

CASE HISTORY

BLACKSHARK DETERMINES SUBSEA BENT CASING ANGLE FOR OFFSHORE PLUG AND ABANDONMENT PROJECT

APPLICATION

Offshore Plug and Adanbonment

TECHNOLOGY

BlackShark Active Ranging Intercept System, MagTraC MWD Ranging, Wireline Keeper Gyro, Electronic Multi-Shot (EMS)

LOCATION

Gulf of Mexico, USA

CUSTOMER CHALLENGE

In 1985 during Hurricane Danny, a barge pushed over the subject well while a workover was being done. Investigations indicated the well head was at about 19 ft below the water and made an angle of about 47° from the vertical. Present day, the top of the well head is at a depth of 6 ft below the seafloor and is offset about 44 ft towards the northwest, away from the original well location.

SDI was challenged to investigate the actual amount of bending of the well casing below the sea bed and determine if it will be possible to bend the casing to vertical and re-enter to plug and abandon the well.

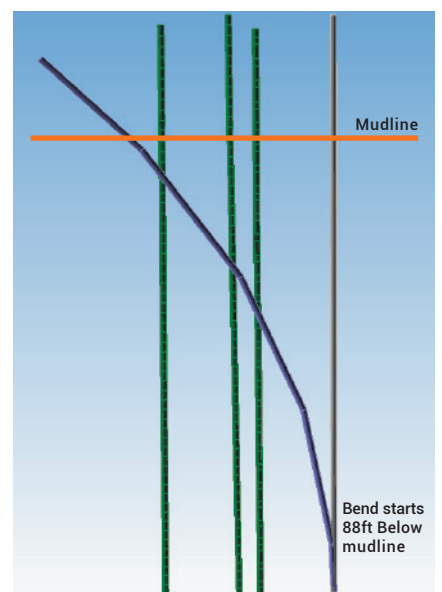
SCIENTIFIC SOLUTION

Scientific experts advised that the bend angle of the well could be determined if 3 boreholes were drilled in close proximity of the existing damaged well and magnetic ranging instruments were deployed. Low frequency AC and DC excitation was then applied directly to the damaged bent wellbore to create a target magnetic field that could be sampled with Scientific's various magnetic ranging instruments.

In Borehole 1, MagTraC passive ranging data was collected using the BlackShark and EMS tools. Using the MagTraC data, the pass-by depth was determined. BlackShark was used to actively range this important pass-by section. In Borehole 2, the same techniques of using passive and active ranging were used to determine pass-by location. After analyzing the ranging data collected from Boreholes 1 and 2, the 3rd borehole location was logged in order to triangulate the data.

The BlackShark tool uses the most sensitive magnetometers ever deployed in the Oil and Gas Industry to give us exact distances between wells. Streaming, high-speed data allows for the calculation of the ranging result in real time providing quick and decisive distance/direction to the target.

The ranging data acquired from the BlackShark and MagTraC systems in all 3 boreholes, successfully identified the angle of bent casing below the mudline.

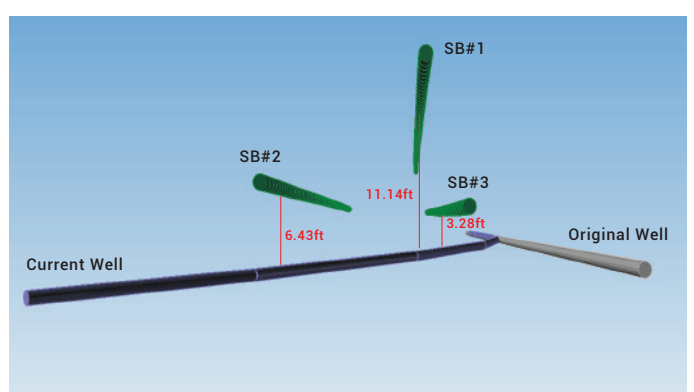


Above: side profile, mudline

CUSTOMER VALUE

Ranging from SB3 gave us our closest pass-by distance of 3.28 ft positioned 55ft below mudline, 36ft in section away, and 47ft in depth below the exposed end of the well. Along with ranging data from the previous boreholes, this is consistent with the bent section of the well forming a 58ft circular arc with a dogleg severity of 76°/100 ft joining the vertical at 88ft below original mud line.

The customer is now able to continue on with completing a plug and abandon of the well, with full knowledge of what the bent over casing looks like below the mudline. Providing the customer with this important data will allow them to determine their options for safe plug and abandon activities.



Above: top profile, wellbore proximity