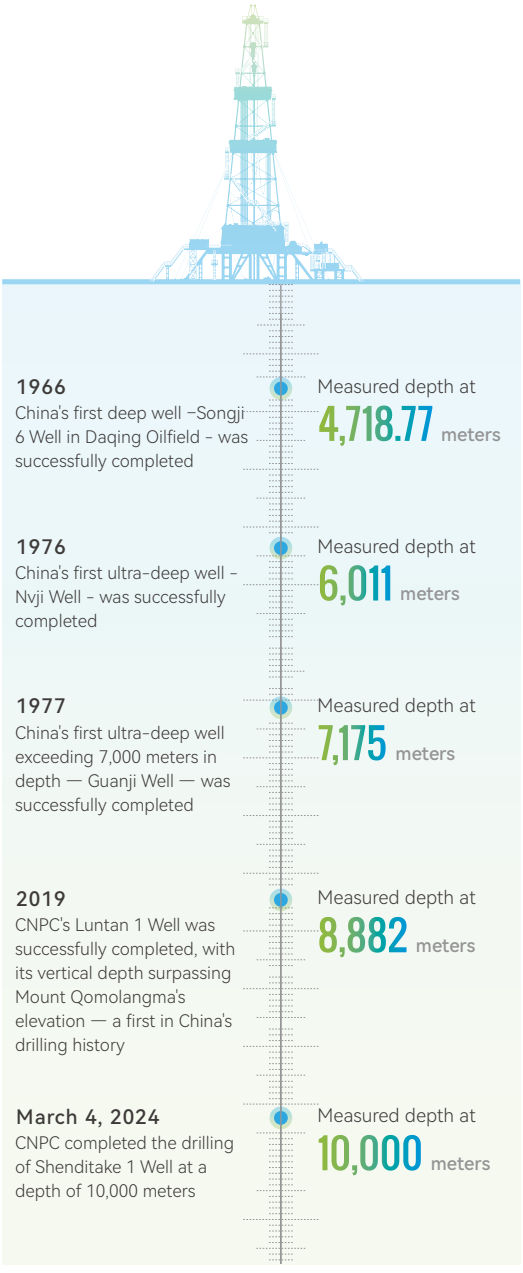
Key Topic

On May 30, 2023, CNPC's Shenditake 1 Well commenced drilling in the heart of the Taklimakan Desert, known as the "Sea of Death." At 14:48:48 on March 4, 2024, the vertical drilling depth surpassed 10,000 meters. This marks a milestone breakthrough for China in the field of "deep space, deep sea, deep earth, and deep blue (referring to advanced computing and AI)."

China's first 10,000-meter scientific exploration well



Note: On January 5, 2025, Shenditake 1 Well was completed at a depth of 10,910 meters, becoming Asia's deepest vertical well and the world's second deepest.

As the exploration and development activities of mid-shallow oil and gas resources in China continue to advance, discovering new reserves becomes increasingly challenging. Currently, deep and ultra-deep oil and gas resources account for about one-third of China's total oil and gas resources. They have become the primary frontier for the country's major oil and gas discoveries. The Tarim Basin, where Shenditake 1 Well is located, is China's largest deep-earth oil and gas accumulation zone. Exploring strategic replacement areas for oil and gas resources in deeper and older strata has become an essential path to ensuring national energy security. Consequently, pursuing deep and ultra-deep resources is an inevitable choice for oil and gas exploration and development.

The 10,000-meter deep-earth scientific exploration project is not only crucial for developing proprietary ultra-deep oil and gas technologies and discovering oil and gas resources, but also of great significance for exploring the Earth's crust and continental evolution, gaining a more intuitive understanding of the earth's internal structure, and solving scientific problems related to the earth's depth. The project also leads to technological progress in related fields such as the development of new materials and the application of high-temperature and high-pressure technologies.

To support the 10,000-meter deep-earth scientific exploration endeavor, the Company developed essential materials, equipment, tools and instruments, including a 12,000-meter automated drilling rig, 220°C high-temperature-resistant water-based polymer drilling fluid, intelligent temperature and pressure responsive plugging materials, a 220°C ultra-high temperature water-based mud system, high-end PDC drill bits, 200°C high-temperature screw drilling tools, ultra-heavy load casing hangers, high-strength coring tools resistant to 240°C, ultra-high-temperature and high-pressure logging tools, and mobile well-site rock sample measurement and imaging systems. This has created a self-supporting, safe, and controllable industrial chain for 10,000-meter deep-earth "well engineering" project. Supported by geological theories and engineering technologies, Shenditake 1 Well not only achieved 100% compliance in key quality indicators such as well deviation, well diameter and logging, but also set multiple records in China during the second and third stages of casing running and cementing operations, including the deepest large-diameter casing installation, the largest tonnage casing installation, and the deepest large-diameter logging using domestic instruments.

The drilling of this 10,000-meter deep well is expected to open up new frontiers for oil and gas exploration and development at depths beyond 10,000 meters, leading to a more stable supply from this energy-rich area. It is of great strategic significance for ensuring national energy security, gaining a technological edge, and expanding oil and gas resources.

The drilling depth of Shenditake 1 Well surpassing 10,000 meters marks China's independent breakthrough in overcoming the technical bottleneck in 10,000-meter ultra-deep well drilling, signifying that its deep-earth oil and gas drilling capabilities and supporting technologies have reached an internationally advanced level.

As the coring operations of Shenditake 1 Well progress, Chinese scientists will obtain first-hand data on basic geological theories, geochemistry and geothermics, enabling them to investigate the mysteries of the Chinese mainland in the earth's evolutionary process.