

IRPC Clean Power Company, Ltd. Three-drum water-tube boiler

PROJECT CASE HISTORY

*Integrated Refinery & Petrochemical Complex (IRPC)
Rayong, Thailand*

Plant Description

IRPC, the first fully integrated petrochemical complex in Southeast Asia, is located in an industrial area of Rayong, Thailand, with energy and sea port operations to support the area's businesses. A subsidiary of Global Power Synergy PCL, IRPC Clean Power Company, Ltd., (IRPC CP) owns and operates a cogeneration plant that produces and sells steam and electrical power.

Project Description

Through engineering, procurement and construction (EPC) contractor TTCL Public Company Limited, The Babcock & Wilcox Company (B&W) was selected to supply IRPC CP's combined heat and power (CHP) plant, CHP II, with an industrial boiler capable of generating and supplying steam to a neighboring factory.

The project required a steam generation solution that could provide five minutes' worth of water retention in case of a loss from feedwater pumps before a low-water trip to the boiler. Cost, transportation and environmental considerations also factored into the design.

B&W's three-drum boilers can be transported with the drum attached or separate for assembly onsite.



B&W's shop-assembled industrial boilers help meet the need for fuel-flexible, high-efficiency, low-emissions steam power.

To meet all requirements of a high-capacity, factory-built unit, B&W engineered and delivered its first elevated three-drum water-tube boiler. It was designed to accommodate ample water holding capacity, much greater than a two-drum design. The large steam drum was mounted prior to shipment, but for instances in which shipping height and weight limitations exist, the steam drum could be transported separately and assembled onsite.

Commercial Operation

Commissioned December 2016

Scope

- Industrial boiler
 - Steam capacity, including deaerator (DA) pegging steam: 115,000 kg/h (253,532 lb/h) at 62 bar (885 psig) and 440° C (825° F)
 - Weight (empty): 143,150 kg (315,592 lb)
- Dual low NO_x burners
- Dual forced draft fans (one for redundancy)
- Economizer
- Control system



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Transportation

Manufactured in West Point, Mississippi, USA, the unit was transferred by truck to the Tennessee-Tombigbee Waterway then by barge to a port near Houston, Texas, shipped to IRPC's dock in Rayong and delivered by truck to the plant.



Results

- Final commissioning showed drum level didn't deviate more than 15 mm from set point during normal plant load swings
- Rated at 100 tons/h (net steam flow less DA pegging steam flow), commissioning results showed unit running at up to 110 tons/h
- CO and NO_x emissions well below required levels. Via the flue gas recirculation (FGR) system, NO_x levels below 25 ppm were achieved over the entire boiler load range
- Boiler efficiency of 84.42% (HHV basis)



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