Project Requirements of the 12th China Petroleum Engineering Design Competition

1. Compilation Principle

The 12th China Petroleum Engineering Design Competition (International Track) requires contestants to complete the process design of the reservoir engineering, drilling and completion engineering, production engineering, surface engineering, HSE and economic evaluation under the open design principle using the provided data.

2. Basic Information and Explanations

(1) Some parameters needed are not provided directly and that should be calculated and determined by the contestants.

(2) In addition to the provided data, contestants can refer to relevant books or literature to obtain the necessary information. This part of work should be cited and demonstrated appropriately in the project.

(3) The basic data provided by the competition are the field data. The contestants can make moderate adjustment to the original data according to the actual situation with reasonable explanation.

(4) The final report should be compiled in accordance with the format of the project report, and the detailed calculation process is given in the form of an appendix. For details, see ' the Format Requirements of the Work of the twelfth China Petroleum Engineering Design Contest '.

(5) If the contestants have questions about the data, they can call the organizing committee, send an email to npedc_rir_2022@163.com or contact the International Cooperation and Exchange Office. However, the organizing committee of the methodological issues involved in the design process will not be answered.

3. Tasks and Targets

Based on the provided data, the design of the reservoir engineering, drilling and completion engineering, production engineering, surface engineering, HSE and economic evaluation should be conducted. Based on comprehensive technical analysis and economic indicators, the best scheme of transformation and development in this

block area should be recommended with specific steps for the implementation of the scheme proposed.

The basic task of reservoir engineering design is to analyze the geological characteristics and reservoir characteristics of the block to calculate and evaluate the reserves. Combined with the characteristics of well test and production test, the development performance is evaluated. Geological model and numerical simulation model are established to study the remaining oil distribution. According to the reservoir and fluid characteristics of layered structural lithologic reservoirs, the development principles of oil and gas reservoirs are formulated, the development mode is determined, and the reasonable well pattern deployment is carried out. Based on the demonstration of oil and gas reservoir engineering method, reasonable production plan is formulated. Development scheme design is completed, and development index prediction is carried out.

The basic task of drilling and completion engineering design is to predict the three pressure of the target layer according to the geological and reservoir characteristics of the block and the relevant data given by the topic, and to design the drilling and completion scheme and optimize the process. The tasks of drilling and completion programme mainly include: the design of well trajectory, well structure, circulating medium, drilling tool combination, hydraulic parameters, drilling construction program, casing, cementing, and the optimization of the completion mode .

The basic task of production engineering design is to design the oil production engineering according to the geological and reservoir characteristics of the block, the test data, the development plan, and the drilling well structure. The tasks of oil production engineering design mainly include the design of CO_2 flooding oil recovery method and process, tubing string, construction string, corresponding supporting technology and appropriate stimulation measures, supporting anti-corrosion, anti-scaling and anti-wax processes, and the optimization of technological measures, equipment selection and working system.

The basic task of the surface engineering design is to design the surface gathering and transportation system based on the geographical conditions, producing fluid characteristics and production conditions of the block. The main tasks include the design of gathering pipeline, CO_2 transport scheme, CO_2 gas injection system, station, supporting sewage treatment, fire safety, power supply system, communication system and environmental protection, and the analysis of pipeline flow security.