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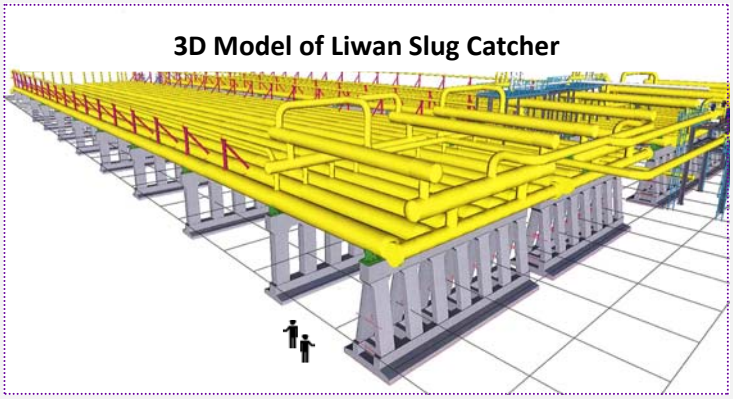
# TECorp Project Selected for Presentation at the 2013 Offshore Technology Conference



**3D Model of Liwan Slug Catcher**

The Chinese National Offshore Oil Corporation (CNOOC) and Husky Energy Inc. have developed Phase I of the Liwan Gas Field in the South China Sea in which gas and condensate flow onshore to the CNOOC Deep-water Onshore terminal via one 30" subsea two phase pipeline. Forecasts of the gas and condensate flow performed by multiphase simulation tools indicated steady state liquid slugs arriving at the terminal during normal operation as well as extreme liquid slugs during pigging operations. This is largely due to the condensate production forecasts coupled with the pipeline final elevation (onshore) being 190 meters (623 feet) higher than beginning elevation causing liquid holdup in the pipe and minor changes in elevation along the pipeline route. A 7,000 cubic meter capacity (44,000 barrel) was specified for the slug catcher.

Although not uncommon to have large multi-pipe slug catchers at onshore receiving stations, the sheer volume of the predicted slug during pigging presented unique challenges to the design and construction of the slug catcher, which is currently deemed to be the largest slug catcher in the world. A total of 28 finger sections (storage tubes) of 56" in diameter each with a length of over 175 meters (574 feet) were required to handle the storage of the large volume of condensate. The 28 parallel storage tubes coupled with the 175 meters length required a plot area of over 15,000 square meters (161,000+ square feet), equivalent to several soccer fields, making this slug catcher the largest single piece of equipment on the entire project.

Since all of the gas and condensate feeding the entire onshore development and gas processing plant must pass directly through the slug catcher without interruption, the criticality of design with regard to flow assurance was paramount to the overall project. Processing & separation capacity in header systems considered elevated future flow rates and pigging operations which were subsequently verified through the use of Computational Fluid Dynamics (CFD).

Several design issues were targeted for special design considerations including large thermal expansions, earthquake loading, slug forces, modularization, construction tolerances and flow assurance.

The paper entitled "Design challenges of the World's Largest Slug Catcher" was selected by the Offshore Technology Conference Program Committee for presentation to the Offshore Technology Conference to be held 6—9 May 2013 in Houston , Texas., USA.

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