UNIVERSITI MALAYSIA PAHANG

BORANG PENGESAHAN STATUS TESIS ◆

JUDUL: STUDY ON CRACK INTERACTION EFFECT OF API STEEL USING FINITE ELEMENT ANALYSIS

SESI PENGAJIAN: 2011/2012

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Tarikh: **25 JUN 2012**

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STUDY ON CRACK INTERACTION EFFECT OF API STEEL USING FINITE ELEMENT ANALYSIS

AHMAD SYAUQI FATHUDDIN BIN MD SHAIMI

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

Faculty of Mechanical Engineering
UNIVERSITI MALAYSIA PAHANG

JUNE 2012

UNIVERSITI MALAYSIA PAHANG

FACULTY OF MECHANICAL ENGINEERING

I certify that the project entitled "Study on Crack Interaction Effect of API Steel Using Finite Element Analysis" is written by Ahmad Syauqi Fathuddin Bin Md Shaimi. I have examined the final copy of this project and in our opinion, it is fully adequate in terms of scope and quality for the award of degree of Bachelor Engineering. I herewith recommend that it be accepted in partial fulfillment of the requirements for the degree of Bachelor Mechanical Engineering.

(Mr. Luqman Hakim Bin Ahmad Shah)

Examiner Signature

SUPERVISOR'S DECLARATION

I hereby declare that I have checked this project and in my opinion, this project is adequate in terms of scope and quality for the award of the degree of Bachelor of Mechanical Engineering.

Signature :

Name of Supervisor : MRS. NORHAIDA BINTI ABD RAZAK

Position : LECTURER

Date : 25^{th} June 2012

STUDENT'S DECLARATION

I declare that this report titled "Study on Crack Interaction Effect of API Steel using Finite Element Analysis" is my result of my own research except as stated in the references. The project has not been accepted for any degree and is not concurrently submitted for award of other degree.

Signature :

Name : AHMAD SYAUQI FATHUDDIN BIN MD SHAIMI

ID Number : MA08125

Date : 25th June 2012

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LIST OF SYMBOLS

mm	Millimeter
MPa	Mega Pascal
%	Percent
kN	Kilo newton
σ	Stress
P_o	Operational Pressure
P_d	Pressure on Defect
E	Young Modulus
UTS	Ultimate Tensile Strength
Y	Yield Strength
e	Strain
Cu	Cuprum
H_2	Hydrogen
O_2	Oxygen
^oC	Degree Celsius
kg	Kilogram
GPa	Giga Pascal
K	Kelvin
m	Meter
λ	Modulus Elasticity
ν	Poisson’s Ratio
r_d	Curvature of the defect on the right side
r_i	Curvature of the defect on the left side
d_y	Vertical separation
d_x	Horizontal separation

LIST OF ABBREVIATIONS

ASTM	American Society for Testing and Materials
ASME	American Society of Mechanical Engineers
API	American Petroleum Institute
MS	Malaysian Standard
LPG	Liquefied Petroleum Gas
NG	Natural Gas
ANSI	American National Standards Institute
HIC	Hydrogen Induced Cracking
SCC	Stress Corrosion Cracking
SWC	Stepwise Cracking
SOHIC	Stress-Oriented Hydrogen Induced Cracking
SSC	Sulfide Stress Cracking
AF	Acicular Ferrite
FP	Ferrite-Pearlite
MSS	Maximum Shear Stress
VMS	Von Mises Stress
2D	Two Dimension