

## THE DRIVING FORCE IN DEEP DRILLING.

Herrenknecht Vertical GmbH, a subsidiary of Herrenknecht AG, designs and manufactures deep drilling rigs and equipment for wells down to 6,000 meters. The innovative "Terra Invader" rigs are specifically adapted to customer and project requirements offering high technical standards based on offshore technology and a number of new developments. Central features comprise an optimized safety concept (hands-off technology) and flexible energy management, comprehensive automation of working processes to increase time savings as well as integrated noise protection devices to benefit our environment.



## DEEP DRILLING RIG TERRA INVADER 350 WITH SLINGSHOT SUBSTRUCTURE FOR EFFICIENT OIL AND GAS EXPLORATION.

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Minimizing the number of transport units for the rig move allows a fast setup at the next well site.



Our service ensures that the rigs are in continuous operation.



## TAILOR-MADE RIGS FOR OIL AND GAS EXPLORATION.



As resources become more and more scarce, oil production is becoming increasingly expensive. In addition to the rise in the cost of equipment and personnel, the cost of exploration and development of new reservoirs is also increasing. The use of state-of-the-art Herrenknecht Vertical deep drilling technology ensures that energy companies will be able to continue economic exploitation of oil and gas reserves in the future.

- ▶ A high level of work automation helps to reduce rig floor personnel which is possible thanks to the new sensitive hydraulic cylinder hoist and the new design of the pipe handling system. This means less personnel costs and more safety at work.
- ▶ Only 59 transport units are necessary for the whole rig move so that the transport costs for our clients can be reduced.
- ▶ The complete well site only needs an area of approx. 30x 72m. This means lower space costs and optimized positioning possibilities in areas where space is restricted.
- ▶ The mud pumps are encapsulated and each of the 1.540KVA generators has optimized exhaust silencers, spark arrestors and flame retards. This high noise protection makes the rig also suitable for drilling in urban areas.

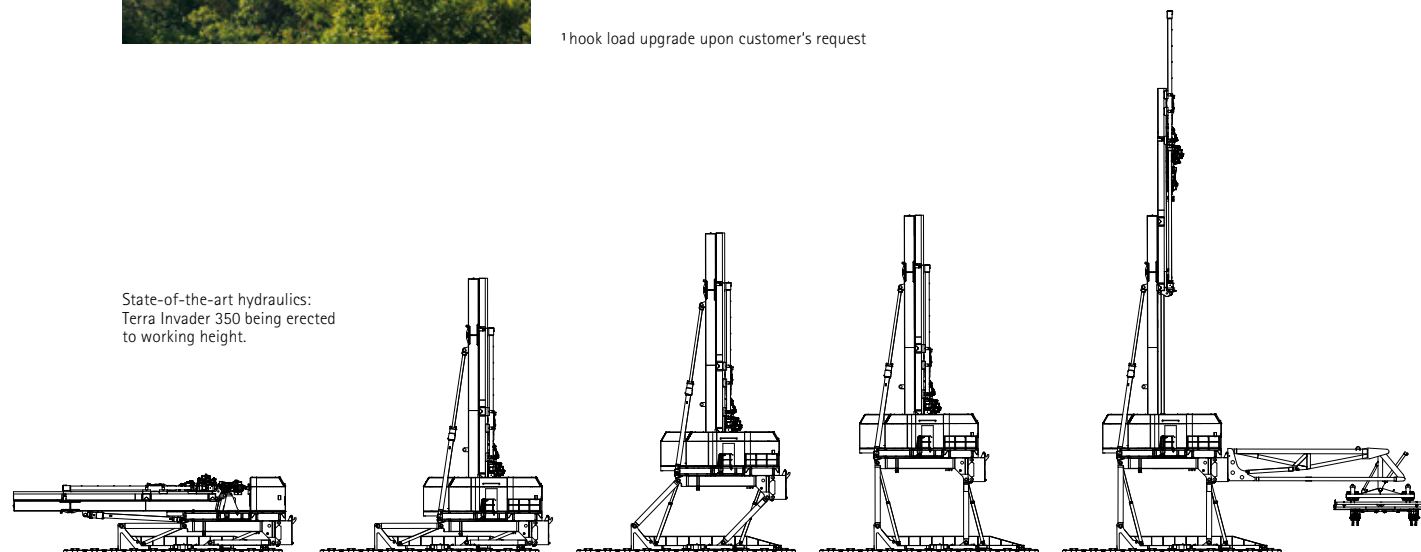
## SPECIAL EQUIPMENT FOR DRILLING IN REMOTE AREAS.



Herrenknecht Vertical recently developed and supplied two tailor-made and unique deep drilling rigs Terra Invader 350 with slingshot substructure for Brazil. Mast and slingshot substructure can be erected hydraulically, no heavy load cranes are necessary. The rig is installed horizontally at the well site. A 22m (72ft) high mast, with a hook load of 410mt (450sht)<sup>1</sup> is then erected. By the hydraulic cylinders, the 9m x 10m (30ft x 33ft) slingshot substructure and the rig floor can be set up to a working height of 9m (30ft).

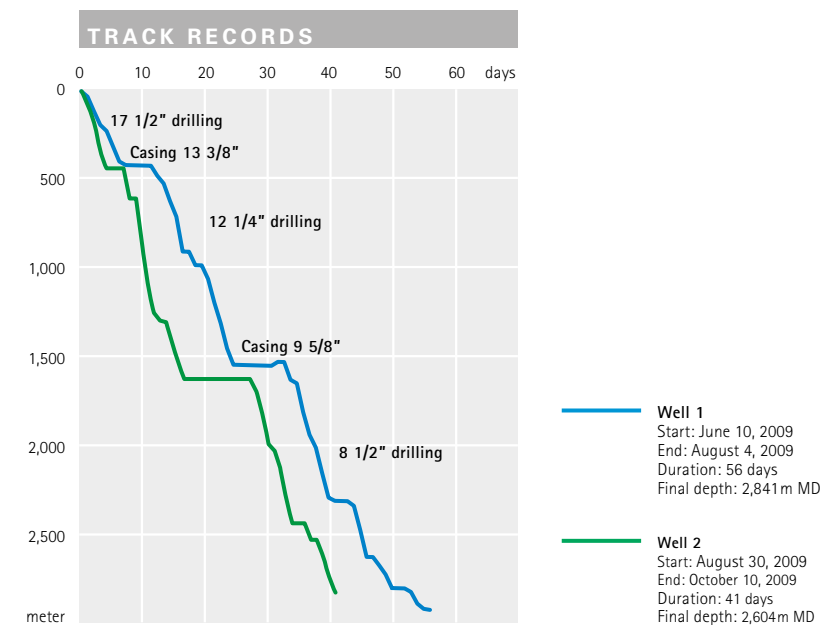
<sup>1</sup> hook load upgrade upon customer's request

State-of-the-art hydraulics: Terra Invader 350 being erected to working height.



## OIL EXPLORATION IN BRAZIL.

To ensure continued economic exploitation of the oil fields in the north east of Brazil, Petrobras – the country's largest energy company – has decided for two Herrenknecht Vertical deep drilling rigs. Heavy-load cranes are not available in this remote area. This is where the full benefits of the hydraulically erectable mast and slingshot substructure come to bear.



### BAHIA I BRAZIL

#### PROJECT DATA

Location:	Bahia, Brazil
Drilling depths:	up to 5,500m
Well diameter:	17 1/2" – 8 1/2"
Geology:	Aliança formations
Employment:	Oil exploration
Operator:	Petrobras
Drilling contractor:	San Antonio Internacional

The first Terra Invader 350 started drilling in June 2009. Meanwhile, the two rigs have drilled several wells at several locations. The slingshot technology ensures a fast and safe rig move procedure.

