

DEEPWATER

INTERNATIONAL

WORLDWIDE DEEP & ULTRA-DEEP E&P NEWS, TECHNOLOGY AND ANALYSIS

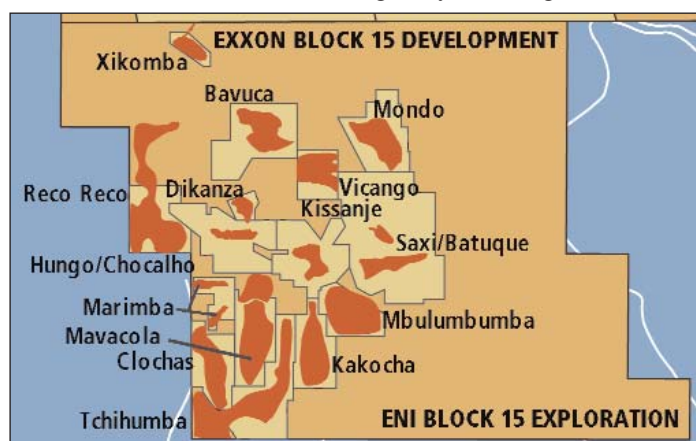
Eni starts ball rolling on new Angolan project

Early feasibility studies are underway for a new standalone deepwater floater project off Angola after Italian Eni confirmed a fresh oil discovery in the western area of **Block 15/06**.

DI hears that the operator is already expanding its potential plans internally for the exploration permit after its second success, which is understood to have substantially exceeded expectations.

The company says the latest well, **Ngoma-1**, struck an oil column of 417ft (127m) in high permeability Miocene sands. That exactly matches the results of its previous and initial find

with its first well in the block earlier this year, on the **Sangos** prospect (see DI, 19 May 2008, page 4).



Ngoma-1 was drilled in 4,662ft (1,421m) of water to a total vertical depth of 11,100ft (3,383m). The well tested 22.5° API gravity oil at higher than forecasted rates from highly permeable rocks, which it says confirms “the high mineral potential” of the block.

A series of further exploration probes are already planned to be drilled in the area on nearby structures over the next two years to evaluate their potential, and Eni says the well programme (up to 8 wells til 2011) provides “significant potential to achieve synergies in the development of the western area of the block”.

However, no firm development plan is likely to emerge much before the end of 2009 with any potential onstream date

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Joint gas scheme emerges in Norwegian Sea

Operator StatoilHydro has hit up to 14 Bcm of gas reserves with its latest deepwater well offshore Norway, close to another of its recent finds and opening up the doors to a new 60 Bcm multi-field development in the Norwegian Sea.

The state-owned major said gas was confirmed with well **6707/10-2S** in a reservoir with good production qualities. The probe was drilled in **Production Licence 218**, located south-east of the **Luva** gas find and 280km west of Sandnessjøen in mid-Norway.

The purpose of the well was to confirm gas in reservoir rocks from the Late Cretaceous age in the prospect, named **Haklang**.

A 417ft (127m) long gas column was proven. Core drilling in the sandstone was carried out and fluid and pressure samples were taken. StatoilHydro estimates the size of the discovery at between 8-14 Bcm of recoverable gas.

The well was drilled to a depth of 11,011ft (3,356m) below sea level and was completed in the Nise formation in Late Cretaceous rock. The water depth is 4,095ft (1,248m).

The well was drilled by the *Transocean Leader*, which is

now drilling sidetrack well **6707/10-2A** with the aim of exploring a deeper prospect in the same licence.

“It is gratifying to hear that gas has been proven also in this well,” said Øystein Michelsen, responsible for StatoilHydro’s activities on the Norwegian continental shelf.

A joint development of Haklang and the nearby Luva and **Snefrid South** discoveries will now be considered, said StatoilHydro. The Luva find was confirmed by BP in 1997.

“We took over as operator and increased our interest in the licence to 75% in 2006. This year we have drilled two exploration wells in the area – Snefrid South and Haklang,” added Mr Michelsen. “The total resource potential of these three finds is expected to be in the size of 40-60 Bcm of recoverable gas. This well is an important step in order to prepare for a new deepwater development in the Norwegian Sea.”

The well was the third exploration well in PL 218, awarded in the 15th Licensing Round in 1996.

Partners in PL 218 are: StatoilHydro (operator, 75%), ExxonMobil (15%) and ConocoPhillips (10%).



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Deep Technology Trends

Into the Blue

The upstream industry's range of platform facilities available or proposed for deepwater projects around the world is expanding at an impressive rate, continually demonstrating the innovative and flexible nature of the E&P sector's contractor community

One of the companies making some of the biggest waves with its various efforts to develop and adapt appropriate solutions for operators is FloaTEC LLC, the Houston-based Joint Venture formed in 2005 by J Ray McDermott and Keppel FELS.

The company is progressing various facility designs on several different fronts but the one that has attracted perhaps most interest in recent times has been 'Project Blue Ocean', FloaTEC's initiative offering a design-ready Drilling, Production and Quarters ETLP™ (Extended Tension Leg Platform).

Details of Project Blue Ocean, or PBO as we shall call it from here on, began to emerge last year, and features the company's proprietary TLP design that enables amongst other things greater payloads in deeper water. With FEED work substantially completed on PBO, it has now reached the stage where it is being offered directly to clients (or through a single purpose asset-owning entity on a lease basis) on a first come basis, so it is a good time for an update on its progress.

One of the simple key aspects of PBO, FloaTEC tells *DI*, is the potential to significantly accelerate the time to first production, while also eliminating risk associated with the tight MODU market. Accelerated time to first production also means of course earlier field evaluation and capture of emerging plays, with earlier reservoir understanding enabling optimised depletion strategies.

But there's much more to it than that, so here are some questions we put to Chris Barton, Director-Business Acquisition for FloaTEC, and his answers, to bring *DI*'s readers up to speed:

DI: Please first explain the company's original thinking/strategy behind the creation of Project Blue Ocean. What are the overall aims and goals of the 'Blue Ocean' brand?

FloaTEC: "It was primarily market driven. The objective was to improve cycle time to first oil, as many projects were experiencing delays due to a number of factors, not the least of which was the lack of MODUs to drill appraisal wells.

The goal of PBO is to create an uncontested market where the competition is rendered irrelevant. We positively believe that most customers will be willing to accept a functionally acceptable facility as compared to a fit-for-purpose design and build, which obviously comes with a cost and schedule premium.

Another objective was to enable FloaTEC to develop the key deliverables for a design-ready ETLP and prove our systems and processes, as well as obtaining current updates to cost, schedule and delivery commitments from the JV parents, vendors and key subcontractors.

ETLP Design Basis

Drilling Rig Specs
2,000,000 lbs hook load,
capable of drilling 35,000ft wells

Production Capacity
- 120,000 b/d of oil
- 110 MMcf/d of gas
- 80,000 b/d of water
- 100,000 b/d of water injection

Well Bay & Risers
18 slots (6x3)
2 export SCR's
2 x W.I. SCR's; 4 x future SCR's

Dimensions
Displacement 87,000mt
Column spacing 67m
Air gap (still water) 32m
Column height 63m
In-place draft 34m
Topsides weight 17,000mt (dry weight); 24,000mt operating weight
Hull steel weight 25,000mt
Tendons (stepped x 12): 44-inch/38 inch

DI: How much of PBO came about as a result of market feedback? Is this something that has been produced in direct response to market/client requests? What else have they been asking for?

FloaTEC: It was really more a function of market research as opposed to market feedback. There were a number of prospects that fell within our target range.

The market has witnessed:

- An increase in oil price
- A limited supply of resources to carry out appraisal drilling
- An increased 'discovery to sanction' duration
- A limited availability of the fabrication yard and installation vessels

All these combined to create the drivers behind the concept, and clearly indicated a need for coming up with a unique yet plausible solution which led to PBO. The challenge our clients face now is getting commitment of marine and fabrication resources, which is guaranteed with PBO, simply because it is funded and fully supported by FloaTEC's JV Parents, KFELS and JRM.

DI: Give us the basics – what's the unit's approximate cost if purchased by a client? How long will it take to build and supply this ETLP, and when could construction realistically start if a client walks in and buys tomorrow – would work start by 2Q 2009?

FloaTEC: The main principle and goal of PBO is to provide an accelerated program thereby providing improved cash flow, which by itself is very appealing to the financial community. The Capex will be priced per current market conditions. Suffice it to say that platforms of this size are going for a billion dollars plus. Realistically, construction could begin in the second half of 2009 if we had a contract signed today.

DI: Own or lease – what is your preference? And do you envisage possessing a fleet of lease ETLPs in the future?

FloaTEC: Our preference is to sell and deliver an EPCI project. Should a client prefer a lease, we would envisage a single purpose entity (SPE) to own PBO and lease the unit to a client. FloaTEC and its JV Parents' participation in such an SPE would be subject to discussions but it would perhaps be a minority stake. We do not envisage a fleet of ETLPs.

DI: Please detail the potential to accelerate time to first production for potential clients. How much can a client speed up their potential project plans by working with you?

FloaTEC: PBO offers up to 18 months of improvement in the overall program from concept to first production. This would obviously vary with the prospect and also how early the client engages us.

DI: What's the current status with PBO? With the FEED now complete, what's happening? What's next?

FloaTEC: The FEED is essentially complete. We are aggressively marketing PBO and carrying out adaptability studies for certain promising near-term projects in the Gulf of Mexico and we are excited about how close our design basis and assumptions appear to meet some of these projects.

DI: Do you expect to see the GoM have the first application of PBO or is PBO in contention elsewhere in the world?

FloaTEC: Our optimism is enhanced considerably as a result of the PBO suitability studies we are conducting for several near-term GoM pursuits. We think the first application will be in the US Gulf.

DI: In an Executive Summary from earlier this year the concept was designed for fields of up to 200mm boe. Has that changed? Also the water depth exemplified was up to 5,250ft. Is that also still the case?

FloaTEC: Given the large capital expense associated with PBO - a full drilling and production unit capable of drilling subsalt wells - the field size

threshold would in our opinion have to be north of 200mm boe.

Although the basis of design sets the overall boundaries and payload, we can accommodate any change within these parameters so long as they remain within the payload carrying capability of the unit. Any water depth less than 5,250ft (1,600m) of course benefits us.

DI: What concepts does PBO's ETLP rival? What are the contending concepts out there in the market that you see as its direct niche opponent?

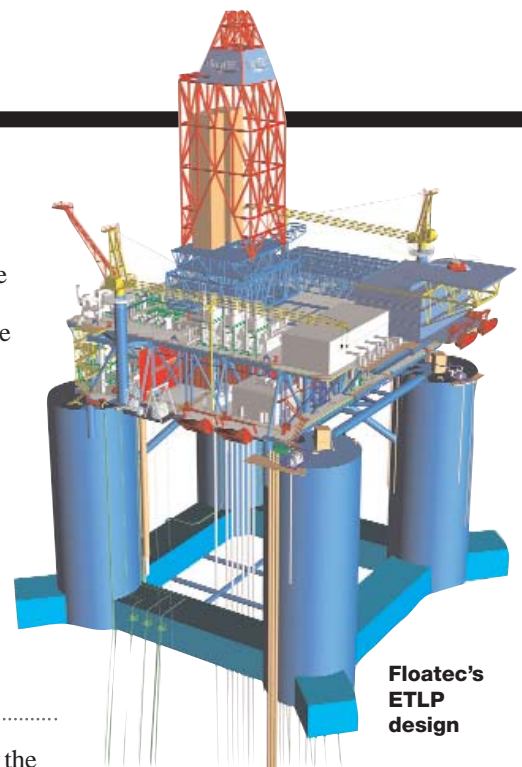
FloaTEC: No other concepts rival the ETLP that we can see, other than perhaps the Classic, or Conventional, TLP. Our design saves considerable weight due to the columns being brought closer inboard. This allows for a very efficient topsides design. Also, the central well-bay obviously provides excellent operational flexibility for drilling and also an efficient hull & riser design as compared to certain other concepts.

DI: Will PBO lead to a further range of floating production alternatives, arising out of this design or process? We now know about Project Blue Ocean but what's on your drawing board in terms of the latest 'Blue Sky' thinking that you can tell us about?

FloaTEC: Our latest Research & Development effort focuses on the development of dry tree semisub technology, and disconnectable Arctic spar designs.

DI: How would you describe FloaTEC's progress since its launch in 2005, when DI first spoke to you (see DI, 20 March 2006, pages 4 & 5)? Where are you now, in relation to where you thought you would be back on launch day? How do you see the next 2 years for the company?

FloaTEC: Our organisational development has been nothing less than astounding. In the 3 years FloaTEC has been in existence we have grown to almost 50 people; and tap into a pool of several hundred engineers in our JV Parent organisations. We are now attracting top talent in the industry and we have established a solid reputation as a front end engineering and technology development company."



Floatec's ETLP design

The above answers indicate that PBO is nearing the crucial point at which it must transfer from the drawing board into the real world and deliver.

FloaTEC's solid investment of time and money into the project over the past two years also demonstrates its belief in the viability of the concept. It has for example had the FEED phase fully financed by its JV Parent companies, with a total investment of more than US \$10m, and with 70,000+ man-hours sunk into it led by FloaTEC, with KFELS, JRME and Houston Offshore Engineering (HOE) supporting.

Typical workscope in any EPCI contracting model would likely see FloaTEC – as the holder of the intellectual property associated with the ETLP design – be responsible for the global engineering, also entailing engineering of the topside structure, hull and mooring design, tendons, risers and drilling systems, as well as procurement of the hull equipment, tendon and riser components.

J Ray McDermott would undertake the topside facilities engineering as well as topside fabrication and procurement of bulks and equipment; also tendon and pile fabrication, integration, commissioning of the topsides and the offshore transport and installation.

KFELS would carry out drill rig engineering, drill rig and hull fabrication, hull procurement bulks, drill rig equipment procurement; integration, hookup and commissioning of the drill rig, and commissioning of the hull.

For further technical information on PBO, go to: www.floatec.com

Deep Technology Trends

Dry-tree semi designs advancing

The ETLP design is not the only item on the menu that FloaTEC has cooking at present, of course, with the company currently possessing two ultra-deep-water dry tree semisubmersible solutions in its portfolio – the Truss Semi (T-Semi) and the Extended Semi (E-Semi) designs (pictured).

FloaTEC's Chris Barton, Director – Business Acquisition, said: "We are advancing development of both designs, and are very excited by the early results we have so far seen from preliminary model tests. Both solutions utilise versions of FloaTEC's proprietary deep draft Semi hull design and rely on hydrodynamic interaction between the heave plate and the hull to reduce motions."

The company has now moved into Phase-2 of its T-semi model test program, with successful tests having just taken place this month.

The difference between the two designs is the installation method of the means to suppress heave. "Both use the same basic deep draft hull design. One version employs a single extendable heave plate, while the other employs a truss section with multiple heave plates. Both concepts have been through initial model testing, and FloaTEC is moving forward with further testing this year, with the objective of commercializing the technology later this year. It is important to note

that this is not new technology. FloaTEC is simply marrying existing technology to add value and create a hybrid to enable dry tree production and direct vertical access into the wellbore," said the company in a statement.

With the E-Semi, the heave plate is installed under the hull as part of the hull construction, so at location the heave plate is lowered into final position.

For the T-Semi, the truss would be launched like a conventional jacket and mated with the hull either near shore or offshore.

The E-Semi offers slightly more flexibility in terms of redeployment, while the T-Semi is "probably more

suited for a permanent installation".

It is significant to note that the motions are limited to enable the use of commercially available tensioners, currently limited to under 30ft stroke. Longer stroke tensioners beyond 30ft would require more real estate to accommodate and are currently not commercially available. Not to mention that they would also be prohibitively expensive, added the contractor.

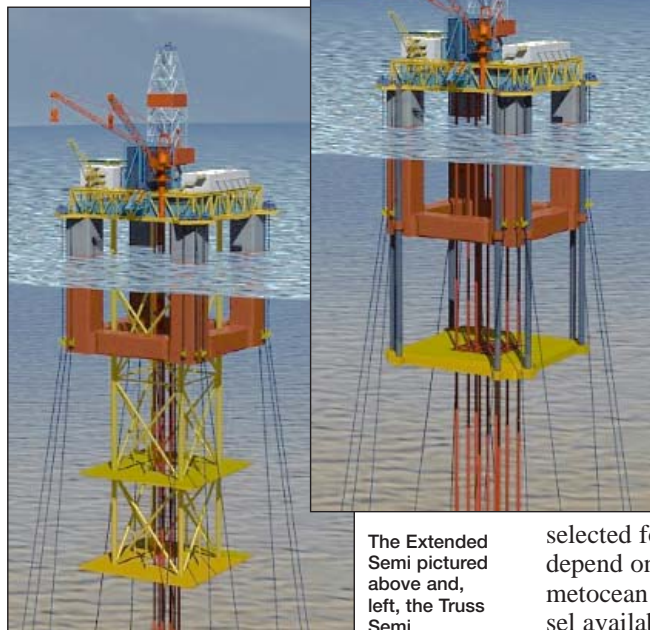
FloaTEC added that it is developing base case designs of the dry tree semi for GoM conditions for two different water depths – 4,300ft (1,311m) and 8,000ft (2,438m).

It commented:

"FloaTEC believes the industry will like not only the ability to quayside integrate the platform but the flexibility that comes with the well bay design of the dry tree semi as well. There are efficiencies in both well bay and deck layout, thus resulting in more efficient drilling and production operations.

"FloaTEC offers both T-Semi and E-Semi to field developers who are looking to capture all the advantages of dry tree drilling and production and direct vertical access to the wellbore; which of the two solutions is ultimately

selected for the field development will depend on operator preference and the metocean and marine/ installation vessel availability in the area."



The Extended Semi pictured above and, left, the Truss Semi

● *Editor's Note* – this article is part of a scheduled series of detailed 'Tech Trends' articles within *Deepwater International* focusing on deepwater technology innovations in the floating production, subsea, drilling market and emerging technology sectors. This has been done in response to feedback from our readers over recent months. All the articles will be available for download by subscribers via our website in due course after they appear in *DI*, with any extra technical information and relevant links also included. For non-subscribers there will be an online download fee.

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