



Application program of CRUST-1 10km continental scientific drilling rig in SK-2 scientific drilling well

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SK-2 Well is located in DaQing city, where is site of the largest oil field in China, Heilongjiang province, north-east of China. The objective of SK-2 well is to obtain full cores of cretaceous formation in Song Liao basin, and to build the time tunnel of Cretaceous greenhouse climate change, and to clarify the causes, processes and results of the formations of DaQing oil field. This will ensure to achieve our ultimate goals, to test the CRUST-1 drilling rig and improve China's deep scientific drilling technology, to form the scientific drilling technology, method and system with independent intellectual property rights, and to provide technical knowledge and information for China's ten kilometers super-deep scientific drilling technical resources. SK-2 Well is at 6400 meter depth, where the drilling inclination is 90 degree and the continuous coring length is 3535 meter that from 2865 to 6400 meter, the recovery rate of the core is greater or equal to 95 percent with 100 millimeters core diameter and 3.9 degree per 100 meter geothermal gradient. The CRUST-1 rig is designated with special drilling equipment for continental scientific drilling combined to the oil drilling equipment ability with advanced geological drilling technology which is highly automatic and intelligent. CRUST-1 drilling ability is 10000 meter with the maximum hook load 700 tons, the total power is 4610 Kilowatt. CRUST-1 will be integrated with a complete set of automation equipment, including big torque hydraulic top drive, high accuracy automatic drilling rod feeding system, suspended automatic drill string discharge device, hydraulic intelligent iron roughneck, and hydraulic automatic catwalk to fully meet the drilling process requirements of SK-2. Designed with advanced drilling technique for 260 degree in the bottom of SK-2 well and hard rock, including the drilling tools of high temperature hydraulic hammer, high temperature resistance and high strength aluminum drill pipe, high temperature preparation of mud treatment and high temperature resistant cementing materials, and bionic bits, that is coupling bionic PDC tooth bit and diamond-impregnated bit for hard rock. All parts of CRUST-1 were successfully assembled along with the derrick and base lift and transported about 3456 kilometers from manufacture, GuangHan city in southwest China's Sichuan province, to the well site of SK-2 in end of 2013. SK-2 will be finished during next 4 years.