Najran adds capacity and WHR

by Najran Cement, Saudi Arabia

Saudi Arabia is one country where the demand for cement just keeps increasing. It is this rise in consumption that has triggered Najran Cement Company (NCC) to continue to expand its cement capacity and along with this investment, the company has decided to introduce the kingdom's first waste heat recovery system for a more sustainable and energy-efficient method of power generation.

NCC was established in 2005 as a Saudi Closed Joint Stock Company with a paid up capital of SAR1150m (US$306.6m). The objective was to be a main supplier of cement in the southern region of Saudi Arabia and an important exporter to Yemen. Locating its cement plant and facilities close to Najran city will greatly contribute to the fast development of the region.

The company has a quarry licence from the Ministry of Petroleum and Minerals of 30km² endowed with huge limestone, clay, sandstone and gypsum deposits that are sufficient for more than 100 years.

The plant was initially planned as a single integrated 6000tpd clinker facility at Sultana, around 240km northeast of Najran at the tip of the Empty Quarter desert. As the project moved along, a decision was taken to expand the clinker plant to 9000tpd by adding one more 3000tpd line to make full use of vast raw material deposits. This was supplemented by a 2Mta standalone grinding unit at Aakfa, 70km west of Najran on the main highway to the Asir region.

The company has its own captive power plants (CPP), water treatment units and housing complexes at both facilities. The technical set-up represents the most prudent mix of technology, dependability and accreditation.

Certifications

NCC has the following certifications:

- ISO 9001:2008 for Quality Management System Certified by TÜV NORD
- ISO 14001:2004 for Environmental Management System Certified by TÜV NORD
- SASO: NCC has also been accredited by Saudi Arabian Standards Organization (SASO) for Quality Products.

Najran Cement preheater building foundation work

Main products features

NCC currently manufactures and markets two types of cement: ordinary Portland cement (OPC) and sulphate-resistant cement (SRC). The main product features include:

- high and stable strength
- softness and high flexibility during mixing and usage
- the hardening and curing period suits multiple usages
- raw materials with high quality are free of alkaline materials, which prevents the cracking that usually occurs in the concrete.

Existing production lines

NCC has a cement plant with a 9000tpd capacity for manufacturing various kinds of cements in the Sultana area of Najran province. At present the plant consists of two production lines, one grinding unit and a CPP as described below:

- Line 1: 6000tpd clinker, cement grinding and packing (commissioned in 2007)
- Line 2: 3000tpd clinker (commissioned in 2008)
- Grinding unit near Najran City (70km), two 135tph cement mills each with a roller press (commissioned in 2009)
- CPP of 56MW based on heavy fuel oil (HFO).

Brownfield project

To capitalise on the expected domestic market development, NCC has plans to expand its clinker capacity by 7000tpd with a new third line. NCC has appointed Holtec Consulting Pvt Ltd, India, as the engineering consultant for the implementation of the project. Line 3 is located parallel to Line 1 and 2 at Sultana. The cement grinding system has a capacity of 400tph (two x 200tph roller presses).

NCC has also planned to expand the power generation capacity of its CPP by adding two additional diesel generators (DG) sets (2 x 7MW) in the existing power generation unit.

Table 2: major equipment for WHR

No of boilers	1 boiler each for air quenching cooler (AQC) for Line 1, Line 2 & Line 3	2 PH boilers for Line 1, 1 PH boiler for Line 2 & 2 PH boilers for Line 3	10 DG boiler for 10 DG sets
Turbine generator set	2 x15MW		
Air-cooled condenser (ACC)	2 (turbine back pressure as 0.22ata at 45°C)		

replace electricity generated by the DG-based power plant, therefore saving approximately 37,200tpa of HFO.

- The electricity generated from the project would help to reduce CO_2 emissions by 145,000tpa and other associated pollution, which would be emitted in absence of the project.
- Saudi Arabia's higher demand for fuel and the tigher supply-demand balance is expected to lead to a reduction in fuel availability
- Awareness of environmental protection has taken a front seat with the installation of the WHR power plant.

Biggest WHR power plant

By installing the WHR power plant with a generation unit of 27.1MW, NCC will have the world's largest WHR power generation unit for the cement industry, as well as being the first WHR-based power plant to be installed in Saudi Arabia.

NCC's mission and strategy

NCC's mission is to enhance the position of the company in the immediate markets through providing high-quality products with reliability and adherence to the effective commercial practices in a way that maximises the economic benefits for all relevant parties while capitalising the high demand in the promising markets.

The company has identified three measures of success: capaciousness, commitment and reliability. Capaciousness relates to the optimal level of productivity at all work levels, while commitment relates to quality, environmental conscience, social responsibility and the possibility to exchange benefits with all parties. Reliability is the degree of sustainability, which ensures that capaciousness and commitments are result oriented.

These three success factors define the business strategy of the company through a participatory approach of serving the markets by the effective mobilisation of its resource base to deliver products that are compliance originated, demand based and customer oriented.

The resource base is driven by an operating model that economises business obligations with all parties into strategic relationships. The availability and quality of the products emanate from a balanced production function being outsourced to an expert group responsible for the operation and maintenance of the production facilities. Therefore, adequate and appropriate frameworks are in place to ensure that productivity is not delivered at the cost of maintenance. A supervision team works to ensure sustained economies of scale and to maintain the highest environment and safety standards (compliance originated), economies of scope (demand based) and the related product quality parameters (customer oriented). The result orientation is made possible by a supply chain that involves international manufacturers of spare parts and qualified local cement distributors to achieve mutual benefit through the management of the company's talent pool.


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