

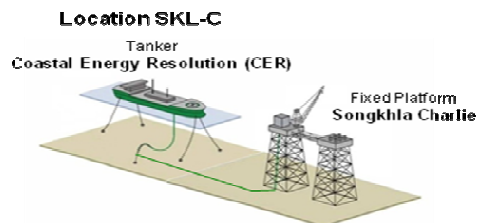
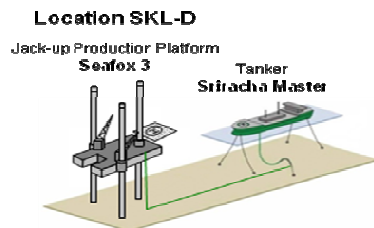
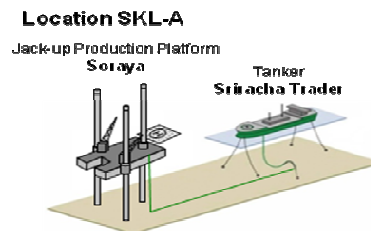
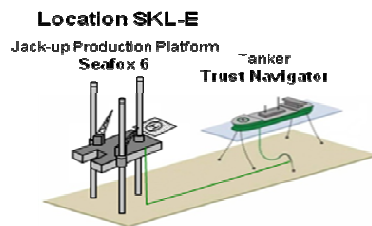


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## SPE Thailand E&P Awards 2011

### Title: Songkhla D and E, Exploration & Development

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**Technical highlights, features and benefits:**

In April 2011, Coastal Energy made a significant Miocene oil discovery at the Songkhla E location during their exploration drilling campaign. Subsequently, Coastal Energy drilled a further 7 appraisal / development wells at the Songkhla E location. After the rig moved off location a Mobile Offshore Production Unit moved over the wellheads. A Hydraulic Workover Unit completed 7 producers with down hole pumps and one injector and these wells were connected to a spread moored tanker. First oil was produced three months after the Songkhla E discovery, with the MOPU currently producing 7,500 bbls per day. The Miocene play indicated possible connection to the Songkhla D location. A similar approach of drilling was used to appraise the Songkhla D area. With drilling crestal and long reach wells, Coastal Energy has proven the Miocene oil reservoir covers the D and E area. Songkhla D oil production is expected to start before the end of 2011 using a second MOPU. Detailed subsurface and engineering studies are now focused on optimizing the Songkhla D and E development. The Songkhla project demonstrates that oil fields can be put on stream quickly with a minimum of capital exposure dramatically improving the project economics.

**How long has the technology been in place in Thailand:**

This approach of fast track Field Development with Mobile Production Units was first applied to the Songkhla A Field in 2008.

**How long has the technology been used:**

The concept of constructing a wellhead structure with a Jack Up rig and mobilizing a Mobile Offshore Production Unit has been operating safely and efficiently for over 3 years.

**Collaboration employed in the project:**

The project used a complete multi disciplinary approach, involving collaboration with 3<sup>rd</sup> party MOPU suppliers, the rig company, marine engineers, drilling engineers, production engineers, geoscientists and reservoir engineers.

**Industry technical paper written:**

CEC has submitted a technical paper to the IPTC 2011 in the category of "Challenges in Development and Production", which has been postponed to February 2012.

**Basis of innovation how conceived? What problems did it solve:**

For CEC, this concept has proven that with multiple exploration prospects in a drilling campaign, risk mitigation is taken into account. Several Songkhla structures drilled in 2009 proved to be uneconomic, but the lessons learned from those campaigns increased the efficiency of moving MOPU's and realizing early production from oil fields safely without building wellhead platforms and renting FPSO's.

**Cost savings / economics**

For offshore developments, due to the high initial investments, it is common practice is to appraise discoveries with additional wells before committing to developments. This can be costly, can lengthen payback time and can destroy the potential value of a field development. Economic indicators for an early production field development project are preferred compared to a traditional development project which will take several years to first oil production. The CEC approach is economical for shallow water near shore oil fields and provides an early cash flow for the company.

**Production growth, mitigation of decline, new production from a discovery**

The Songkhla D and E wells discovered the first Miocene oil producing reservoirs in the Songkhla basin. The discovery significantly increased CEC's reserve base and doubled the company's production. The field is being developed using an early production system with MOPU's, down hole pumps and produced water reinjection. Several infill drilling campaigns will be required to keep up field production and optimize reservoir recovery.

**HSE performance**

Since operations started, CEC has an excellent safety record and is still the first operator in the Gulf of Thailand to implement a zero discharge policy. All cuttings from the Synthetic Based Mud drilling fluids are transported to shore and disposed of in a cement factory. All produced water is being re-injected into the formations. No produced water or drill cuttings have been disposed of in the sea.

**Any new standards established for the company or industry**

CEC designed, constructed and removed several wellhead structures using a jack-up drilling rig. This experience shows that oil fields can be developed quickly, mitigating subsurface risk with minimal capital outlay. The concept is possible if appraisal wells are designed and completed as free standing production wells (if they are successful) enabling MOPU's to be quickly deployed alongside. The CEC approach greatly reduces the initial capital investments. First oil can be achieved in months rather than years.

**Why should this project win the Thailand annual E&P Award?**

CEC's innovative approach to field development has now proven for over 3 year that oil fields close to shore can be exploited economically while fully complying with strict environmental standards. The Songkhla A and C fields are on production for several years, the Songkhla E Miocene reservoir produced first oil 3 months after discovery and the Songkhla D will be on production by December 2011. In addition, before moving the rig to Songkhla D, CEC made another Lower Oligocene oil discovery in the centre of the Songkhla Basin at the H location. This field is planned to be developed in 2012 with another MOPU. The impact on corporate Thailand and overseas operators is significant because the concept shows oilfields can be brought on stream safely in several months instead of years.

Vicksburg JU rig



Exploring at Songkhla D

Seafox 6 MOPU



Early production at Songkhla E

