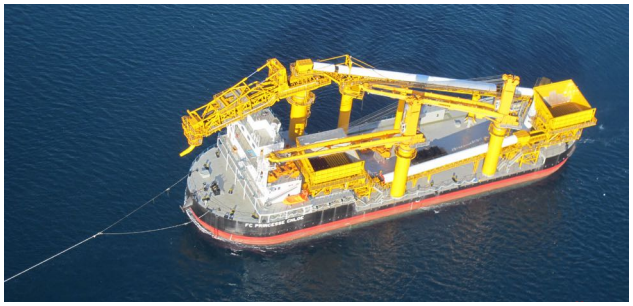

Figure 1. Bedeschi floating transfer station (FTS) equipment, *Princess Chloe*.

Figure 2. Bedeschi FTS for *Emco 1*, Russia.

Figure 3. Bedeschi floating storage and transfer station (FSTS) *River King*, Pakistan.

- Developing long-term relationships with clients.

The first and the foremost requirement is properly understanding the client and the project's requirements, and then designing the solutions to suit them. The requirements of every project, however minor in nature, are unique for the project and thus the systems must be designed suitably.

Another aspect which helps Bedeschi stay current and innovative in its thinking is having the ability to translate its innovation into workable designs, and then having the capability to put the designs into production. Some of the examples of Bedeschi's innovations include: curved and rotating delivery chutes on shiploaders to deliver cargo in all parts of the ocean-going vessel's holds; variable speed driven belt feeders for smooth material extraction from hoppers; double shiploaders on transhippers; hoppers with collapsible side walls to reduce crane grabs lifts; software integration between desired delivery flowrate and cargo extraction from hoppers; to name a few.

The aforementioned innovations are able to be implemented because Bedeschi has an in-house design team which works in close co-ordination with the project's department to execute the ideas into workable designs and then interact with the in-house production facility. At the state-of-the-art production facility, the designs can be fabricated, assembled, and tested before being shipped for installation on board the transhippers.

Variety of transhippers

Over the years Bedeschi has developed several transhippers to handle coal – both for loading and for discharging operations. Depending on the requirements of the project they can be classified into two major types:

- Floating transfer station (FTS) – smaller devices with two cranes and a combination of cargo handling system.
- Floating storage and transfer station (FSTS) – large vessel with four cranes combined with cargo handling system, with storage on board.

Solutions in practice

Here, two recent coal transhipment solutions implemented by Bedeschi are discussed, which essentially elaborate each of the types mentioned previously.

One example of the various solutions implemented by Bedeschi is the FTS *Emco I*, delivered to Russia as part of Shakshtersk Port to support their client – East Mining – in enhancing their cargo handling capacity to 8 million tpy (Figure 2). The FTS has been fully renovated and has been adapted to cater to the new operational needs by Bedeschi as well as its partners. Emphasis has been laid on the environmental protection, particularly dust emission, to render the system totally 'green'. The FTS is equipped with two heavy duty Liebherr cranes, which deliver cargo into two hoppers fitted adjacent to the cranes. Each hopper has been fitted with a 1300 tph feeder belt which helps in uniform material extraction and transferring to the belt conveyors. An array of belt conveyors transfer the coal to

a 2500 tph capacity shiploader designed to load vessels up to Panamax size.

Another project commissioned by Bedeschi in 2019 was the FSTS *River King* (Figure 3). This project has been implemented to cater to the coal import requirements of Hub Power Company, the largest independent power producer of Pakistan. Owing to the draft restriction at Karachi Port, the FSTS has been deployed at the harbour where deep water is available to receive Capesize vessels. The FSTS transfers the coal from the OGVs into barges, which then transport the coal to the port for discharge.

The cargo handling system has been completely designed and produced by Bedeschi based on the requested requirements and functionality of the system for the transhipping of coal.

The cargo handling system comprises of two double receiving hoppers, which receive coal from four side-mounted Liebherr cranes. Each hopper is fitted with variable speed driven feeder belts. The feeder belts act as coal extractors from the hoppers and deliver the coal onto fixed longitudinal belt conveyors leading to a slewing and luffing type loader to deliver the coal into the receiving barges moored alongside at 2500 tph. The system has also been equipped with an automatic sampling device, online weighing scale, and metal detectors. This FSTS is the lifeline of the power plant and is successfully engaged in helping the power plant receive coal for its needs.

These two projects described have been implemented for handling coal – one for loading and the other for discharging. Both are being used to overcome the infrastructural bottlenecks of two different ports. With the implementation of these transhipment systems, both ports are now capable of handling large vessels, thereby eliminating their restrictions. These systems can operate in adverse weather conditions and are fully relocatable. Furthermore, the systems were implemented under strict time schedules and adhere to stringent environmental norms.

In total, six transhipment solutions for coal have been implemented by Bedeschi for the Indonesian coal industry, and these have been operating successfully: FSTS *Mara*; FTS *Princess Chloe*; FTS *Vittoria*; FTS *Zeus*; FTS *Apollo*; and FTS *Bulk Celebes*.

Summary

Bedeschi remains committed to the development and betterment of the supply chain logistics of coal – whether it is for loading coal at exporting locations or for receiving coal at the destinations. In addition to development of offshore solutions for coal, Bedeschi has also developed several coal handling ports, which are in successful operation in Turkey, Philippines, US, Russia, Colombia, to name a few. For Bedeschi, innovativeness is not a destination but a process, which the company always strives to excel in. DB