ABSTRACT

The development mode is an important part of the deepwater oil & gas developments including surface floating platform, subsea production system and gas/oil transportation. Various reasons such as, geological location, reservoir size, well pattern, experience of operators etc., may have a great influence on the development mode. How to select the optimum development mode is a decisive factor in the development costs, risks and flexibility in later stages for deepwater oil & gas fields. Based on reservoir data, site characteristics of the fields, applicable local rules and oil company marketing strategy, the screening process can be employed to eliminate all of the impracticable options and find the optimum development option in terms of technical and economic feasibility. In order to make the selection process more objective and effective, we attempt to develop a model for the development option of deepwater oil and gas fields to analyze the validity of existing development modes in this paper. The results can provide the engineers some references in the front end engineering studies.

KEY WORDS: Development mode; mathematical Model; influencing Factors; Egina.

INTRODUCTION

With the offshore oil & gas development developing from shallow water to ultra-deep water, some oil-rich sea area has become the focus in the field of global gas & oil developments, such as Gulf of Mexico (GOM), Brazil, West Africa and so on (Zhang and Chen, 2009; Tian and Yang, 2006). And, the development mode of representative deepwater oil & gas in these sea areas has naturally become the research focus in recent years.

According to the subsea well type, the development mode can be generally classified into three basic types: dry tree, wet tree, and the mix of the two (Ollen et al., 2001; Wang et al., 2010). In the dry tree development mode, Christmas trees are installed above water, usually on platforms like TLP, Spar, etc. Advantages of this mode include its convenience of drilling, maintenance and its high production efficiency. But this mode is suitable for only a limited number of wells because of the field and floating structure parameters and performance. In the wet development mode, Christmas trees are installed underwater. This mode allows the subsea wells to be located over a wide area, and it is able to prevent damages to production facilities caused by bad weather and sea conditions. In addition, it can accelerate the cycle time to the first production because of the installation of some subsea facilities. Therefore, the wet development mode is more widely used in deep water oil & gas developments. The third development mode is the mixture of dry and wet trees, which has the advantages of the two. But the investment cost is very high. The typical development modes are shown in Fig.1.