



HAKURYU-5



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HAKURYU-5, a twin lower hull, column stabilized, propulsion - assisted semi-submersible drilling unit was designed through the engineering collaboration of Japan Drilling Co. and Mitsubishi Heavy Industries and commissioned in July 1977 at Mitsubishi Hiroshima Shipyard.

HAKURYU-5 is designed to perform drilling operations in maximum 1,640 ft. of water with 3,500 m.tons of deck load
In 1985, HAKURYU-5 was modified to meet the latest

requirements for the construction and equipment of MODU (I.M.O. MODU CODE A414)

In 1998, VARCO TDS-4S was installed.

In 2001, portside crane was upgraded to have 40 m.tons loading capacity at 18 m radius for handling subsea trees.

In 2003, base oil storage and the third mud pump were installed and accommodation was modified for having 110 people.

In 2008, lower hull was upgraded by installing with deep dish.

DESIGN:

Mitsubishi MD 501, propulsion assisted semi-submersible drilling rig.

MAIN DIMENSIONS:

Length overall.....	348'
Breadth overall (without anchor rack).....	220'
Main deck elevation.....	123'
Operational draft.....	74'
Column diameter (without sponson).....	4 x 30' (bow and stern) 4 x 23' (midship)
Weight (Light ship condition).....	16,030 tons
Displacement (Drilling condition).....	32,593 tons
Helicopter deck.....	Capable for SIKORSKY S-61N

DESIGN CRITERIA:

Designed cruising speed.....	3.5 knots (calm sea)
Max. operating water depth.....	1,640'
Max. drilling depth.....	30,000'

STORAGE CAPACITIES:

Fuel oil.....	5,710 bbls
Drill water.....	12,130 bbls
Potable water.....	3,510 bbls
Active mud.....	1,400 bbls
Reserve mud.....	3,145 bbls
Base oil storage.....	2,580 bbls
Bulk mud.....	9,956 cu.ft.
Bulk cement.....	9,956 cu.ft.
Sack storage.....	(Area) 17,657 cu.ft.

MAX. GROSS VARIABLE LOAD (ON DECK LOAD):

Drilling condition.....	5,850 tons (3,500 tons)
Towing condition.....	3,550 tons (2,800 tons)

CLASS:

American Bureau of Shipping; ❖AI M Column Stabilized Drilling Unit and ❖AMS Self Propelled Drilling Unit.

I.M.O. MODU Code A414 for the construction and equipment of MODU.

ACCOMMODATION:

Air conditioned three-storied cabins for 110 persons.

POWER EQUIPMENT:

Main Generator	4sets	2,000 KVA, AC 600 V, 60 Hz each driven by 2,100 PS 720 rpm engine.
Emergency generator	1 set	500 KVA, AC 450 V, 60 Hz driven by 600 PS, 900 rpm engine.

PROPULSION EQUIPMENT:

2 sets	8 ft. dia. Mitsubishi-Kort nozzles and rudders each driven by two 1,000 KW DC motors.
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MOORING SYSTEM:

Anchors	8 sets	12 tonnes Bruce FFMS MK 4
Anchor Chains	8 sets	ABS RQ3S, 5,400 ft. usable length of 3" chain
Anchor Windlasses	4 sets	Double drum Pulling capacity 210 tons x 30 ft/min, with automatic hydraulic brake for speed controlling. Brake capacity 450 tons.

DRILLING EQUIPMENT:

Drawworks	1 set	Continental-Emsco, Model C-3 type II, driven by three 560 KW DC motor with sand line drum and ELMAGCO 7838 brake.
Derrick	1set	Continental-Emsco dynamic design 160' x 40' x 40' load capacity 1,333,000 lbs.
Travelling Block	1 set	Continental-Emsco, type RA 60-6 capacity 650 tons.
Top Drive	1 set	VARCO TDS-4S, 45,500 ft-lbs continuous torque at 115 rpm, 13,800 ft-lbs at 270 rpm, GE752 high torque DC motor, 1,100 HP with model PH-85 pipe handler.
Iron Roughneck	1 set	NOV ST-120.
Rotary Table	1 set	Continental-Emsco, type T-4950 driven by one 600 KW DC motor.
Mud pump	3 sets	Continental-Emsco, FB-1,600 triplex mud pumps, each driven by two 560KW DC motors.
Cementing unit (lease item)	1 set	Schlumberger CPS-361.
Heave Compensator	1set	NL Shaffer 500,000 lbs with 18' stroke with Airlock System.
Riser Pipe tensioner	12 sets	NL Shaffer 80,000 lbs with 50' stroke.
Guide line tensioner	4sets	NL Shaffer 16,000 lbs with 40' stroke.
Messenger line tensioner	4 sets	NL Shaffer 16,000 lbs with 40' stroke.
BOP Stack	1 set	Vetco HY Diverter
	1 set	Two NL Shaffer 18-3/4" x 10,000 psi. SL double type & Two NL Shaffer 18-3/4" x 5,000 psi spherical type with Two Vetco 18-3/4" x 10,000 psi H-4 Connector.
BOP Control System	1set	Koomey control system Model 26300-3S with accumulator unit 3,000 psi WP, Hydraulic pump : T360-50 x 2, AC-62 x2, and master/mini control panel.
Riser pipe	34 pcs	VETCO, 21" OD x 50' length x 5/8" wall thickness integral type with 6E connector, choke and kill lines (2.625" x 10,000 psi)
Drill Pipe	300 jts	5-1/2" x 21.9#/ft S-135 Drill Pipe
	300 jts	5-1/2" x 21.9#/ft G-105 Drill Pipe
MUD TREATMENT SYSTEM:		
Shale Shakers	3 sets	NOV VSM 300
Mud Cleaner	1 set	NOV VSM 300 Shale Shaker with Mud Cleaner Header Unit
Degasser	1 set	DERRICK Vac-Flo, Model-1000
AUXILIARY EQUIPMENT:		
Deck crane	2 sets	Sumitomo Link Belt S.G.D.-16S, capacity 43 tons at 59.1' (port) & 34.5' (starboard) radius with 150' boom, driven by GM8V-71 diesel engine.
B.O.P. crane	1 set	Two hook type each 55 tons capacity.
Distilling unit	2 sets	SPECIFIC EQUIPMENT SE132ROAS-1 & SASAKURA VVC-54L-EL
Position Indicator:	1 set	Sonardyne MRAMS/USBL



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