FINITE ELEMENT ANALYSIS ON MULTI-PLANE DEFECTS OF ASTM 106 STEEL PIPE

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Report submitted in partial fulfilment of the requirements for the award of the degree of Bachelor of Mechanical Engineering

Faculty of Mechanical Engineering
UNIVERSITI MALAYSIA PAHANG

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I hereby declare that the work in this project report "*Finite Element Analysis On Multi-Plane Defect of ASTM 106 Steel Pipe"* is my own except for quotations and summaries which have been duly acknowledged. The report has not been accepted for any degree and is not contently submitted in candidate of any other degree.

Signature :…….

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TTM	Trans Thailand-Malaysia
ASTM	American Society for Testing and Materials
FEA	Finite Element Analysis
PGU	Peninsular Gas Utilization
PLUS	North-South Expressway
SSGP	Sabah Sarawak Gas Pipeline
SOGT	Sabah Oil and Gas Terminal
LNG	Liquified Natural Gas
API	American Petroleum Institute
SCC	Stress-Corrosion Cracking
SMCS	Stress Modified Critical Strain
ASME	American Society of Mechanical Engineer
CAD	Computer Aided Design
HSS	High Speed Steel
2D	Two Dimension
3D	Three Dimension

LIST OF SYMBOLS

P_y	Internal pressure on the onset of yield
σ_1	Ratio of the applied tensile force F to the metal area A
ε_i	Strain at onset of instability
d	Pipe outer diameter
T	Pipe wall thickness
k	Strength coefficient
w	Defect width
L	Pipe length
t	Defect thickness
$P_{\exp}$	Experimental pressure
V_{Void}	Volume of voids
σ_y	Yield stress
σ_0	Von Mises effective stress
σ_m	Hydrostatic pressure (mean stress)
σ_{eq}	Von Mises effective stress
σ_{eq}	Von Mises effective stress
α	Material constant
ε_f	Fracture strain