

DLR70 WITH NATIONAL OILWELL OS435HD CRANE

CLIENT: Transocean
APPLICATION: DLR used to lift subsea trees
CRANE LOCATION: Transocean Legend semisubmersible drilling rig

For the Kitan Project in the Timor Sea, Transocean wished to lift a 77,162 lbs (35 metric tonnes) subsea tree section at a 35 ft crane radius with 2m significant wave height with their National OS-435HD crane.

Without the DLR the load could only be lifted in seas of less than Hsig=1m. The DLR increased the crane capacity by 30% at Hsig=2 allowing a wide weather window and increased crane radius for the operation. The DLR gave the operator comfort by knowing that the crane capacity would remain robust even if a larger motion than expected transpired. If a lift equivalent to 3m wave conditions took place due to bad timing of the lift or unexpected vessel or rig motion, the DLR would provide a 40% improvement in capacity such that the crane would only be 3% outside its design curve. Without the DLR, the crane would be 47% outside its rating.

The DLR design and crane rerating were certified by Lloyds Register. In addition, National Oilwell also reviewed the proposed load charts and issued a revised load chart confirming the TENSA calculations.

OFFSHORE BOAT LIFT CRANE CHART									
Wave Height, Hsig [m]	Crane Radius [ft]	35	40	45	50	55	60	65	70
	Crane Radius [m]	10.7	12.2	13.7	15.2	16.8	18.3	19.8	21.3
	DLR installed	SAFE WORKING LOAD SWL [tonne]							
1	No	41.64	40.86	40.10	39.13	38.20	36.40	34.31	32.45
	Yes	46.30	44.95	43.70	42.30	40.99	38.95	36.70	34.68
	Increase with DLR	11%	10%	9%	8%	7%	7%	7%	7%
2	No	31.72	31.32	30.91	30.31	29.71	28.35	26.73	25.30
	Yes	40.98	39.82	38.73	37.49	36.33	34.37	32.17	30.22
	Increase with DLR	29%	27%	25%	24%	22%	21%	20%	19%
3	No	23.86	23.70	23.52	23.16	22.80	21.79	20.55	19.45
	Yes	33.89	32.94	32.05	31.02	30.06	28.39	26.50	24.84
	Increase with DLR	42%	39%	36%	34%	32%	30%	29%	28%

The benefit of the DLR increases with larger seastates.



DLR250 WITH FAVCO PC300 CRANE

CLIENT: Thies
APPLICATION: DLR used to lift structures for desalination project
CRANE LOCATION: jackup construction barge JB115

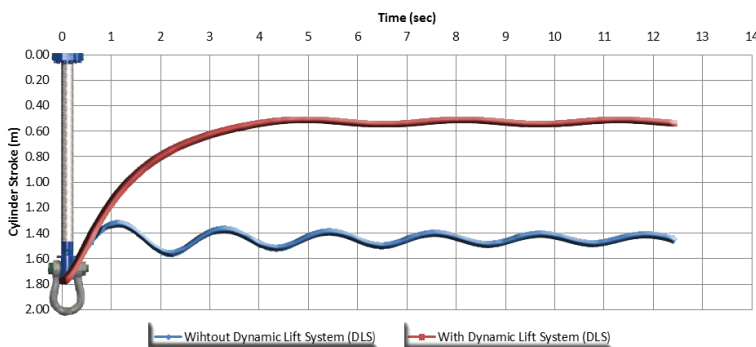
For the Victorian Desalination Project, the client Thies and their offshore project managers Independent Offshore Solutions needed to install a number of seabed intake and discharge structures weighing up to 250 tonnes over a 3 month period in Bass Strait. This location is renowned for consistent long period swells coming from the Southern Ocean. The construction jackup was equipped with a Favco PC300 crane which has to be severely derated in larger seastates. In addition, the lift speed for the heavy lifts was too slow to guarantee that the load could be lifted clear of the transport barge without recontact.

TENSA offered a DLR250 Dynamic Load Reducer equipped with our Dynamic Lift System (DLS). The DLS uses TENSA's rental external high pressure gas accumulator system to provide a rapid lift of 1.2 metres in conjunction with the crane lift. This ensures the load will lift clear of the vessel deck without recontact.

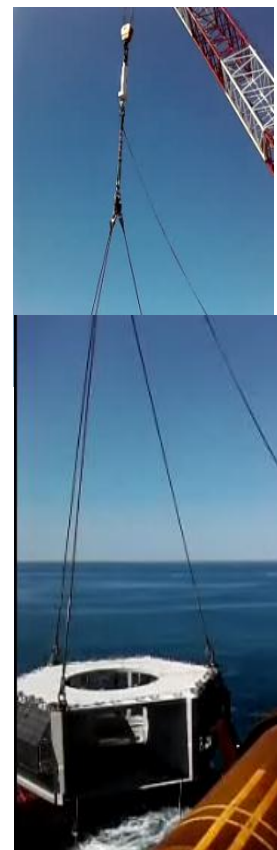
The DLR design and crane rerating were certified by Lloyds Register. In addition, Favco endorsed the load charts and issued a revised load chart confirming the TENSA calculations.

OFFSHORE BOAT LIFT CRANE CHART									
Wave Height, Hsig [m]	Crane Radius [ft]	35.4	39.4	45.9	52.5	59.1	65.6	72.2	78.7
	Crane Radius [m]	10.8	12	14	16	18	20	22	24
	DLR installed	SAFE WORKING LOAD SWL [tonne]							
1	No	300.00	300.00	300.00	300.00	282.40	256.20	230.70	209.00
	Yes	250.00*	250.00*	250.00*	250.00*	250.00*	250.00*	239.33	217.43
	Increase with DLR							4%	4%
2	No	205.40	205.40	205.00	204.70	201.90	183.10	164.40	148.40
	Yes	250.00	250.00	250.00	250.00	250.00	227.30	204.59	184.90
	Increase with DLR	22%	22%	22%	22%	24%	24%	24%	25%

* Limited to the maximum working load of DLR250.



The performance of the complete DLR and DLS system was modelled in our simulation software which accurately models the complete system including accumulators, gas hoses and damping behavior..



DLR10 FOR APACHE JOHN BROOKES PLATFORM

CLIENT: Apache Energy Limited
APPLICATION: DLR used to lift replacement main gas valve
CRANE LOCATION: John Brookes Platform offshore WA

Apache Energy used the DLR10 to provide increased capacity to their Oilstates crane installed on the John Brookes Platform.

The DLR10 reduced the dynamic factor from 2.4 to 1.35.

This gave an increase in capacity of 78%, giving the crane almost the same lift capacity for boat lifts as for on platform lifts.

In addition, the DLR gave the flexibility to operate in a greater seastate than would have been otherwise possible.

