

World's Largest Oil Refinery- Jamnagar Refinery

(Reference: hydrocarbons-technology)

The majority of world's 10 largest refineries are situated in the Asia Pacific region, with India hosting the world's largest refinery complex, followed by Venezuela and South Korea. Here is the largest oil refinery in the world, based on processing capacity.



Jamnagar Refinery Upgrade, India

Order year: 1996

Plant type: Asia

Type of installation: Refinery

Location: Gujurat, India

Estimated Investment: Rs 9,700 crore (\$207 million)

Completion: 2000

Sponsor: Reliance Industries Limited

In early 1999, the Foxboro Company received a multimillion dollar order from the Reliance Jamnagar refinery in India for a fully applied closed-loop (automatically controlled) crude blending system. The system was



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incorporated in Reliance's refinery, which was completed in 1998 after a 24-month construction period.

The project confirmed that Reliance had entered the next phase of its growth, with commissioning of facilities having commenced at the new Jamnagar petrochemical complex.

The upgrade of the Jamnagar Petrochemicals complex significantly enhances the degree of vertical integration, enabling Reliance to capture value across a broader spectrum of the energy chain.

In 2008, a second refinery was built adjacent to the first, with an investment of over \$6bn to double the company's Jamnagar facility's capacity to approximately 1.24 million barrels per day. Construction on the refinery was started in 2005 and took 36 months to complete in 2008.

The second refining unit can process approximately 29 million tons or 580 KBPSD (thousand barrels per stream day). The combined capacity of the two refineries is 62 million tons, ranking the Reliance's Jamnagar refineries first among the top ten refineries in the world.

Process NMR analyzer automation system

The automation system is the Process NMR analyzer which facilitates closed-loop crude blending by providing the Connoisseur model with on-line measurements not previously available outside of the lab. Connoisseur utilizes these measurements to supervise closed-loop blending of highly consistent crude feedstocks. The absence of variability in these feedstocks helps to optimize downstream operations.

This closed-loop crude blending system is based on Foxboro's I/A Series Process NMR (Nuclear Magnetic Resonance) analyzers and Simulation Science's powerful Connoisseur MPC (Model-based Predictive Control) package running on a Foxboro I/A Series control system



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The system was jointly implemented and supported by Foxboro Far East in Singapore, Invensys's large Indian operation headquartered in Chennai, and Foxboro's Strategic Measurement Operations in Massachusetts. Foxboro is backing this advanced solution with a performance guarantee based on specific reductions in the variability of blended crude feedstocks following project completion in early 2000.

Jamnagar plant production and cost

The Jamnagar Complex is the first manufacturing complex of its kind, having a fully integrated petroleum refinery, petrochemicals complex, captive power plants, and a captive port, with related infrastructure. It represents the largest single investment at a single site in India.

The refinery comprises more than 50 process units. Some of the processes being used by the refinery encompass crude oil distillation, catalytic cracking, catalytic reforming and delayed coking.

The refinery project required a total investment of Rs 9,700 crore (\$207 million) which was a fraction of the total project cost of Rs 20,400 crore (\$437 million).

Construction of the plant commenced in 1996 and had an initial construction period of 29-30 months. However Reliance pushed contractors to work on a two shift-24hr basis so as to have the site finished within a 24-month period. On completion the refinery at the complex had a capacity to produce 15 million tonnes per year of refined crude.

Lead contractors

The original construction of the complex, which included the refinery, was led by Bechtel, which worked in close collaboration with Reliance throughout. Construction was carried out by a number of Indian companies such as Larsen & Toubro (L&T), Dodsai, Punj Lloyd, Trafalgar House and Simplex.



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The Foxboro Company led the installation of the automation system, both in 1997 when the complex was in phase one of construction and in 1999 with the refinery's most recent upgrade.

The Jamnagar Refinery

With a refining capacity of over 33 million tons per year and paraxylene production of 1.5 million tons per year, Reliance Jamnagar is the world's largest grassroots refinery and aromatics complex. Reliance Petroleum's parent company, Reliance Industries Ltd., is the largest private sector company in India.