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Digital Simulation

OFFSHORE OIL ENGINEERING

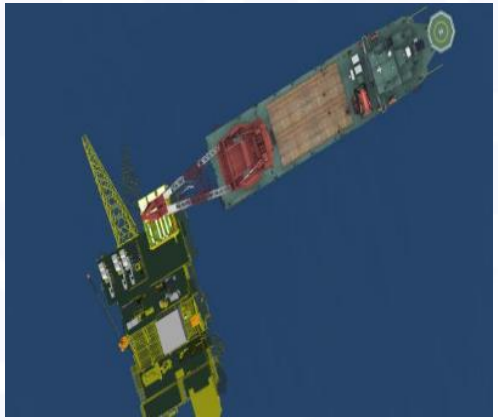
Digital Simulation

Typical Project: LW3-1 CEP

Notes: LW3-1 CEP, the weight of compressor module is 2,800 tones

One application case is the simulation of gas compressor installation simulation, which has been completed in 2015 in South China Sea. The simulation will serve to familiarize Key Personnel involved with the offshore crane operation; it also serves as a “Team Building Exercise” where everyone will have the chance to know each other. The simulation will include moving and maintaining position within certain parameters which will be defined by “Excursion Zones” during various stages of the lifting. The simulation include safety limit analysis of environmental conditions, the safety analysis of load collision, and the analysis of anchoring influence on underwater facilities and pipelines and so on. The simulations will be carried out under normal/anticipated environmental conditions as well as extreme environmental conditions. Contingency exercises such as towline failure and tug blackout will also be carried out during the course of the Simulation.



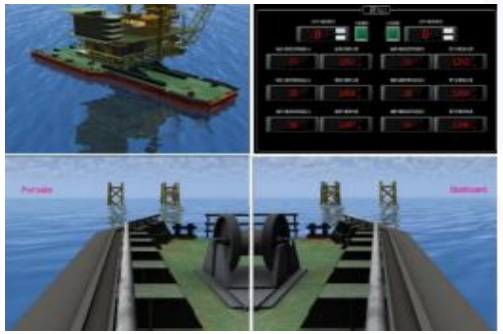
Digital Simulation

Typical Project: Wenchang 9-2/9-3

Notes: 8-legged structure, the floatover weight is 33,000 tones.

The Wenchang 9-2/9-3 Gas Field is located in the South China Sea. The simulation served to familiarize the process of CEPB Platform Module Floatover Installation. This simulation training included the operation training of move from stand-off position to position 300/50m off jacket, move from 50m into mating position, mating, move out of mating position. With different setting for every parameter such as wind speed, wind direction, tide speed, tide direction, wave-height, wave speed and even emergency cases such as towline failure, the operation team was trained to get familiar with different cases during the floating over operation and how to handle them.

Tug Handling Simulator



Anchor Operation

Visual Simulation

Digital Simulation

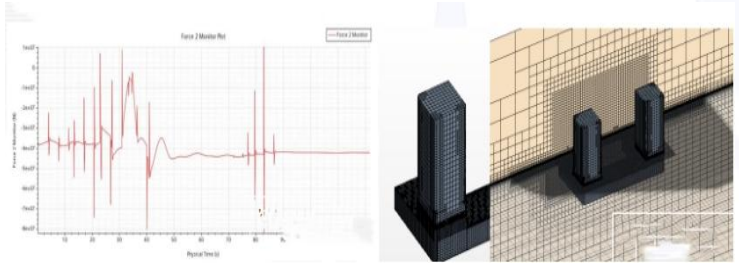
Typical Project: LingShui17-2 (Deep Sea No.1)

Construction simulation： There was no interference during the docking process under the designed operating conditions. According to the analysis of the 3D model data provided by the project team, there was no interference between the pipeline and the hull. The attendees believe that the simulation process is highly consistent with the actual process, and interference inspection has guiding significance for the site, which has been recognized by the owners

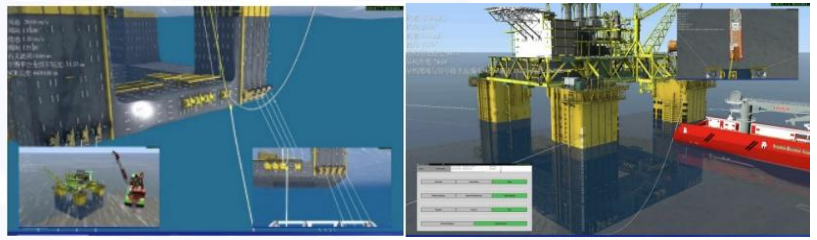
Transportation simulation： The error between the direct sailing resistance value and the experimental value is kept within 10%, and the numerical model is highly effective. The curve fitting is non-linear, and the quadratic curve fitting degree is high, providing data reference for towing simulation operations

Installation simulation： Analyze and verify the collision interference between the signal chain and the ship and platform under various working conditions, the load on the operating equipment, and the load transfer and adjustment scheme. Through simulation verification of the homework plan and training of the homework team, risk items such as chain and equipment interference, unreasonable chain length and status caused by different sea conditions during the mooring and reconnection process were identified, ensuring the safety of project operations.

Construction Simulation



Transportation Simulation

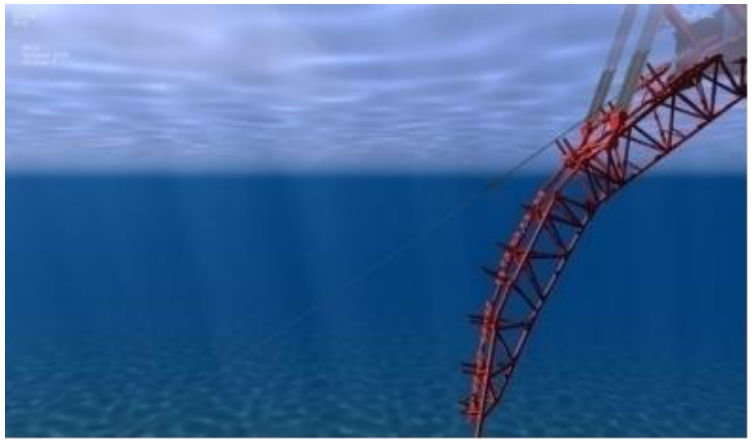


Installation Simulation

Digital Simulation

Pipe Laying Simulation

The pipe laying simulation based on research that can complete offshore pipe laying simulation operations. The visual simulation training system is a semi-physical simulation system; it can complete individual training and teamwork training. The individual training includes: tensioner operation training and hydraulic winch training; teamwork training subject includes initial laying, laying operation, abandonment and recovery by HYSY 201. During the simulation procedure, the subject can achieve cooperative training of ROV, pipe laying and DP. In order to improve the authenticity of the simulation, complete research tasks of project, includes creating virtual coordinate system, analysis of Hydrodynamic Mathematical Model, movement and forcing analysis on subsea pipeline and so on.



Pipe Laying Operation

Digital Simulation

Typical Project： liuhua11-1(Haiji-2)

Notes: Installation of 300 meter large jacket

the Simulation served to sliding launch of the jacket, wet support transportation, and double ship lifting of steel piles. By simulating the state of the jacket and steel piles during the construction process under set sea conditions and operating parameters, the feasibility of the construction plan is evaluated to develop the optimal offshore installation construction plan.

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