ТЗ – построить БС высокого ледового класса с глубиной моря 1100-1500 м и глубиной бурения до 14000 м!
Строительство судов после 2011 года – информация для размышления

Буровые суда 7 поколения

Поколения БС

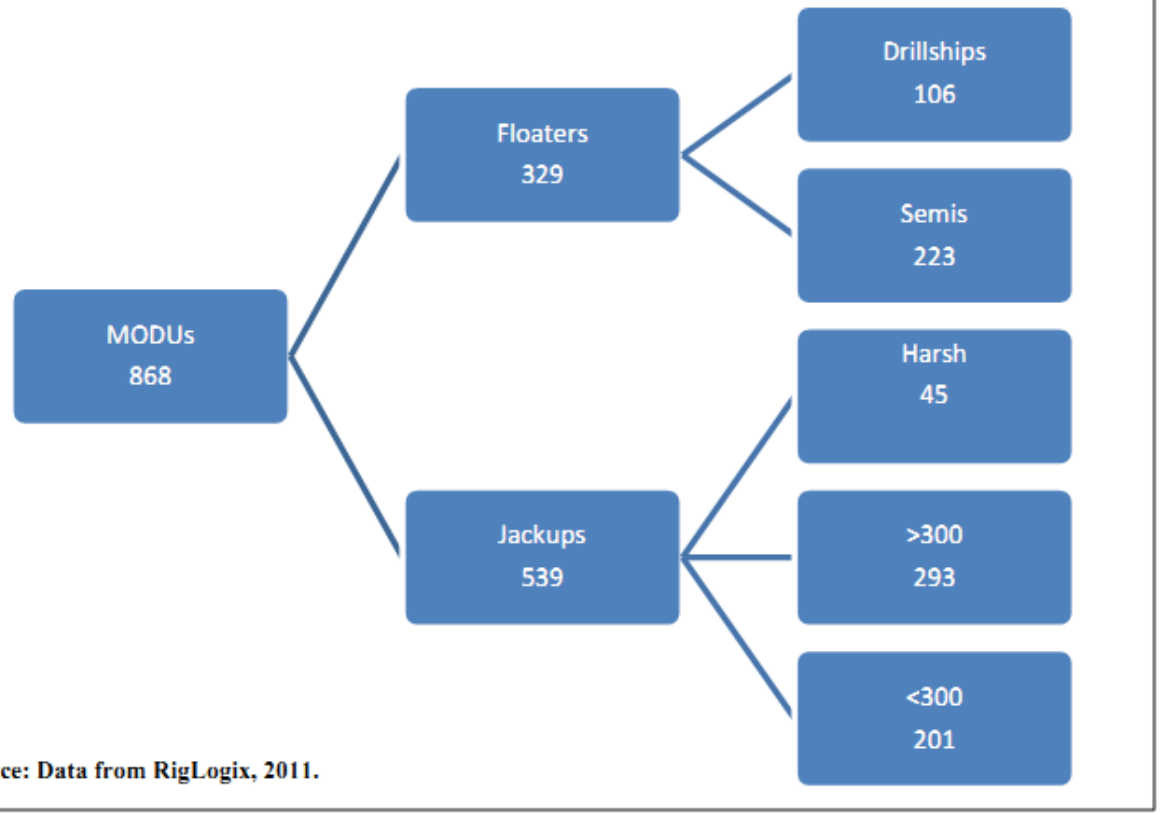
Глубина воды максимальная, м	Поколение (годы постройки судов соответствующего поколения)	Диапазон длин между перпендикулярами судов Lпп / количество судов	Диапазоны значений соотношений главных размерений			Коэффициент общей общей
			L/B	B/d	D/d	
200	1 (до 1969 г)	106/1	-	-	-	-
300	2 (1969-1974)	137-146/3	4,77-7,22	3,17-3,95	1,67-1,73	0,68
500	3 (1975-1989)	107-171/7	5,0-7,01	2,74-2,8	1,47	-
1 000	4 (1990-1997)	125-144/3	5,4 - 6,67	2,63-2,92	1,41	-
2 500	5 (1998-2004)	137-154/10	4,36-6,22	3,22-5,29	1,68-1,96	-
3 000	6 (2005-2010)	158-235/16	4,85-6,35	3,0-4,94	1,44-2,24	0,82
3 600	7 (с 2011 г)	210-213/5	4,99-5,91	3,79-4,94	1,89-2,34	-

ЦОФ

- Глубина моря
- Глубина бурения
- Ледовый класс
- Экология + WINTERIZATION (-50)
- Система позиционирования
- Количество вышек
- Возможность хранения нефти
- Экипаж
- Краны

Состав флота 2011

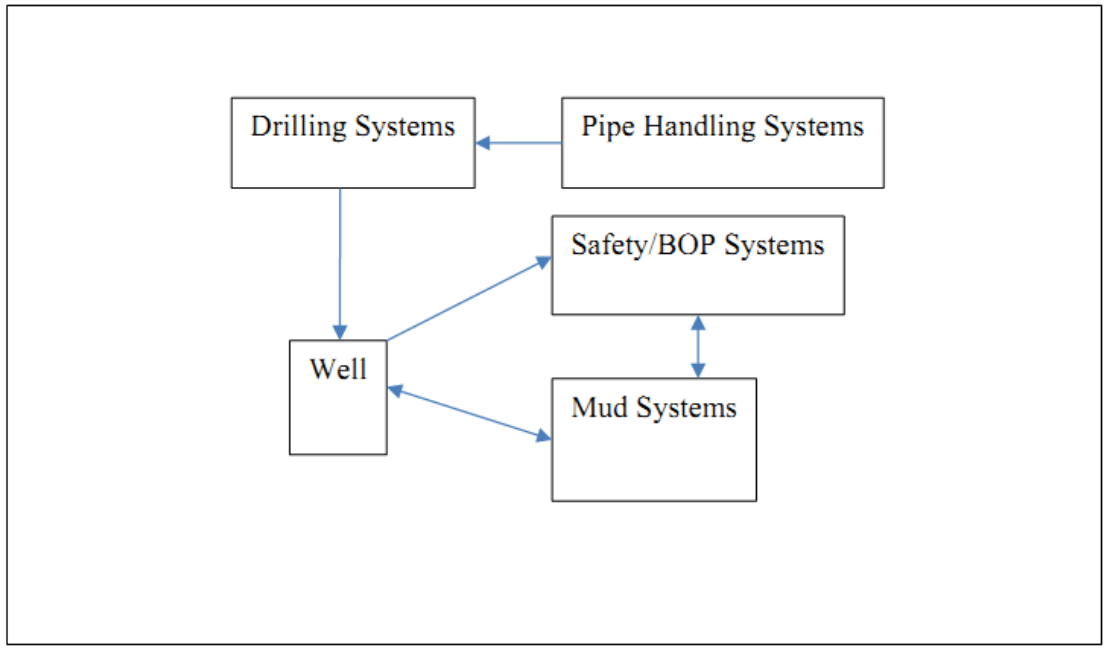
сейчас 1256 ед



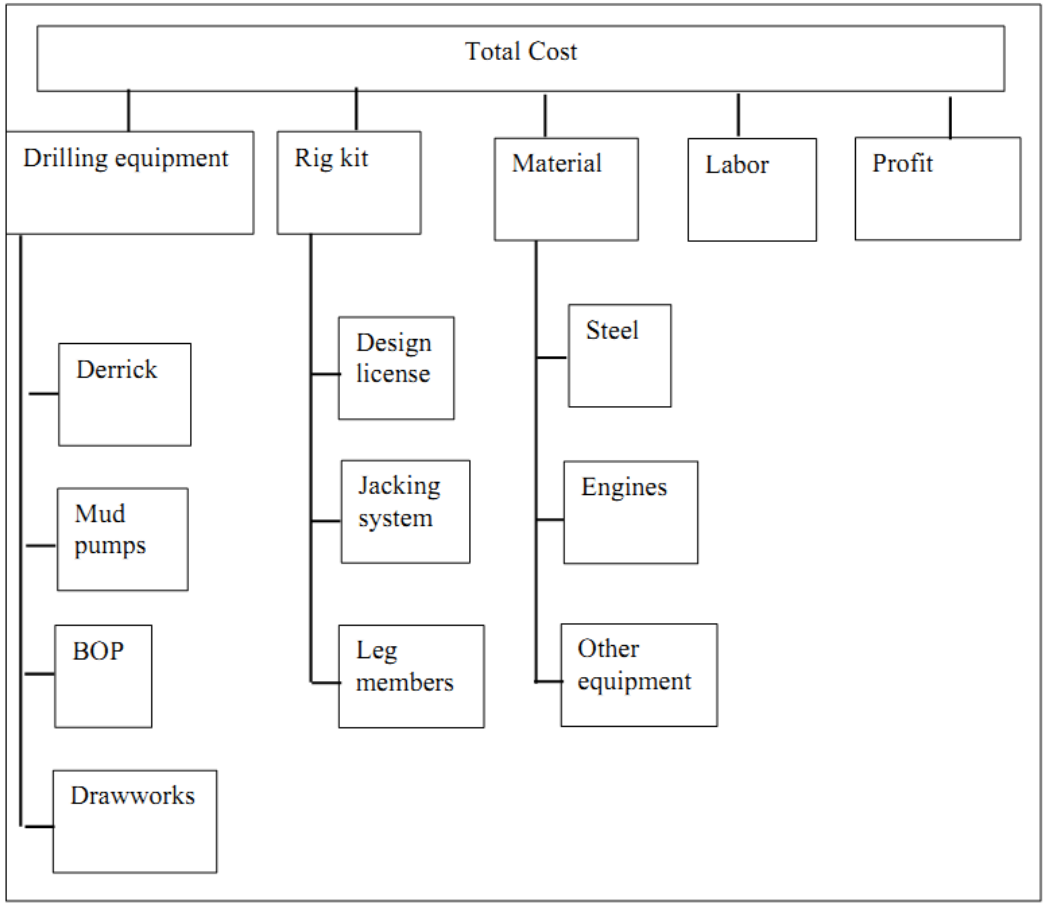
Source: Data from RigLogix, 2011.

Global supply of newbuild and existing MODUs in the 1Q 2012.

Формирование цены

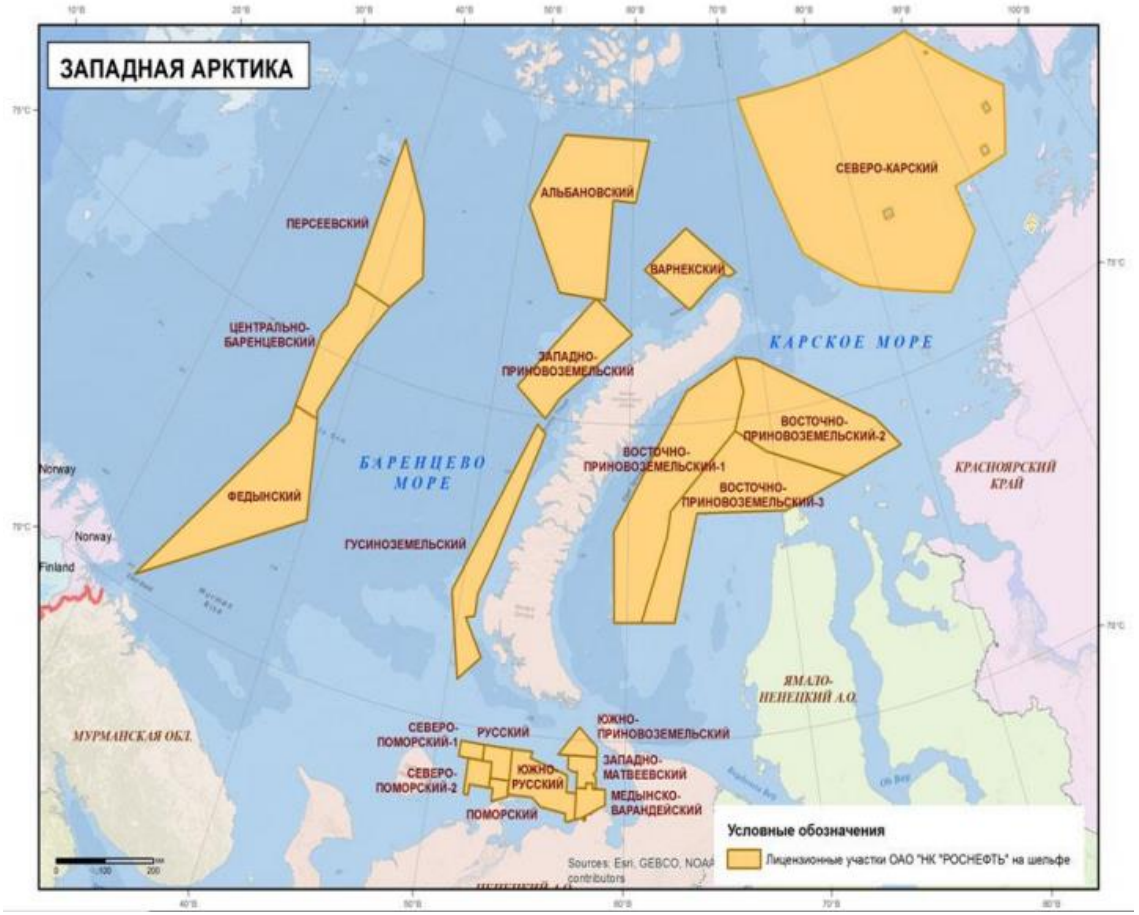


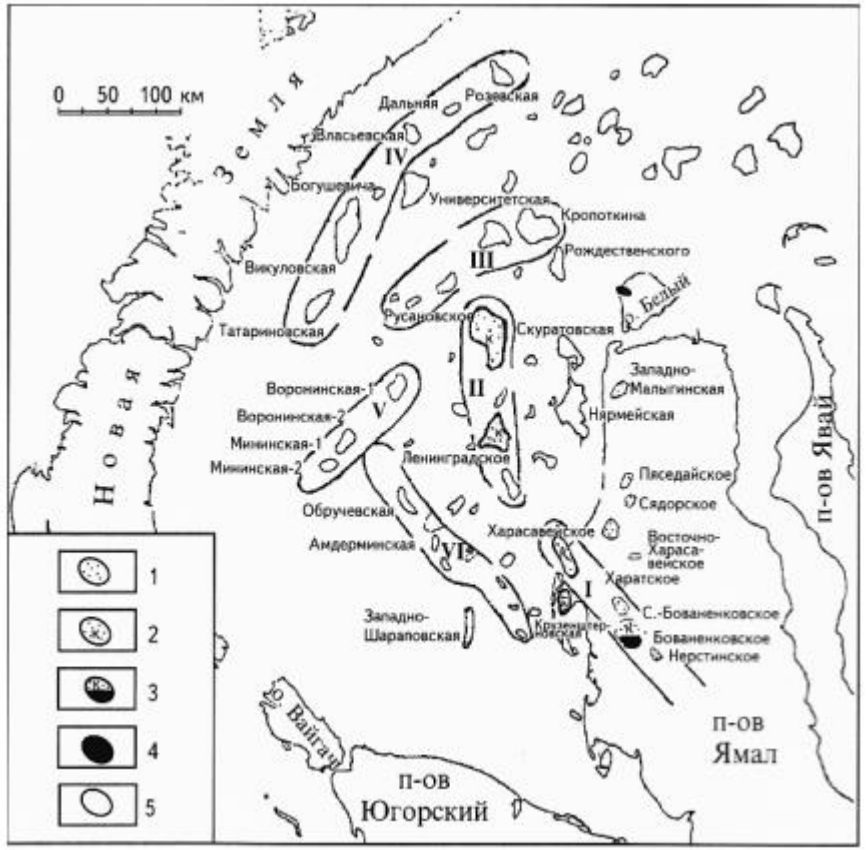
Interactions between major rig systems.



Distribution of capital costs for jackup rig construction.

Западная Арктика





Стоимость от глубины моря

и ледового класса

Drillship Replacement Cost Models

Cost (million \$) = $\alpha_0 + \alpha_1$HARSH + α_2WD						
Model	α_0	α_1	α_2	R^2	Model p	SE
A	204.4 **	196**	0.031 **	0.65	**	67.2
B	0	234.7*	0.053**			94.0

Note (*): p is less than 0.05; (**): p is less than 0.01. Terms without asterisks are not significant.

Цена проектов

VDL – палубная нагрузка
Harsh – арктический класс
Water depth – глубина моря

Drillship Design Class Properties and Newbuild Cost in 2011

Design	Number	Price (million $)	Water depth (ft)	Harsh	VDL (tons)	Displacement (tons)
DSME 10000	2	579	10,000	N	24,000	112,000
DSME 12000	6	590–782	10,000–12,000	N	24,000	112,000
GustoMSC P10000	11	590–630	10,000–12,000	N	20,000	75,000
GustoMSC PRD12,000	1	632	12,000	N	15,000	45,000
Samsung 10000	17	638–820	10,000–12,000	N	22,000	105,000
Samsung 12000	8	550–650	10,000–12,000	N	22,000	105,000
Stena/Samsung	1	1,150	7,500	Y	19,000	108,000
Huisman GT-10000	2	550–585	10,000	N	20,000	60,000

Source: Jefferies and Company, Inc., 2011; Industry press.

Цена строительства буровых судов колеблется от 550 до 1,2 млрд. Долл. США при водоизмещении от 45 000 до 112 000 тонн , что отражает различия в возможностях хранения нефти и VDL от 15 000 до 24 000 тонн.

Samsung 10000 и 12000 и GustoMSC P10000 - самые популярные проекты, способные хранить небольшое количество нефти (примерно 140 000 баррелей) в начале производства, в то время как Gusto PRD12000 и Huisman GT-10000 конструкции исключают хранение нефти, чтобы уменьшить размер судна и эксплуатационные и капитальные затраты.

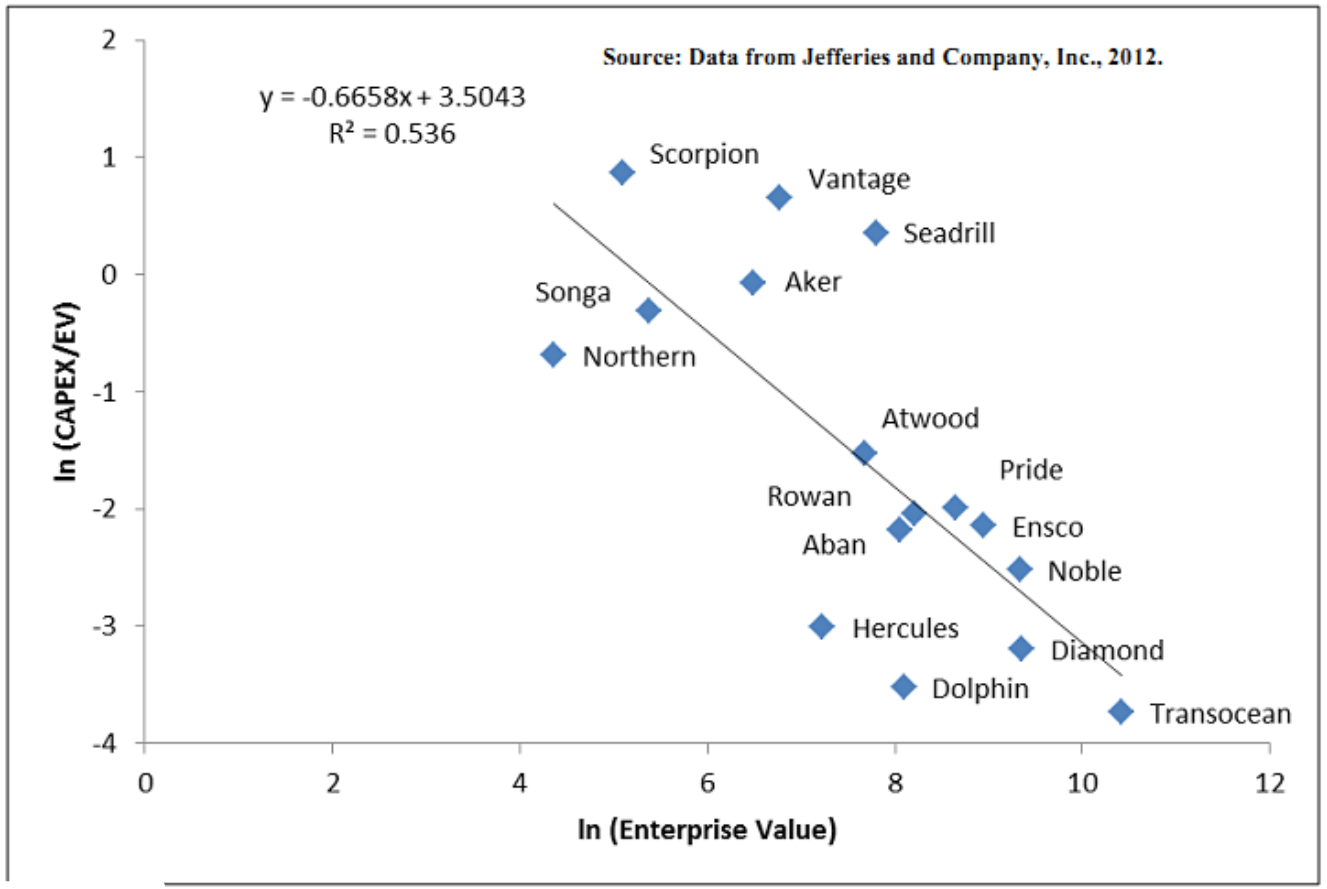
Компании

The Largest Publicly Traded Drilling Contractors in 2011

Firm	Enterprise value[a] (billion $)	Fleet value[a] (billion $)	2011 revenue (billion $)	Jackups	Semis	Drillships	Total	Headquarters
Transocean	25.4	32.1	9.1	68	50	23	141	U.S.
Seadrill	27.1	15.6	4.0	21	12	6	39	Norway
Diamond Offshore	8.9	8.7	3.3	13	32	3	48	U.S.
ENSCO	16.7	14.5	2.8	42	18	5	65	U.S.
Noble	13.3	11.7	2.7	45	14	13	72	U.S.
Saipem	26[c]	4.5	1.0[b]	7	7	2	16	Italy
Rowan	4.5	5.7	0.9	31	0	0	31	U.S.
Songa Offshore	1.7	1.9	0.7	0	5	0	5	Norway
Ocean Rig	3.6	3.0	0.7	0	2	4	6	Norway
Atwood Oceanics	3.2	2.7	0.6	6	6	1	13	U.S.
Aban	2.9	2.4	0.6	15	0	3	18	India
Hercules Offshore	1.3	1.1	0.5[b]	33	0	0	33	U.S.
Vantage	1.5	1.7	0.3	4	0	4	8	U.S.
Japan Drilling	0.4	1.2	0.3	4	2	0	6	Japan
Total	110.5	106.8	26.4	289	148	64	501	
% of world fleet				54%	66%	60%	58%	

Note: (a) Enterprise and fleet value evaluated on December 21, 2011. (b) Only includes offshore drilling revenues. (c) Most of Saipem's enterprise value is associated with non-offshore drilling activities and is not included in the total.
Source: Jefferies and Company, Inc., 2012; financial reports; RigLogix, 2011.

Зависимость CAPEX



Relationship between firm size and relative newbuilding expenditure, 2005–2011.

C = f (Hartsh, WD)

Drillships

Replacement cost models were specified using an environmental indicator (HARSH) and water depth (WD, ft) variables:

$$\text{Replacement Cost} = \alpha_0 + \alpha_1 \text{HARSH} + \alpha_2 \text{WD}.$$

Year of delivery was correlated with water depth and excluded from the model. Results are shown in Table N.9. The coefficient of the water depth term was positive and for every 1,000 ft increase in water depth replacement costs increased by $31 million. The harsh environment coefficient suggests that a harsh environment drillship costs $196 million more than a moderate environment drillship. This is far more than the harsh environment premium in the jackup or semi cost models, and is partially the result of semis and jackups being more amenable to modification for harsh environments.

Cost

Costs of Rigs Under Construction in 2012 in Million Dollars

	Jackups	Semis	Drillships
Average	217	595	634
Minimum	159	460	550
Maximum	530	809	1,150
Standard deviation	73	96	92
Sample size	77	17	47

Source: Data from Jefferies and Company, Inc., 2012.

Replacement Costs of Selected Rigs in 2012

Rig	Class	Delivery year	Upgrade year	Replacement cost (million $)
Deepwater Discovery	Drillship	2000		615
Deepwater Navigator	Drillship	1974	2000	400
Discoverer Inspiration	Drillship	2010		640
GSF Celtic Sea	Semi	1982	1998	423
Cajun Express	Semi	2000		540
Transocean Spitsbergen	Semi	2010		850
Constellation II	Jackup	2004		210
GSF High Island	Jackup	1979		150
Transocean Honor	Jackup	2011		189

Source: Data from Jefferies and Company, Inc., 2012.

Rigzone

Distribution of Rigs by Class and Operator, Including
Cold-Stacked Rigs and Rigs under Construction in the 1Q 2011

Company	Jackup	Drillship	Semi	Total
Transocean Ltd.	68	23	50	141
Noble Drilling	45	13	14	72
ENSCO	49	7	20	76
Diamond Offshore	13	3	32	48
Seadrill Ltd	21	6	12	39
Hercules Offshore	53	0	0	53
COSL	27	0	6	33
Rowan	31	0	0	31
Maersk Drilling	14	0	6	20
Aban Offshore	15	3	0	18
Saipem	7	2	7	16
Nabors Offshore	16	0	0	16
Atwood Oceanics	6	1	6	13
National Drilling	13	0	0	13
ONGC	8	2	0	10
Petrobras	6	0	4	10
All others (87 firms)	147	46	66	259
Top 4 firms	205	46	116	367
Top 8 firms	337	52	134	523
Total	539	106	223	868

Source: Data from RigLogix, 2011.

Geographic Distribution of Active Rigs by Nation in 2011

Region	Jackups	Semis	Drillships	Total
US GOM	51	20	10	81
Persian Gulf	85	0	0	85
Brazil	3	52	15	70
North Sea	32	36	2	57
Southeast Asia	42	9	2	53
West Africa	17	13	9	39
India	34	2	9	45
China	28	4	0	32
Mexico	24	3	0	27
Egypt	20	2	2	24
Australia	1	7	1	9
Ghana	0	3	2	5
Azerbaijan	2	3	0	5
Venezuela	3	0	2	5
All others	49	20	8	77
Top 4	171	108	27	306
Top 8	292	136	47	475
Total	394	175	57	626

Source: Data from Rigzone, 2011.

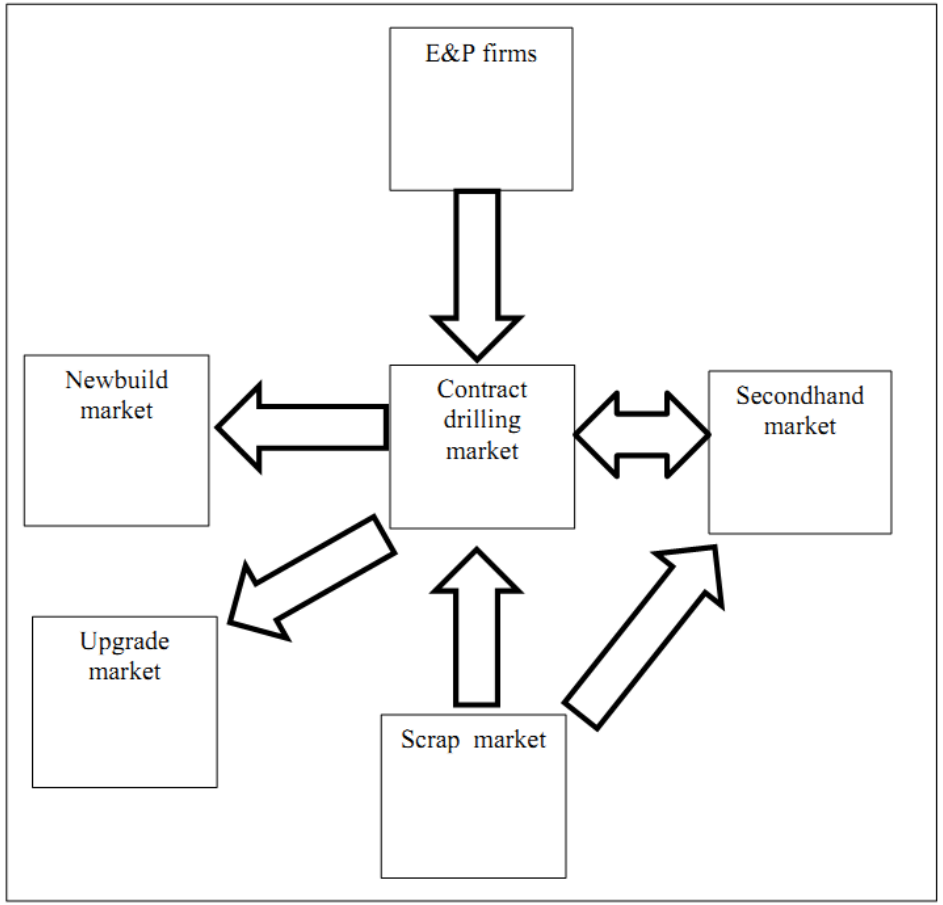
Затраты на обновление

Examples of Drillship Upgrade Contracts

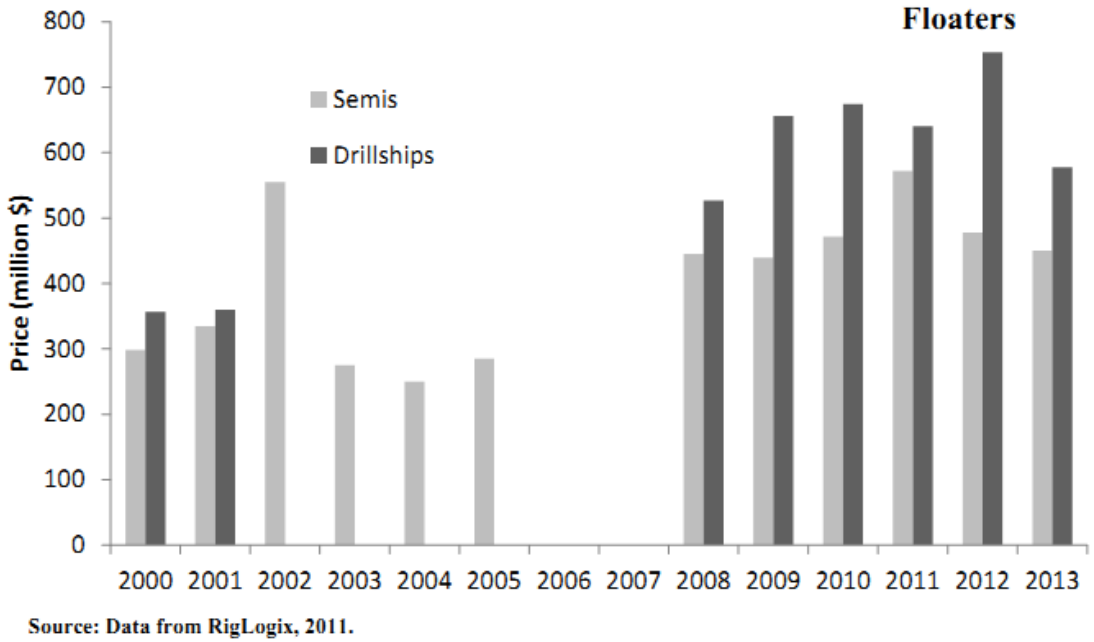
Customer	Shipyard	Year	Cost (million $)	Scope
Transocean	Signal	2010	32.4	Living quarters upgrade, equipment replacement, painting, hull and tank repair
Noble	Keppel Brazil	2010	152	Replacement of accommodations and heliport; modifications to stern
Neptune Marine	Sembawang	2009	340	Increase water depth capacity, add dynamic positioning, upgrade drilling equipment

Source: Industry press.

Движение CF на рынке БС

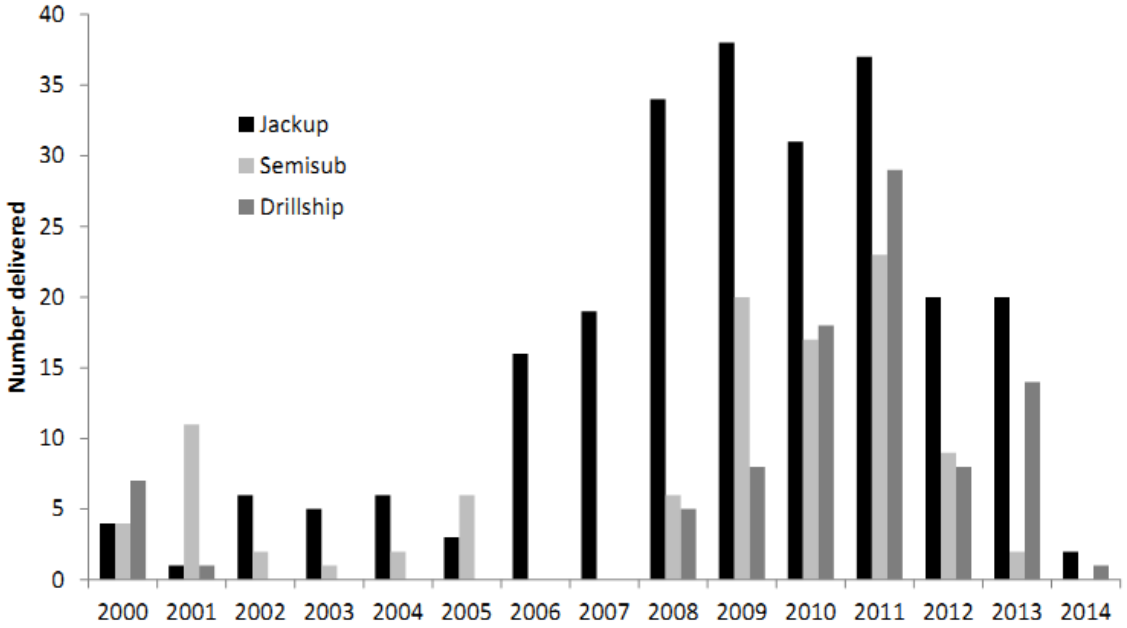


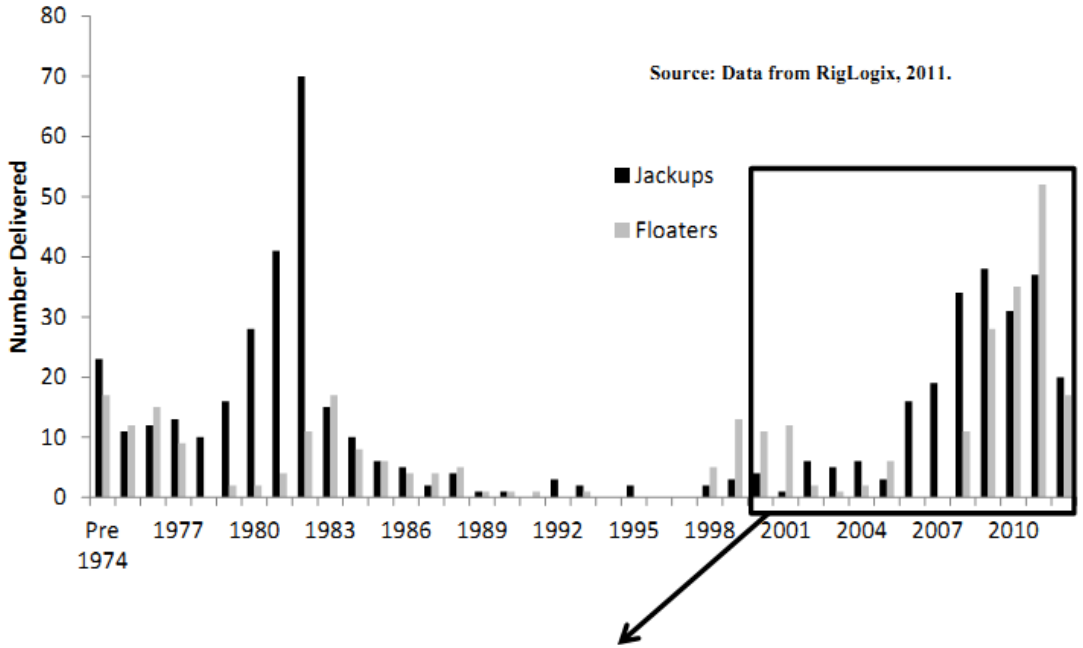
Direction of cash flow through offshore rig markets.



Source: Data from RigLogix, 2011.

Динамика строительства

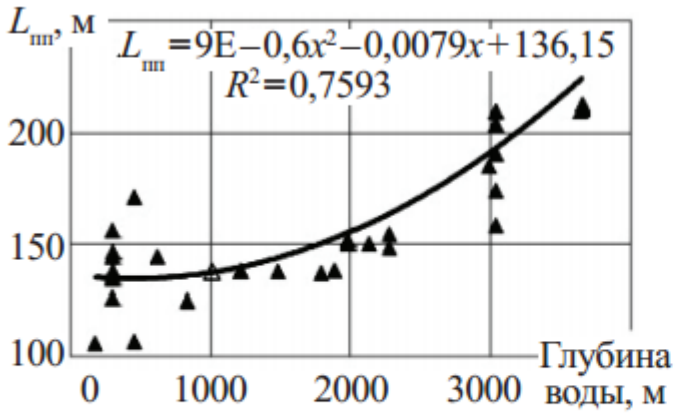




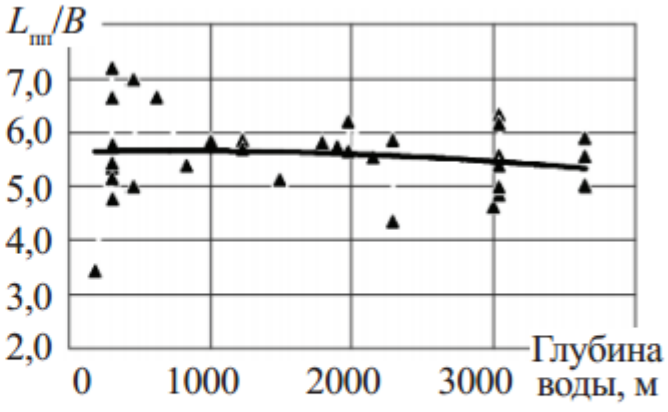
Новострой 2018-2020

Ship Name	Deadweight (DWT)	Built	Flag
ENSCO DS-14	66 334	2020	Marshall Islands
JURONG 11-1117	70 000	2020	Marshall Islands
SIRI	70 000	2019	Panama
JURONG ARACRUZ 71-3082	70 000	2019	Panama
ENSCO DS-13	66 344	2019	Marshall Islands
WEST DRACO	59 179	2019	Panama
WEST DORADO	59 200	2019	Panama
WEST LIBRA	65 000	2019	Bahamas
SONANGOL QUENGUELA	61 411	2019	Bahamas
JURONG 11-1116	70 000	2019	Marshall Islands
OCEAN RIG CRETE	60 150	2019	Marshall Islands
ARPOADOR	70 000	2018	Panama
JURONG ARACRUZ 71-3078	70 000	2018	Panama
ITAOCA	70 000	2018	Panama
CAMBURI	70 000	2018	Panama
PACIFIC ZONDA	60 000	2018	Liberia
GUARAPARI	70 000	2018	Panama
COBALT EXPLORER	58 000	2018	Bahamas
OCEAN RIG SANTORINI	60 150	2018	Marshall Islands
WEST AQUILA	65 000	2018	Unknown
SONANGOL LIBONGOS	61 304	2018	Bahamas

Зависимости и соотношения



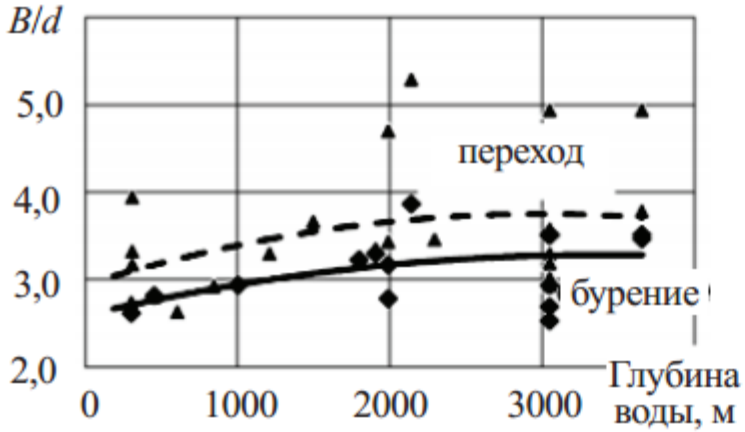
а)



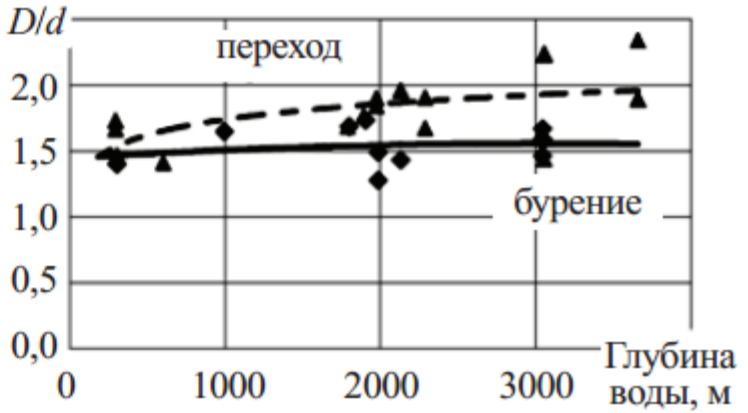
б)

Зависимости для бурового судна: *а* — длины $L_{пп}$, м; *б* — соотношения длины к ширине L/B от глубины воды при бурении

Зависимости



а)



б)

Зависимости для бурового судна: *а* — соотношения ширины к осадке *B*/*d*; *б* — соотношения высоты борта к осадке *D*/*d* от глубины воды при бурении

Зависимости

ДЛИНА ОТ ГЛУБИНЫ (3 ПОКОЛЕНИЕ)

$$L = 136,15 - 0,079h + 0,000009 * h^2$$

ВЫВОДЫ

В результате анализа конструкции и характеристик буровых судов разных поколений определены их особенности и тенденции развития, а именно:

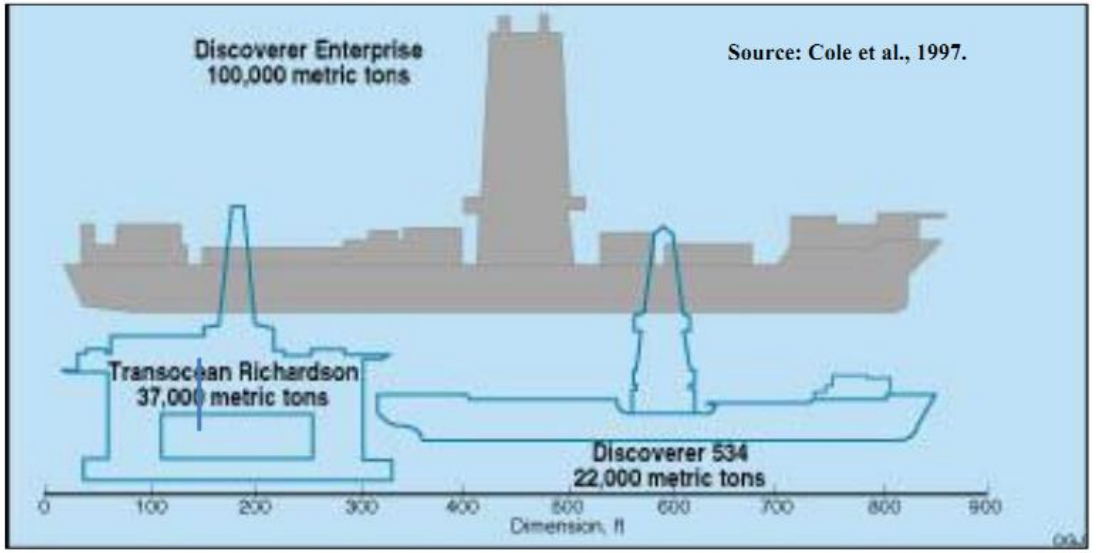
- использование буровых вышек с дублированием рабочих операций на полноразмерных буровых судах, что сокращает время буровых работ;
- использование буровых вышек новой коробчатой конструкции со сниженным положением центра тяжести, что позволяет уменьшить размеры бурового судна.

2. Получена аналитическая зависимость длины бурового судна от расчетной глубины воды на точке бурения. При применении зависимости на начальной стадии проектирования бурового судна необходимо учитывать конструктивные особенности буровой вышки, которую предполагается использовать: буровая вышка обычной конструкции или с дублированием операций, или коробчатой конструкции.

West Polaris

600 млн USD

Dual activity derrick on the 6th generation *West Polaris* drillship built in 2008.



Size comparison of *Discoverer Enterprise*, *Discoverer 534*, and *Transocean Richardson*, a 4th generation semi.

WEST POLARIS

Drillship, IMO: 9372535

WEST POLARIS Drillship, IMO: 9372535

Vessel Identification

Name:	West Polaris
IMO:	9372535
Flag:	Panama
MMSI:	356656000
Callsign:	3EOK6

Technical Data

Vessel type:	Drill Ship
Gross tonnage:	59,626 tons
Summer DWT:	61,439 tons

Additional Information

Class society:	American Bureau Of Shipping
Build year:	2008

ENSCO DS-10

Drillship, IMO: 9698666

ENSCO·DS-10·-·IMO·9698666¶

625°000·000·USD¤

Vessel Identification

Name: Ensco Ds 10
IMO: 9698666
Flag: Marshall Islands

Technical Data

Vessel type: Drill Ship
Gross tonnage: 60,100 tons
Summer DWT: 60,600 tons
Length: 230 m
Beam: 38 m
Draught: 11.5 m

Additional Information

Status: In Build
Class society: American Bureau Of Shipping

• Ship particulars

Information		Since
IMO number :	9698666	
Name of ship :	ENSCO DS-10	(since 01/09/2017)
Call sign :	V7FY8	
MMSI :	538005678	
Gross tonnage :	57335	(since 01/09/2017)
DWT :	40800	
Type of ship :	Drilling Ship	(since 01/09/2017)
Year of build :	2017	
Flag :	Marshall Islands	(since 01/09/2017)
Status of ship :	In Service/Commission	(since 28/09/2017)
Last update :	26/03/2019	

DEEPWATER PONTUS

Drillship, IMO: 9675183

DEEPWATER·PONTUS,·Drillship,·IMO:·9675183¶

625·000·000·USD¤

Vessel Identification

Name: Daewoo 3509
IMO: 9675183
Flag: Marshall Islands

Technical Data

Vessel type: Drill Ship
Gross tonnage: 41,150 tons
Summer DWT: 62,449 tons

Additional Information

Status: In Build
Class society: Det Norske Veritas

• Ship particulars

	Information	Since
IMO number :	9675183	
Name of ship :	DEEPWATER PONTUS	(since 01/07/2017)
Call sign :	V7BE5	
MMSI :	538005125	
Gross tonnage :	70095	(since 01/07/2017)
DWT :	62449	
Type of ship :	Drilling Ship	(since 01/07/2017)
Year of build :	2017	
Flag :	Marshall Islands	(since 01/07/2017)
Status of ship :	In Service/Commission	(since 10/07/2017)
Last update :	26/03/2019	

WEST POLARIS

Drillship, IMO: 9372535

WEST POLARIS, Drillship, IMO: 9372535

600 000 000 USD

Vessel Identification

Name: West Polaris
IMO: 9372535
Flag: Panama
MMSI: 356656000
Callsign: 3EOK6

Technical Data

Vessel type: Drill Ship
Gross tonnage: 59,626 tons
Summer DWT: 61,439 tons

Additional Information

Class society: American Bureau Of Shipping
Build year: 2008

- **Ship particulars**

Information		Since
IMO number :	9372535	
Name of ship :	WEST POLARIS	(since 01/07/2008)
Call sign :	3EOK6	
MMSI :	356656000	
Gross tonnage :	59626	(since 01/03/2009)
DWT :	61439	
Type of ship :	Drilling Ship	(since 01/07/2008)
Year of build :	2008	
Flag :	Panama	(since 01/07/2008)
Status of ship :	In Service/Commission	(since 15/07/2008)
Last update :	26/03/2019	

NOBLE GLOBETROTTER I

Drillship, IMO: 9540845

NOBLE GLOBETROTTER I, Drillship,
IMO: 9540845

585 000 000 USD

Vessel Identification

Name: Noble Globetrotter I
IMO: 9540845
Flag: Liberia
MMSI: 636014475
Callsign: A8UD3
Former name(s):
- Noble Globe Trotter (Until 2011 Sep)

Technical Data

Vessel type: Drill Ship
Gross tonnage: 34,213 tons
Summer DWT: 32,477 tons
Length: 189 m
Beam: 31 m
Draught: 9.8 m

Additional Information

Home port: Monrovia
Class society: American Bureau Of Shipping
Build year: 2011

• **Ship particulars**

Information		Since
IMO number :	9540845	
Name of ship :	NOBLE GLOBETROTTER I	(since 01/09/2011)
Call sign :	A8UD3	
MMSI :	636014475	
Gross tonnage :	35676	(since 01/12/2011)
DWT :	32477	
Type of ship :	Drilling Ship	(since 01/05/2011)
Year of build :	2011	
Flag :	Liberia	(since 01/05/2011)
Status of ship :	In Service/Commission	(since 18/05/2011)
Last update :	23/11/2018	

NORBE VIII

Drillship, IMO: 9562568

NORBE·VIII,·Drillship,·IMO:·9562568¶

800°000°000·USD¤

Vessel Identification

Name:	Norbe Vii
IMO:	9562568
Flag:	Bahamas
MMSI:	311028400
Callsign:	C6YB4

Technical Data

Vessel type:	Drill Ship
Gross tonnage:	67,021 tons
Summer DWT:	75,852 tons

Additional Information

Home port:	Nassau
Class society:	American Bureau Of Shipping
Build year:	2011

• **Ship particulars**

Information		Since
IMO number :	9540845	
Name of ship :	NOBLE GLOBETROTTER I	(since 01/09/2011)
Call sign :	A8UD3	
MMSI :	636014475	
Gross tonnage :	35676	(since 01/12/2011)
DWT :	32477	
Type of ship :	Drilling Ship	(since 01/05/2011)
Year of build :	2011	
Flag :	Liberia	(since 01/05/2011)
Status of ship :	In Service/Commission	(since 18/05/2011)
Last update :	23/11/2018	

¤

BOLETTE DOLPHIN

Drillship, IMO: 9625516

BOLETTE DOLPHIN, Drillship, IMO: 9625516

630 000 000 USD

Vessel Identification

Name:	Bolette Dolphin
IMO:	9625516
Flag:	Singapore
MMSI:	563347000
Callsign:	9VXD8

Technical Data

Vessel type:	Drill Ship
Gross tonnage:	51,437 tons
Summer DWT:	34,000 tons
Length:	229 m
Beam:	36 m
Draught:	16.5 m

Additional Information

Class society:	Det Norske Veritas
Build year:	2014

• Ship particulars

Information		Since
IMO number :	9625516	
Name of ship :	BOLETTE DOLPHIN	(since 01/02/2014)
Call sign :	9VXD8	
MMSI :	563347000	
Gross tonnage :	51437	(since 01/02/2014)
DWT :	34000	
Type of ship :	Drilling Ship	(since 01/02/2014)
Year of build :	2014	
Flag :	Singapore	(since 01/02/2014)
Status of ship :	In Service/Commission	(since 21/02/2014)
Last update :	26/03/2019	

MAERSK VIKING

Drillship, IMO: 9624146

MAERSK VIKING, Drillship, IMO: 9624146

650 000 000 USD

Vessel Identification

Name:	Maersk Viking
IMO:	9624146
Flag:	Singapore
MMSI:	566940000
Callsign:	S6LY3

Technical Data

Vessel type:	Drill Ship
Gross tonnage:	60,683 tons
Summer DWT:	59,468 tons
Length:	228 m
Beam:	42 m
Draught:	8.5 m

Additional Information

Class society:	American Bureau Of Shipping
Build year:	2014

• Ship particulars

Information		Since
IMO number :	9624146	
Name of ship :	MAERSK VIKING	(since 01/02/2014)
Call sign :	S6LY3	
MMSI :	566940000	
Gross tonnage :	60705	(since 01/02/2019)
DWT :	59468	
Type of ship :	Drilling Ship	(since 01/02/2014)
Year of build :	2014	
Flag :	Singapore	(since 01/02/2014)
Status of ship :	In Service/Commission	(since 24/02/2014)
Last update :	26/03/2019	

PACIFIC KHAMSIN

Drillship, IMO: 9623324

PACIFIC KHAMSIN, Drillship, IMO: 9623324

600 000 000 USD

Vessel Identification

Name:	Pacific Khamsin
IMO:	9623324
Flag:	Liberia
MMSI:	636015856
Callsign:	D5DE5

Technical Data

Vessel type:	Drill Ship
Gross tonnage:	60,936 tons
Summer DWT:	58,597 tons

Additional Information

Home port:	Monrovia
Class society:	Det Norske Veritas
Build year:	2013

• **Ship particulars**

Information		Since
IMO number :	9623324	
Name of ship :	PACIFIC KHAMSIN	(since 01/08/2013)
Call sign :	D5DE5	
MMSI :	636015856	
Gross tonnage :	60936	(since 01/08/2013)
DWT :	58597	
Type of ship :	Drilling Ship	(since 01/08/2013)
Year of build :	2013	
Flag :	Liberia	(since 01/08/2013)
Status of ship :	Laid-Up	(since 26/02/2019)
Last update :	26/03/2019	

VALENTIN SHASHIN

Drillship, IMO: 7907166 (3 поколение)

- **Ship particulars**

Information		Since
IMO number :	7907166	
Name of ship :	VALENTIN SHASHIN	(since 01/02/2018)
Call sign :	UAXW	
MMSI :	273414200	
Gross tonnage :	12923	(since 01/10/1998)
DWT :	7245	
Type of ship :	Drilling Ship	(during 1981)
Year of build :	1981	
Flag :	Russia	(since 01/02/2018)
Status of ship :	Laid-Up	(since 20/12/2018)
Last update :	30/04/2019	

Размерения

Наименование, идентификация	Цена, млн USD	Контракт	Дата стр	Символ класса	GT	Dw	Do	D	Lpp	B	H	T
WEST POLARIS, Drillship, IMO: 9372535	600 USD	2005	10.07.2008	.+A1, Drilling Unit, (E), +AMS, +ACCU, +DPS-3, NBL, SH-DLA	59 626	61 439	35 400	96 839	219,40	42,00	19,00	13,00
NOBLE GLOBETROTTER I, Drillship, IMO: 9540845	585 USD	2008	18.05.2011	.+A1, Drilling Unit, Ice Class IA, (E), +AMS, +ACCU, XDPS-3	34 114	37 034	18 966	56 000	173,56	32,20	18,90	12,00
NORBE VIII, Drillship, IMO: 9562568	800 USD	2008	15.03.2011	.+A1, Drilling Unit, (E), +AMS, +ACCU, +DPS-3, SH-DLA	67 821	75 852	26 948	102 800	230,00	42,00	19,00	13,03
BOLETTE DOLPHIN, Drillship, IMO: 9625516	630 USD	2011	21.02.2014	.1A1 Ship-shaped Drilling Unit HELDK CRANE E0 DYNPOS-AUTRO DRILL BIS	51 437	34 000	32 669	66 669	210,10	36,00	18,15	11,02
MAERSK VIKING, Drillship, IMO: 9624146	650 USD	2011	24.02.2014	.+A1, Drillship, HELIDK(SRF), (E), +AMS, +ACCU, +CDS, +DPS-3, NBL, SH-DLA, BWT+	60 000	61 000	35 000	96 000	219,40	42,00	19,00	12,00
PACIFIC KHAMSIN, Drillship, IMO: 9623324	600 USD	2010	31.08.2013	.+1A1 Ship-shaped Drilling Unit COMF-V(2) HELDK-S CRANE E0 ESV-DP[HIL] F-AM DYNPOS-AUTRO DRILL BIS	60 936	58 597	30 943	89 540	219,40	42,00	19,00	12,00

Глубина

№	Наименование, идентификация	Символ класса	GT	Max water	Drilling depth	N, квт	DP	Diesel electric propultion	Коп	Crane	Accommodation, Crew
1	WEST POLARIS, Drillship, IMO: 9372535	.+A1, Drilling Unit, (E), +AMS, +ACCU, +DPS-3, NBL, SH-DLA	59 626	1 430	3 048	27 000	DP3	6*4500	0,79	2*175	
2	NOBLE GLOBETROTTER I, Drillship, IMO: 9540845	.+A1, Drilling Unit, Ice Class IA, (E), +AMS, +ACCU, XDPS-3	34 114	4 572	12 190	36 800	DP3	3*3700+3*3700	0,81		180
3	NORBE VIII, Drillship, IMO: 9562568	.+A1, Drilling Unit, (E), +AMS, +ACCU, +DPS-3, SH-DLA	67 821	3 000	12 120	33 000	DP3		0,80	2*85+2*80	
4	BOLETTE DOLPHIN, Drillship, IMO: 9625516	.1A1 Ship-shaped Drilling Unit HELDK CRANE E0 DYNPOS-AUTRO DRILL BIS	51 437	3 000	12 200	45 600	DP3	6x fixed, diam 4.1m azimuths+6x azimuths	0,80	1*100+1*165+2*85	210
5	MAERSK VIKING, Drillship, IMO: 9624146	.+A1, Drillship, HELIDK(SRF), (E), +AMS, +ACCU, +CDS, +DPS-3, NBL, SH-DLA, BWT+	60 000	3 600	12 000	33 000	DP3		0,80		230
6	PACIFIC KHAMSIN, Drillship, IMO: 9623324	.+1A1 Ship-shaped Drilling Unit COMF-V(2) HELDK-S CRANE E0 ESV-DP[HIL] FAM DYNPOS-AUTRO DRILL BIS	60 936	3 657	12 186	48 000	DP3	6	0,79	4*85	200

ЦОФ

Drillship Design Class Properties and Newbuild Cost in 2011

Design	Number	Price (million $)	Water depth (ft)	Harsh	VDL (tons)	Displacement (tons)
DSME 10000	2	579	10,000	N	24,000	112,000
DSME 12000	6	590–782	10,000–12,000	N	24,000	112,000
GustoMSC P10000	11	590–630	10,000–12,000	N	20,000	75,000
GustoMSC PRD12,000	1	632	12,000	N	15,000	45,000
Samsung 10000	17	638–820	10,000–12,000	N	22,000	105,000
Samsung 12000	8	550–650	10,000–12,000	N	22,000	105,000
Stena/Samsung	1	1,150	7,500	Y	19,000	108,000
Huisman GT-10000	2	550–585	10,000	N	20,000	60,000

Source: Jefferies and Company, Inc., 2011; Industry press.

Новострой 2009

Newbuild and Replacement Cost and Selected Sample Statistics in 2009

		Newbuild			Replacement		
		Drillship	Semi	Jackup	Drillship	Semi	Jackup
Cost (million $)	Average	672	553	225	470	366	142
	Standard deviation	53	102	104	114	87	32
	Coefficient of variation	0.08	0.18	0.46	0.24	0.24	0.23
Water depth (ft)	Average	10,135	8,333	362	8,256	4,352	293
	Standard deviation	1,585	2,192	42	2,815	2,902	71
	Coefficient of variation	0.16	0.26	0.12	0.34	0.67	0.24
Age (yr)	Average				16	24	24
	Standard deviation				12.4	10.8	10.1
	Coefficient of variation				0.78	0.45	0.42

Note: Newbuild statistics based on 39 jackups, 35 semis and 37 drillships. Replacement statistics based on 282 jackups, 149 semis and 35 drillships.
Source: Jefferies and Company, Inc., 2009; Industry press.

2009 БС на (Harch=-50°C) = 2,2

Newbuild Costs by Country of Shipyard in Million U.S. Dollars in 2009

Rig type	Water depth (ft)	Harsh	India	US	China	Singapore	UAE	Korea	Italy	Average
Jackup	≤350	Y	240 (2)							240
		N	182 (1)	178 (5)		163 (5)	174 (9)			172
	350–400	Y				465 (1)				465
		N		223 (2)		212 (10)				213
	≥400	Y			607 (1)	473 (2)				530
		N								
Semi	≤2,500	Y			375 (3)					375
		N								
	2,500–7,500	Y						633 (1)		633
		N			574 (2)	480 (1)				542
	≥7,500	Y			557 (5)			623 (3)	615 (1)	585
		N			604 (9)	517 (7)	547 (3)			563
Drillship	7,500	N						683 (5)		683
		Y						1,500		1,500
	10,000							(1)		
		N						676 (23)		676
	12,000	N			616 (2)			700 (6)		681

Note: Sample sizes in parentheses.
Source: Jefferies and Company, Inc., 2009; Industry press.

Поправка на Арктику

Drillship Replacement Cost Models

Cost (million \$) = $\alpha_0 + \alpha_1$HARSH + α_2WD						
Model	α_0	α_1	α_2	R^2	Model p	SE
A	204.4 **	196**	0.031 **	0.65	**	67.2
B	0	234.7*	0.053**			94.0

Note (*): p is less than 0.05; (**): p is less than 0.01. Terms without asterisks are not significant.

Стоимость замещения

Модели стоимости замещения были определены с использованием экологического показателя (HARSH) и переменные глубины воды (WD, футы):

Стоимость замены = α0 + α1HARSH + α2WD=
204,4+196,0+0,031*7500 (232,5) = 632,9 млн USD

или

= 234,7+0,053*7500 = 632,2 млн USD

Год доставки был соотнесен с глубиной воды и исключен из модели.

Коэффициент водной глубины был положительным и на каждые 1000 футов увеличивает затраты на строительство на 31 млн. долларов. 102000$/м

Коэффициент арктического класса предполагает, что бурение в суровых условиях окружающей среды обходится на 196 миллионов долларов больше, чем в нормальной среде бурения.

Результаты показаны в таблице N.9.

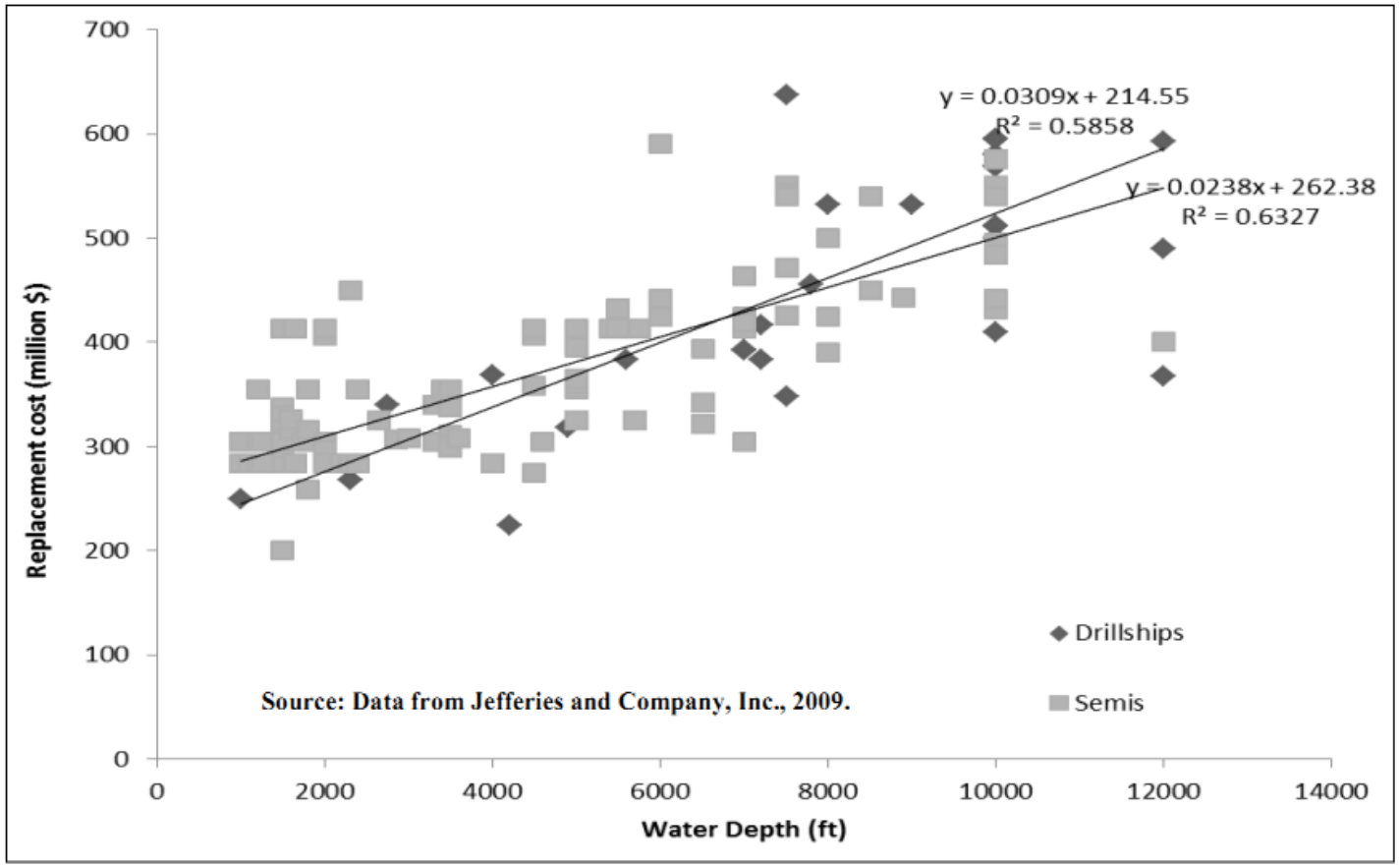
Table N.9.

Drillship Replacement Cost Models

Cost (million \$) = $\alpha_0 + \alpha_1 HARSH + \alpha_2 WD$						
Model	α_0	α_1	α_2	R^2	Model p	SE
A	204.4 **	196**	0.031 **	0.65	**	67.2
B	0	234.7*	0.053**			94.0

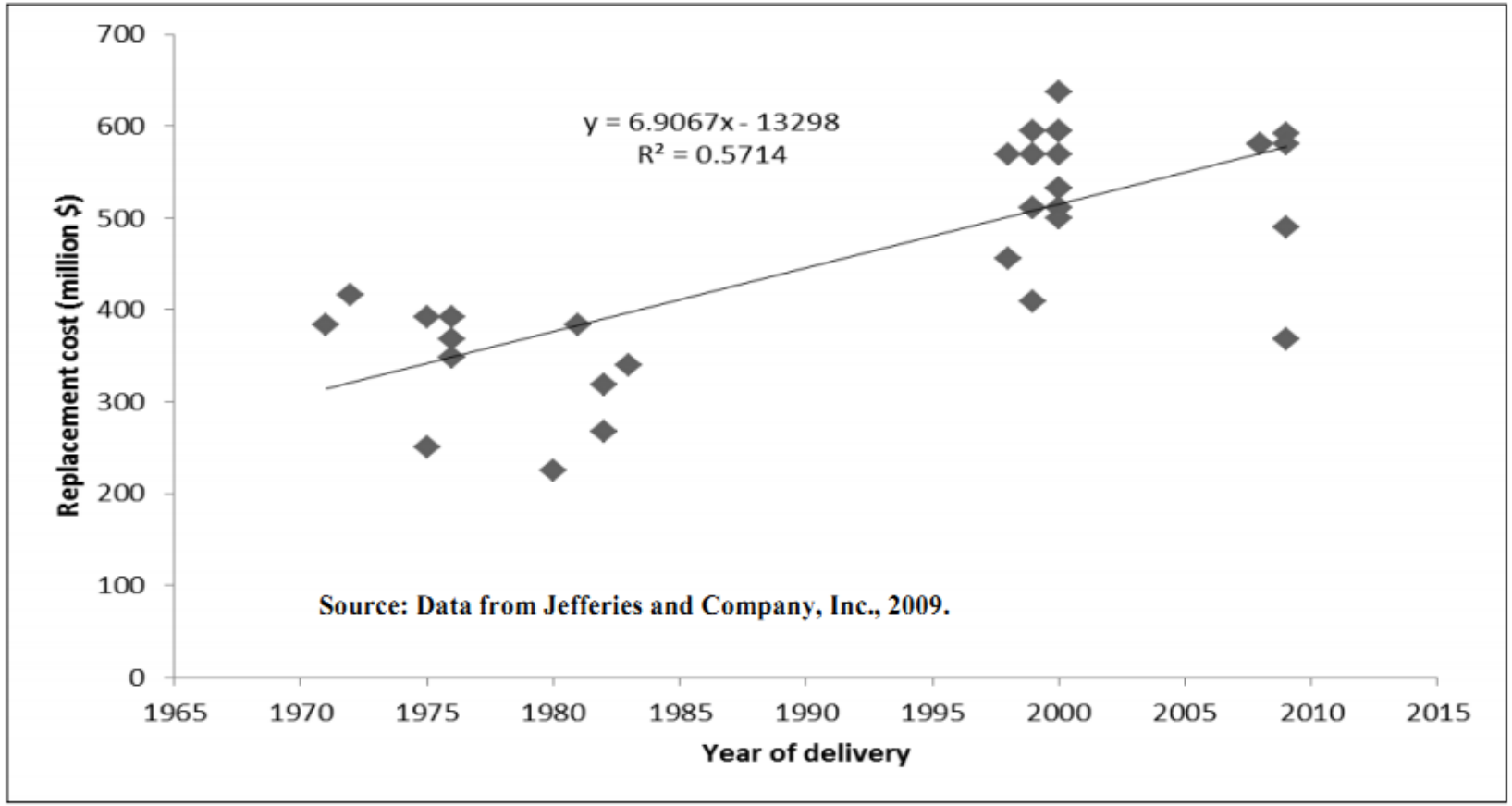
Note (*): p is less than 0.05; (**): p is less than 0.01. Terms without asterisks are not significant.

Зависимость от глубины



Replacement costs of semisubmersibles and drillships as a function of water depth.

Динамика цен



Replacement costs of drillships as a function of delivery year.

Динамика аренды

Average Dayrates by Region between 2000-2006 and 2006–2010

	Jackups			Floaters		
	2000–2006 ($/day)	2006–2010 ($/day)	Change	2000–2006 ($/day)	2006–2010 ($/day)	Change
West Africa	69,379	154,488	123%	163,534	374,130	129%
Southeast Asia	67,846	159,731	135%	92,229	278,060	201%
North Sea	86,927	180,657	108%	113,330	337,589	198%
Persian Gulf	58,126	106,541	83%			
US Gulf of Mexico	48,776	81,865	68%	122,530	361,995	195%

Source: Data from RigLogix, 2011.

Models of the Relationship between Utilization Rates and Dayrates, 2006–2010

	$\ln(DR_t) = \beta_0 + \beta_1 \ln U_x$					
		β_0	β_1			
	Region		x=12	x=18	x=24	R^2	Autoregressive order
Jackups	West Africa	12.2	1.2			0.62	none
	Southeast Asia	12.3	1.7			0.80	none
	North Sea	12.2		3.0		0.27	none
	Persian Gulf	12.2		3.9		0.35	none
	US GOM	11.7	1.0			0.77	first
	World	12.0	1.5			0.67	none
Floaters	West Africa	12.8			3.0	0.98	first
	Southeast Asia						NA
	North Sea	12.8		2.4		0.99	second
	US GOM	13.3		3.5		0.99	second
	World	13.4		3.9		0.99	second

Source: Data from RigLogix, 2011.

Глубина и ставка

Relationship between Maximum Drilling Depth and Dayrates, 2000–2010

	Drilling depth category (ft)	Dayrate ($/day)	Number in sample	Standard error ($/day)	Significantly different
Jackups	Less than 15,000	53,804	41	4,299	A
	15,000 to 20,000	58,421	1,866	786	A
	20,000 to 25,000	86,580	1,632	1,257	B
	25,000 to 30,000	98,508	975	1,919	C
	Greater than 30,000	170,375	100	7,707	D
Floaters	Less than 20,000	168,664	117	10,794	A
	20,000 to 25,000	176,570	1,099	3,885	A
	25,000 to 30,000	255,213	407	7,324	B
	30,000 to 35,000	264,882	212	9,020	B
	Greater than 35,000	409,058	35	23,104	C

Source: Data from RigLogix, 2011.

Инвестпроект

$$NPV = \sum_{t=0}^{t=25-A} \frac{Net\ cash\ flow_t}{(1+D)^t}.$$

The best model included terms for water depth, water depth squared, and hull length times hull width:

$$D = 49{,}316 - 3{,}233WD + 0.563WD^2 + 0.12LB,$$

where D is lightship displacement (tons), WD is water depth capability (feet), and L and B are the length and breadth of the rig (feet), respectively. Environmental class, designer and build year were not significant predictors.

Исходные

NPV Newbuild Model Variable Definitions

Variable	Unit	Description
C	$	Purchase price of the rig
T	yr	Maturity of debt
I	%/yr	Interest rate of debt
G	% of C	Upgrade cost
O_a	$/day	Daily operating costs when the rig is active
O_s	$/day	Daily operating costs when the rig is stacked
DR	$/day	Dayrate
t	yr	Life time of the rig
U_t	%	Utilization rate in year t
U_e	%	Average utilization rate over t
X	%/yr	Tax rate
D	%/yr	Discount rate

Optimistic and Expected Parameterizations of the Newbuilding Model

Variable	Unit	Expected	Optimistic
C	$ million	200	175
T	yr	7	15
I	%/yr	4.5	3
G	% of C	25	25
O_a	$/day	60,000	50,000
O_s	$/day	10,000	6,000
DR	$/day	Variable	Variable
t	yr	25	25
U_t	%	Variable	Variable
U_e	%	Variable	Variable
X	%/yr	15	10
D	%/yr	15	10

OPEX

Stacked and Active Operating Expenditures for Jackups and Floaters, 2010–2011

Rig type	Firm	Rig type	Status	OPEX ($/day)
Jackups	Transocean	High-spec	Operating	87,000
			Stacked	10,600
		Standard	Operating	46,000
			Stacked	6,900
	Hercules	Domestic	Operating	32,000
			Stacked	6,700
		International	Operating	47,000
			Stacked	8,000–12,000
	Diamond	High-spec	Operating	55,000
		Standard	Operating	45,000–
Floaters	Transocean	Ultra-deepwater	Operating	150,000
		Deepwater	Operating	137,000
			Stacked	26,000
		Midwater	Operating	104,000
			Stacked	10,000

Source: Firm annual reports.

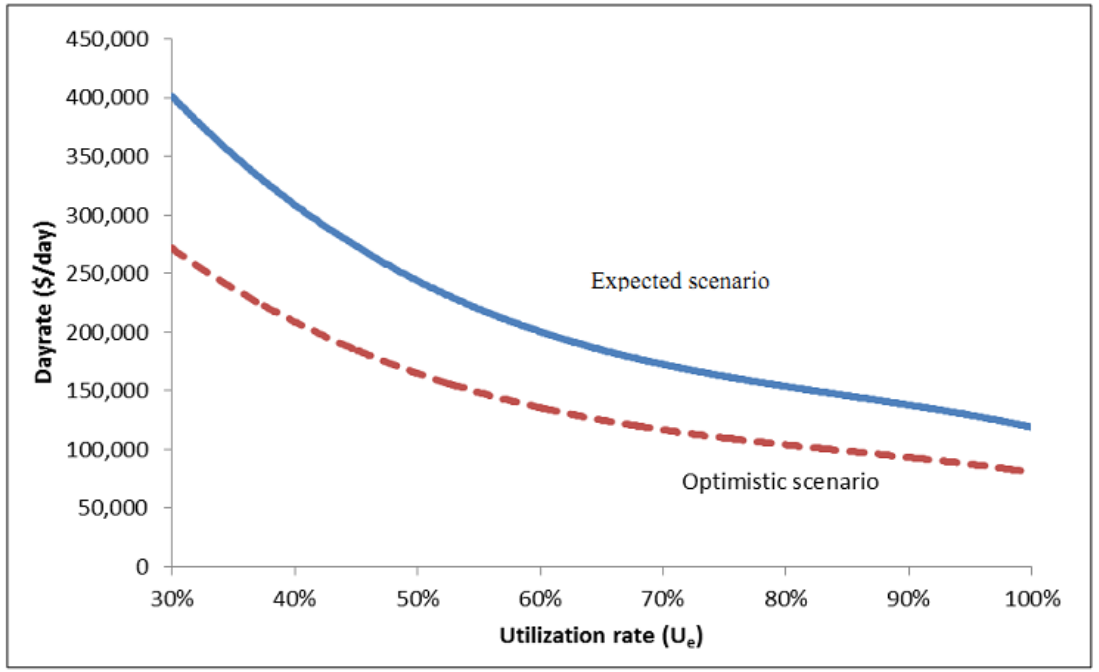
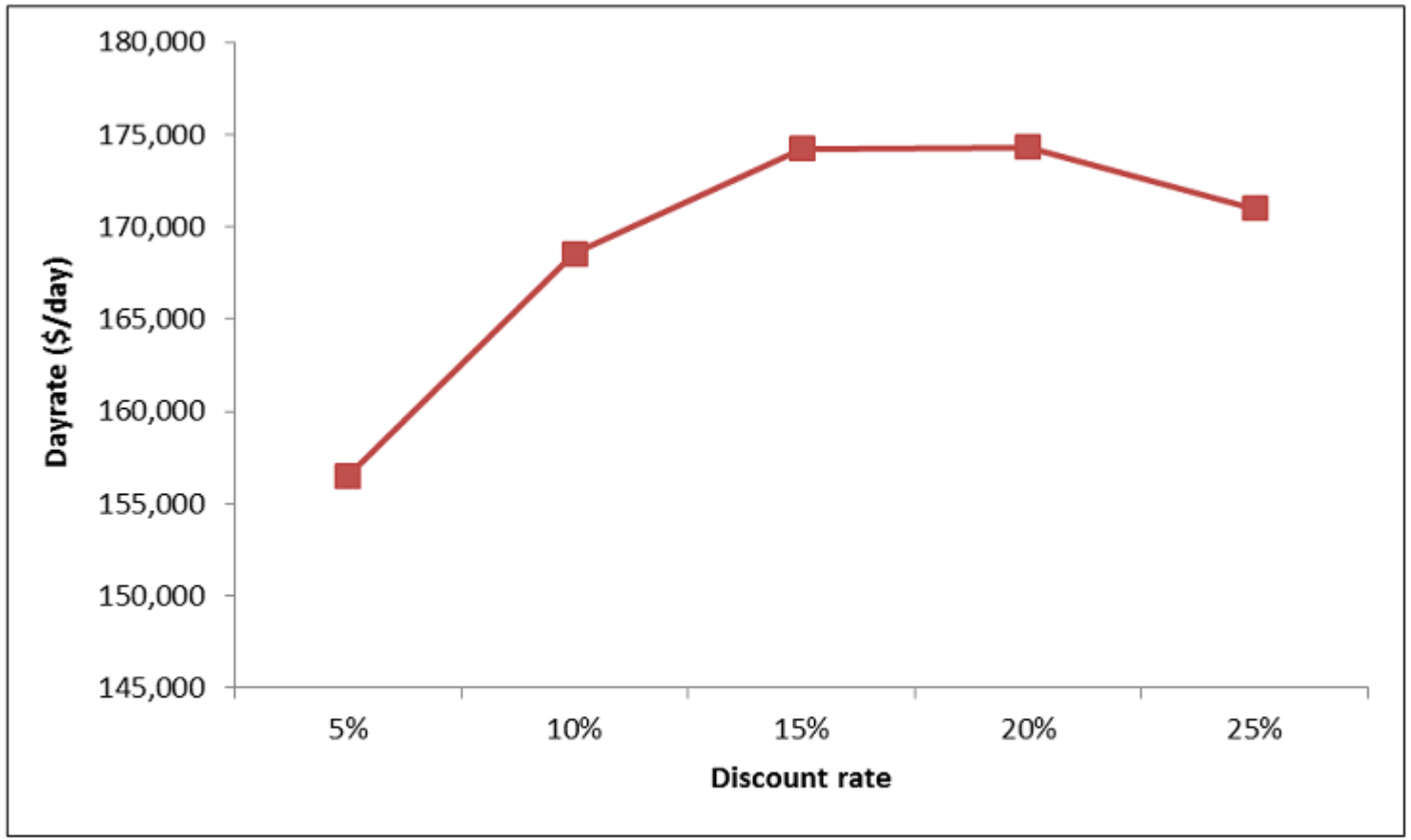


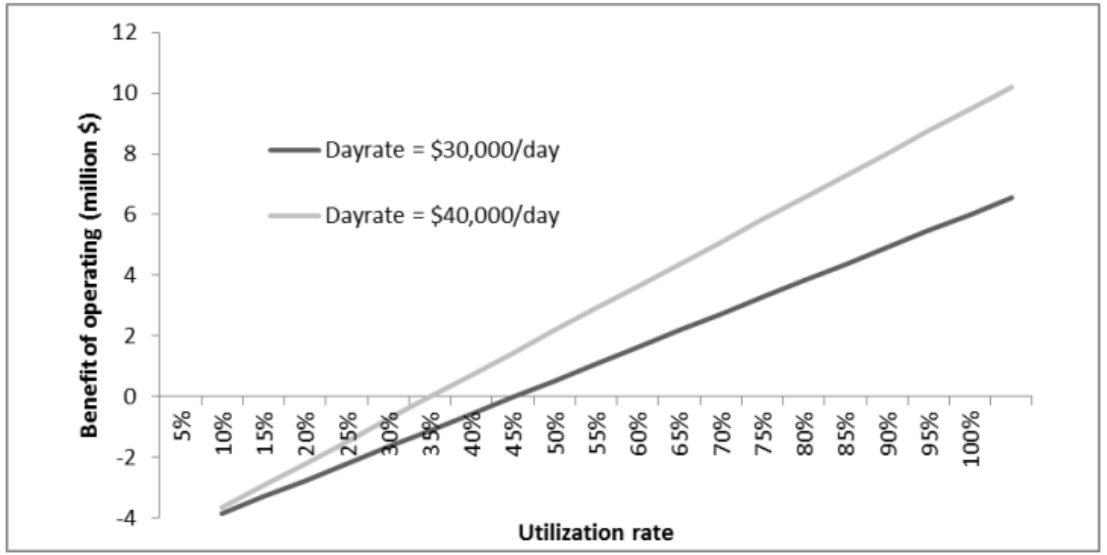
Figure F.3. NPV break-even points of utilization and dayrates under expected and optimistic assumptions for fixed utilization.

Сценарии по дисконтированию

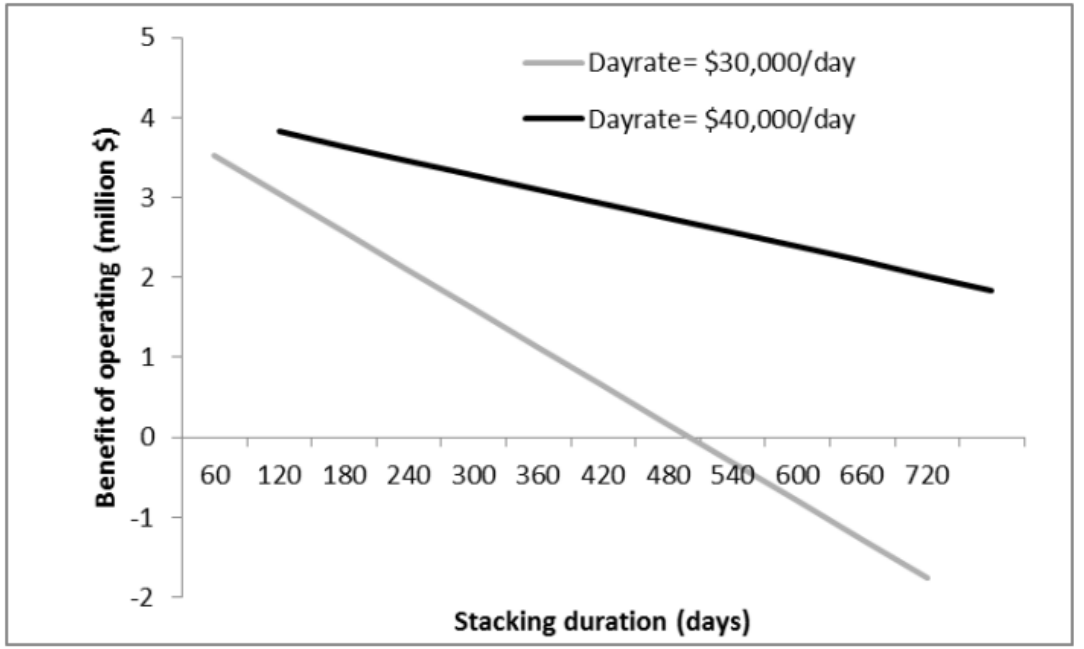


Sensitivity of the break-even dayrate fixed utilization model to changes in discount rate.

Загрузка



Effect of utilization on the benefit of the stacking versus operating.



Effect of stacking duration on the benefit of stacking versus operating.

Source: Jefferies and Company, Inc., 2011. Rig Name	Rig Design	Year Delivered/ Upgraded	Max. Water Depth	Current Location	Current Status	Operator	Net Asset Value	Asset Repl. Value	Cont. Exp.	Est. Current Dayrates
Semisubmersibles - 11										
West Eminence	CS-50 MkII (N) (DP)	2009	10,000'	Brazil	Drilling	Petrobras	$810.0	$640.0	7/15	$618,500
West Orion	F&G ExD (DP)	2010	10,000'	Brazil	Drilling	Petrobras	845.0	640.0	7/16	618,500
West Taurus (2)	F&G ExD (DP)	2008	10,000'	Brazil	Drilling	Petrobras	830.0	640.0	2/15	650,000
West Pegasus	Moss Maritime CS50 Mk II (DP)	2011	10,000'	Mexico	Drilling	PEMEX	630.0	640.0	8/16	465,000
West Aquarius	GVA 7500-N (DP)	2008	10,000'	Far East	Drilling	ExxonMobil	680.0	640.0	2/13	526,000
West Hercules (1)	GVA 7500-N (DP)	2008	10,000'	Far East	Drilling	Husky	660.0	640.0	5/12	495,000
West Alpha (3)	Dyvi Ultra Yatzy	1986	2,000'	North Sea	Drilling	Consortium	355.0	425.0	7/12	509,000
West Phoenix (3)	CS-50 MkII (N) (DP)	2008	10,000'	North Sea	Drilling	Total	650.0	640.0	1/12	553,000
West Venture (3)	Smedvig ME-5000 (DP)	2000	6,000'	North Sea	Drilling	StatoilHydro	510.0	610.0	7/15	444,000
West Capricorn	F&G ExD (DP)	2011	10,000'	US Gulf	Enroute	-	478.0	478.0	-	-
West Sirius	F&G ExD (DP)	2008	10,000'	US Gulf	Drilling	BP	660.0	640.0	7/14	474,000
Drillships - 4										
West Polaris (4)	Saipem 10000 (DP)	2008	10,000'	West Africa	Drilling	ExxonMobil	720.0	640.0	10/12	611,000
West Navigator (3)	MST III-CADS (DP)	2000	7,500'	North Sea	Drilling	Shell	635.0	636.8	6/14	618,000
West Capella	Saipem 10000 (DP)	2008	10,000'	West Africa	Drilling	Total	725.0	640.0	4/14	542,000
West Gemini	Saipem 10000 (DP)	2010	10,000'	West Africa	Drilling	Total	670.0	640.0	9/12	447,000

Sample net asset values of Seadrill floaters as calculated by Jefferies, 4Q 2011.

2003-2004

Компания-владелец и название БС	Проектант	Строитель, год постройки/модернизации	Глубина, м		Экипаж, чел.	Размеры корпуса, м, длина х ширина х высота борта	Переменная нагрузка, т	Емкости для размещения, м³					Высота и г/п буровой вышки, м х т	Кол-во и г/п кранов, ед. х т	Система позиционирования*	Район эксплуатации
			моря	бурения				Сухих компонентов и цемента	Бурового раствора	Топлива	Воды для бурового раствора	Питьевой воды				
Diamond Offshore Drilling															.	
1. «Ocean Clipper»	Wodeco/Mitsubishi	Mitsubishi Heavy Industries, Япония, 1977/1999	2300	7600	140	161,3x33,2x12,2	11600	560 + 550**	730	2280	700	510	55x500	3	.	Бразилия
Frontier Drilling ASA															.	
2. «Frontier Deepwater»»	IHC Gusto	Scots Shipbuilding, Шотландия, 1977	1500	7600	99	153,7x23,4x12,4	8370	520 + 490	390	2370	3650	750	49x600	1x25, 1x40	DP	Ю.В. Азия
3. «Frontier Discoverer»	Sonat Offshore	Avondale Shipyards, США, 1976	610	6100	120	158,3x23,5x12,4	9060	360 + 460	320	1310	1270	270	529x600	3x50	Я, **турель**, 8, **трос**, 70 мм, 760м, **цепь** 64мм, 910м, **якорь** 13,6т	Ю.В. Азия
4. «Frontier Duchess»	.	Taiwan Shipbuilding, Тайвань, 1976/2000	700	7600	110	147,7x25,2x13	11500	440 + 2180	710	1030	4970	600	49x450	3	Я, **трос** 73 мм, **якорь** 13,6 т	Ю.В. Азия
5. «Frontier Ice»	.	Hapag Lloyd Werft GmBH, Германия, 1999	610	6100	109	183x21,6x13,1	9800	570 + 220	600	3520	2760	230	49x370	2x22, 1x43	Я, **цепь** 70 мм, **якорь** 13,6 т	Ю.В. Азия
Gazprom																
6. «Gazprom-1»	Черноморсудопроект, Украина	Херсонский ССЗ, Украина, 1998	300	6500	109	159x25,3x11,7	.	.	.	.	.	.	.	.	.	.
Global SantaFe																
7. «GSF C.R.Luigs»	GlobalSantaFe	Harland&Wolff, Сев.Ирландия, 1999	2750	10700	150	231,5x36,0x18,3	26000	790	2100	7150	4770	1590	55x900	4	DPS-3	Зап. Африка
8. «GSF Jack Ryan»	- " -	- " -	2400	- " -	.	.	.	.	.	.	.	.	.	.	.	- " -
9. «Glomar Explorer»	- " -	Sun Shipbuilding, США, 1973/1997	2300	9100	140	188,8x35,4x15,5	23500	270 + 220	320	.	1590	160	.	3x45	Я, 8, **трос**, 32 мм, 1220, **якорь** 15 т	Индия
10. «Glomar Robert F.Balder»	- " -	Far East Levingston, Сингапур, 1983	840	7600	96	142,7x23,2x10,7	7420	690	570	2160	2940	180	58x590	3x30, 1x65	Я, 8, **трос**, 76 мм, 1680, **цепь** 460 м, **якорь** 12 т	Зап. Африка
The Great Shipping Co. Ltd.																
11. «Gesco Badrinath»	FELS	Far East Levingston, Сингапур, 1973	180	6100	80	106,1x21,3x6,7	6360	270 + 220	320	.	1600	150	.	2x45, 1x125	Я, 8, **трос**, 32 мм, **якорь** 15 т	Индия
Navis ASA	.															
12. «Belford Dolphin»	.	Samsung Yard, Корея, 2000	3000	11300	130	205,2x40,0x19,5	22680	1300 + 550	2500	5100	2900	580	43x1000	1x80, 2	.	Индия
Noble Corporation																
13. «Noble Leo Segerius»	Gusto Engineering	PSV Gusto, Голландия, 1983/2003	1500	6100	115	148,8x26,8x12,5	6900	550	670	2600	3170	680	56x450	3x64	DP Segeloc 903	Бразилия
14. «Noble Muravlenko»***	- " -	Rauma-Repola Oy. Финл., 1982/1996	1200	6100	116	- " -	6800	- " -	490	2540	1700	- " -	49x450	1x25, 1x40	- " -	- " -
15. «Noble Roger Eason»	.	Mitsubisi, Япония, 1977/1988	1800	6100	105	164,7x27,1x13,4	9820	600	560	5140	1020	450	- " -	2x38, 1x50	- " -	- " -
Northern Offshore																
16.«Discoverer 1»	.	Mitsui, Япония, 1977	460	6100	108	115,9x21,3x8,0	5410	270	250	1530	1650	130	52x500	.	Я, **турель**, 8, **якорь** 13,6 т	Мексик. залив
17. «Energy Searcher»	.	Hong Kong United Dockyard, Китай, 1982	600	7600	97	186,0x24,3x12,0	10000	470	400	1560	2500	690	49x570	3x45	Я, 8	Азия, Ср. море
18. «Northern Explorer II»	Donheiser Marine	Todd Schipyard, США, 1976	180	6100	102	115x30,5x8,8	5800	530 + 1360	610	1110	650	180	56x450	2x35, 1x80	Я, 8, **трос**	Ю.В. Азия
19. «Northern Explorer III»	Gusto	IHC Holland, Голландия, 1973/1998	230	6000	103	149,5x23,8x12,5	7220	1980	650	3700	990	280	49 м	2	Я, 8, **трос**, 70 мм, 880, **цепь**, 75 мм 230 м, **якорь** 6,5 т	Ю.В. Азия
Oil & Natural Gas Corp. Ltd.																
20. «Sagar Bhushan»	Hitachi Zosen	HSL, Индия, 1987	300	6100	108	145,9x24,5	10350	310	510	2150	1600	700	49x630	1x40, 1x60	Я, 8	Индия
21. «Sagar Vijay»	- " -	Hitachi Zosen, Япония,	.	.	.	.	.	220	350	- " -	- " -	790	.	.	.	Индия

2003-2004

		1985														
Petrolia Drilling ASA																
22. «Valentin Shashin»	**Gusto**	**Rauma-Repola, Финляндия, 1981/1998**	**1370**	**6100**	**115**	**149,9x28,8x12,7**	**7500**	**520**	**530**	**2210 т**	**1700 т**	**670 т**	**49x450**	**1x25, 1x40**		**Браз., Ю.Афр.**
Saipem Portugal CmercioMarítima																
23. «Saipem 10000»	Samsung	Samsung Heavy Industries, 2000	3000	9100	160	227x42	20000	610	1960	560	2890	1070	1130 т	2x85	DP Class 3	Западная Африка
24. «Schahin Cury Langer»	Gusto	Scott Lithgow, Шотландия, 1977	1500	5000	124	153,4x23,5x12,5	7500	280 + 650	480	2170	680	250	49x450	1x25, 1x40	DP	Бразилия
Seatankers Management Co. Ltd.																
25. «Kulluk» (ледостойкое)	Earl & Wright-Lavelin	Mitsui Engineering & Shipbuilding, Япония, 1983	180	6100	108	Ø 81,1x 29,9	7700	610	420	1600	670	320	49x630	3x70	**Я, трос**, 89 мм, 1150 м, **якоря** 6x15 т + 6x12 т	Море Бофорта
Smedvig/Offshore																
26. «West Navigator»	Statoil MST	Samsung Heavy Industries, Корея, 1998	2500	10000	120	253x42	14500	840	1200	3250	1800	1000	Сдвоенная 36x680	2x35, 2x70	DP Class 3	Западная Африка
Transocean																
27. «Deepwater Discovery»	Samsung R&B Falcon	Samsung Heavy Industries, Корея, 2000	3000	9100	140	228,4x42,1x8,9	22000	1190 + 1010	950	480	2800	1400	64x900	2x45, 3x80	DP	Нигерия
28. «Deepwater Expedition»	Rauma-Repola	Kherson/ Rauma-Repola 1997/1999	- " -	- " -	130	171,1x28,4x11,7	8500	550	1720	3050	1150	530	55x900	1x40, 3x80	DP	Бразилия
29. «Deepwater Millennium»	Samsung R&B Falcon/Conoco	Samsung Heavy Industries, Корея, 1999	- " -	- " -	- " -	221,4x42,1x20,1	22850	960 + 1010	810	4500	2800	1000	900 т	3x50, 1x80	DP Class 3	Мексик. залив
30. «Deepwater Pathfinger»	- " -	- " -	- " -	- " -	- " -	- " -	- " -	- " -	- " -	- " -	- " -	- " -	- " -	- " -	- " -	- " -
31. «Deepwater Frontier»	- " -	- " -	2300	10700	- " -	- " -	20000	.	.	.	.	.	.	.	DP	Бразилия
32. «Deepwater Navigator»	Earl & Wright	Mitsui Shipbuilding, Япония, 1977/1998	2200	7600	123	167,8x26,2x12,8	22850	510 + 330	730	2530	3020	480	56 м	2 + 1	DP903	Бразилия
33. «Deepwater Enterprise»	Transocean Offshore Enterprise	Astano, Испания 1999	3000	10700	200	254,7x38,1x18,9	20000	910	2450	7620	4180	800	Сдвоенная 69x1800	4x60	- " -	Мексик. залив
34. «Deepwater Deep Seas»	- " -	- " -	.	.	.	.	.	.	.	.	.	.	.	.	.	- " -
35. «Deepwater Spirit»	- " -	- " -	.	.	.	.	.	.	.	.	.	.	.	.	.	- " -
36. «Deepwater Seven Seas»	Sonat Offshore	Mitsui Shipbuilding, Япония, 1976/1997	2100	7600	140	162,9x26,5x9,8	8770	720	730	7320	1970	430	52x600	2x35, 2x50	Simrad ADP 703 MK1	Бразилия
37. «Deepwater 534»	- " -	- " -	- " -	- " -	128	- " -	7600	410	670	6040	- " -	- " -	- " -	- " -	- " -	Индия
38. «Joides Resolution»	Earl & Wright	Halifax Shipyard, Канада, 1978/1984	1800	9100	120	143,3x23,8x12,5	7720	230	320	4700	1590	160	45x590	1x35, 2x60	DP	Неограничен
39. «Peregrine I»	Gusto Engineering	Rauma-Repola, Финляндия, 1982/1996	1700	7600	116	152,5x23,8x12.5	7500	550 + 870	480	3000	1060	670	53x450	2x40	DP	Бразилия
40. «Peregrine III»	- " -	IHC Shiedam, 1976/1997	.	.	.	.	.	.	.	.	.	.	.	.	.	Мекс. зал.

* DP – динамическая, Я – якорная, 8 – количество якорно-швартовных линий, для троса/цепи указаны диаметр/калибр, мм и длины, м, для якоря – масса, т
** Здесь и далее, если указывается сумма, то первая цифра означает емкость бункеров, вторая – мешков (1 мешок – около 0,109 м^3)

2008-2011

Основные характеристики буровых судов построенных в период 2008-2010 гг и ожидаемых к вводу в эксплуатацию в период 2011-2013 гг.
(перевод не метрических величин в метрические и округления выполнены с инженерной точностью)

Проект	Количество построенных/строящихся судов	Годы постройки	Глубина, м		Экипаж, чел.	Размеры корпуса, м, длина х ширина х высота борта	Переменная нагрузка, т	Емкости для размещения, м³					Высота и г/п буровой вышки, м х т	Кол-во и г/п кранов, ед. х т	Система позиционирования
			моря	бурения				Сухих компонентов и цемента	Бурового раствора	Топлива	Воды для бурового раствора	Питьевой воды			
Samsung/Saipem 10000-12000	12/15	2008-2010/2011-2012	3000-3660	12200	180-210	228x42x19	20000	ок.500+500	ок.2000	5300-8000	ок.2800	ок.1300	60x900 или Сдвоенная, 2x60x900	4x85	Динамическая, DP -3
Transocean Offshore enhanced Enterprise-class	5/-	2009-2010	2300-3660	12200	200	255x38x19	20000	450+450	2500	5700	3200	800	2x70x900	4x100	DP
Gusto P10000	-/3	-/2011-2012	3000-3660	12200	210	229,6x36x17,8	.	450+450	3400	7500	2700	1400	Сдвоенная, 900т и 675т	1x160, 1x100, 2x85, 1x20	DP -3
MPF 10000	-/1	-/2012	3000	10700	180	291,4x50x27	25000	3000	1860	6350	4520	2000	64x900	4x85	DP -3
Huisman Globetrotter	-/2	-/2011, 2013	3000	12200	180	189x32	20000	.	.	.	.	.	2x1000	.	
DSME Ultra Deepwater Drillship	1/2	2010/2011-2012	3000-3660	12200	180	238x42x19	20000	2000	3200	6500	2400	1300	64x900	3x85, 1x50	DP -3
DrillMAX	3/-	2008-2009	2300	10700	180	228x42x19	20000	1238+420	3300	11500	4000	2000	Сдвоенная, 900т+545т	3x85	DP -3
DrillMAX ICE	-/1	-/2011	2300	10700	180	228x42x19	17500	1238+420	3300	11500	4000	2000	Сдвоенная, 900т+545т	4x85	DP -3
Norbe	-/4	-/2011	3000	10700	.	.	.	.	.	.	.	.	.	.	DP -3
Bully PRD12000	1/1	2010-2011	3660	12200	150	161,1x32x15,1	.	.	.	.	.	.	.	.	DP -3
Итого судов	22/29														

Samsung HI Co Ltd

Continuity in Offshore Biz over the last 8 years

Prelude FLNG
(2011~2017, delivered)

Ichthys CPF
(2012~2017, delivered)

Martin Linge
(2012~2018, delivered)

Egina FPSO
(2013~2018, delivered)

Petronas FLNG
(2014~2020)

Appomattox
(2015~2017, delivered)

Johan Sverdrup P/F(2 units)
(2015~2018, delivered)

Mad Dog Ⅱ FPU
(2017~2020)

ENI FLNG
(2017~2023)

Under Construction

Благодарю за внимание!

Некоторые допущения и оговорки:

- Все выводы первого приближения
- Все суда имеют DP3 и двойной корпус
- Loa/Lp =1,11
- Экипаж 180-220 чел
- Все СЭУ дизель-электрические → ВРК и азиподы 5-6
- Коп = 0,78-0,81
- Зависимость от глубины моря 1500 м и бурения после 12000 – экспоненциальная
- Удельная стоимость по поколениям 15-35 $/кгDo

Вывод:

При поиске оптимального решения проектант столкнется с проблемой соотношения размера судна и веса верхнего строения

Стоимость судна ориентировочно 700 млн $ (50000 $/м бурения)