### PIPELINES CORROSION

BY

AHMAD SHUKRI MD ALI UITM NO.: 2000609838

MOHD FAIZAL GHAZALI UITM NO.: 2000416898

# Under The Supervision Of PUAN SAIDATUL AKMAR SHAMSUDIN

A final project submitted to the Faculty of Mechanical Engineering, MARA university of Technology (UiTM) as a partial fulfillment of the requirements for the Diploma in Mechanical Engineering.

## **TABLE OF CONTENT**

TITLE	<u>PAGE</u>
ACKNOWLEDGEMENT	i
OBJECTIVE	ii
CORROSION	1
TYPES OF CORROSION	14
CORROSION ENVIRONMENT	24
PROTECTION	41
PREVENTION	56
APPENDIX	Q./

**ACKNOWLEDGEMENT** 

Assalamualaikum w.b.t.

First and foremost, we would like to extend our sincere gratitude to our

supervisor, Puan Saidatul Akmar Shamsudin for her kind assistance, guidance

and encouragement throughout the duration in completing this research.

Our special acknowledgment to the Ir. Fadil, our UiTM engineer who has giving

fullest support on this research. A special gratitude goes to all our course mates

of Diploma In Mechanical Engineering for their support, competition and

comment.

We also like to take this opportunity to express our sincere appreciation to all the

individuals who have contributed and assisted me directly or indirectly in order to

produce this research.

Thank you very much. Wassalam.

AHMAD SHUKRI MD ALI MOHD FAIZAL GHAZALI

DIME MAY 2003

i

#### **OBJECTIVE**

From our research, corrosion is important to our environment today. Most of facilities that we use are made from steel. Corrosion is a deleterious process and causes a great deal of destruction and inconvenience in our communities. For that reason we try to get more information by doing this research. From our research, we give some objective that we have to the reader:

- i. Corrosion are made from environment like:
  - a. Water
  - b. Soil
  - c. Atmosphere
  - d. Dry gases
  - e. Human body
- ii. Corrosion can protect in many ways like electrochemical.
- iii. Corrosion can control is thus the prevention of this deterioration by three general ways:
  - a. Change the material
  - b. Change the environment
  - c. Place a barrier between the material and its environment
- iv. Corrosion can decrease water quality.

#### **CORROSION**

Corrosion, the deterioration caused by chemical reaction with the environment, affects materials as different as structural metals, ceramics, and wood, as well as works of art and artifacts from past civilizations. Corrosion technology is a field of study that focuses on the mechanisms of corrosion and on the design of protective schemes to prevent it or limit its extent.

#### ALLOYS

Materials made by melting together two or more elements, at least one of which is a metal

#### ANODE

A site of chemical oxidation (loss of electrons)

#### CATHODE

a site of chemical reduction (gain of electrons)

#### CORROSION

a destructive chemical process; most often applied to the conversion of a metal to one of its compounds, for example, the corrosion of iron by oxygen and water to produce iron oxides (rust)

#### CRYSTAL

a type of solid in which the particles are arranged in a definite geometric lattice; the basic cell, reproduced in three-dimensional space, results in one of fourteen commonly found crystal types