

PROJECT SUMMARY

ONGC intend to develop marginal fields located in western offshore collectively called cluster-7 fields and process the total production through a hired FPSO. Bumi Armada Navigation SDN Berhad, a subsidiary of Bumi Armada Berhad is the main contractor for C7 offshore Transportation & Installation work for the provision of FPSO vessel in the C7 field, 210km west of Mumbai, India.

ESSAR projects Limited (ESSAR) is the subcontractor for the work as directed by Bumi Armada Navigation Sdn. Bhd through Armada C7 Pte. Ltd (an affiliate company) for the T & I work. The marine spread used for this project include Work Barge DLB Nand Gaurav, cargo Barges with AHT tugs.

CubicWheels Engineering Services Private Limited is the sub-contractor for ESSAR Projects Limited which provided Project Management and Installation support Engineering services for the Transportation & Installation scope of work in the C7 project.

T & I SCOPE

ESSAR scope of work comprises of Engineering, management and co-ordination activities necessary for the transportation and installation of underwater anchor piles for mooring lines, Laying of mooring chain and lines and Underwater piles for MWA foundation including

- > *Project Management and Engineering, logistics handling of FIM from the contractor*
- > *Procurement and Fabrication of temporary installation aids for the project.*
- > *Transportation and installation of a 3 x 3 mooring system, comprising of 1829mm Dia. underwater anchor pile driven at a water depth of 88m using IHC S-280 hydraulic hammer for a depth ranging between 22.50m to 37.30m below seabed.*
- > *Transportation and laying of Mooring lines comprising of 130mm dia Studless chains and 136mm Dia. Spiral stranded wire connected to mooring piles using LTM Shackle*
- > *Transportation and installation of MWA foundation Comprising of 2 nos underwater pin piles of 1829 dia driven water depth of 88m using IHC S-280 hydraulic hammer for a depth of 23.5m and installation of MWA base frame of 137MT.*

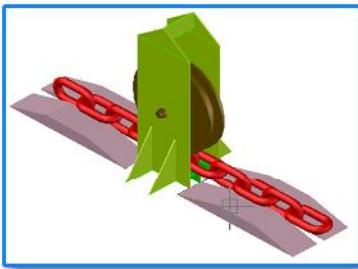
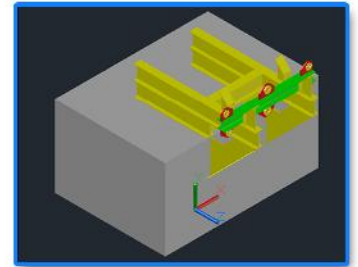
ROLE OF CWESPL IN C7 PROJECT

CubicWheels provided the Complete Project Management and Installation support Engineering services for the T & I scope of work in C7 project under the direction of client.

- *We executed the first phase of T & I work which involves load out of mooring chain from the cargo vessel and Chain flaking on material barge in order to facilitate the installation of mooring chain at the field at offshore.*
- *The rigging plan that was devised by ESSAR for lifting operation of Pile Guide Frame, anchor pile, chaser pile and hammer was infeasible and impromptu to site working conditions at offshore. Hence CubicWheels devised a revised and conducive rigging plan to carry out the lifting operations of the same that proved to very efficient for all the rigging operations.*
- *We devised the rigging plan for MWA Base Frame (30m x 18m x 5.5m) for offloading in the Mumbai port from the Heavy Lift vessel to the cargo vessel.*
- *The initial rigging plan of MWA frame provided by ESSAR was very intricate and complex. CubicWheels modified the rigging plan by introducing two nos of 250Mt spreader bar that facilitated the installation of MWA base frame.*

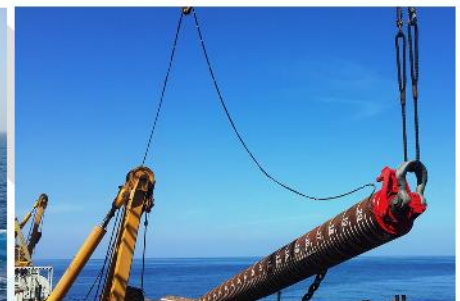
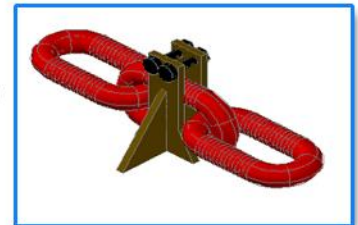
ROLE OF CWESPL IN C7 PROJECT

- CubicWheels Engineered and installed a Pile Hang-off frame with the working limit of 300Mt at the Port side of DLB Nand Gaurav in order to alleviate the installation of anchor pile at the depth of 90m water column.
- We performed sea-fastening of the anchor piles and mooring chains as per the approved drawing by employing manpower and required lifting equipment at the Mumbai port after getting statutory approval from the port authorities.
- CubicWheels developed all the detailed procedures for the execution of Transportation and installation scope of work of the project as directed by ESSAR Projects Limited
- Chain tensioning analysis was done by us for the reduced length of chain and without pendant wire in order to reduce the barge downtime and complete the job in a reduced time.
- A chute arrangement was installed at the stern side of material barge AF300 to prevent the damage of the deck plate during chain laying.
- The Gypsy winch that was primarily installed to maintain the tension and withhold the mooring chain during chain laying failed during the load test and also could not hold the chain due to inappropriate teething arrangement.



Hence CubicWheels Engineered and installed a roller arrangement with box frame with overall size of (5.5m Width x 2.650m Height) at the stern side of material barge in order to facilitate the lay down of mooring chain into the sea bed without any twist. This roller arrangement proved to be very conducive and less expensive method for chain laying process.

We engineered and installed a chain lock support at the stern side of DLB Nand Gaurav for fastening of mooring chain to the barge in the chain tensioning process. The chain stopper of size (0.6m Height x 0.4m Width) was designed to the working limit of 50T to secure the chain to the barge during the chain tensioning process.



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