Battling Heavy Seas

Large cranes are impressive. The interplay between steel cables, swinging loads and movement safely conveys loads to their designated location in all weather conditions. Operating cranes on the high seas is even more technically demanding. In contrast to their colleagues on land, operators of offshore cranes additionally have the heavy seas to contend with.

Offshore cranes are exposed to wave action.

_ A swaying offshore crane on a ship must deposit a load on the seabed without damaging it. Finding the right moment to set the load down is extremely difficult and challenging. The crane follows the movement of the ship, which causes the load to move up and down. It becomes even more complicated when an offshore crane has to transfer a load to another ship. The waves cause the crane and the ship to move in different directions. Crane operators must take this additional movement into consideration while handling their loads.

Winches with secondary drive technology can be used down to a depth of 4,000 meters.

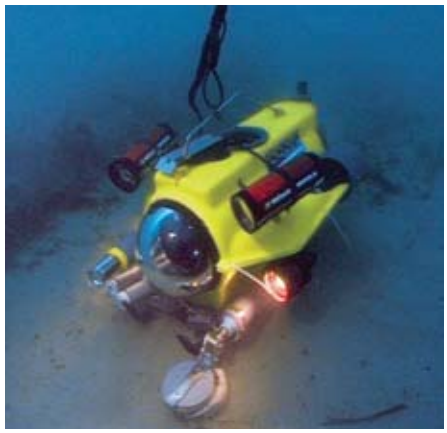
Stability on the high seas

A system which compensates the rising and falling movement of the waves makes operating offshore cranes much easier. The active heave compensator measures rising, falling and drifting movements of the ship and calculates the correction values, which are then compensated via the crane's winch. This way, the ship's movements that are transmitted to the load are reduced to a minimum.

Hydraulic secondary drive units from Rexroth have proven their worth on heave compensation systems and ensure a high compensation result. These drives operate with constant pressure systems and are virtually independent of line lengths. The energy retrieval when lowering the load is a further advantage. Energy is stored and later reused when lifting the load. Rexroth is the only provider of this technology worldwide. Secondary drive heave compensators with steel cables are currently used at depths down to 2,500 meters and for loads up to 160 tons. Remotely Operated Vehicles (ROV) are used for this purpose. ROVs are remote-controlled submarine robots equipped with cameras and robotic arms that assist the crane operator when placing a load on the bottom of the ocean.

Submarine mission

Conventional winches reach their limits at depths greater than 2,500 meters because the weight of the steel cable greatly reduces their working load. Therefore, plastic cables are used instead. They are much lighter, but also more elastic and sensitive to temperature. This kind of heave compensator also uses secondary drive winch systems, which compensate the weaknesses of the plastic cable thanks to their excellent control characteristics.



A remote-controlled submarine robot helps to place loads on the seabed.

The two systems have one thing in common: outstanding wave motion compensation of above 90 percent which ensures that loads are conveyed to their designated location even in stormy weather – thanks to secondary drive technology from Rexroth.

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