

Subsea Well

Development and Fatigue

Analysis

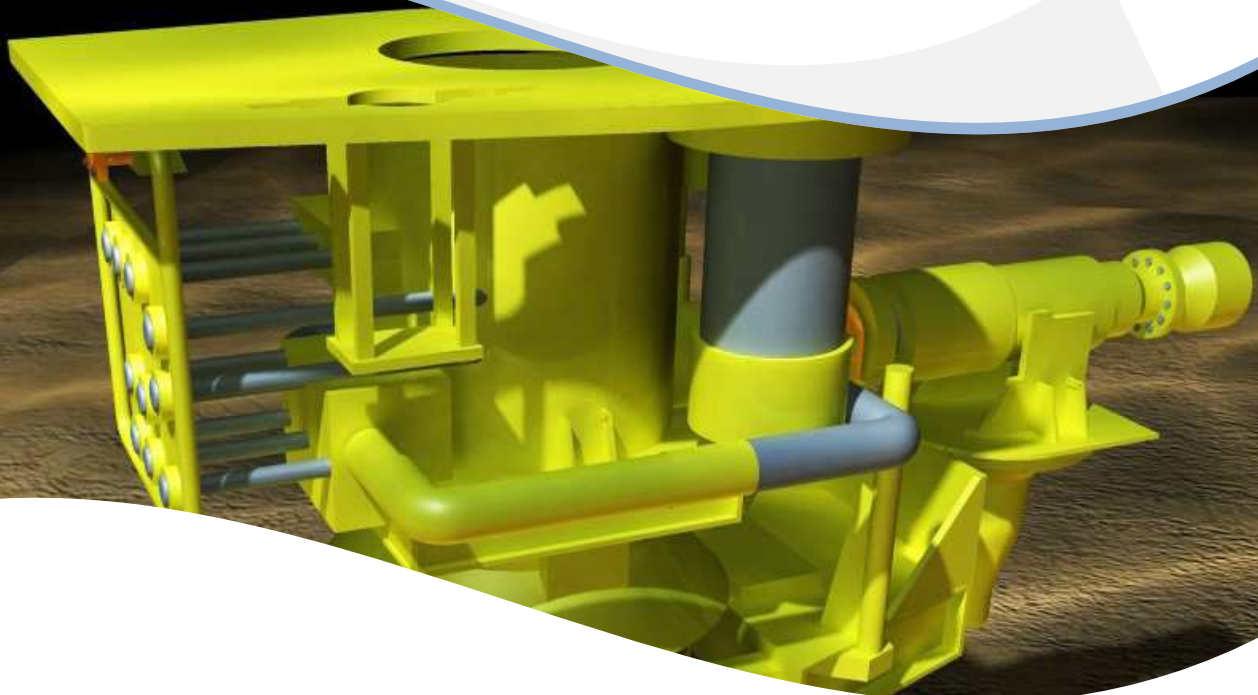
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J.Koto

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Preface



This book introduces basic education on subsea well development for students, fresh offshore engineers and universities' staffs. The book consists of six chapters as follows: The first chapter discusses overview of subsea well. In the second chapter, drilling subsea well, subsea well specification, subsea well construction, subsea well completion and standard and code practiced used in subsea technology are explained in detailed with an example. The third chapter discusses subsea blowout preventer (BOP) and how to control BOP during drilling rig. The fourth chapter comes up with subsea wellhead components and wellhead guide system, the fifth chapter discusses on subsea well test and completion using senTHREE-7 as an example and wellhead fatigue analysis is discussed in the last chapter using Subsea Pro -Simulation & Installation- Software.

Many pictures and illustrations are enclosed in this book to assist the readers' understanding. It should be noted that some pictures and contents are borrowed from other companies' websites and brochures which are quoted and listed in the references. This book mainly is designed for basic education on subsea engineering purposes only not for traded.

2017 (Third Edition)

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List of Abbreviations

Abbreviation	Description
HTHP	High Temperature and High Pressure
BOP	Blow Out Preventer
RP	Recommended Practice
RAO	Response Amplitude Operators
MODU	Mobile Offshore Drilling Unit
DP	Dynamic Positioning
OCTG	Oil Country Tubular Goods
SLEM	Simple Linear Elastic Model
AE	Double Layer Asphalt Enamel
AGRU	Acid Gas Removal Unit
AISC	American Institute of Steel Construction
ALARP	As Low As Reasonably Practicable
AM	Amplitude Modulation
AMS	Asset Management System
ANSI	American National Standards Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
BDV	Blowdown Valve
BOCC	Bintulu Operations Coordination Centre
BOPD	Barrel Oil per Day
BP	Boiling Point
BPD	Barrel Per Day
BS	British Standards
BWPD	Barrel Water per Day
CBMS	Condition Based Monitoring System
CCIR	Consultative Committee on International Radio
CCITT	Consultative Committee on International Telegraphy and Telephony
CCR	Central Control Room
CCTV	Closed Circuit Television
CDBM	Corrosion Design Basis Memorandum
CITHP	Closed In Tubing Heat Pressure
CPP	Central Processing Platform

CRA	Corrosion Resistance Alloy
dB	Decibel
dba	Decibels, weighted sound pressure level
DBM	Design Basis Memorandum
DC	Direct Current
DNV	Det Norske Veritas
DOE	Department of Energy
DOSH	Department of Occupational Safety & Health
DSF	Deck Support Frame
E11R-C	E11 Riser Platform C
EEZA	Exclusive Economic Zone Act
EIA	Electronics Industries Association
EOS	Equation of State
EPCIC	Engineering, Procurement, Construction, Installation & Commissioning
EQA	Environmental Quality Act
ESD	Emergency Shutdown
Ex'd'	Flameproof
Ex'e'	Increased Safety
F&G	Fire and Gas Detection
FBE	Fusion Bonded Epoxy
FEED	Front End Engineering Design
FGS	Fire and Gas System
FM	Frequency Modulation
FO	Fiber Optic
FTHP	Flowing Tubing Head Pressure
FTHT	Flowing Tubing Head Temperature
FWS	Full Well Stream
GMDSS	Global Maritime Distress and Safety System
GMS	Gas Metering Station
GPA	General Platform Alarm
GTG	Gas Turbine Generator
GWR	Guide Wave Radar
HART	Highway Addressable Remote Transducer
HAT	Highest Astronomical Tide
HF	High Frequency
HH	High High
HIPPS	High Integrity Pressure Protection System
HLO	Helicopter Landing Officer
HMI	Human Machine Interface
HSE	Health, Safety and Environment

HVAC	Heating, Ventilation and Air Conditioning
ICAO	International Civil Aviation Organization
IEC	International Electro-technical Commission
IMCS	Intelligent Motor Control System
IMO	International Maritime Organization
IMS	Information Management System
INMARSAT	International Maritime Satellite
IP	Ingress Protection
IPF	Instrument Protective Function
IR	Individual Risk
IS	Intrinsically Safe
ISO	International Standards Organization
ITU	International Telecommunication Union
ITU-R	International Telecommunication Union – Radio-communication, (formally CCIR)
ITU-T	International Telecommunication Union – Telecommunication Standardization, (formally CCITT)
JB	Junction Box
KHz	kilohertz
LAN	Local Area Network
LAT	Lowest Astronomical Tide
LER	Local Equipment Room
LL	Low Low
LNG	Liquified Natural Gas
LQ	Living Quarters
LV	Low Voltage
MAC	Manual Alarm Callpoint
MCC	Motor Control Center
MDTCA	Ministry of Domestic Trade and Customer Affairs
MESC	Materials and Equipment Standards and Codes
MHz	Megahertz
MLNG	Malaysia LNG Sdn Bhd
MMI	Man Machine Interface
MMSCFD	Million Metric Standard Cubic Feet per Day
MSL	Mean Sea Level
MV	Medium Voltage
MW	Molecular Weight
NACE	National Association of Corrosion Engineers
NDB	Non Directional Beacon
NFPA	National Fire Protection Association
NVR	Network Video Recorder

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OSHA	Occupational Safety And Health Act
OTN	Open Transport Node-Proprietary Standards
P&ID	Piping and Instrumentation Diagram
PABX	Private Automatic Branch Exchange
WHCP	Wellhead Control Panel
WHP	Wellhead Platform
WRC	Welding Research Council

List of Symbols

Symbol	Descriptions
A	Added mass
θ	Slope at free end
F	Force

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Autobiographies



Jaswar Koto was born on October, 1970. He is a descendant of the Prophet Rasullullah S.A.W through Husein R.A. He is a President of Ocean and Aerospace Research Institute, Indonesia. Professor on offshore engineering and also President of International Society of Ocean, Mechanical & Aerospace for scientist and engineers.

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