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Produced Water Separation at Unmanned Offshore Wellhead Platform: A Concept Report

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Abstract

In the mature producing offshore fields, managing water production is an important and critical aspect of the oil and gas production. Fields where topside processing facility has reached to its maximum handling capacity, installation of additional equipments require a new approach. Taking a clue from the latest profiles of Indian Offshore Assets which suggest increase in water cut of the order of 70% presently and rising up to 92% by 2030 overloading the process (separation and produced water conditioning) facilities at Process Platforms. This is where project on produced water separation at offshore wellhead platforms was taken up. Water separation at wellhead can be used to:

- Increase the oil production rate in a pipeline with a given diameter
- Reduce capacity constraint at separator inlet
- Develop compact and low weight facilities for marginal topsides

With aim to minimize produced water handling at downstream of Wellhead Platform i.e. at process platform, free water is to be knocked out at WHP with

- ❖ Minimum Wellfluid pressure reduction
- ❖ Minimum Floor Space
- ❖ Minimum Interference
- ❖ Maximum reliability

Recent developments have made possible separation system meeting strict requirements with respect to both performance and reliability. There are separators operating in subsea environment removing produced water from Wellfluid with desired results. In view of this, the present condition of Mumbai offshore field necessitates the deployment of such techniques in the ageing Mumbai High field as well.

This study focuses on produced water separation at offshore WHP and examines the factors affecting separation at unmanned WHP. The study also analyzes the impact of Produce Water Separation at WHP. The possible impacts envisaged are flow assurance, reduced backpressure on wells, wells deliverability, capacity constraint at the Separator inlet and Liquid handling at PWC system of Process Platform.

Introduction

In the mature producing offshore oil fields, managing water production is an important and critical aspect of the oil and gas production. Fields where topside processing facility has reached to its maximum handling capacity, installation of additional equipments require a new approach. The latest profiles of ONGC's Offshore Assets indicate increase in water cut from 70% presently to 92% by 2030 overloading the process (separation and produced water conditioning) facilities at Process Platforms. Produced water separation at offshore Unmanned Well Head Platform (WHP) is aimed to remedy this problem. Water separation at wellhead can help to: