

Floating Production What's New in August

Jim McCaul – IMA

Current Inventory – 320 oil/gas floating production units are now in service, on order or available for reuse on another field. FPSOs account for 64% of the existing systems, 79% of systems on order. Production semis, barges, spars and TLPs comprise the balance. Total oil/gas inventory is the same as last month – but two units on order last month (*N’Goma FPSO* and *Delta House Semi*) were completed and are now in the active inventory.

Another 29 floating LNG processing systems are in service or on order. Liquefaction floaters account for 17%, regasification floaters 83%. No liquefaction floaters are yet in service – all 5 are on order. Total LNG inventory is the same as last month.

In addition, 102 floating storage units are in service, on order or available.

Number of Floating Production and Storage Units In Service, On Order or Available for Reuse (As of 1 August 2014)

	<u>Total</u>	<u>Active</u>	<u>On Order</u>	<u>Available</u>
<u>Oil/Gas Production</u>				
FPSO	213	160	37	16
Production Barge	10	8	2	0
Production Semi	47	41	2	4
Production Spar	22	20	2	0
TLP	28	24	4	0
Total	320	253	47	20
<u>LNG Processing</u>				
FLNG	5	0	5	0
FSRU	24	13	11	0
<u>Storage Systems</u>				
FSO	102	92	9	1

Production Floater Order Backlog – 63 production floaters are currently on order, a reduction of two units since last month. The figure includes 37 FPSOs, 10 other oil/gas production units and 16 LNG processing units. In the later are 5 floating liquefaction plants and 11 regasification terminals.

The backlog of orders has been falling over the past few months as deliveries outpace intake. Backlog is down from a high of 72 units last October. Given expected orders and scheduled deliveries over the next five months, order backlog at end 2014 will likely be in the range of 58 to 60 units.

The declining trend is mostly the result of a wave of orders 24 to 36 months back that created a cluster of deliveries in 2014. Recent orders have been strong – just not as high as deliveries. But there has also been some impact from deferral/rethinking of several projects – e.g., Rosebank, Fram, Fyne, Mad Dog, Cheviot, etc.

Who's Building What – Production and storage floaters are being built in more than 40 locations. Here's a summary of where various type systems are currently being built.

- **FPSO conversions** – Shipyards in Singapore and China are the principal players in this type activity. Of the 20 FPSO conversions now in progress, 9 are being performed in Singapore. Keppel is converting 6 tankers to FPSOs, Sembawang is converting 2 tankers and Jurong has 1 conversion. Another 8 conversions are being performed in China – 3 at Chengxi and 5 at Cosco Dalian. To meet local content requirements, a portion of topsides completion in around half of these contracts is being performed in Brazil.
- **Purpose built FPSOs** – Korea and Brazil are the main sources of large purpose built FPSOs. Yards in these countries have contracts for 13 of the 17 new FPSOs now on order. In Korea, Hyundai is building 2 FPSOs, Samsung 2 units and Daewoo 1 unit. One of the Samsung units (Egina) will have significant topsides work performed in Nigeria. In Brazil 8 replica FPSOs are being built by Ecovix at the new Rio Grande Shipyard. Elsewhere, 2 FPSOs are being built in China and 2 FPSO hulls are being built in Japan with topsides finishing in Singapore or Brazil.
- **Other oil/gas production units** – Asia is the dominant area for building non-shipshape production units. At the moment 5 of the 10 large purpose-built non-shipshape units on order are being built in Korea. Samsung is building a production semi and Hyundai is building a spar, a TLP and 2 large production barges. The topsides to several units are being completed in the US or Indonesia. Elsewhere, a spar hull is being built in Finland for topsides completion in the US and MMHE is finishing a TLP in Malaysia.
- **FSRUs** – Construction of regas units is fully reserved to Korea and China. Eight FSRUs are now being built in Korea. Samsung is building 4 FSRUs, Hyundai and Daewoo are each building 2 FSRUs. In China, Wison Nantong is building 2 FSRU barges.
- **FLNGs** – Liquefaction floaters are all being built in Asia. In Korea, Samsung is building 2 units, including the massive Prelude FLNG for Shell and the initial FLNG for Petronas. Daewoo is building the second FLNG ordered by Petronas. In China, Wison is building a liquefaction barge for use in Colombia. All of these units are newly built hulls. In Singapore, Keppel is converting an LNG carrier into an FLNG.

The large role of Asia facilities in this market sector is apparent from the above. Overall, 50 of the 63 current production floater orders are contracted with Asian yards. In term of number of production floater fabrication/conversion contracts being performed, the Asian share of market is just under 80%.

Backlog of Planned Floater Projects – 231 floating production projects are in various stages of planning as of beginning August. Of these, 58% involve an FPSO, 13% another type oil/gas production floater, 23% liquefaction or regasification floater and 6% storage/offloading floater.

Among new projects emerging since last month, LoneStar FLNG, a Texas company, proposes to build an FLNG by inserting a midsection in an existing Moss LNG carrier. The mid-section would contain the liquefaction module and turret. Processing and gas treatment would be on an accompanying cylindrical FPSO or fixed platform. The unit would be capable of processing 1 to 4 mtpa. LNG transfer from the FLNG to transport carrier would be performed in a sheltered area. Among proposed applications is use of the unit for gas export in the US GOM.

**Breakdown of Planned Projects by
Type Production System Required**
(As of 1 August 2014)

<u>Type System Required</u>	<u>Number of Projects</u>
FPSO	133
OTHER FPS	30
FLNG	32
FSRU	21
FSO	<u>15</u>
Total	231

Brazil, Africa and SE Asia continue to be the major locations of floating production projects in the visible planning stage. We are tracking 44 projects in Brazil, 50 in Africa and 40 projects in SEA – 58% of the visible planned floating production projects worldwide. Several large projects in Brazil and (less so) Africa will require multiple production units.

**Breakdown of Planned Projects by
Location of Field**
(As of 1 August 2014)

<u>Project Location</u>	<u>Number of Projects</u>
Africa	50
Brazil	44
SE Asia	40
GOM	24
No. Europe	23
Aust/NZ	15
Medit	10
SW Asia	10
Other	<u>15</u>
Total	231

Around 12% of the 231 visible planned projects are likely to advance to the EPC contracting stage within the next 12 to 18 months. These projects typically have either entered the FEED phase, pre-qualification of floater contractors has been initiated or bidding/negotiation is in progress. A list of near term projects is provided below.

Floating Production Projects in the Advanced Planning Stage

Project	Country	Operator	Water Depth (meters)	Production Start Possible	Likely Type Unit	Likely Lease or Own	Likely Mooring System *
Sankofa	Ghana	ENI	1000	2017/20	FPSO	Lease	ET
Camela	Angola	Cobalt Energy	1525	2017/18	FPSO	Lease	ET
Bonga Southwest	Nigeria	Shell	1200	2020/21	FPSO	Own	S
Aje	Nigeria	YFP	150	2016/20	FPSO	Lease	S
Chissonga	Angola	Maersk Oil	1355	2017/18	FPSO + TLWP	Own	ET
Libra EWT	Brazil	Petrobras	2200	2016	FPSO	Lease	S
Tartaruga Verde	Brazil	Petrobras	930-980	2017	FPSO	Lease	S
Park of the Sweets	Brazil	Petrobras	1900	2017	FPSO	Lease	S
Sul Parque Baleias	Brazil	Petrobras	1010	2018	FPSO	Lease	S
Oliva/Atlanta	Brazil	Queiroz Galvao	1560	2017/19	FPSO (1+1)	Lease	ET or S
Ayatsil/Tekel	Mexico	Pemex	120	2017/18	FPSO	Lease	IT
Pemex EWT	Mexico	Pemex	80-700	2016/17	FPSO	Lease	IT or DP
West Cameron LNG	USA	Delfin	<20	2017/18	FLNG	Own	TY
Main Pass LNG Hub	USA	F McMoRan	65	2017/20	FLNG	Own	ET
Lavaca Bay LNG	USA	Excelebrate	<50	2018/20	FLNG	Own	J/P
Appomattox	USA	Shell	2270	2017/19	SEMI	Own	S
Mad Dog 2	USA	BP	1370	2018/19	TLP	Own	T
Leviathan Phase 1	Israel	Noble	1630	2017/19	FPSO	Lease	ET
Bream	Norway	Premier	~100	2018	FPSO (cylindrical)	Lease	S
Bressay	UK	Statoil	91	2018/19	FSO	Own	IT
P Meridian Regas	UK	Meridian	<50	2016/18	FSRU	Lease	IT
Madura BD	Indonesia	CNOOC	55	2016/17	FPSO	Lease	ET or S
Gehem/ Gendalo	Indonesia	Chevron	1550-1830	2017/18	Barge (2)	Own	S
Ubon	Thailand	Chevron	75	2018	FSO	Own	ET
Nong Yao	Thailand	Mubadala	60-75	2015	FSO	Lease	ET
Wassana	Thailand	KrisEnergy	60	2015	FSO	Lease	ET
North Malay	Malaysia	Hess	55	2016/17	FSO	Own	ET
Tembikai	Malaysia	Vestigo	50-100	2016/17	FSO	Lease	SPM

* IT = Internal turret ET = External turret S = Spread moored T = Tendons J/P = Jetty/pier moored SPM = Single pt mooring TY = Tower yoke DP = Dynamic positioning

Another 50% of the visible projects are at a stage of development where the EPC contract for the production unit is likely within the next 18 to 48 months. The remaining 38% of projects are less advanced in planning, with the EPC contract likely 4 to 10 years out.

Outlook for Equipment Orders – Oil demand keeps growing, the threat of conventional supply disruption keeps pressure on finding new sources of oil and a large number of additional deepwater drill rigs are entering service. These are clearly positive indicators for deepwater project starts and floating production system orders.

Importantly, the most basic underlying market driver, price of crude oil, remains supportive of deepwater oil development. As of beginning August, Brent is trading around \$106. For delivery at the end the decade, Brent is trading around \$99 in the futures market. This pricing level provides solid commercial support to all but the most marginal deepwater projects.

But oil companies have been pulling back on investment in new projects. Barclays' mid-year survey of oil industry executives found that spending by oil majors will be flat in 2014. Earlier the bank projected a 3% increase in spending.

In the deepwater sector, cost escalation is causing companies to slow investment decisions. The planned \$6 billion Bressay heavy oil project in the UK North Sea, for example, hit a cost wall that forced Statoil to rethink the project. Cost escalation caused Chevron to stop, at least temporarily, the \$10 billion Rosebank project offshore the UK Shetlands Islands. Commenting on the cost pressures, Technip said in July that "some of our customers are taking a much slower and more combative approach."

Compounding this, shale oil and gas development is increasingly drawing capex resources from energy companies. Rystad Energy says "spending on drilling, completion and lease equipment in North American shale plays will reach \$140 billion in 2014." The figure is up 10% from 2013 and Rystad expects similar growth in 2015. Wood Mackenzie expects the Texas Wolfcamp tight oil play alone to draw \$12 billion in capital spending in 2014. Some of the growing capital expenditures on shale projects have undoubtedly migrated from deepwater development.

The impact has been to cause some backing off on new deepwater project starts – which may explain why orders for production floaters are within, but at the low end of our forecast range.

We will examine these conflicting underlying market forces in more detail when we issue our new five year forecast of floating production system orders in September.

Further Details – We have the capability to prepare detailed customized reports on all aspects of the floating production systems market. For further information, please contact Jim McCaul at imaassoc@msn.com or call 202 333 8501. We will be pleased to discuss how we might be of assistance.

Terms Used

FPSO – Floating Production, Storage and Offloading Vessel
FSO – Floating Storage and Offloading Vessel (no production plant)
FSRU – Floating LNG Storage and Regasification Unit
FLNG – Floating LNG Liquefaction Plant
Semi – Production Semisubmersible
TLP – Tension Leg Platform
SPAR – Production Spar (cylindrical shape)
FPS – Floating Production System (all types)
EWT – Extended Well Test
FEED – Front End Engineering and Design
EPC – Engineering Procurement Construction contract

About Jim McCaul

Jim is the founder and manager of IMA, a consulting firm providing market analysis, competitive benchmarking and business planning support in the maritime and offshore sectors. Over the past 40 years IMA has performed more than 350 business consulting assignments for 170+ clients in 40+ countries.

One of the firm's specialties is analyzing requirements for floating production systems. IMA has published more than 50 reports since 1996 analyzing this business sector and has been engaged by numerous clients to assist in analyzing specific market opportunities in the floating production sector.

Please visit our website www.imastudies.com for more information about Jim McCaul and IMA.

