شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

# بسم الله الرحمن الرحيم

HANAA ALY

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# جامعة عين شمس

## التوثيق الإلكتروني والميكروفيلم

## قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

## يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

HANAA ALY

# MODELING OF FAILURE PROBABILITY OF SURFACE CONTROLLED SUB-SURFACE SAFETY VALVE AT GAS LIFT WELLS, GULF OF SUEZ - EGYPT

By

**Abdelrahman Darweesh Khaled Ayad**

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
**Petroleum Engineering**

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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**Prof. Dr. Abdulaziz M. Abdulaziz**

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Prof. of Petroleum Engineering
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**Title of Thesis:**

Modeling Failure Probability for Surface Controlled Subsurface Safety Valve at Gas Lift Wells, Gulf of Suez - Egypt

**Key Words:**

Failure Probability; Surface Controlled Sub-Surface Safety Valve; Gulf of Suez; lifetime; operational risk.

**Summary:**

This research aims to develop probability models for surface controlled subsurface safety valves versus lifetime, oil properties, water properties and compositions of downhole deposits, and concentration of sour gases in produced gas taking into account the different manufacturers of the valves. This research also aims to develop a model for cumulative number of failures for repairable valves versus lifetime. These models are expected to reduce operational risk, operation expenditures and unscheduled production interruptions.

# 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 reference section.

Name: Abdelrahman Darweesh Khaled Ayad        Date: 26-09-2021

Signature:

# DEDICATION

I devote this dissertation to my family: my parents, my wife, my daughter, and my son. I want to record a special moment for my son Yassin on his birthday, and I started writing this dissertation.

# ACKNOWLEDGMENTS

Firstly, all thanks to Allah, who inspired, guided, and helped me finish this work. I would like to express great thanks to Dr. Abdelaziz M. Abdelaziz for his precious guidance, continuous encouragement, patience, and support in this study. I am very blessed to work with a great supervisor like him. I want to take this occasion to present my great thanks to the people who have played a vital role in my study at Cairo University. Also, I would like to thank all the professors at the Petroleum Department of Cairo University who taught and inspired me during the pre-master's courses.

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