ABSTRACT

Big Data is coming. Big Oil and Gas might be hidden behind Big Data. It also brings new opportunities and challenges in the development and management of oil and gas fields. Intelligent development and management is the starting point of efficient oil and gas development. At present, offshore oil and gas field development is facing many challenges, including increasing development cost, human resource cost, operating cost as well as pressure from stricter environment protection requirements. At the same time, development of new technologies such as Big Data and artificial intelligence (AI) has brought new opportunities to deal with these problems. Faced with problems and opportunities, how to develop offshore oil and gas resources efficiently is an urgent problem to be solved.

INTRODUCTION

Big Data is coming. The essence of the world is data. The world presents itself to the human beings with data, so a better data means better decision making. The key of Big Oil and Gas hides behind Big Data. It also brings new opportunities and challenges in the development and management of oil and gas fields (Li, Liu, Bi and Li, 2018). Intelligent development and management of oil and gas fields is the starting point of efficient oil and gas development. At present, offshore oil and gas field development is facing many challenges, including increasing development cost, human resource cost, operating cost as well as pressure from stricter environment protection requirements. The formation conditions continue being more complex which rises the exploration cost; development and production management is increasingly difficult; the number of marginal oil and gas fields is increasing; drilling, completion and engineering operation resource are limited. All result the development cost increases. QHSE requirements are more and more strict. With oil company grows, more training and safety production issues need to be addressed. Meanwhile, the corresponding regulations are more and more strict, which requires efforts to reduce emission and enhance energy saving. The increase of human resource cost lead to an increase in operating cost. At the same time, development of new technologies such as Big Data and artificial intelligence (AI) has brought new opportunities to deal with these problems. Faced with problems and opportunities, how to develop offshore oil and gas resources efficiently is an urgent problem to be solved.

Platform with field engineers is a common mode for offshore oil and gas field development. As equipment reliability and automation level increase, more and more oil and gas fields are being developed using unmanned wellhead platforms (Li, 2014). Compared with the conventional manned platform, the unmanned platform reduced the investment and operating cost, and increased the profit rate. With the development of Big Data and AI, intelligent oil fields have injected new vitality into the development of offshore oil and gas fields. With intelligent oil fields development, it is possible to discover new reserves, enhance oil recovery, reduce the inspections frequency, and further increase the rate of return. By improving the level of platform automation and remote control capability, the on-site workload is greatly reduced, and production personnel do not need to be stationed at platform for a long time.