

Overview

Country or Region: India

Industry: Oil & Gas

Customer Profile

BG Exploration & Production India Ltd. (BGEPIIL), a subsidiary of the BG Group - the UK's leading energy supplier, supporting around 500,000 businesses with everything from gas and electricity to boiler maintenance, efficiency and renewable energy. BGEPIIL explores, produces, supplies, distributes, and transmits piped natural gas to domestic, commercial, and industrial customers, as well as compressed natural gas for natural gas vehicles. It operates offshore oil and gas fields in the Gulf of Cambay and the north west of Mumbai in India. It also involves in the cogeneration business.

Emergency Shut Down System at British Gas Panna Field Operation



The Need

The BGEPIIL's requirement was to migrate the existing pneumatic based shutdown system to electronic based shutdown system at Panna facility located 95KM from Mumbai shore base, as the existing system worked independently and had a very limited interface with the centralized distributed control system. The response time of the pneumatic system was considerably slower and there was no established reliability. Additionally, there was no mechanism of trouble shooting and alarm system in case of plant shutdown.

BGEPIIL awarded this project to L&T-C&A for replacing the pneumatic shutdown system with a SIL 3 certified PLC based shutdown system, seamlessly integrating with the existing platform control system, enhancing the diagnostic coverage of the safety shutdown system and bringing down the hazards to a tolerable risk level. The aim was to obtain maximum production flexibility, while ensuring operational safety.

The Solution

The order was bagged by L&T-C&A under global competitive bidding against stiff

competition from Domestic and International automation players. The scope of work covered the migration of existing pneumatic shutdown panels (10 nos.) to ESD System, supply of E-Room along with sub-system (HVAC, UPS, PAGA, FAP, Fire suppression system, VHF, CCTV etc.) replacement of existing pneumatic instruments (level, pressure, valves, etc.) with electronic instruments and supply of cable, junction boxes, cable tray, hardware etc, as well as engineering, installation and commissioning services, involving Multiple engineering disciplines – instrumentation, process, electrical, structural, piping and mechanical.

The L&T-C&A team has successfully replaced the existing pneumatic shutdown panels with new SIL 3 PLC, existing pneumatic field instruments with electronic field instruments such as radar, nucleonic, magnetostrictive type level transmitter, pressure transmitter, solenoid valves etc. A60 fire rated, E-Room was designed, fabricated and tested complying to SOLAS standards.

Innovative ways were adopted to move shutdown activities to pre-shutdown such as: instrument hook-up using spare ports of the pressure switch, replacement of

About Us

L&T Control & Automation (C&A) is a Strategic Business Unit of L&T Electrical & Automation. It is a part of Larsen & Toubro – the multi-billion India-based conglomerate. L&T's C&A business is market leader in delivering integrated electrical & automation solutions in India and overseas. With over three decades of experience in diverse industry segments, C&A delivers value through comprehensive solutions based on varied technology platforms and incorporates the benefits of its wide-ranging experience. L&T's state-of-the-art Electrical & Automation Campus at Navi Mumbai in India has the latest testing and manufacturing equipment. It incorporates a modular manufacturing unit, an application software laboratory and a fully networked office for engineering and project management.

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- Iron & Steel making E&I
- E&I for Bulk Material Handling
- E&I for Ports

Oil & Gas

Upstream, Midstream and Downstream

- Integrated Process Control
- Pipeline SCADA
- Emergency Shutdown and Fire & Gas
- Terminal Automation & Tank Farm

Power

Generation, Transmission and Distribution

- Integrated controls for Boilers and Turbines
- Station C&I
- E, C&I for CHP, AHP, WTP
- E&I for Solar Plants
- Smart Grid

Infrastructure

Highways, Ports and Metro Railways

- Highway Traffic Management
- Metro Rail BMS & AFC
- Airport Baggage Handling
- Power Management
- Smart City & ITS

Buildings

Hotels, Hospitals, Factories, Malls, Data Centres

- Substation
- MV / LV Power Distribution System
- ELV / CCTV / Fire Detection & Alarm Systems (FDAS) with suppression solution
- Access Control
- Lighting Control

floats in chambers by isolating low pressure vessels, dry run of cause and effects checks performed by simulating real shutdown conditions. L&T-C&A minimized the hot work during field activities with the help of anchor stud technology in place of welding to reduce operational hazards.

Integrated FAT of ESD system with 100% simulation of field I/Os through PLC/SCADA based simulator had been conducted at C&A works, which minimised off-shore activities to the great extent.

The pre-migration field activities were completed without any process shutdown and by adhering to the stringent BG process for project management, engineering, quality, HSSE and site activities.

Many challenges came in the course of project execution, right from engineering to completion, as it involved replacement of the shutdown system on live running platform. The major challenges involved engineering of new ESD system and field instrumentation to meet the exact technical requirements of pneumatic shutdown system and field instrumentation, engineering of E-Room

along with sub-system, third party integration with existing system (TG, PGCs, FG, DCS).

It also included a huge field activities like laying of 25 km cable, 4 km process/pneumatic tubing, installation and commissioning of 350 nos of field instruments and mobilising more than 150 personnel on barge to complete the field activities in time.

The modernization is designed to optimize platform operation and control systems, with the aim of upgrading its reliability overall flexibility. L&T-C&A has achieved more than 180,000 offshore manhours without any injury on the ESD migration project and completed well before the allotted shutdown period, which was well appreciated by BGEPL.

The Benefits

- Improved operational reliability and maintainability
- Improved personnel and equipment safety
- Scalability, reliability and redundancy
- Reduction in O&E personnel

New Shutdown system at Panna

