MAINTAIN GAS COMPRESSION CAPACITY – ABQAIQ

PROJECT NAME	MAINTAIN GAS COMPRESSION CAPACITY
LOCATION	ABQAIQ
CLIENT	TECHNIP / SAUDI ARAMCO
CONSTRUCTION PERIOD	20 MONTHS

MAC was entrusted by Technip - France, as a main sub-contractor, to carry out the multi-discipline civil, buildings, mechanical, electrical, instrumentation, insulation, and painting construction works for Saudi Aramco's Abqaiq Plants expansion. The Project consisted of:

- A new 100 MMSCFD capacity gas compression train B, Plant 499 including a Heat Recovery Steam Generator
- A new by-passable heat recovery steam generator in existing train A
- Three new buildings on Lump Sum Turnkey basis:
  - Electrical Substation # 88
  - Team Building
  - Operator Shelter (the former was demolished)
- Modification of existing buildings:
  - Electrical Substations #19, #20, #38 and #83
  - Process Interface Building PIB 17
- A new 700 MMSCFD flare system including installation of 5,700m of 60" piping in existing operational live pipe racks, KO drum and 90m flare
- The works included a shutdown period with the unit in operation, involving execution of up to 60 tie-ins and hot-taps up to 20m elevation and was subjected to special authorizations delivered by

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SAUDI ARAMCO/TECHNIP under strict Quality and Safety regulations

- The construction project involved over 2.4 million man-hours of Direct labour and over 0.7 million man-hours of Indirect labour with a sustained peak load of direct manpower of 870 plus 160 indirect labor and supervision totaling 1030 men. All personnel were accommodated and catered for in MAC's camp adjacent to the job site where full life support facilities were provided
- The achieved Quality Control Index was 97.8%
- The Safety Record involved over 3 million worked man-hours without any Lost Time Accident

The scope of work, split into two Packages 1 and 2, consisted of:

- SITE PREPARATION and CIVIL WORKS involving hand excavation in areas where underground existing services were encountered, major foundations for new equipment and structures totaling 8,000m^3, demolition of concrete paving, reconstruction of paving after foundation works, miscellaneous foundations and plinths on paving for pipe supports, additional fire proofing to existing steel structures, concrete cable trenches and ducts for underground cables, foundations for tanks and pumps along flare pipe rack, basin for cooling tower, pit for underground drum and concrete paving for all new plant area
- UNDERGROUND PIPING WORKS involving drainage of the new train B, including construction of manholes, catch basins and all accessories; modifications of existing drainage in train A, demolition of existing pipes and installation of a new U/G cooling water system including connections to existing piping and manholes, Drainage of the new flare KO drum area, Underground fire water network, including installation of accessories, External underground networks for buildings from network up to building battery limits, installation of drinking water and sanitary sewer for the Team Building, and oily water sewer for Substation # 88
- MECHANICAL WORKS consisted of construction of the new 100 MMSCFD capacity gas compression train B (Unit 499 B) with heat recovery

steam generator, addition of a new by-passable HRSG in existing train A (Unit 499 A). Engineering, Supply and Fabrication of 250 ton of structural steel, keep required for modification/reinforcement of existing pipe racks, were designed, supplied, fabricated and erected in live, operational areas. A further 1250 ton supplied by Technip for the complete construction of the new 700 MMSCFD 60" capacity flare line system consisted of about 5700 m of 60" piping that had to, since the racks were inaccessible to cranes, be slid from temporary platforms into intermediate levels of crowded, operational pipe racks. The scope of work included a 2-Crane Tandem Heavy Lift of the 90m flare stack and associated KO drum and Tie-in to the flare header in existing rack, modification of existing pipe racks and construction of a new pipe rack and pipe way supporting the new flare header, execution of more than 100 tie-ins in existing plant, including performance of hot-taps up to 60"

- ELECTRICAL WORKS consisted of bulk materials supply, modification of existing substations # 19, 20, 38 and 83 and construction/testing of new 13.8/4.16/0.48 KV Substation # 88 including installation of Transformers, Low voltage switchgear and bus ducts, Motor Control Center, Battery chargers, Plant lighting installation, Cathodic Protection and Grounding works. The work involved installation of 8 km of Cable Trays, 140 km of Power & Control Cables and a complete Communication System
- INSTRUMENTATION WORKS involving installation, loop checking, testing, calibration, precommissioning, inspection as well as procurement of bulk materials for control system and instrumentation in running units with control room and technical room energized and involving Revamping works. Part of the instrumentation was of the Foundation Field Bus Design, and included installation of a DCS involving optic fibre and their 2000 points Input/Output connections performed by Fisher Rosemount representative
- INSULATION WORKS of HRSG and Steam Cycle Piping
- PAINTING of all Plant and flare lines

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