



# Alliance Engineering

A Wood Group Company

## Offshore Projects



Engineering Excellence  
Predictability, Safety, and Quality



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Alliance has designed the world's deepest TLP, Spar, and Semi-Sub.

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Alliance provides complete shelf field development.

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Alliance designs FPSO topsides, from concept through detail.

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## About Alliance

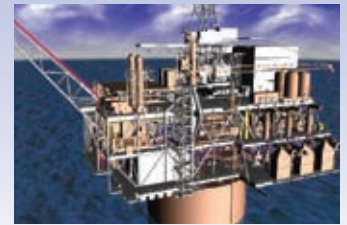
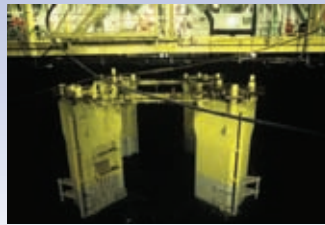
Alliance Engineering provides highly optimized concept-to-completion custom engineering and design solutions for the oil and gas industry. Past projects include some of the world's most recognized project developments. With an emphasis on quality initiatives, cost-effective engineering, and a partnership approach to customer relationships, Alliance has provided cutting-edge and fit-for-purpose engineering services for customers worldwide.

Alliance offers services and expertise for: offshore projects, including topsides facilities for fixed-platforms, FPSO's, semi-submersibles, tension leg platforms (TLP'S) and Spar-type deepwater developments, and onshore projects, including upstream production and processing facilities, compressor stations, pipelines, and storage projects. Alliance has offices in Houston, TX, Denver, CO, and Canonsburg, PA.

# About Offshore

## Alliance Engineering's Offshore Services

- FPSO topsides design – concept through detail
- Deepwater topsides design – including lightweight, single-lift topsides
- Shelf platform design – topsides and jackets
- Brownfield support – including upgrades and expansions



**Engineering excellence – predictability, safety, and quality**

## The Alliance Advantage

### Lightweight / Single-Lift Topsides



#### Hull

- Smaller displacement
- Greater payload flexibility
- Lower hull and mooring costs



#### Fabrication

- Faster fabrication
- Avoid redundant steel weight and cost
- Topsides fabrication cost savings

#### Topsides

- Efficient layout design
- Improved deck space utilization
- Reduction in key equipment weight
- Lower topsides facility costs



#### Installation

- Fewer lifts / single lift
- Less offshore risk
- More complete pre-commissioning
- Faster hook-up and commissioning
- Lower mooring loads
- Lower installation costs



**Lightweight and space-saving design – typical savings in the 10's to 100's of millions of dollars**  
**No sacrifice to safety or production – reduced schedule, lower costs**

### The FPSO Design Kit

#### What is in the FPSO design kit?

- Library of layouts
- Inventory of module designs



**Jump-start your FEED, shorten your schedule, improve reliability, and add flexibility**  
**Save time, weight, and money**



# Perdido Spar

Alaminos Canyon, Block 857  
Shell

- Scope of work: conceptual, FEED, detailed engineering and design, procurement, support of topsides fabrication, and ongoing operations support
- Design rates: 200 MMscfd / 100,000 BOPD
- Water depth: 7,817 ft.
- Lift weight: 9,350 short tons



*Perdido was completed in 2009.*

Perdido's records include: (1) world's deepest offshore oil and gas drilling and production facility, and (2) world's deepest spar. The Perdido spar platform acts as a central processing hub, accommodating production from five subsea, direct vertical access separation caissons. This hub can accommodate 19 wells within a sixty-mile diameter. The topsides were installed in a single lift. Perdido is in a remote location, over 100 miles from the coast and 60 miles from the nearest operating platform. It won Energy Construction Project of the Year for 2009 at the Platt's Global Energy Awards.

**Perdido:**

***Ultra-deep, remote production – on a single-lift topsides***

# Shenzi TLP

Green Canyon, Block 653  
MODEC / BHP

- Scope of work: conceptual, FEED, detailed engineering and design; procurement and support of topsides fabrication
- Design rates: 50 MMscfd / 100,000 BOPD (125,000 BOPD debottlenecked) / 125,000 BPD future water injection with sulfate removal
- Water depth: 4,373 ft.
- Lift weight: 8,350 short tons



*Shenzi was completed in 2008.*

Shenzi set the record for world's largest oil capacity in a single-lift topsides (at time of installation). Shenzi is the world's largest MOSES TLP. Shenzi is a single-module topsides, and acts as a subsea host to the production from three drill centers. The Shenzi TLP is a complex facility designed to the new API hurricane criteria imposed after the Katrina and Rita storms of 2005. The production facility includes two interconnecting processing trains for reliability and was completed ahead of schedule.

**Shenzi:**

***World's largest oil capacity – on a single-lift topsides***

## Independence Hub Semi-Sub



***Independence Hub was completed in 2007.***

### **Mississippi Canyon, Block 920 Enterprise Products Partners / Anadarko**

- **Scope of work:** conceptual, FEED, detailed engineering and design, procurement, support of topsides fabrication, and ongoing operations support
- **Design rates:** 1 Bscfd / 90,000 bhp compression capacity / 7,800 BPD MEG regeneration
- **Water depth:** 7,920 ft.
- **Lift weight:** 8,600 short tons
- **Can accommodate up to 27 flowlines**

Independence Hub's records include: (1) world's deepest offshore production platform, and (2) world's deepest semi-submersible. Independence Hub has the world's largest single train MEG reclamation system. It had uptime of 98.4% in 2008 (exclusive of flex joint repair and weather), and uptime of 99.3% in 2009. It was named one of Offshore Magazine's Top 5 Projects for 2007, won Engineering Project of the Year at the 2008 Platt's Global Energy Awards, and won a Distinguished Achievement Award at the 2010 Offshore Technology Conference.

***Independence Hub:  
Award-winning, record-setting gas production on a lightweight topsides***

## Magnolia TLP



***Magnolia was completed in 2004.***

### **Garden Banks, Block 783 ConocoPhillips**

- **Scope of work:** FEED, detailed engineering and design, procurement, and construction support of topsides
- **Design rates:** 150 MMscfd / 50,000 BOPD
- **Water depth:** 4,674 ft.
- **Quayside integration**

Alliance won the 2008 FIATECH Celebration of Engineering and Technology Innovation (CETI) Award in the category of Automated Design. The award highlighted Alliance as a company who can deliver high-quality results on major projects, and streamline design and coordinate engineering across disciplines. The Magnolia project also won the "Offshore Energy Achievement Award for Production / Facilities" in 2006.

**At the time of installation, Magnolia was the world's deepest TLP.** It can act as host for future subsea tiebacks. Magnolia featured dry tree wells with provisions for a completion / workover rig. For Magnolia's topsides development work,

***Magnolia:  
Award-winning design and world's deepest TLP***

## Marco Polo TLP

### Green Canyon, Block 608 Anadarko

- **Scope of work:** FEED, detailed engineering and design, procurement, and construction support of topsides
- **Design rates:** 400 MMscfd / 120,000 BOPD
- **Water depth:** 4,300 ft.
- **Lift weight:** 6,300 short tons

At the time of installation, Marco Polo was the world's deepest TLP. It has the capacity to act as a host facility for multiple subsea flowline risers, and provides allocation measurement facilities for multiple third-party producer tiebacks. The facility provides support for pipeline hub and host services – including the largest process heat system in the Gulf of Mexico, which has a 168 MMBTU/hr capacity. Marco Polo also supports a platform rig for servicing dry tree platform wells, and the topsides were installed in a single lift. Marco Polo's operating partners were awarded the Distinguished Achievement Award at the 2007 Offshore Technology Conference for their joint development of this field.

**Marco Polo:  
120,000 BOPD on a single-lift topsides**



**Marco Polo was completed in 2003.**

## Horn Mountain Spar

### Mississippi Canyon, Block 127 BP

- **Scope of work:** conceptual, FEED, detailed engineering and design, procurement, and fabrication support of topsides
- **Design rates:** 70 MMscfd / 65,000 BOPD
- **Water depth:** 5,423 ft.
- **Lift weight:** 4,450 short tons

Horn Mountain set the record for world's deepest dry tree production platform (at time of installation). When Alliance was awarded the topsides FEED contract, the project schedule called for first oil production in the 2nd quarter of 2004. Alliance adopted a fast-track engineering and fabrication execution plan for the single-lift topsides – which shortened the schedule by 18 months. First oil was achieved in November 2002.

**Horn Mountain:  
Record-setting, fast-tracked, money-saving topsides design**



**Horn Mountain was completed in 2002.**

# Toucan



*Toucan was completed in 2008.*

## Offshore Trinidad EOG Resources

- Scope of work: detailed engineering and procurement assistance
- Design rates: 200 MMscfd / 1,000 BOPD / 5,000 BWPD
- Water depth: 430 ft.
- Jacket weight: 4,000 short tons
- Deck weight: 1,428 short tons
- Drilling package weight: 4,000 short tons

**This platform has a 12-slot well bay, and space is provided to accommodate future subsea production facilities.**

The deck has three levels providing a total working surface of some 40,000 sq. ft.; the top deck is designed to support drilling and well completion. The Toucan platform is located 43 miles off the east coast of Trinidad. The platform was analyzed for environmental forces, fatigue, earthquake, loadout, transportation, and installation, including 100-year and 1-year storms as well as high Eddy current events.

***Toucan:  
Challenging jacket design***

# Valemon



*Valemon pre-FEED was completed in 2008.*

## Offshore Norway StatoilHydro

- Scope of work: pre-FEED for jacket and topsides drilling rig
- Design rates: 570 MMscfd / 5,000 BOPD / 25,000 BCPD / 10,000 BWPD
- Water depth: 442 ft.

**Alliance designed a topsides for installation in the North Sea, with space for future expansion and well accessibility from a jack-up.**

***Valemon:  
A Norwegian fixed-platform project executed outside Norway***

## Corocoro

### Gulf of Paria, Offshore Venezuela ConocoPhillips

- Scope of work: preliminary and detailed engineering
- Design rates: 50 MMscfd / 60,000 BOPD / 100,000 BHPD
- Water depth: 30 ft.
- Floatover deck weight: 9,000 short tons



*Corocoro was completed in 2008.*

Alliance designed a bridge-connected wellhead platform to process crude, water, and gas for installation offshore Venezuela. Alliance completed the work with an integrated team, which included local Vepica Venezuelan engineering personnel. Alliance also prepared ITB packages. The deck was designed for installation over an eight-legged jacket, which was designed for a floatover installation. The CPF is designed to receive produced fluids from a bridge-connected wellhead platform (WHP), and production gets transferred to a floating storage and offloading (FSO) unit.

#### **Corocoro:**

***Alliance joins with local resources for project success***

## Oilbird Field Development

### Offshore Trinidad EOG Resources

- Scope of work: conceptual, detailed engineering, and procurement assistance
- Design rates: 300 MMscfd / 10,000 BOPD / 10,000 BHPD
- Water depth: 240 ft.
- Jacket weight: 1,200 short tons
- Deck weight: 1,650 short tons



*Oilbird was completed in 2006.*

At the time it was installed in 2006, EOG's Oilbird platform was Trinidad and Tobago's largest and heaviest offshore structure. It was fabricated in Trinidad, with assistance from an in-country Alliance Engineering site team. The EOG Resources (TT) managing director, in the June 15, 2006 Trinidad and Tobago *Newsday Business Review*, noted that the fabrication and construction of Oilbird "marked a 'new high water mark' for the local construction industry." The platform was installed in 2006, ahead of schedule.

#### **Oilbird:**

***With an internationally-integrated project team,  
Alliance delivers – ahead of schedule***

## CDX DPA



**CDX DPA was completed in 2004.**

### Bohai Bay, Offshore China Samedan

- **Scope of work: installation expert consultant**
- **Topsides weight: 4,000 short tons**
- **Jacket weight: 400 short tons**

**Alliance completed a review of the jacket and deck structural details, as well as the procedures and techniques, for the floatover installation of the deck structure.** Areas of concern and corrections that were made before the installation included the direct impact between deck leg steel to pile steel and the impact between the deck structure and the transport barge. In

order to alleviate the potential problems several additions and modifications to the existing jacket and deck were recommended. A soft line winch system was recommended to reduce the relative lateral motions between the barge and the preinstalled jacket. Other recommendations included additions to the pile top, modifications to the deck leg stabbing cone, the addition of a water jet system, and the addition of a sand cone assembly. Alliance provided expert onsite consulting during the modifications and successful installation of the floatover deck.

### **CDX DPA: A challenging floatover project**

## Tamar



**Tamar's design was completed in 2011.**

### Levantine Basin, Offshore Israel Noble Energy

- **Scope of work: detailed engineering and design**
- **Design rates: 1.2 Bscfd / 5,400 BCPD**
- **Water depth: 800 ft.**
- **Topsides weight: 14,000 short tons (operating)**

**Alliance provided detailed engineering and design services for the fast-track natural gas Tamar Platform Project, including topsides facilities and deck structure.**

The Tamar natural gas field is located offshore Israel in the eastern Mediterranean Sea's Levantine Basin. The platform acts as a hub to several subsea wells, which are connected to the platform by 150 km long flow lines. The single-lift topsides facility has four deck levels and weighs nearly 10,000 tons (lift). The facilities are designed for maximum uptime and reliability to ensure Israel's uninterrupted supply of natural gas.

### **Tamar: A major gas platform in the eastern Mediterranean Sea**

# Jubilee

## Offshore Ghana MODEC

- Scope of work: detailed design of topsides
- Design rates: 160 MMscfd / 120,000 BOPD / 84,000 BWPD / 232,000 BPD water flood / 1.6 million BBLs storage
- Water depth: 5,000 ft.

MODEC was selected by the Jubilee Field Partners and Tullow Ghana Ltd. to provide and operate the first FPSO to be installed in the Jubilee Field Offshore Ghana, as part of the Phase 1 development plan. Alliance was contracted by MODEC to perform the detailed design of nine of the sixteen topsides modules, perform a detailed review of the remaining seven modules, and layout and interface all of the modules on the FPSO deck. Alliance utilized a value-added center in India for a portion of the detail work. This work was coordinated in virtual time between the two offices using PDMS Global. Alliance managed the engineering work as lead engineering contractor and reviewed the engineering design for the FPSO topsides for all engineering disciplines.



*Jubilee was completed in 2009.*

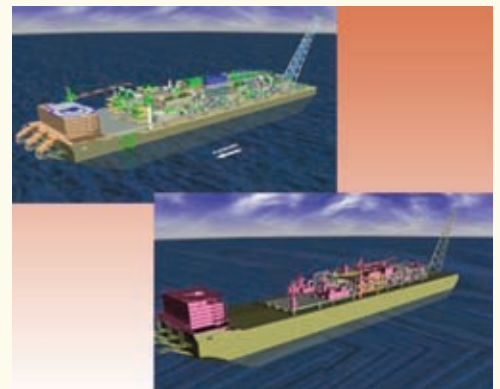
***Jubilee:  
Another fast-track project completed on time***

# Nsiko

## Offshore Nigeria Chevron

- Scope of work: cost reduction study, pre-FEED
- Design rates: 250 MMscfd / 100,000 BOPD / 100,000 BWPD / 275,000 BPD
- Water depth: 5,000 ft.

Alliance was contracted by Chevron to perform a study to reduce the weight – and thereby the cost of the FPSO topsides. Chevron came in with a the topsides weight of 20,400 MT, making it challenging to move the project forward. Alliance started with a clean slate, and revised the process to reduce compression requirements and layout to reduce piping runs and required structural steel. The net result was topsides that weighed 13,326 MT without reducing functionality. The cost savings was estimated at \$300 million.



*Nsiko was completed in 2007.  
Pictured above are topsides before  
(top) and after weight reduction.*

***Nsiko:  
Alliance delivers significant cost savings on a deepwater FPSO***

## Tui



*Tui was completed in 2006.*

### Offshore New Zealand Prosafe

- Scope of work: FEED verification, detailed engineering and design of topsides, and procurement assistance
- Design rates: 20 MMscfd / 50,000 BOPD / 118,000 BWPD / 120,000 BFPD / 1 Million BBLS Storage
- Water depth: 5,000 ft.

The Umuroa FPSO, which operates in the Tui Area Development, is a converted tanker. It is turret-moored and ABS Classed. Alliance provided FEED verification, detailed engineering and design, and procurement assistance services for this project. The Tui Area Development is located within PMP 38158 in the Taranaki Basin, approximately 30 miles offshore the west coast of New Zealand's North Island. Prosafe owns and operates the vessel. Umuroa's conversion was performed in Singapore.

*Tui:  
First oil-only oil project*

## Su Tu Den



*Su Tu Den was completed in 2003.*

### Offshore Vietnam MODEC / Conoco Vietnam

- Scope of work: conceptual, detailed engineering and design of topsides, procurement assistance, fabrication and commissioning support
- Design rates: 35 MMscfd / 65,000 BOPD / 65,000 BWPD / 90,000 BPD water flood / 1 million BBLS storage
- Water depth: 150 ft.

**Chi Minh City.** For this project, Alliance provided conceptual design, detailed engineering and design, and procurement assistance on the topsides of a new-build FPSO, the Cuulong MV9 FPSO (the "Ruby Princess"). This FPSO, constructed in South Korea, is ABS Classed and turret-moored. It is designed so that it can be expanded in-situ to handle 110,000 BOPD for Phase 2 of the project.

*Su Tu Den:  
Major FPSO in the far east*

## Bijupira & Salema

### Offshore Brazil MODEC / Enterprise / Shell

- Scope of work: conceptual, detailed engineering, procurement, and construction support
- Design rates: 75 MMscfd, 70,000 BOPD, 50,000 BWPD, 92,000 BPD water flood, 1.3 million BBLs storage
- Water depth: 2,200 ft.



*Bijupira & Salema was completed in 2002.*

The Fluminense FPSO, which operates in the Bijupira and Salema fields, is a conversion of a ULCC tanker (225,529 dwt). It is turret-moored and ABS Classed, and features all subsea hardware. The Bijupira and Salema fields are located adjacent to each other in the Campos Basin, 175 miles from Rio de Janeiro. The project schedule was very aggressive and utilized engineering support through module fabrication. MODEC provided overall project management and tanker modifications, and the conversion was performed in Singapore.

***Bijupira & Salema:  
Project success on an aggressively-scheduled deepwater FPSO***

## Tantawan

### Offshore Thailand SBM / Pogo Producing (field now owned by Chevron)

- Scope of work: conceptual, detailed engineering and design
- Design rates: 200 MMscfd / 50,000 BOPD / 25,000 BWPD / 1.2 million BBLs storage
- Water depth: 200 ft.



*Tantawan was completed in 1998.*

The Tantawan Field was the first field in the Gulf of Thailand that produced crude oil and condensate as well as natural gas. For this project, Alliance provided detailed engineering and design on the topsides for a converted tanker, the Tantawan Explorer FPSO (110,000 dwt). The FPSO is ABS Classed and turret-moored, and is part of a field development that includes 5 wellhead platforms. The Tantawan Field is located in the Gulf of Thailand, 250 miles south of Bangkok.

***Tantawan:  
Alliance produces project success, from concept through detailed design***

# Deepwater Projects

Completion Date	Project	Location	Water Depth (ft.)	Design Rates	Hull	Topsides Lift Weight (Short Tons)
2009	<b>Perdido</b> Shell	GoM AC 857	7,817	100,000 BOPD 200 MMscfd	SPAR	9,350
2008	<b>Shenzi</b> BHP	GoM GC 653	4,373	100,000 BOPD / 125,000 BOPD (debottlenecked) 50 MMscfd	TLP	8,350
2007	<b>Independence Hub</b> Enterprise Products / Anadarko	GoM MC 920	7,920	1 Billion scfd	Semi-sub	Quayside Integration
2005	<b>Okume Complex</b> TLP's Amerada Hess	Offshore Equatorial Guinea	1,650 900	25,000 BOPD 30 MMscfd (each)	TLP	Quayside Integration
2007	<b>Magnolia</b> ConocoPhillips / Devon	GoM GB 783	4,674	50,000 BOPD 150,000 MMscfd	TLP	Quayside Integration
2003	<b>Marco Polo</b> GulfTerra / Anadarko	GoM GC 608	4,300	120,000 BOPD 400 MMscfd	TLP	6,300
2002	<b>Horn Mountain</b> BP / Oxy	GoM MC 127	5,423	65,000 BOPD 70 MMscfd	SPAR	4,450
2000	<b>Prince</b> El Paso Energy	GoM EW 1003	1,490	50,000 BOPD 80 MMscfd	TLP	3,450
1999	<b>Allegheny</b> Atlantia / British- Borneo	GoM GC 254	3,350	25,000 BOPD 45 MMscfd	TLP	2,500
1998	<b>Morpeth</b> Atlantia / British- Borneo	GoM EW 921	1,699	35,000 BOPD 42 MMscfd	TLP	2,800



**Perdido: World's  
Deepest Spar**



**Magnolia: World's  
Deepest TLP**



**Independence Hub:  
World's Deepest Semi-  
submersible**

**Alliance Engineering has designed topsides for the world's deepest TLP, the world's deepest spar, and the world's deepest semi-submersible (at the time of installation)**

# Shelf Projects

Completion Date	Project Name Client	Scope	Location	Oil BOPD	Gas MMscfd	Water Depth (ft.)
In Progress	<b>SNX</b> DSME / Chevron	Detailed Engineering and Design of Topsides and Jacket	Offshore Angola	16,400	176	386
2011	<b>Tamar</b> Noble Energy	Detailed Engineering and Procurement Assistance	Offshore Israel	---	1,200	800
2009	<b>Pinauna</b> El Paso Energy	Owner's Engineer and Design for Wellhead and FSO	Offshore Brazil	25,000	30	120
2008	<b>Corocoro</b> ConocoPhillips	Preliminary and Detailed Engineering	Offshore Venezuela	60,000	50	30
2008	<b>Toucan</b> EOG Resources	Detailed Engineering and Procurement Assistance	Offshore Trinidad	1,000	200	430
2008	<b>Valemon</b> StatoilHydro	Pre - FEED for Jacket and Topsides	Offshore Norway	5,000	16 MMscmd	442
2008	<b>SMAD</b> CABGOC	Pre - FEED, Field Development, and Gas Utilization Study	Offshore Angola	160,000	300	170
2007	<b>Olokola</b> Chevron	FEED of Nine Non-Associate Gas Wellhead Platforms (NWP's)	Offshore Nigeria	30,000	30 - 90	30 - 200
2006	<b>GACE Platforms A&amp;B</b> Chevron	Detailed Engineering and Procurement Assistance	Offshore Colombia	19,000	850	90 - 100
2006	<b>Oilbird</b> EOG Resources	Conceptual, Detailed Engineering, and Procurement Assistance	Offshore Trinidad	10,000	300	240
2006	<b>Alba "B3" Gas Compression Platform</b> Noble Energy	Detailed Cost Estimate	Offshore Bioko Island, Equatorial Guinea	---	990	200
2005	<b>Independence Trail</b> Enterprise Products	Detailed Engineering of Facilities, Jacket, and Deck	GoM West Delta Block 68	---	1,000	110
2004	<b>CDX DPA</b> Samedan	Detailed Design and Installation Supervision of the Floatover Topsides	Offshore China	---	---	---
2004	<b>Poinsettia Platform</b> British Gas	FEED Engineering for a Lifted Jacket	Offshore Trinidad	---	---	530
2004	<b>Benguela Belize</b> DSME	Project Management Including Project Director, Engineering Manager, Interface Manager, and Structural Consultant	Offshore Angola	220,000	250	1,280
2003	<b>Parula</b> EOG Resources	Basic Design, Detailed Engineering, and Procurement Assistance	Offshore Trinidad	2,000	140	237
2003	<b>Camamu</b> El Paso	Owner's Engineer for Wellhead and FSO	Offshore Brazil	25,000	30	120
2002	<b>Block CDF 12-1</b> Kerr McGee / CNOOC	Concept Development	Bohai Bay, China	10 - 60,000	50	120
2002	<b>Production Platform Block 26</b> Trintomar	Preliminary Engineering for Topsides	Offshore Trinidad	20,000	50	75
1998	<b>Dong Fang</b> CNOOC	Gas Field Development, Basic Design Contract, Engineering and Design	Offshore China	20,000	250	70m
1998	<b>Salsa Platform "B"</b> Shell Offshore, Inc.	Detailed Engineering and Design, Procurement, and Project Management Assistance	GoM Garden Banks Block 172	30,000	300	690
1997	<b>Enchilada Platform "A"</b> Shell Offshore, Inc.	Detailed Engineering and Design, Procurement, and Project Management Assistance	GoM Garden Banks Block 128	60,000	400	633

# FPSO Projects

Completion Date	Project Name Scope	Location	Hull Type	Moor-ing	Storage Capacity BBLs	Oil BOPD	Water BWPD	Gas MMscfd	Water Depth (ft.)
2009	<b>Jubilee</b> MODEC Detail Design	Ghana	Conversion	Turret	1.6 Million	120,000	84,000	160	5,000
2006	<b>Tui</b> Prosafe Concept Through Detail	New Zealand	Conversion	Turret	1 Million	50,000	118,000	20	5,000
2003	<b>Su Tu Den</b> MODEC Concept Through Detail	Vietnam	New Build	Turret	1 Million	65,000	65,000	35	150
2002	<b>Bijupira &amp; Salema</b> MODEC Concept Through Detail	Brazil	Conversion	Turret	1.3 Million	70,000	50,000	75	2,200
1998	<b>Tantawan</b> SBM Concept Through Detail	Thailand	Conversion	Turret	1.2 Million	50,000	25,000	200	200
2010	<b>Aje</b> Chevron Pre-FEED, Proj. Management	Nigeria	Conversion	Turret	1 Million	35,000	50,000	175	300
2008	<b>SSP</b> OPE Conceptual	West Africa	New Build	Spread	1 Million	80,000	155,000	70	4,000 - 10,000
2008	<b>Negage</b> CABGOC Pre-FEED	Angola	Conversion	Turret	1.4 Million	100,000	90,000	60	4,300
2007	<b>Petrobras Tambua Urugua</b> Teekay Topside Dev./Bid Support	Brazil	Conversion	Turret	1 Million	47,723	42,160	353	5,000
2007	<b>Cascade / Chinook</b> Petrobras America, Inc. Verification Engineering	GoM	Conversion	Turret	600,000	80,000	16,000	16	8,500
2007	<b>Nsiko</b> Chevron Pre-FEED	Nigeria	Conversion	Spread	1.6 Million	100,000	100,000	250	5,000
2006	<b>Alvheim</b> Dragados EPC Bid Support	Norway	Conversion	Turret	540,000	80,000	130,000	100	400
2006	<b>Gehem-Ranggas</b> Unocal FEED Definition	Indonesia	Conversion	Spread	1.2 Million	50,000	7,000	700	5,000
2006	<b>Gendalo</b> Unocal FEED Definition	Indonesia	Conversion	Spread	1 Million	33,000	3,000	650	5,000
2005	<b>Frade</b> Chevron FEED	Brazil	Conversion	Turret	1.5 Million	100,000	130,000	35	3,600
2004	<b>Agbami</b> HHI EPC FEED Verification	Nigeria	New Build	Spread	2.3 Million	250,000	250,000	450	5,000
2003	<b>Sanha (LPG)</b> JGC Structural Detail	Angola	New Build	Turret	N/A	N/A	N/A	N/A	N/A



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