FRIGSTAD ENGINEERING

Frigstad Engineering

The Frigstad Engineering Group has provided rig designs and engineering services to the offshore drilling and production industry since 1981. With offices in Cyprus, Singapore, Norway and Brazil we have established strong ties with major offshore shipyards and suppliers of drilling equipment and we are able to serve our clients world-wide. Frigstad Engineering operates with a deeply embedded philosophy of designing and modifying rigs according to the operational needs of the professionals who work on them and with the expectations of oil companies and investors in mind. Particular emphasis is placed upon equipment selection and arrangement which offers superior safety and operational performance while maintaining the highest levels of environmental protection and cost-efficiency.

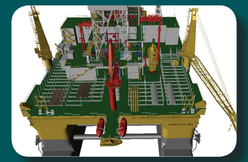
The Frigstad D80 DP3-SDR-PSM design

Frigstad D80 is a purpose-designed semi-submersible drilling unit developed by Frigstad Engineering. D80 is a proprietary design with superior cost efficiency and performance - tailor made for efficient drilling of deepwater exploration and development wells.

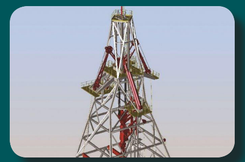
Frigstad D80 MW DP3 - Key Features

- 9,000 ft water depth capacity
- 50,000 ft drilling depth capacity
- Vertical racking capacity 7,200 ft riser inn 100 ft stands and 40,000 ft drill pipe in quad. Stands
- Variable deck load capacity of more than 5,000 tones
- 2 x 100 tonnes platform cranes and large deck space for handling and storage of a number of fully assembled X-mas trees
- Large moonpool opening of 39 x 8 m
- Powerful DP3 system with 8 thrusters that enables the rig to stay on location even in severe weather conditions and transit by up to 8 knots.
- Anchor winches for hook-up to pre-set mooring system

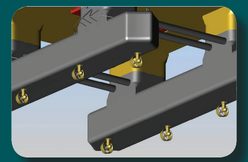
160 persons



Open & unrestricted deck space



Crown mounted compensator



4,2 MW azimuth thrusters

Frigstad D80™ Outline specification D80 DP3 SDR-PSM

REGULATIONS			
SOLAS 2011, MARPOL 1973/78, IMO MODU CODE 2009, all with latest amendments			
CLASSIFICATION			
DNV 1A1 COLUMN STABILIZED DRILLING UNIT , DYNPOS AUTRO (DP3), POSMOR-ATA, CRANE, HELDK-SH, ECO, F-AM, DRILL and BMW-T			
ENVIROMENTAL OPERATING LIMITS			
Maximum wind velocity	70 knots / 100 knots	Air gap (Operating/Survival)	12.1 /15.6 m (39.7/51.2ft)
Wave height Hs	15,8/29,4 m (51,8/96,5 ft)		
PRINCIPAL PARTICULARS			
Length of pontoons	105 m (344,5 ft)	Displacement (operational)	45,038 t (49,646 st)
Width & length, pipe rack deck	76 x 73 m (249,3 x 239.5 ft)	Displacement (survival)	41,467 t (45,710 st)
Height to pipe rack deck (ABL)	39,6 m (129,9 ft)	Displacement (transit)	35,523 t (39,157 st)
Draft (operational)	19 m (62.3 ft)	Water depth (max)	9,000 ft (2,743 m)
Draft (survival)	15.5 m (50.9 ft)	Drilling depth (max)	50,000 ft (15,240 m)
STORAGE CAPACITIES			
Bulk mud	327 m³ (11,550 ft³)	Drill water, pontoon	3,325 m³ (20,914 bbls)
Bulk cement	327 m³ (11,550 ft³)	Potable water, pontoon	965 m³ (6,070 bbls)
Sack material, upper hull	8,000 sacks	Open pipe rack deck area	3,200 m2 (34,445 ft²)
Base oil for mud, pontoon	887 m³ (5,579 bbls)	Variable deck load (max oper.)	6,319 t (6,966 st)
Liquid mud / brine, upper hull	1,301 m³ (8,183 bbls)*	Variable deck load (max transit)	5,000 t (5,512 st), excl. anchors and mooring wire
Liquid mud / brine, pontoon	2,772 m³ (17,435 bbls)*	Payload (max operational)	12,390 t (13,658 st)
Diesel fuel oil (MDD), pontoon	4,747 m³ (29,858 bbls)*	* denote 90% capabilities	
ACCOMODATION / OFFICE			
Total capacity of 160 persons in 1 and 2 person cabins with private sleeping area. Twelve (12) office space and service facilities.			
MATERIAL HANDLING			
Deck cranes	Two (2) 100 t revolving deck cranes with 55 m boom. Capable of handling any under-water thruster change out. One (1) 12 t knuckle boom tubular handling crane.		
Cargo handling and logistics	Two (2) 6 t cargo elevators & several forklifts to service storage and machinery areas on pipe rack deck and inside the deck box and pipe rack deck including: engine rooms, mud pump room, cement unit room, workshops, sack storage, warehouse, galley stores etc.		
MARINE SYSTEMS			
Main power / emergency power	Eight (8) diesel engines, each with 4,800 kW capacity. Total installed power is approx. 38,400 BMW. Two (2) of the main generators are assigned as both main and emergency generator. Each shall be located in separate compartment.		
Dynamic positioning	DP Class 3. Eight (8) MW azimuth thrusters.		
Power distribution	AC power propulsion and DP with MP+AW drives and VM system. 11 kV AC alternators.		
Mooring system	Four (4) double drum winches with eight (8) fairleads for connection to pre-set system. Each with a stowage capacity for 400 m wire, diameter 89 mm.		
DRILLING SYSTEMS			
Drilling rig	Single quad. Derrick with 1,000 st capacity, set-back for 40,000 ft drill string/casing in 124-135 ft stands, equipped with offline stand building capacity.		
Rotary table	One (1) 60.5" rotary with independent drive.		
Top drives	One (1) top drive, with 1,000 st capacity.		
Riser tensioners	Six (6) in-line hydraulic cylinder riser tensioners mounted on skid system (DATS). 3,200,000 lbs total net tensioning capacity (6 engaged).		
BOP and riser	Two (2) 18,75" x 10,000 psi annular preventors. Six (6) 18,75" x 15,000 psi Ram preventors. 7,200 ft of 40 ft, 21" riser joints with c&k, booster and hydraulic lines. Storage on piperack deck for 1,800 ft of riser.		
Drill string	5 7/8" drill strings with subs, drill collars, heavy weight drill pipes.		
DRILLING FLUID SYSTEMS			
Mud pumps and treatment system	Four (4) Main Mud Pumps, Triplex, 2,200 HP, 7,500 psi wp. Four (4) linear motion shale shakers, where two (2) equipped as mud cleaners (desilter and desander), one (1) Gumbo Screen, two (2) degasser units and two (2) 60 bbls trip tank		
OTHER			
Helicopter deck capacity	Designed for MI8 and EH 101 helicopters.		
Life-saving equipment	Four (4) lifeboats with total capacity of 320 persons. Fourteen (14) inflatable life rafts with capacity of 25 persons each. One (1) fast rescue boat.		

Note: The details included in this specification are subject to change without prior notification doc no 1000-FEL-SA10-0003 - rev 0

FRIGSTAD ENGINEERING LTD
Airanti Court, 2nd floor, Offive 202
50 Ayias Zonis Street
Limassol CY-3090
Cyprus
+357 2534 4245
fe@frigstad.com

FRIGSTAD ENGINEERING (SINGAPORE) PTE LTD
9 Temasek Boulevard #44-02
Suntec Tower 2
038989 Singapore
+65 6349 0082
fe@frigstad.com

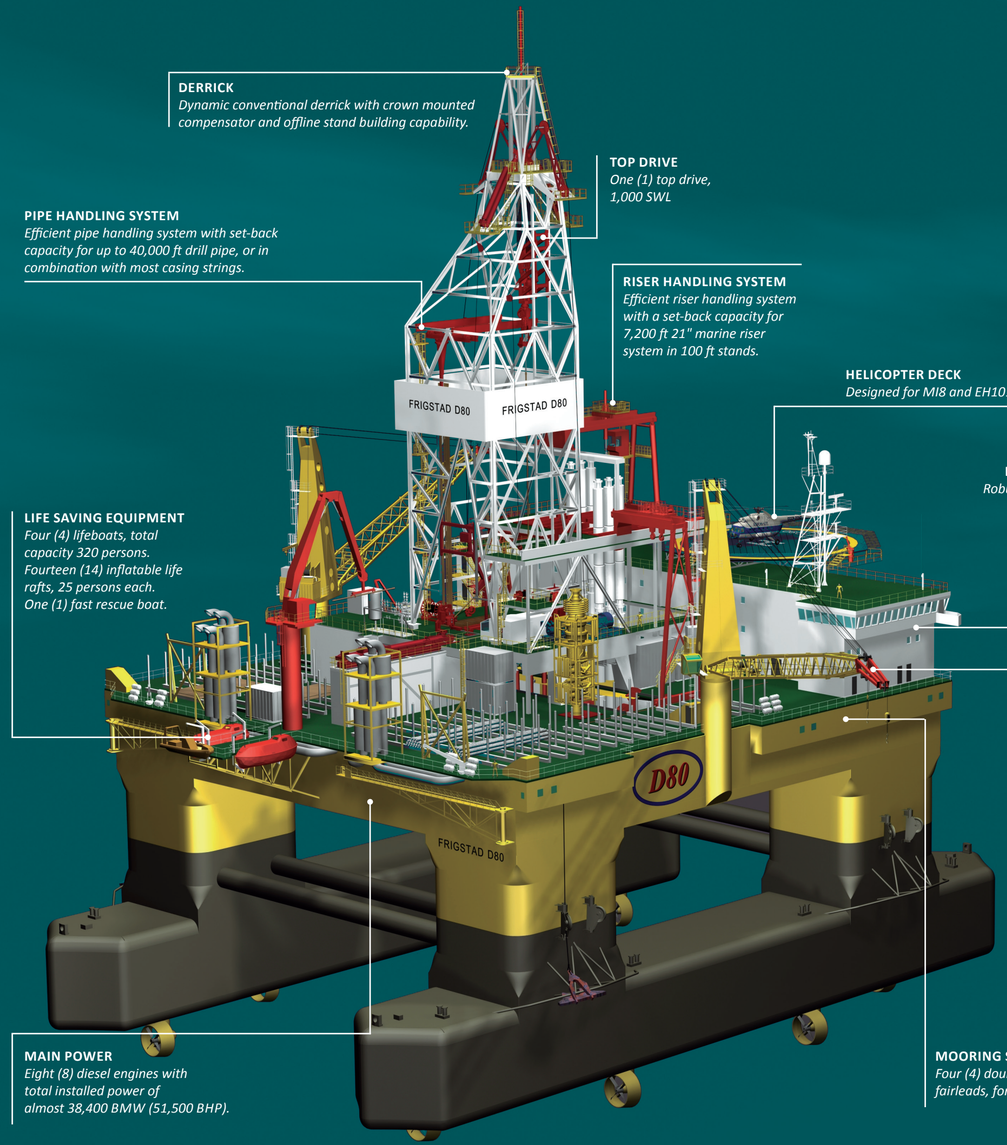
FRIGSTAD ENGINEERING (NORWAY) AS
Holbergsgate 11
4614 Kristiansand
Norway
+47 3870 8340
fe@frigstad.com

FRIGSTAD ENGINEERING, BRAZIL OFFICE
Praia de Botafogo 501, Sala 202A
Rio de Janeiro 22250-040
Brasil
+55 21 25 46 99 79
fe@frigstad.com

FRIGSTAD ENGINEERING

Frigstad D80™ DP3

Tailor made solution for efficient deepwater exploration & development



DERRICK
Dynamic conventional derrick with crown mounted compensator and offline stand building capability.

TOP DRIVE
One (1) top drive, 1,000 SWL

PIPE HANDLING SYSTEM
Efficient pipe handling system with set-back capacity for up to 40,000 ft drill pipe, or in combination with most casing strings.

RISER HANDLING SYSTEM
Efficient riser handling system with a set-back capacity for 7,200 ft 21" marine riser system in 100 ft stands.

HELICOPTER DECK
Designed for MI8 and EH101.

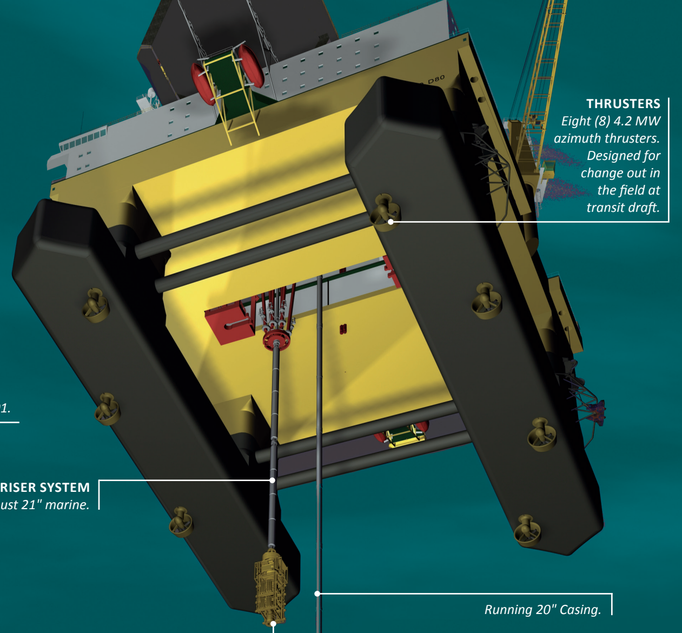
LIFE SAVING EQUIPMENT
Four (4) lifeboats, total capacity 320 persons.
Fourteen (14) inflatable life rafts, 25 persons each.
One (1) fast rescue boat.

ACCOMODATION/OFFICES
Total capacity of 160 persons in 1 and 2 person cabins with private sleeping area. Ample office space and service facilities.

DECK CRANES
Two (2) 100 t main deck revolving cranes with 55 m boom, capable of handling any under water thruster change out.

MAIN POWER
Eight (8) diesel engines with total installed power of almost 38,400 BMW (51,500 BHP).

MOORING SYSTEM
Four (4) double drum winches with eight (8) fairleads, for connecting to pre-set system.



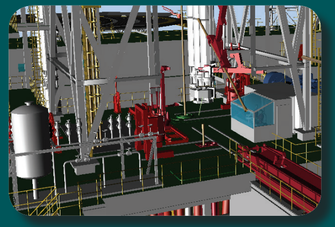
THRUSTERS
Eight (8) 4.2 MW azimuth thrusters. Designed for change out in the field at transit draft.

RISER SYSTEM
Robust 21" marine.

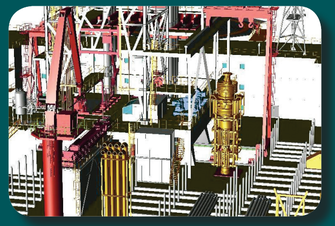
Running 20" Casing.

SIMULTANEOUS OPERATIONS
BOP & riser hung off In DATS frame.

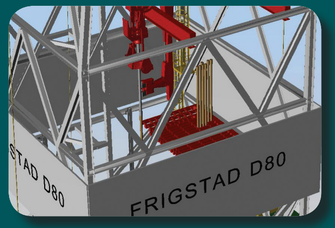
PIPE HANDLING



Off-line strand building capability

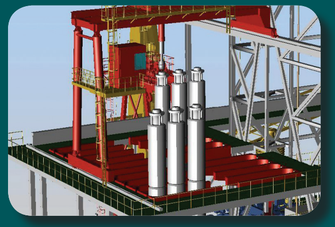


Horizontal pipe & tubular handling
using a knuckle crane & catwalk machine



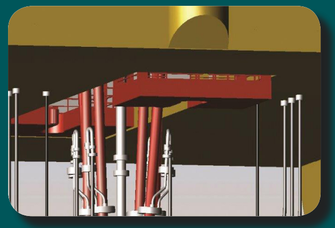
Vertical pipe handling using a bridge racking crane

BOP & RISER HANDLING



Vertical riser storage & handling

400 t BOP handling gantry crane



Separate transporters for BOP & X-mas trees