شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

جامعة عين شمس

شبكة المعلومات الجامعية

@ ASUNET

HOSSAM MAGHRABY

شبكة المعلومات الجامعية

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

HOSSAM MAGHRABY

شبكة المعلومات الجامعية

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

HOSSAM MAGHRABY

شبكة المعلومات الجامعية

Ain Shams University Information Network
جامعة عين شمس
شبكة المعلومات الجامعية
@ ASUNET

بعض الوثائق
الأصلية تالفة

HOSSAM MAGHRABY

شبكة المعلومات الجامعية
Ain Shams University Information Network
جامعة عين شمس
شبكة المعلومات الجامعية
@ ASUNET

بالرسالة صفحات

لم ترد بالأصل

HOSSAM MAGHRABY

DEVELOPMENT OF A GENERAL METHODOLOGY FOR ENERGY CONSERVATION AND PROCESS INTEGRATION IN NATURAL GAS PROCESSING PLANTS
CASE STUDY: WESTERN DESERT GAS COMPLEX (WDGC - GASCO)

By

Tamer Hamdy Riad Hafez

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
INTERDISCIPLINARY MASTER - PETROLEUM & NATURAL GAS TECHNOLOGY

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2019

DEVELOPMENT OF A GENERAL METHODOLOGY FOR ENERGY CONSERVATION AND PROCESS INTEGRATION IN NATURAL GAS PROCESSING PLANTS
CASE STUDY: WESTERN DESERT GAS COMPLEX (WDGC - GASCO)

By

Tamer Hamdy Riad Hafez

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
INTERDISCIPLINARY MASTER - PETROLEUM & NATURAL GAS TECHNOLOGY

Under the Supervision of

Prof. Dr.
Sahar Mohamed El-Marsafy
……………………………….

Professor of Chemical Engineering
Chemical Engineering Department
Faculty of Engineering, Cairo University

Dr.
Tamer Samir Ahmed
……………………………….

Asset. Professor of Chemical Engineering
Chemical Engineering Department
Faculty of Engineering, Cairo University

Eng.
Nehad El-Kordy
United Gas Derivatives Company
(UGDC) Chairman
Ministry of Petroleum

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2019

DEVELOPMENT OF A GENERAL METHODOLOGY FOR ENERGY CONSERVATION AND PROCESS INTEGRATION IN NATURAL GAS PROCESSING PLANTS
CASE STUDY: WESTERN DESERT GAS COMPLEX (WDGC - GASCO)

By

Tamer Hamdy Riad Hafez

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
INTERDISCIPLINARY- MASTER OF SCIENCE
in
PETROLEUM & NATURAL GAS TECHNOLOGY

Approved by the
Examining Committee

Prof. Dr. Sahar Mohamed El-Marsafy	**Thesis Main Advisor**
Eng. Nehad Mohamed El Kordy	**Advisor**
Eng. Mohamed Mones Shahat	**External Examiner**
Eng. Hesham Radwan	**External Examiner**

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2019

Engineer's Name: Tamer Hamdy Riad Hafez
Date of Birth: 26/11/1978
Nationality: Egyptian
E-mail: tamer_hamdy@gasco.com.eg
Phone: 01003395812
Address:

Registration Date: 1/10/2013
Awarding Date: .../.../2019
Degree: Master of Science
Department: Interdisciplinary Master - Petroleum &Natural Gas Technology

Supervisors:

Prof. Dr. Sahar Mohamed El-Marsafy (CUFE).
Dr. Tamer Samir Ahmed (CUFE)
Eng. Nehad Mohamed El-Kordy (UGDC CEO)

Examiners:

Prof. Dr. Sahar El-Marsafy (Thesis main advisor)
Eng. Nehad El-Kordy (Advisor)
Eng. Mohamed Mones Shahat (External examiner)
Eng. Hesham Radwan (External examiner)

Title of Thesis:

Development of a General Methodology for Energy Conservation and Process Integration in Natural Gas Processing Plants Case Study: Western Desert Gas Complex (WDGC - GASCO)

Key Words:
General Methodology for Energy conservation, Process Integration and optimization for gas sector, Gap analysis, gas plants Equipment efficiency, IRR.

Summary:

The purpose of the present thesis is to develop a general method of methodology suitable for application in industry, including gas plants, to rationalize and improve the efficiency of energy use, by establishing a mechanism to monitor the current operational performance of equipment in factories, compare this performance with design performance and identify gaps between operational performances. We can identify opportunities to improve energy efficiency and increase production. The test of the effectiveness of the method was applied as a case study on a GASCO's Western Desert Gas Complex (WDGC) gas plant.

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: Date:

Signature:

Acknowledgement

This research work is an outcome of the cooperation protocol between the Egyptian Ministry of Petroleum and Cairo University, produced via the post graduate studies interdisciplinary program Natural Gas Engineering and Technology offered to engineers working in the Egyptian oil and gas sector.

The author would like to express his gratitude and appreciation to Dr. Sahar Mohamed El-Marsafy, Prof. of Chemical Engineering, and Cairo University for her supervision, continuous advice, valuable comments and unfailing aid all through the course of work of the thesis.

Thanks to Asset. Dr. Tamer Samir, Associate prof of Chemical Engineering, Cairo University, for his supervision and effective help.

Appreciation is also due to Eng. Nehad El-Kordy, UGDC chairman, Ministry of Petroleum for her outstanding support, useful comments and, remarks and guidance all through the learning process of this master thesis.

Furthermore I would like to thank Dr. El-Sayed El Tayeb Prof of Petroleum Engineering, Cairo University for suggesting the topic as well for his keen help and non-stop sincere support.

Gratitude and appreciation are due to GASCO for providing the research team with the necessary data.

Table of Contents

List of Tables