

American SHIP REVIEW

2006-2007

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SHIP OF THE YEAR:

Harvey Discovery: GOING DEEP FOR THE OIL INDUSTRY



Harvey Discovery: building from the seafloor up

by Larry Pearson



Brian Cavadin photos

The slowdown in offshore boat building is over. Construction of all sorts of offshore vessels is back. Most major players in the market are building boats in lots of three or more.

Harvey Gulf International Marine Inc., of Harvey, La., is a prime example. The company is in the middle of a \$200 million construction program involving three 280-foot supply boats, a 16,500-hp offshore anchor handling tug and a 265-foot dive support/well-intervention vessel. The company is also adding DP-1 gear to an existing 13,500-hp tug.

The 265-by-58-foot dive support, well-intervention and supply vessel *Harvey Discovery* has a hull depth of 18.5 feet and a draft of 15.5 feet when fully loaded. It is designed to be flexible

Top, Harvey Discovery at work near an oilrig in the Gulf of Mexico. Left, the vessel's 65-ton crane, designed to lift components needed for seabed construction projects.

enough to do several jobs well. The ship contains all necessary equipment to enable divers to work on subsea infrastructures. *Harvey Discovery* also carries two remotely operated underwater vehicles (ROVs) to perform in deep waters where divers cannot travel. Down deep in the hull and on the rear main deck, *Harvey Discovery* is a major-league supply boat with a carrying capacity of 3,500 long tons. Of that total, 2,300 tons can be put on the 180-by-50-foot clear rear deck. The rear deck also has two 13-by-13-foot steel-structured safe havens protecting the crew from harsh weather conditions.

Tanks are set up to haul 325,000 gallons of rig water, 265,000 gallons of rig fuel, 8,000 barrels of liquid mud and 2,000 gallons of methanol. Dry bulk tanks in the hull can hold 8,000 cubic feet of material. There is an 80-psi compressed air system on board to deliver the dry bulk material to the rig. The liq-

uids can be discharged at the rate of 1,200 gallons per minute at 185 feet of head. The liquid mud tanks have Butterworth mixers to keep the material from separating. The mixers also aid in cleaning the tanks after the material is delivered. Those are impressive numbers for any supply boat, but *Harvey Discovery* is more — much more.

The vessel also has a moon pool, cranes and other gear for light well-intervention work. Chartered by Saipem



America (formerly known as Sonsub), the vessel will work primarily on subsea construction projects. One of the main features of this vessel is that it can support one or two ROVs. Each ROV has its own van that can be loaded on the vessel to support undersea operations.

Saipem America is a major force in subsea construction. The company has developed its own line of ROVs, such as the heavy work class 200-hp *Innovator*. The company has also developed special tools for pipeline installation and repair. ROVs are essential in water over 1,000 feet deep, which is the practical limit for divers to operate.

The 13-by-13-foot moon pool on *Harvey Discovery* is a critical feature, along with the 65-ton crane, to move heavy components of construction projects to or from the seabed.

Harvey Discovery is a larger version of vessels currently under contract by

Saipem America, such as the 240-footers *Innovator* and *Dominator*. The new vessel, designed for heavy-duty construction, has a 65-ton electro-hydraulic knuckle boom crane with more than twice the lifting capacity of *Innovator* and *Dominator*. Its moon pool is several times larger than those on the two older vessels.

A 100-ton stern roller, combined with 9,000 square feet of clear deck space, is more evidence that this vessel will be a heavy-duty workhorse.

“We anticipate the *Harvey Discovery* will be involved in ROV surveys such as touchdown monitoring for pipe lay, valve and tree manipulation and maintenance, laying of concrete mats and installing manifolds, tees and jumpers,” said Robert Corken of Saipem America. “The vessel’s larger moon pool and heavier lifting capacity of the crane means this OSV can install and lift larger infrastructure components than our other vessels rated for subsea construction.”

Aker Yards Marine of Houston and Vancouver, British Columbia, was responsible for the production detailing, piping arrangements, structural drawings and other work necessary to apply for regulatory approvals.

“We also supplied these same services for the series of 280-foot supply vessels that Eastern (Shipbuilding Group in Panama City, Fla.) is building for Harvey Gulf,” said Ron Pearson, head of the Houston office of Aker Yards Marine.

Main propulsion power for *Harvey Discovery* comes from a pair of Caterpillar long-stroke 3516B engines generating a total of 4,750 hp. The engines drive five-blade 95-inch diameter z-drives. Top speed is 13.5 knots and cruise speed is 11 knots.

Vessels such as *Harvey Discovery* need plenty of electric power, and this vessel has three Caterpillar 425-kW gensets and



Brian Calverin photos

Far left, the tall windows facing aft from the pilothouse give the crew a clear view of the 180-by-50-foot cargo deck, above, which can carry 2,300 tons.

a 500-kW genset used for clean ROV power.

Harvey Gulf is rated DP-2 certified and has two 1,100-hp Schottel control-pitch bow thrusters. Dual thrusters fore and aft are necessary to meet the DP-2 requirements. DP-2 certification requires backup thrusters in case one fails. The DP system is by Kongsberg and includes two DP control stations in the wheelhouse, one at the forward helm and a second at the aft-facing station. A third control station is in the hull at the engineer’s station.

Harvey Discovery includes several advanced navigation aids that work with the DP system, including a Kongsberg High Precision Hydroacoustic Positioning Reference system. This system uses a transmitter on the vessel to send a signal to a seabed receiver, which

Capt. Mark Henrix at the computer station in the wheelhouse. Many of the vessel’s operations are fully computerized, including an automated tank-level-indicator system, vessel stability management program, cargo discharge system and fuel management program.





Left, the vessel is propelled by two 5-bladed 95-inch diameter Schottel z-drives. Below, the power for the z-drives comes from two Caterpillar long-stroke 3516B diesels generating a total of 4,750 hp, giving the vessel a top speed of 13.5 knots.

Brian Gauvin photos

uses the signal to calculate the exact position of the vessel relative to the receiver.

A 2,000-meter fan beam system also tracks the vessel's relative position. The system, typically mounted outside the vessel atop the pilothouse, emits a laser beam that bounces off solid objects, such as a platform or other vessels fitted with reflective targets. The system uses the reflected beams to calculate heading and range. Readings are fed into the vessel's



Chief Engineer Donald VanGrossen in the cab of the electro-hydraulic knuckle-boom crane, which has twice the lifting power of two other vessels under contract to Saipem America, a subsea contractor.

DP-2 navigation system using a standard data interface.

There are several computerized systems on *Harvey Discovery*, including a fully automated tank level indicator system, a vessel stability management program, computerized cargo discharge system and a fuel management program.

The computerized touch-screen monitor and alarm system is by NREC Power Systems, Houma, La.

Navigation gear in addition to the DP-2 system includes a pair of 96-mile radars, a magnetic compass, autopilot, gyrocompass and 1,500-meter fathometer.

Communications gear includes all the components for a GMDSS system operating more than 150 miles from shore, including MF/HF radios, five VHF radio sets, satellite "C" and single side band communications gear.

Accommodations include 8 four-bunk rooms, a pair of six-bunk rooms and two singles. There is also a four-bed hospital, a 10-person conference room, a 30-person locker room, a 16-person movie theater and an exercise room.

The vessel has significant off-ship firefighting capacity with two monitors capable of delivering 5,000 gallons per minute each.

Harvey Discovery is certified under U.S. Coast Guard regulations Subchapter L&I Oceans and SOLAS. It is also

American Bureau of Shipping classed +A1, +AMS, Loadline, DPS-2 certified-Circle E.

Harvey Gulf International operates seven ocean towing vessels ranging in size from 9,000 to 13,500 hp, three anchor handling boats from 13,500 to 16,000 hp, three 240-foot offshore supply vessels and one 280-footer. •

HARVEY DISCOVERY

SPECIFICATIONS

OWNER/ OPERATOR:	Harvey Gulf International Marine, Inc. Harvey, La.
DIMENSIONS:	L: 265' B: 58' D: 15.5'
DESIGNER:	Harvey Gulf International Marine and Aker Yards Marine, Houston
BUILDER:	Eastern Shipbuilding Group, Panama City, Fla.
MISSION:	Offshore supply, dive-support and well-inter-vention vessel
CREW SIZE:	10-20

HULL:	<ul style="list-style-type: none"> □ Steel monohull 	<ul style="list-style-type: none"> □ MF/HF radios □ Satellite "C"
PERFORMANCE:	<ul style="list-style-type: none"> □ Maximum: 13.5 knots □ Cruise: 11 knots 	ADDITIONAL INFORMATION:
PROPULSION:	<ul style="list-style-type: none"> □ (2) Caterpillar 3516B long-stroke at 2,375 hp each □ (2) Schottel bow thrusters at 1,100 hp □ (2) Schottel 1,100 hp z-drives with 95" 5-blade propellers 	<ul style="list-style-type: none"> □ 65-ton Hydramarine knuckle boom crane □ 13'-by-13' moon pool □ (2) 13'-by-13' deck safe havens □ (2) Offshore firefighting monitors at 5,000 GPM □ Computerized tank level indicator system □ Computerized vessel stability management program □ Computerized cargo discharge system □ Fuel management program □ Online communications □ Butterworth tank cleaning system □ (3) DP control stations □ Liquid mud PIP stripping system □ Ergonomically designed pilothouse □ Real-time video on main deck □ 2000-meter fan beam relative positioning system □ HIPAP 500 acoustic positioning system □ Radian positioning system □ NREC Power Systems touch-screen monitor and alarm □ 46 bunks □ 4-man hospital □ 30-man locker room □ 10-man conference room □ 16-man movie theater □ Exercise room
GENERATORS:	<ul style="list-style-type: none"> □ (3) Caterpillar 3412 at 425 kW each □ Caterpillar ROV clean power at 500 kW □ Emergency unit at 99 kW 	
CAPACITIES:	<ul style="list-style-type: none"> □ Fuel: 265,000 gal □ Water: 325,000 gal □ Liquid Mud: 8,000 barrels □ Dry Bulk: 8,000 cubic feet □ Dry Bulk Discharge Pressure: 80 PSI 	
NAVIGATION:	<ul style="list-style-type: none"> □ Kongsberg High Precision Hydroacoustic Positioning Reference System □ (2) 96-mile radar □ Autopilot □ GPS with differential □ Gyrocompass □ DP-2 with three control stations □ 1,500-meter fathometer 	
COMMUNICATIONS:	<ul style="list-style-type: none"> □ (5) VHF □ 1-A3 GMDSS including 	