

= Deepwater Horizon =

Deepwater Horizon was an ultra @-@ deepwater , dynamically positioned , semi @-@ submersible offshore oil drilling rig owned by Transocean . Built in 2001 in South Korea by Hyundai Heavy Industries , the rig was commissioned by R & B Falcon , which later became part of Transocean , registered in Majuro , Marshall Islands , and leased to BP from 2001 until September 2013 . In September 2009 , the rig drilled the deepest oil well in history at a vertical depth of 35 @,@ 050 ft (10 @,@ 683 m) and measured depth of 35 @,@ 055 ft (10 @,@ 685 m) in the Tiber Oil Field at Keathley Canyon block 102 , approximately 250 miles (400 km) southeast of Houston , in 4 @,@ 132 feet (1 @,@ 259 m) of water . On 20 April 2010 , while drilling at the Macondo Prospect , an explosion on the rig caused by a blowout killed 11 crewmen and ignited a fireball visible from 40 miles (64 km) away . The resulting fire could not be extinguished and , on 22 April 2010 , Deepwater Horizon sank , leaving the well gushing at the seabed and causing the largest oil spill in U.S. waters .

= = Design = =

Deepwater Horizon was a fifth @-@ generation , RBS @-@ 8D design (i.e. model type) , deepwater , dynamically positioned , column @-@ stabilized , semi @-@ submersible mobile offshore drilling unit , designed to drill subsea wells for oil exploration and production using an 18 @.@ 75 in (476 mm) , 15 @,@ 000 psi (100 @,@ 000 kPa) blowout preventer , and a 21 in (530 mm) outside diameter marine riser .

Deepwater Horizon was the second semi @-@ submersible rig constructed of a class of two , although Deepwater Nautilus , its predecessor , is not dynamically positioned . The rig was 396 by 256 ft (121 by 78 m) and capable of operating in waters up to 8 @,@ 000 feet (2 @,@ 400 m) deep , to a maximum drill depth of 30 @,@ 000 ft (9 @,@ 100 m) . In 2010 it was one of approximately 200 deepwater offshore rigs capable of drilling in waters deeper than 5 @,@ 000 ft (1 @,@ 500 m) . Its American Bureau of Shipping (ABS) class notations were " A1 , Column Stabilized Drilling Unit , AMS , ACCU , DPS @-@ 3 " .

In 2002 , the rig was upgraded with " e @-@ drill " , a drill monitoring system whereby technical personnel based in Houston , Texas , received real @-@ time drilling data from the rig and transmitted maintenance and troubleshooting information .

Advanced systems played a key role in the rig 's operation , from pressure and drill monitoring technology , to automated shutoff systems and modelling systems for cementing . The OptiCem cement modelling system , used by Halliburton in April 2010 , played a crucial part in cement slurry mix and support decisions . These decisions became a focus for investigations into the explosion on the rig that month .

= = History = =

= = = Construction and ownership = = =

Deepwater Horizon was built for R & B Falcon (which later became part of Transocean) by Hyundai Heavy Industries in Ulsan , South Korea . Construction started in December 1998 , the keel was laid on 21 March 2000 , and the rig was delivered on 23 February 2001 , after the acquisition of R & B Falcon by Transocean . Until 29 December 2004 the rig was registered in the Republic of Panama .

Transocean , through its Steinhausen , Switzerland subsidiary Triton Asset Leasing GmbH , operated the rig under the Marshalllese flag of convenience . The rig was leased to BP on a 3 @-@ year contract for deployment in the Gulf of Mexico following construction . The lease was renewed in 2004 for a year , 2005 for 5 years , and 2009 for 3 years covering 2010 to 2013 . The last contract was worth \$ 544 million , or \$ 496 @,@ 800 a day , for a " bare rig " , with crew , gear and support

vessels estimated to cost the same .

According to R & B Falcon 's filings to SEC in 2001 , the transfer document between R & B Falcon and Transocean was dated 17 August 2001 , and the rig was specified as " official registration number of 29273 @-@ PEXT @-@ 1 , IMO number of 8764597 , with gross tonnage of 32 @,@ 588 and net tonnage of 9 @,@ 778 " and the transfer value as US \$ 340 million . As of 2010 , the rig was insured for US \$ 560 million covering the replacement cost and wreckage removal .

= = = Drilling operations = = =

Deepwater Horizon worked on wells in the Atlantis (BP 56 % , BHP Billiton 44 %) and Thunder Horse (BP 75 % , ExxonMobil 25 %) oil fields . It was described at times as a " lucky " and " celebrated " rig , and in 2007 was still described as " one of the most powerful rigs in the world " . In 2006 it discovered oil in the Kaskida oil field , and in 2009 the " giant " Tiber field . The well in the Tiber field has a vertical depth of 35 @,@ 050 ft (10 @,@ 683 m) and a measured depth of 35 @,@ 055 ft (10 @,@ 685 m) , below 4 @,@ 132 ft (1 @,@ 259 m) of water . The well was the deepest oil well in the world , and more than 5 @,@ 000 feet (1 @,@ 500 m) further below the seabed than the rig 's official drilling specification stated on the company 's fleet list .

In February 2010 , Deepwater Horizon commenced drilling an exploratory well at the Macondo Prospect (Mississippi Canyon Block 252) , about 41 miles (66 km) off the southeast coast of Louisiana , at a water depth of approximately 5 @,@ 000 feet (1 @,@ 500 m) . The Macondo prospect exploration rights were acquired by BP in 2009 , with the prospect jointly owned by BP (65 %) , Anadarko (25 %) and MOEX Offshore 2007 (10 %) . Deepwater Horizon was still working on the Macondo site on 20 April 2010 , when a violent explosion occurred leading to destruction of the rig and resulting oil spill . The well was in the final stages of completion at the time ; its cement casing was injected and hardening , and the rig was due to move shortly to its next role as a semi @-@ permanent production platform at the Nile site followed by a return to the Kaskida field . The exploratory work was described as " concluded " and permission had already been requested from MMS to terminate operations at the Macondo site .

During its operational lifetime , the rig was actively in operation for 93 % of its working life (2 @,@ 896 of 3 @,@ 131 days) . The remainder partly relates to time spent between sites .

= = = Regulation , safety , and inspection = = =

The Minerals Management Service (renamed on 18 June 2010 to the Bureau of Ocean Energy Management , Regulation and Enforcement , or Bureau of Ocean Energy (BOE)) is the regulatory and inspecting body for offshore oil drilling and rigs in the United States of America . According to an Associated Press investigation , certain safety documentation and emergency procedure information , including documentation for the exact incident that later occurred , was absent . The exact number of required monthly inspections performed varied over time ; the inspections were carried out as required for the first 40 months , but after that around 25 % of inspections were omitted , although the investigation notes this is partly expected , since there are circumstances such as weather and movement which preclude an inspection . Reports of the last three inspections for 2010 were provided under Freedom of Information legislation . Each of these inspections had taken two hours or less .

During its lifetime the rig received 5 citations for non @-@ compliance , 4 of which were in 2002 (safety , including the blowout preventer) and the other in 2003 (pollution) . A sixth citation in 2007 related to non @-@ grounded electrical equipment was later withdrawn when the equipment was determined to be compliant with regulations . Overall the Deepwater Horizon 's safety record was " strong " according to a drilling consultant reviewing the information . In 2009 the Minerals Management Service " herald [ed] the Deepwater Horizon as an industry model for safety " . According to AP 's investigation " its record was so exemplary , according to MMS officials , that the rig was never on inspectors ' informal ' watch list ' for problem rigs " .

= = Explosion and oil spill = =

At 9 : 45 P.M. CDT on 20 April 2010 , during the final phases of drilling the exploratory well at Macondo , a geyser of seawater erupted from the marine riser onto the rig , shooting 240 ft (73 m) into the air . This was soon followed by the eruption of a slushy combination of drilling mud , methane gas , and water . The gas component of the slushy material quickly transitioned into a fully gaseous state and then ignited into a series of explosions and then a firestorm . An attempt was made to activate the blowout preventer , but it failed . The final defense to prevent an oil spill , a device known as a blind shear ram , was activated but failed to plug the well .

At the time of the explosion , there were 126 crew on board ; seven were employees of BP , 79 of Transocean , there were also employees of various other companies involved in the operation of the rig , including Anadarko , Halliburton and M @-@ I SWACO . Eleven workers were presumed killed in the initial explosion . The rig was evacuated , with injured workers airlifted to medical facilities . After approximately 36 hours , Deepwater Horizon sank on 22 April 2010 . The remains of the rig were located resting on the seafloor approximately 5 @,@ 000 ft (1 @,@ 500 m) deep at that location , and about 1 @,@ 300 ft (400 m) (quarter of a mile) northwest of the well .

The resultant oil spill continued until 15 July when it was closed by a cap . Relief wells were used to permanently seal the well , which was declared " effectively dead " on 19 September 2010 .

= = Aftermath = =

Transocean received an early partial insurance settlement for total loss of the Deepwater Horizon of US \$ 401 million around 5 May 2010 . Financial analysts noted that the insurance recovery was likely to outweigh the value of the rig (although not necessarily its replacement value) and any liabilities ? the latter estimated at up to US \$ 200 million .

Litigation , ultimate roll call of damage , and the scope of final insurance recovery were all unknown as of June 2010 , with analysts reporting that the aftermath was of unprecedented scale and complexity compared to previous disasters which themselves took many years to unfold and resolve . A July 2010 analysis by the Financial Times on the aftermath cited legal sources as saying that " at some point the scale of the litigation becomes so large that it really is novel " , that " the situation is likely to be complicated further because the variety of probable cases means it will be hard to aggregate them into so @-@ called class actions " and that there was " no way to put this in historical context because we have never faced anything like this before " . As with the Exxon Valdez disaster , litigation was being discussed in terms of a 20 @-@ year timescale .

In January 2013 , Transocean agreed to pay US \$ 1 @.@ 4 billion for violations of the US Clean Water Act . BP had earlier agreed to pay \$ 2 @.@ 4 billion but faced additional penalties that could range from \$ 5 billion to \$ 20 billion . In September 2014 , Halliburton agreed to settle a large percentage of legal claims against them by paying \$ 1 @.@ 1 billion into a trust by way of three installments over two years . On 4 September 2014 , U.S. District Judge Carl Barbier ruled BP was guilty of gross negligence and willful misconduct under the Clean Water Act (CWA) . He described BP 's actions as " reckless , " while he said Transocean 's and Halliburton 's actions were " negligent . " He apportioned 67 % of the blame for the spill to BP , 30 % to Transocean , and 3 % to Halliburton . BP issued a statement strongly disagreeing with the finding , and saying the court 's decision would be appealed .