



# **KHURSANIYAH GAS PLANT**



## Concept and Location

The Karan Gas field is one of the largest off shore oil fields, near the industrial city of Jubail in Saudi Arabia. The area is of vital strategic importance to Saudi ARAMCO, due to its close proximity to several oil fields in the vicinity.

The Khursaniyah Gas Plant was originally envisioned to process 1 billion standard cubic feet per day (scfd) of associated gas from the Abu Hadriya, Fadhili, Khursaniyah, Marjan, Safiniyah and Zuluf fields. The gas plant was to be integrated with Khursaniyah Central Oil Processing Facilities to minimize required utilities and capture synergies. The Khursaniyah Gas Plant then underwent an expansion in order to process gas from the offshore Karan field which was the first non-associated offshore gas field project being developed by Saudi Aramco in the Kingdom.

To realise the construction of this complex gas plant, of vital importance to Saudi ARAMCO's regional strategy, Drake & Scull Construction's Saudi Arabian Civil Construction subsidiary, International Centre for Civil Contracting (ICC) were contracted to undertake the complete civil works for the gas plant.

The gas plant is located about 140 kilometers north of Dhahran, and includes facilities to transport gas from the field via a 110-kilometer subsea pipeline to onshore processing facilities at the Khursaniyah Gas Plant.

The Khursaniyah Gas Plant includes facilities to process and stabilize 500,000 bpd of Arabian Light crude oil blend from the Abu Hadriya, Fadhili and Khursaniyah fields and a grassroots gas plant to process

1 billion scfd of associated gas. The facility also has the capacity to inject 1.1 million bpd of non-potable water for reservoir pressure maintenance.

The project included the construction of two trains of gas conditioning and ethane and NGL recovery with a total capacity of one billion standard cubic feet a day of sour gas. The facilities will also produce 560 million standard cubic feet a day of sales gas and 300,000bpd of ethane and NGL and 1,800t of sulphur. The design and construction of the facilities themselves on the 49km<sup>2</sup> site was fast tracked cutting 12 months off the building process schedule.

The project included building a central Gas-Oil Separation Plant (GOSP) and wet crude handling facilities to process crude from the three fields (140 oil and water wells), gas gathering compression facilities, a cogeneration plant, crude stabilisation and water injection. The project will treat 500,000bpd of crude oil and 450,000bpd of injection water.

Besides the main plant itself, the design for the premises also include the construction of three gas processing trains, each with a capacity of 600 million scfd. The trains included facilities for gas sweetening, acid gas enrichment, gas dehydration, and supplementary propane refrigeration. In addition, the gas plant also required a cogeneration plant with boiler, sulfur recovery unit with storage tank, substations and a transmission pipeline linked to the Kingdom's Master Gas System.



## Scope of Work

ICC undertook the following elements of work for the Khursaniyah Gas Plant:

- Complete execution of civil construction works including supply of required materials, labour and supervision to site
- The general works include temporary site facilities
- Earth works, earth (soil) improvement works and backfilling
- Civil and Architectural construction of buildings
- Complete Design, Installation, testing and commissioning of HVAC, plumbing, sanitary & drainage equipment
- Installation, testing and commissioning of fire fighting, fire protection & fire alarm systems
- Small power Systems
- Installation of outdoor foundations & trenches
- All other civil, building and structural works

Working in tandem with the other teams on site, ICC's strong planning and reporting procedures ensure that the plant construction proceeded along set lines. ICC achieved strong progress in record time, as the civil works were completed in tandem with the site MEP and engineering pace.

ICC co-ordinated with other teams to ensure that the complete mobilization of manpower, equipments, land surveying, laying and

erection of pipes, fixing the necessary supports, flanges, valves and other mountings, and general maintenance of the worksite was carried out smoothly.

ICC's work was appreciated by the client and their role was subsequently expanded on site. ICC was also contracted to work on the Karan Utilities and Co Generation plant in Khursaniyah region, responsible to undertake the complete civil works of the main plant and the supporting structures.

Due to the familiarity with the gas plant, ICC was able to work on both sites and achieve the deadlines well within budget. The quality of work and the speed of execution resulted in minimum construction downtime and helped the client to reach their scheduled launch target.

ICC's workforce utilised their familiarity and expertise in petrochemical projects to achieve brisk progress on the project, completing the civil works well within the set targets. The Karan offshore platforms, power facilities, subsea pipelines, and gas processing facilities located at Khursaniyah Gas Plant achieved reached their stated objective of realising a production of 400 million scfd of gas and later increased processing capacity to 1 billion scfd. The gas plant will also be debottlenecked to process 90 million scfd of sour gas and 65,000 bpd of sour condensate from the Manifa Field and is targeted to process 1.8 billion scfd of non-associated gas in the near future.