

Weighing the Maureen Hi-Deck

Client: Phillips Petroleum Europe-Africa Limited
Main Contractor: Howard Doris Limited



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The 20,000 tonne Maureen deck - an integrated Hi-Deck design by Brown and Root - was built over water, spanning between the quayside and a line of piled supports. The specification required that the deck should be weighed on completion, with the option left open on interim progress weighings. The method of weighing should produce results within $\pm 1\%$ accuracy. A further requirement was that the arrangement provided for weighing should be available to make adjustments to compensate for any foundation settlement which might occur during construction.

For weighing, a total of 40 No. Weigh Packs, were installed in groups of 4 under each of the 10 temporary leg supports within simple access stools provided in their bases.

The Weigh Pack configuration is a pair of Flat Jacks of the same size placed one upon another. One of the pair is fitted with a pressure gauge, pre-opened in a press to a calculated extent and then calibrated against a known load cell. The other jack of the pair is a working, i.e. lifting, jack. Thus when a structure is lifted by inflation of the lifting jack, the pressure induced in the calibrated jack when referred to the jack's own calibration graph provides an accurate weight.

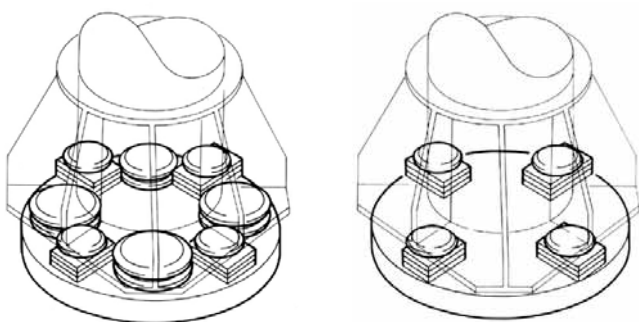
On this project the individual Weigh Pack capacities ranged from 560 to 870 tonnes.

The lift distance at each support was monitored with dial gauge micrometers set to record relative movement between the foundation top and the underside of the temporary leg support.

Computer control gave visual display and print-out's for individual leg load and height, total load and centre of gravity location.

Interim and final weighing operations each consisted of several separate lifts and excellent repeatability was shown. At the final weighing, seven sets of results produced a maximum variation of only $\pm 0.25\%$ of the total weight.

The centre of gravity determined by weighing was extremely close to that determined by calculation.



Above: Weigh packs interspaced with permanent steel packs which are used in conjunction with a permanent Flat Jack to transfer the final load.