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## Validation of ESP Oil Wells Measured Parameters Using Simulation Olga Software

By: Ganat, TA (Ganat, T. A.)<sup>[1]</sup>; Hrairi, M (Hrairi, M.)<sup>[1]</sup>; Hawlader, MNA (Hawlader, M. N. A.)<sup>[1]</sup>

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3RD INTERNATIONAL CONFERENCE ON MECHANICAL, AUTOMOTIVE AND AEROSPACE ENGINEERING 2016

Book Group Author(s): IOP

Book Series: IOP Conference Series-Materials Science and Engineering

Volume: 184

Article Number: UNSP 012057

DOI: 10.1088/1757-899X/184/1/012057

Published: 2017

Document Type: Proceedings Paper

### Conference

Conference: 3rd International Conference on Mechanical, Automotive and Aerospace Engineering (ICMAAE)

Location: Int Islam Univ Malaysia, Kulliyah Engn, Kuala Lumpur, MALAYSIA

Date: JUL 25-27, 2016

### Abstract

The significant challenge in the oil and gas industry is the concurrent measurement of commingled gas, oil and water production, either using three phase test separator or multiphase flow meter (MPFM). A major issue in these applications is the uncertainty of the measurements, due to different measurement operations conditions. A new computational approach has been generated to estimate oil well flow rate of 48 oil wells using Electrical Submersible pump (ESP) from D, G, and W oil fields located in North Africa. The idea is to close the wellhead wing valve and the ESP is kept running normally and the wellhead flowing pressure before shut-in the well and the build-up of wellhead flowing pressure after shut-in the well are measured. OLGA software has been used to make comparison with multiphase flow model available in the OLGA software against each nominated ESP oil well parameters obtained from measured field data. The objective was to verify the obtained shut-in wellhead pressure after closing the choke wing valve (WHPa) from the measured field data with the obtained shut-in wellhead pressure valve from the simulation model. In this paper the simulation results showed that the estimated WHPa are in agreement with the measured WHPa. The relative errors for individual oil field are within accuracy standard specification (typically +/-10%). The overall relative errors are low and within acceptable uncertainty range, where the aggregate relative error for all wells was less than +/-4% which is considered acceptable. Therefore, the results have demonstrated that the new computational method can work under ESP oil wells conditions and has the ability to perform accurate results even when closing the wellhead wing valve for short time span.

### Author Information

Reprint Address: Hrairi, M (reprint author)

+ Int Islamic Univ Malaysia, Dept Mech Engr, POB 10, Kuala Lumpur 50728, Malaysia.

Addresses:

+ [1] Int Islamic Univ Malaysia, Dept Mech Engr, POB 10, Kuala Lumpur 50728, Malaysia

E-mail Addresses: [mftah@iiu.edu.my](mailto:mftah@iiu.edu.my)

### Publisher

IOP PUBLISHING LTD, DIRAC HOUSE, TEMPLE BACK, BRISTOL BS1 6BE, ENGLAND

### Categories / Classification

Research Areas: Engineering; Materials Science

Web of Science Categories: Engineering, Aerospace; Engineering, Mechanical; Materials Science, Multidisciplinary

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