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## Ship-shape building moves forwards

by [Zoe Naylor](#)

Dhow building has long been one of Dubai's economic mainstays and a vital link in the emirate's maritime history. But times are changing: Dubai Dry Docks are now home to one of the world's leading ship repair yards, capable of handling some of the biggest vessels in the world.

And the new Safina Project, currently underway at Dubai Dry Docks, is likely to cement Dubai's status within the global marine industry. Built within the Dry Docks' existing site adjacent to Port Rashid and Dubai Maritime City, the Safina Project occupies 140,000m<sup>2</sup> of the current shipyard's total area of 800,000m<sup>2</sup>. Central to the US \$45 million (AED165 million) project is an innovative hydrolift system for launching newly built ships.

The main contractor on the project is a joint venture of local firm, NSCC, and French company, Bachy Soletanche, with Royal Haskoning winning the appointment of consulting engineer.

"Dubai Dry Docks has historically been a ship repair yard but is now diversifying into the area of building new ships," says David Laird, the project manager. "One of the elements of this is the new hydrolift."

According to Laird, the main advantage of the hydrolift is that it enables ships to be built on land and transferred at land level. "Most large shipyards build blocks of ships and then lift them down, so the vessels are actually built below the water level. The docks are then flooded so the ship can get out."

But since the hydrolift is above ground level, completed vessels or parts of a vessel (up to 120m by 60m) can easily be transferred from a fabrication facility at ground level to sea level without the need for slipways.

Firstly, the hull sections will be transferred from the fabrication area via a skidding system and onto a platform within a walled basin. A gate is placed across the transfer way and the basin pumped full of water, causing the hull section to float.

The hull section is then manoeuvred to a deeper part of the basin and eventually floated out to sea after lowering the water level and opening the main seaward gate.

While the main use for the facility will be to transfer large sections of hull from land to sea, and then into dry dock for final assembly, the transfer process can also be used the other way round, with ships being recovered and put onto the platform for general repairs.

"In effect we can do the process in reverse," says Laird. We can recover a ship, or part of a ship, from the water, open the landward gate and then bring it onto the land to work on."

Since there are already three conventional dry docks on site, Laird says that the hydrolift offers an enhanced facility for ship recovery: "At the moment we can flood a dry dock, open the gate, bring a ship in and recover it by pumping out the water. But when it's recovered in the dry dock it's not on land — it's still behind a dock gate 12m below sea level. The hydrolift is an alternative way of docking and undocking vessels."

The Safina Project also incorporates an 80m by 220m-long panel and process line shed. "The specialist automated panel line equipment can manufacture various panels and sections of ships and can fabricate 75 tonnes of steel every nine hours," says Laird.

Steel plate is processed in the panel line area before being transferred into the assembly area and built into

either a complete ship or sections. These can then be launched using the hydrolift.

Construction of the hydrolift itself involves building diaphragm quay walls, impounding walls, a concrete transfer platform, entrance abutments and two gates — one landward and one seaward.

NSCC and Bachy Soletanche began the initial construction in August 2005 with reclamation works to bring sand ashore to create the platform and create a dry working environment.

“Sand was brought onto the site to reclaim an area in the water to make a working platform, then work began on driving cast in-situ bentonite piles to minus 18m down to the sandstone,” explains David Punchard, resident engineer at Royal Haskoning.

Piling is now completed, as are the diaphragm quay walls, and work is now focusing on the construction of the walls above ground level, which will raise the walls of the dry dock to about 10m above sea level.

“We’ve done the first pour of concrete for the 5.5m-high basin walls, which should be finished in July,” says Punchard. The dock floors and sills will be reinforced concrete, with the sill itself being constructed in the dry in a cofferdam.

“We’re also building the slab of the transfer platform,” he adds. “This is a reinforced concrete slab upon which the new ships will be placed prior to launch.” Royal Haskoning is also designing the landward gate for the transfer system.

“When the landward gate opens, the ship can move into the facility and the landward gate then closes,” explains Laird. At this point the ship is still on dry land. The water level in the basin is then raised (hence the term ‘hydrolift’), leaving the vessel afloat in the basin. The facility measures 120m by 60m and can cater to vessels that will float in 4m of water.

“The water is then let out so it is back down to sea level inside of the seaward gate. The gate then opens and the vessel can leave the facility,” adds Laird.

The 65m-long, 16m-tall and 8m-deep seaward gate is being constructed in sections. Designed by Royal Haskoning, it is being built by Dubai Dry Docks. The steel and concrete sections of the gate will be joined together in the dry dock, and when complete, the dock will be flooded and the 2,500-tonne gate will be floated out into place.

An integral part of the Safina Project is the massive Goliath shipyard crane that will be used within the shipbuilding process. Designed by Konecranes and fabricated on site using around 600 tonnes of steel, the 300-tonne capacity crane will eventually stand 60m high and span 73m, with a 45m clearance under the hook.

But before it can carry out any such lifting duties, the Goliath crane must first be lifted into an upright position from its current horizontal position on the ground.

“We’ve built the two 55m-long legs, which are currently lying flat,” says Laird. “Next we have to lift the legs up, then jack the main beam up and weld it into position,” he adds.

Fagioli, a specialist heavy lifting firm, will begin lifting the crane into place in about a week’s time. The entire process will take around 14 days. When completed, it will be the largest land-based Goliath crane in Dubai, according to Laird.

In addition to focusing on shipbuilding, the Safina Project will add to Dubai’s Dry Docks’ existing ship repair capacity. Once complete in August 2006 the overall facility will be able to handle any size vessel, from tugboats up to VLCCs (very large crude carriers). As with so many of Dubai’s construction projects, big is most definitely beautiful.