



# Y3DC Project – The Route to Success

PDO (Petroleum Development Oman) has successfully achieved the substantial completion of the third phase of the Yibal depletion compression gas project (Y3DC). The project is of strategic importance in meeting the country's energy needs and leverages continuous gas production from the mature Yibal gas field in Central Oman. The reservoir has been in production since 1972. Over the last few years, however, with gas demands becoming more prominent, the Yibal GGP has undergone a series of expansions to accommodate the increasing demand.

The goal of this depletion compression project was to enable delivery of the gas from the wells to the pressure level required for further processing (compression followed by water and hydrocarbon dew-pointing) in the existing facilities and to sustain a GGP peak production capacity of 23 MMSCMD. The project was of significant national importance to the Oman Government as gas from this field is used for generating power.

We were the contractor for execution of this project, along side our Omani wing M/s L&T Electromech LLC. The EPC work started in August 2013 and achieved substantial completion in February 2016.

### Ring fencing team with focused approach

The Engineering Team from L&T Chiyoda as well as the key members from L&T Gulf were posted in L&T's Knowledge City office next to the client's team.

Finish to Start approach was adopted, wherein work sequencing for construction was finalized, which became the basis of the Engineering Deliverables and Material Ordering and Delivery Plan. A Constructability study was performed to validate the activity sequencing for construction and suitable resource loading. The project schedule was developed wherein the work could complete ahead of schedule.

In order to monitor construction activities at the micro level, a construction schedule was detailed up to

Level-4 construction and resource loading in the same was done to monitor the progress of construction.

Submission and approval of planning package was done within 45 days of contract commencement.

KPIs were set for engineering – discipline wise, procurement and construction-discipline wise, which helped in day to day monitoring and improved the control of project progress.

### On-site Success

Drawings were made available for planning purposes which helped the on-site team to plan and allocate the resources more judiciously and to commence work simultaneously on multiple fronts. The early release of cut-out details has been expedited based on early ordering of panels and HVAC. The same helped release the super structure drawings early. To ensure maximum utilisation of resources, room-wise interior work (block work) was undertaken. This allowed for plastering followed by internal painting, HVAC ducting work and installation of electrical panels.

### Advance Tie-in Shutdown

Advance Tie-in shutdown was advanced by almost a year to make sure that the completion date was unaltered. There were 53 piping Tie-ins, two major electrical Tie-ins

and one instrumentation Tie-in to be executed during shutdown. To achieve this goal, the engineering activities were carried out in advance (bolstered by timely inputs from construction and commissioning team).

Material procurement was separately planned and a separate material tracking system was developed for these Tie-ins to make sure that there were no miss outs. The pre-fabrication scope was clearly marked and all the erectable and fabrication material were consolidated 1 month before the shutdown.

### Safety First

After 36 months of executing the project, in July 2016, the Y3DC project team clocked 8.8 million LTI free Man Hours including 8.1 million LTI free Man Hours of Construction. During this period people were provided with HSE training at site which played an important role in achieving the feat. In spite of the stringent PDO HSE requirement, we have successfully completed 4 HSE Milestone audits as per schedule and contract value was received timely for each HSE milestone audit.

## Key Milestones

Pre-Start Up Review	Successful 72 Hour Test Run to ensure:	Before time completion
<ul style="list-style-type: none"><li>• Verify that all HSE aspects have been addressed in the design phase.</li><li>• Confirm the state of physical readiness of the facilities for start-up "Ramp Up" and " Steady State Operations".</li><li>• Assess the effectiveness of the controls that are in place to manage pre-commissioning, implementation of systems/ procedures and handover.</li><li>• Determine the state of "Readiness for Operations" in order to ascertain that there is a safe and solid basis for the introduction of Hydrocarbons.</li><li>• Successful &amp; safe completion of pre-commissioning and commissioning of the project.</li></ul>	<ul style="list-style-type: none"><li>• The operational stability of Y3DC facilities while operating them within designed operating conditions.</li><li>• No adverse impact on critical system parameters while meeting guaranteed performance.</li><li>• 30-Day test run in accordance with test acceptance criteria.</li></ul>	<ul style="list-style-type: none"><li>• Completion was ahead of time without any safety and quality issues. It is a proud moment for the project team, to have achieved the key milestone of substantial completion on time, despite the execution challenges</li></ul>

## Success Factors

1. Majority of site queries were resolved within 24 hours and maximum time taken was 48 hrs which was enabled by a dedicated Design co-ordinator deputed at site from the engineering team. This helped in smooth execution of site activities.
2. Regular morning tool box meeting within Engineering, Procurement and Project Management teams for raising the issues or show stoppers well in advance so that they are resolved / mitigated before they become bottleneck and impact schedule.
3. Focal points were identified for individual assignments required for the project (FPD, PSUA, CCMS, CMMS, Punch points etc.).
4. Young and dynamic team leading to close co-ordination among Engineering, Procurement, Construction and CSU teams (both sides LTHE and PDO).
5. Timely mobilisation of competent Commissioning Team.
6. Compressor delivery was advanced.
7. Timely mobilisation of resources as per the required target completion.

“ The realisation of this project is one of the key milestones towards national efforts to achieve sustainable gas production. The contractors should be praised as Y3DC was commissioned ahead of its planned schedule in a highly volatile global oil and gas market scenario over the past 18 months.

Said Maktoomi  
(Oil & Gas Portfolio Manager, PDO)

“ The Joint efforts of PDO & LTHE Project team were commendable and with the steer of the Company's leadership and support of all stakeholders, the project sailed through its journey from concept to reality on a very tight schedule and to the highest standards. The key achievement of the project was to attain more than 8.5 million manhours without any lost time injuries.

Ali Wardy  
(Project Manager, PDO)