

# HAKURYU-5

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 (Option 1,970 ft). of water with 3,600 m.tons of deck load,

In 2009, lower hull was upgraded by installing "deep dish" for life enhancement, structural improvement and increase of variable load. In 2014, accommodation was upgraded to 150 persons, deck cranes were replaced with new ones with larger capacities, main drilling & ship service equipments were renewed.

## DESIGN:

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

## 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.

## 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).....	(17,268 tons)
Displacement (Drilling condition).....	(32,593 tons)
Helicopter deck.....	Capable for SIKORSKY S-61N & S92

## DESIGN CRITERIA:

Designed cruising speed.....	3.5 knots (calm sea)
Max. operating water depth.....	1,640' (500m) (Option 1,970' – 600m)
Max. drilling depth.....	29,527' (9,000m)

## STORAGE CAPACITIES:

Fuel oil.....	5,710 bbls
Drill water.....	8,308 bbls
Potable water.....	3,510 bbls
Active mud.....	2,060 bbls
Reserve mud.....	630 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.
New Brine storage at Aft Column Sponson.....	1,900 bbls

## MAX. GROSS VARIABLE LOAD (ON DECK LOAD):

Drilling condition.....	5,379 tons (3,600) tons
Towing condition.....	3,550 tons (2,800) tons

## ACCOMMODATION:

Air conditioned three-storied cabins for 150 persons.

## POWER EQUIPMENT:

Main Generator	4 sets	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 FFTS MK 4
Anchor Chains	8 sets	ABS RQ3S, 4,900 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 597 KW DC motor with sand line drum and ELMAGCO 7838 brake.
Derrick	1 set	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 580 tons.
Top Drive	1 set	VARCO TDS-4S, Max. torque 45,500 ft-lbs, Max. speed 205rpm, GE752 high torque DC motor, 1,100 HP with model PH-85 pipe handler.
Rotary Table	1 set	Continental-Emsco, type T-4950 driven by one 600 KW DC motor.
Heave Compensator	1 set	NL Shaffer 500,000 lbs with 18' stroke with Airlock System.
Iron Roughneck	1 set	NOV ST-120.

## BOP & RISER EQUIPMENT:

BOP Stack	1 set	NL Shaffer 18-3/4" x 10,000 psi. standard double ram type
	1 set	NL Shaffer 18-3/4" x 10,000 psi. fabricated double ram type
	2 sets	NL Shaffer 18-3/4" x 5,000 psi spherical type
	2 sets	Vetco 18-3/4" x 10,000 psi H-4 Connector.
BOP Control System	1 set	NOV/Koomey control system Model BD-60-60-3 with accumulator unit 3,000 psi WP, one master and one 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 (4"OD x .636"wall x 10,000 psi)
Riser Pipe tensioner	12 sets	NL Shaffer 80,000 lbs with 50' wireline travel.
Guide line tensioner	4 sets	NL Shaffer 16,000 lbs with 40' wireline travel.
Messenger line tensioner	4 sets	NL Shaffer 16,000 lbs with 40' wireline travel.

## MUD TREATMENT SYSTEM:

Mud pump	3 sets	Continental-Emsco, FB-1,600 triplex mud pumps, each driven by two 560KW DC motors.
Shale Shakers	4 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	SeaTrax Marine Cranes,
	S10832 (stbd):	100.6 MT @ 21 m (deck lifts), 76 MT @ 17 m / 71.6 MT @ 21 m / 13.2 MT @ 52m (supply boat lifts) with 49 m boom
	S9028 (port):	65.3 MT @ 21 m (deck lifts), 61.9 MT @ 13 m / 42.5 MT @ 21 m / 11.9 MT @ 45 m (supply boat lifts) with 43 m boom
B.O.P. crane	1 set	Two hook type each 55 tons capacity.
Distilling unit	2 sets	SASAKURA VVC-60L-EL, 60 m3/day each
Position Indicator:	1 set	Sonardyne MRAMS/USBL



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