DEVELOPMENT OF AN INTEGRATED MODEL TO MAXIMIZE GAS PRODUCTION

By

Miral Mohamed Nassar

A Thesis Submitted to the
Faculty of Engineering at Cairo University
In Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
In
INTERDISCPLINARY MSC.-GAS PRODUCTION ENGINEERING

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Under the Supervision of

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Title of Thesis:

Development of an Integrated Model to Maximize Gas Production.

Key Words:
Fluid Flow Assurance, Integrated Asset Modeling, Flowline size optimization, Choke optimization, Sand production control.

Summary:
Production optimization ensures that wells and facilities are always operating at their peak performance to maximize production. This work describes a procedure, to develop Inflow Performance Curves, Tubing Performance Curves, ensure the flow of gas production without any obstacles and the application of different sand control techniques for one of the Egyptian Gas Fields, with the help of Petroleum Experts Kit.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Miral Mohamed Nassar Date: April 23, 2019

Signature: Miral Moh’d

Dedication

This work is dedicated to all my family and friends who helped me accomplish this step.

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Miral Mohamed, 2019

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Nomenclature

AOF	Absolute Open Flow, MMSCFD
BaSO4	Barium sulfate
Bbl/d	Barrel per day
c	Performance coefficient MSCF/day/psi^2
CaCO3	Calcium carbonate
CAPEX	Capital expenditure
CaSO4	Calcium sulfate
CO_2	Carbon Dioxide
FA	Flow Assurance
GAP	Petroleum Expert Network software
G_p	Cumulative gas production
GWC	Gas Water Contact
IAM	Integrated Asset Model
IPR	Inflow Performance Relationship
KCl	Potassium chloride
MBAL	Petroleum Expert Material Balance software
MDT	Modular formation dynamic tester
MEG	Mono Ethylene Glycol
MgCO3	Magnesium Carbonate
MMSCF	Millions standard cubic feet
n	Number of compressor stages
OPEX	Operating expense
P	Reservoir pressure
P&A	Plugged & Abandon
pH	Power of Hydrogen
ppm	Parts per million
P_R	Reservoir pressure
PROSPER	Petroleum Expert Production Performance software
Ps	Separator pressure