2011 TRAINING COURSES BROCHURE

- Risk-Based Inspection (RBI)
- Piping System & Pipeline Integrity
- Pipe Stress Analysis Using Caesar II Software
- Reliability Centered Maintenance
- Failure Analysis for Industrial Equipments
- Fitness for Service
- Corrosion Control Management
- Material Selection
- Rotating Equipment: Operation & Maintenance
- Lifetime Assessment & Extension Program
- Emergency & Shutdown System
- Vibration Analysis
- Boiler: Operation & Maintenance

www.reksolindo.co.id

Reksolindo Training
learn more.. solve more..

Reksolindo Training Program

We are committed to provide the highest quality engineering training programs in the field of Engineering. Public courses are available for individuals as well as in-house training tailored to meet the specific needs of corporate clients. In-House Training can be conducted, around the year, at your location or facilities provided by Reksolindo Training.

Why choose us?

- Highly qualified and experienced trainers
  Our team consists of highly qualified and experienced trainers with years of teaching, coaching, counseling experiences as well as hands-on and in-depth expertise in various industries with proven track records.
- Training Report
  We provide written report after training as a feedback to your company. Report describes briefly overview of each session, discussion and other information needed.
- Technical Insight & Case Study
  Our courses combine technical knowledge and experience to make learning accessible and entertaining.
- Convenient Place & High Quality Training Material
  Classroom & Training Material are excellent designed to create a positive learning environment

Public Courses

Public course is open for anyone from any organization & presented at our comfortable, well-appointed & uninterrupted learning environment. Public Courses provide opportunities to learn and interact with peers from other companies.

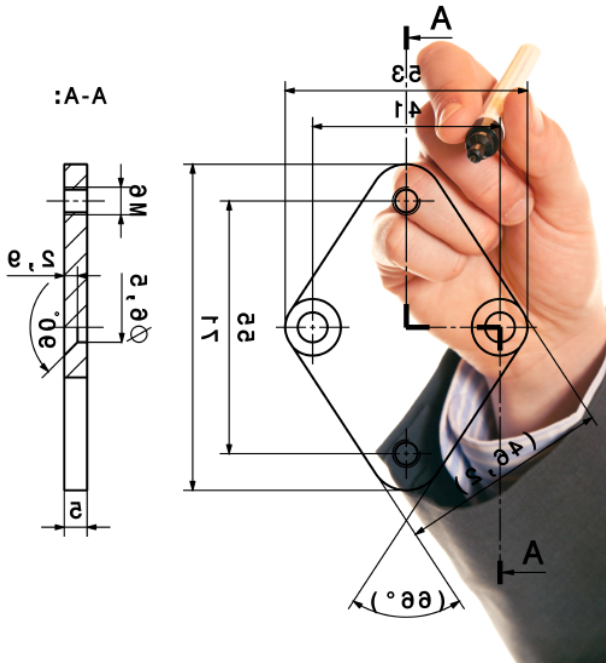
Public Courses by Request

Courses requested from customers can be a solution when the training needs of multiple clients exceed the public course schedule and individual clients do not have enough participants for in-house course. Reksolindo Training will add courses to the public course schedule after a contracted commitment from a client(s) to send a minimum number (3 attendees). The course is then opened to public registrations.

In-House Training

When you need to deliver support for your staff, at the best cost available, use our In-house Training Service. We provide tailored training solutions delivered at a venue you choose. Alternatively we can develop a bespoke course that fits your requirements and fulfils the training needs of your staff.

- **Training Focused on Your Needs** – With our highly experienced trainers we are able to specifically tailor training courses to meet the individual needs of the client.
- **Cost Efficiency** – using our In-house Service is a great way to reduce your costs; with a per day rate you are charged one price for up to 15 people; and you control the venue costs.
- **Convenience** – training dates to suit you at a venue that is convenient.
- **Fast Results** – with years of experience, our trainers provide practical hints and tips for immediate use in the field.
- **Confidentiality** – our trainers know how to develop a safe environment that allows delegates to talk openly about their challenges, resolve problems and see how they could apply their new knowledge.



REKSOLINDO TRAINING SCHEDULE		
Piping System & Pipeline Integrity | 5 days	Jan 24 – 28	Jul 25 - 29
Piping Instrument & Diagram (P&ID) | 5 days	Mar 7 – 11	
Pipe Stress Analysis Using CAESAR II Software | 5 days	Sep 26 – 30	
Flow Measurement | 4 days	Nov 7 - 10	
Advanced Flow Measurement | 5 days	Mar 21 – 25	
Risk Based Inspection | 3 days	Feb 16 – 18	Oct 10 - 12
Reliability Centered Maintenance | 3 days	Feb 23 – 25	May 18 – 20
Lifetime Assessment & Extension Program | 4 days	May 2 – 5	Oct 17 - 20
Fitness for Service | 3 days	Apr 25 - 27	Dec 27 – 29
Predictive & Preventive Maintenance | 3 days	Jun 6 – 9	Oct 25 – 28
Integrated Maintenance Strategy | 5 days	May 23 - 27	Nov 14 – 18
Total Productive Maintenance | 3 days	Feb 7 – 9	Dec 5 – 7
Maintenance Cost Engineering Asset Management | 4 days	Jul 4 - 7	
Emergency & Shutdown System | 5 days	Feb 28 – Mar 4	
Failure Analysis For Industrial Equipment | 4 days	Mar 14 – 17	Nov 14 - 17
Corrosion Control Management | 3 days	Apr 18 – 21	
Failure Mode & Effect Analysis (FMEA) | 5 days	Nov 28 – 2 Des	
Corrosion & Its Prevention | 3 days	Jan 31 – 2 Feb	
Rotating Equipment : Operation & Maintenance | 4 days	Mar 28 – 31	Dec 19 - 22
Mechanical Design | 4 days	Apr 4 – 7	
Valve Technology | 4 days	May 10 – 13	
Vibration Analysis | 3 days	Jun 20 - 22	
Material Selection | 4 days	Sep 12 – 15	
Gas Turbine Operation & Maintenance | 4 days	Apr 11 – 14	
Boiler Operation & Maintenance | 4 days	Jul 11 – 14	
Diesel Engine | 4 days	Sep 6 – 9	
Gas Engine Principle & Practice | 4 days	Nov 1 – 4	
FRP Technology for Oil & Gas Industry | 4 days	Jun 13 – 16	
Choke & Control Valves | 5 days	Oct 3 – 7	

Training will be held in ASTON PRIMERA Pasteur or Hotel Jayakarta Bandung

COURSE FEES			
	Regular	**Early Bird**	**3 or More Attendees**
3-days course	4.950.000	4.450.000	+ 10% off
4-days course	5.950.000	5.450.000	
5-days course	6.950.000	6.450.000	

Terms and Conditions:

1. All the Public Training will be held in Bandung
2. Course fee excluding Tax.
3. Course fee including:
   - Coffee Break & Lunch
   - Training Kit (Pen, Note, Bag/Backpack)
   - A full set of the course Module
   - CD containing complete course slide
   - Certificate of Completion
4. The early bird will apply only to sign up 21 days before the course commencing date, over that period we apply the regular price.
5. REKSOLINDO TRAINING reserves the right to cancel classes up to one week before scheduled date due to low registration. Upon cancellation, REKSOLINDO TRAINING will provide registrants a full refund for pre-paid course fees. Cancellation of courses does not imply responsibility for reimbursement to registrants for non refundable expanses.
6. Please note that :
   - 25% from the total course fee will be charge as cancellation fee for any cancellation made 7 days to 3 days before the event.
   - 50% from the total course fee will be charge as cancellation fee for any cancellation made within 2 days before the event.

Instructor's Profile

Dr. Ir. Husaini Ardy.

He is lecturer staff in Mechanical Engineering Department, Institute Teknologi Bandung since 1984. He got his Ph.D degree (1994) in Materials Engineering from Illinois Institute of Chicago USA, Master degree (1997) in Mechanical Engineering from Institut Teknologi Bandung, and Bachelor degree (1984) in Mechanical Engineering from Institut Teknologi Bandung. He has a long track record as an engineering material consultant for industries such as BP. Indonesia, VICO Indonesia, TotalFinaElf, Exxon-Mobile Oil, Conoco Indonesia, Petrochina,. Star Energy, Premier Oil, Amerada Hess, Pertamina UP-V, Pertamina UP-VVI, PT. Petrokimia Gresik, PT.PUSRI, PT. Pupuk Iskandar Muda, Pt. Asean Aceh Fertilizer, PT. Krakatau Steel, PT. KHI, PT. Hickham Indonesia, and Sucofindo Lab.

Dr. Ir. Slameto Wiryolukito

He is a lecturer staff in Mechanical Engineering Department, Institut Teknologi Bandung since 1982. He got his Ph.D degree (1994) in Materials Engineering from Illinois Institute of Technology. Chicago USA, Master Degree (1989) in Mechanical Engineering from Institut Teknologi Bandung, and Bachelor Degree (1982) in Mechanical Engineering from Institut Teknologi Bandung. He has a long track record as an engineering material consultant for industries such as BP Indonesia, TotalFinElf, Exxon-Mobile Oil, Conoco Indonesia, Pertamina UP-VI, PT. Krakatau Steel, PT. KHI.

Dr. Ir. Hermawan Judawisastra

He got his Ph.D (2002) in Material Engineering from Katholieke Universiteit, Belgium. He has a long track as material consultants for industries such as PT. Pupuk Kujang, PT. KAI, PT. Krakatau Steels, BP-Indonesia, PLN and Conoco Philips.

Dr. -Ing. Ir. Tri Yuswidjajanto

Has more than 18 years experience in fuel engine, propulsion system, and tribology. He got his Dr. –ing (2002) from Technische Universitaet Clautsthal, Clautsthal-Zellerfeld, Germany. In 2001-2004 he was a Head of Fuel Engine & Propulsion System Laboratory in Institute of Technology Bandung. He graduated from ITB with a BSc in mechanical engineering in 1987. Currently he is a lecturer staff in mechanical engineering department.

Ahmad Taufik, M.Eng, Ph.D.

Risk and Integrity Specialist, and Chairman for Indonesian Society for Reliability (ISR), Ph.D form Georgia Institute of Technology, Atlanta, USA (1996), He has over 10 years experiences in oil & gas industries. He was with Lloyd's Register before and now joined with PT. Surveyor Indonesia and PT. AT Solusi as a risk consultant. Taufik has performed in depth study in fatigue and fracture mechanics research and member of ASM, ASME and SRE. He is also a part time lecturer at Graduate Study Program, ITB.

Dr. Rachman Setiawan

He was born in Surabaya on 15 March 1974. He got his Dr- from the University of Southampton United Kingdom in 2004, now he works as Assistant Professor School of Mechanical and Aerospace Engineering, ITB. He has more than 6 years as a training instructor and 14 years of experience as a mechanical consultant.

DR. Ir. I Wayan Suweca

He has been a senior consulting engineer specialist for PT. TIMAH Tbk., PT. TAMBANG BATUBARA Bukit Asam, KONDUR Petroleum S.A., and PT. KAI whereas he's involved in failure analysis of machineries and equipments' design. Mr. Wayan also is a distinguished professor of mechanical engineering at ITB since 1987 and has conducted numerous short courses and seminars for various major oil companies such as PT. CALTEX Pacific Indonesia, PT. FREEPORT Indonesia as well as VICO.

His field of expertise includes mechanical design and drawing, stress analysis and computer aide MSC/Nastran finite element program, mining hydraulics, and vibrations control as well as maintenance management. Mr. Wayan received his Ph.D. in Mechanical Engineering from Ecole Centrale de Lyon, French in 1990.

Prof. DR. Ir. IGN. Wiratmaja Puja

He has 16 years continuous mechnanical engineering experience in failure and stress analysis, mining machinery and design as well as mechanical drawing and has been a consulting engineering expert in machinery and equipment maintenance for PT. Tambang Batubara Tanjung Enim, KONDUR Petroleum and PT. Kereta Api Indonesia. He also has served as an in-company training instructor for several major oil and gas companies such as PT. Badak LNG, PT. Freeport Indonesia, VICO and PT. Timah Tbk.

Mr. Wiratmaja has authored numerous publications and presentations related to mechanical engineering and mining machinery. He holds a M.Sc. and Ph.D. degree in Mechanical Engineering from the University of Kentucky, USA.

DR. Ir. H. Bagus Budiwantoro

He is a senior engineering consultant engaged in railway, mining, and petroleum projects. Currently, Mr. Bagus works as an experienced professor of mechanical engineering for ITB and has conducted several short courses for various organizations in machinery' components and its vibrations as well as machinery' structures and its dynamics.

He has also published numerous articles in the same field, available either internationally or nation wide. Mr. Bagus received his Master and Doctorate degree in Mechanical Engineering from Ecole Centrale de Lyon, France in 1990.

Endra Joelianto, Dr. Ir

He is an expert in control engineering. His outstanding research is: Hybrid Control Systems, Discrete Event Control Systems, Petri Nets Analysis and Application on PLC, Robust PID Controller, Advanced Process Control, Industrial Automation using PLC/DCS. He received first degree (Ir.) in Engineering Physics in 1990 from Department of Engineering Physics, ITB and Doctor of Philosophy (PhD.) in Control Engineering in 2001 from Department of Engineering, The Australian National University, Australia. He is coordinator of Intelligent Control and Automation, and founder of PLC Research Group, Laboratorium Instrumentasi dan Kontrol (LINK), Departemen Teknik Fisika, Institut Teknologi Bandung. He was the founder and the director of Schneider-OMRON PLC Training Center, Maranatha Christian University, Bandung. The Schneider-OMRON PLC Training Center has cooperation with PT. Schneider Electric Indonesia, PT. OMRON Corporation Japan, Invensys WONDERWARE

PIPING SYSTEM & PIPELINE INTEGRITY

"This course will center on the on the practical aspects of piping and pipeline design, integrity, maintenance and repair."

COURSE OBJECTIVES

- Gain an in-depth knowledge of pipe and fitting material specifications, manufacturing, fabrication process and their influence on mechanical properties of strength and toughness, to help in material selection and failure analysis.
- Understand the technical background to the design equations, and their application to the design of piping systems and pipelines. The course addresses rules of good practice in layout of piping systems for reliable operation.
- Gain a practical understanding of piping and pipeline mode of failure, corrosion mechanisms, how to recognize them, classify them and resolve them.
- Learn risk assessment for piping & pipeline i.e. probability of failure and their consequences if failures occur.
- Introduced to the latest techniques and research in piping and pipeline integrity to analyze a degraded condition due to either corrosion or mechanical damage.

BACKGROUND

The Piping Systems & Pipeline Code establishes rules of the design, inspection, maintenance and repair of piping systems and pipelines throughout the world. The objective of the rules is to provide a margin for deterioration in service.

COURSE OUTLINE

Introduction
History of Pipeline Technology, ASME Codes and Standards, API Standards, NACA, MSS-SP, PFI Standards, Fundamentals of Maintenance and Integrity

Line Pipe Materials Selection
API 5 Land ASTM Specifications, Practical Aspects of Metallurgical Properties , Chemistry and Material Test Reports, Line pipe Manufacturing, Fabrication and Fittings Specification, Mechanical Properties : Strength and Toughness, Material selection technique

Pipe Welding
Overview of Pipe and Pipeline Welding Practice, API 1104 and ASME IX Requirement, Welding In-service: Challenge and Solutions

Strength Integrity for Sustained Loads
Operating and Design Pressure, Temperature Effect, Vibration In Service

Strength Integrity for Occasional loads
Pressure Transients, Buried Pipe, Pipeline Failures

Corrosion Assessment and Protection
Introduction to Practical Corrosion, Classification of Corrosion mechanisms, General Wall Thinning, Local Corrosion: Galvanic Effect, Crevice Corrosion, Pitting Corrosion, Environmental Effects, Hydrogen and H2S Effects, Microbiological Corrosion, Corrosion Protection, Cathodic Protection Overview

Risk Assessment Overview
Introduction to Risk Assessment, Risk Criteria, Probability of Failure, Consequence of Failure, Risk Representation

Fitness for Service Overview
Application of ASME B31G to Determine Remaining Life, Application of 579 to General and Local Corrosion, Analysis of Dents and Gouges in, Pipelines, How to Evaluate cracks in Piping and Pipeline

Maintenance & Repair
Flange and mechanical joints, Pressure and leak Testing, Repair Technique

INSTRUCTORS

Prof. Dr. Ir. IGN. Wiratmaja Puja & Team

COURSE FEES | 5 Days

Rp. 6.950.000 (Regular)

Rp. 6.450.000 (Early Bird)

RISK BASED INSPECTION (RBI)

"This ability to analyze the combined effect of multiple factors help users better focus their limited resource. As results, RBI improves the outcomes of important "run, repair or replaced" decision."

COURSE OBJECTIVES

- Select the most effective RBI approach for their needs
- Manage RBI projects
- Create specific equipment inspection plans
- Establish implementation processes for their particular infrastructure and culture

BACKGROUND

Every industry is under pressure to reduce production expenses. Together competition has forced profit margins downward, thereby highlighting the critical importance of maintaining an uninterrupted product flow. Another problem is that industry aging infrastructure makes it difficult to achieve the optimal level of equipment availability. In answer to these challenges, several landmark technologies and philosophies have emerged during the past 10 to 15 years, such as risk based inspection.

New RBI technologies enable companies to incorporate a range of key factor into their decision making processes, including equipment reliability consideration as well as safety, environmental, and business determinants. Often there is a misunderstanding about how to apply RBI methods. There are many companies using RBI that achieve a high level of success (i.e., optimized cost and lower risk). However, others still struggle with how to implement RBI. Either they believe costs are too high or have problem taking the next step or just inverse. Lack of knowledge/experienced is address through RBI's course.

Using semi-quantitative and quantitative approaches, the course covers technical content that is board and deep. Class discussion is an effective way for participant to gain insight about the focus of various RBI methods and parameters to include in effective analytical program.

COURSE OUTLINE

1. Overview of risk based inspection
2. Intro to API 580/581
3. Assessing consequence of failure
4. Assessing the like hood of failure
5. Assessment of damage in :
   a. Thinning mechanism
   b. Cracking mechanism
   c. External damage
   d. Other type of damage
6. Assessment of various risk determinations
7. Assessment of analysis and data validation
8. Assessment of inspection planning
9. Conducting an RBI study and software application demo

WHO SHOULD ATTEND

- Inspection Managers and Engineers
- Operational Auditing Managers and Engineers
- Risk Analysis Managers and Engineers
- Others who want to broadened their knowledge in RBI

COURSE FEES | 3 Days

Rp. 4.950.000 (Regular)
Rp. 4.450.000 (Early Bird)

INSTRUCTORS

Dr. Ir. Slameto Wiryolukito
Dr. Ir. Hermawan Judawisastra

RELIABILITY – CENTERED MAINTENANCE

COURSE OBJECTIVES

- Understanding RCM
- Understanding maintenance philosophy based on third generation maintenance
- Preventing serious failure
- Optimizing operation cost and machine capacity
- Acquiring effective and efficient manufacturing tools

BACKGROUND

Nowadays RCM is regarded as a key solution to control down-time problem, product qualification, safety and maintenance cost. RCM prepared a method to identify equipment based on its reliability and lowering maintenance cost but still delivers reliable performance.

COURSE OUTLINE

Brief History of RCM
a. Airlines Experience
b. RCM analysis history
c. RCM in other various sector

Introduction to Reliability-Centered Maintenance
a. Changes in maintenance world
b. Maintenance and RCM
c. RCM and seven basic question
d. RCM implementation

What RCM could achieve?
a. RCM analysis results
b. RCM benefits

RCM Implementations
a. Who knows?
b. RCM Group Review
c. Facilitator
d. Auditor
e. Implementation Strategies
f. RCM Preservation Properties
g. Building Expertise in RCM

Predictive maintenance technique
a. Introduction
b. Condition Inspection Technique
c. Dynamic Inspection Technique
d. Particle Inspection Technique
e. Chemistry Inspection Technique
f. Physical Effect Inspection Technique
g. Temperature Inspection Technique
h. Electrical Effect Inspection Technique
i. Analysis Level.

Factory registration
a. What is "Factory Registrations"?
b. What is "Machine"?
c. How assets should be numbered?
d. What information that should be noted?
e. How to assemble factory registration?

Function and Failure
a. Function and performance standard
b. Functional failure
c. Modes of failure
d. Effects of failure

Failure cause and technical record
a. Failure process
b. Six pattern of failures
c. Technical record data

Failure Consequences

Preventative tasks

Default Action
a. Scheduled inspection to find failure
b. Unscheduled maintenance
c. Re-design
d. Lubrication

RCM decision diagram
a. RCM Decision Process
b. Decision Form Completion

Planning, Organization, and Task initiative design
a. Task Package
b. Planning and Maintenance Control System
c. Damage Reporting

INSTRUCTOR

Dr. –Ing. Ir. Tri Yuswidjajanto

COURSE FEES | 3 Days

Rp. 4.950.000 (Regular)
Rp. 4.450.000 (Early Bird)

PIPE STRESS ANALYSIS & DESIGN USING CAESAR II SOFTWARE

"This course is really an Introduction to Piping Stress Analysis and Practice using CAESAR II, and each participant should bring their own personal computer (laptop) and we provide a copy of the CAESAR II pipe stress analysis program for use during the course."

BENEFITS

- To learn the piping Codes, Standard and Regulations, Technical Piping Documentation, piping design loads and be able to conduct stress analysis,
- To understand the ANSI Piping Codes and ASME Codes,
- To learn piping support analysis & design,
- To utilize software Caesar II to conduct static and dynamic stress calculation, including expansion, bend, flange, and other equipment

BACKGROUND

It is vital that the piping engineer and designer not only learn how to pipe up a process using this technology but also understand and comply with the requirements of industry codes and standards. The Fundamentals of Piping Design is an introduction to the design of piping systems, various processes and the layout of pipe work connecting the major items of equipment for the new hire, the engineering student and the veteran engineer needing a reference.

CAESAR II is the Pipe Stress Analysis standard against which all others are measured and compared. The CAESAR II spreadsheet input technique revolutionized the way piping models are built, modified, and verified. CAESAR II was the first pipe stress program specifically designed for the PC environment. The interactive capabilities permit rapid evaluation of both input and output, thereby melding seamlessly into the "design - analyze" iteration cycle.

CAESAR II incorporates a wide range of capabilities, from numerous piping codes, to expansion joint, valve & flange, and structural databases, to structural and buried pipe modeling, to equipment and vessel nozzle evaluation, to spectrum and time history analysis.

COURSE FEES | 5 Days	INSTRUCTORS
Rp. 6.950.000 (Regular) Rp. 6.450.000 (Early Bird)	Dr. Ir. I Wayan Suweca and team

Course Outline (See Next Page)

Pipe Strees Analysis & Design Using CAESAR II SOFTWARE
COURSE OUTLINE

BASIC THEORY:

- Basic Stress Theory
  Introduction. Brief history. Piping system. Pipeline system. Codes, standard, and regulation. Codes & standards agencies.
- Piping Systems: Codes, Standards and Regulations
- Piping Design Loads .
  Introduction. Sustain Loads: weight; pressure. Occasional Loads: wind; relief valve discharge; seismic. Expansion Loads. Load Combinations. Vibration Aspects.
- Pipe Stress Requirement
  Review of Failure Theory. Stress Categories. Fatigue Aspect. Service Levels and Loads. B31 Basic Reference Data & Formula.
- ANSI Piping Codes and ASME Codes
- Pipe Support Systems
- Pipe Stress Analysis
  Static Review: force and moments, equilibrium state, free body diagram. Stress review: stress state, stress due to various loading (axial, bending, torsion, and shearing). Stress in pipe (hoop, longitudinal, and radial stresses). Stress analysis: principal stresses, Mohr circle, stress intensification factor (SIF).

CAESAR II:

- Main Menu
  Piping Spreadsheet. Auxiliary Field. Support Spreadsheet. Preprocessing. Analysis Procedure. Error Checking. Output Processing.
- Modeling Approach
  Anchors. Bends. Cuts. Restraints. Flexible Joints. Frames. Hangers. Nozzles. Pipes. Reducers. Rotating Equipment. Tees. Valves. Vessels. Load case.
- Static Analysis
  Linear Analysis. Nonlinear Analysis. Support Gap and Friction Properties. Spring Directions: one-point and two-point supports. Soil Yield Effects. Y-Stop Lift-Off. Weightless Vs. As Built Gap Treatment. Solution Sequence. Displacement Tolerance. Force Tolerance and Friction Tolerance. Failure to Converge. Hanger Analysis.
- Dynamics Analysis
  Modal Analysis : general principle of static correction methods, missing mass correction, zero period acceleration (ZPA) correction, mass discretization. Response Spectrum Analysis : square root of the sum of the squares (SRSS), grouping method, ten percent method, double sum method. Harmonic Analysis. Force Spectrum. Sismic Anchor Movement Analysis.
- Structural and Buried Pipeline
  Pipe-Soil Interaction. Properties for a Horizontal Pipe Orientation. Properties for a Vertical Pipe Orientation. Determination of Zone Locations. Define the Transition. Soil Forces and Deformations. Report. Conclusions.
- Output Processing
  Coordinate Systems. Total vs. Incremental Loading. Pipe Displacements. Pipe Forces and Moments: global option, anchor forces, support forces. Support Deformations. Straight Pipe Forces and Moments. Curved Pipe Forces and Moments. Frame Member Forces. Stress Intensification Factors. Hoop Stress. Longitudinal Stress. Torsional Shear Stress. Principal Stress. Maximum Shear Stress. Location of Maximum Shear Stress. Octahedral Shear Stress.
- Case Studies: Real problem

FAILURE ANALYSIS FOR INDUSTRIAL EQUIPMENTS

"Introducing the role of failure analysis methodology in exploring the root cause of component failure and how to prevent the similar failure in the future."

BACKGROUND

Failure analysis is designed to identify the failure modes, identify the failure site, identify the failure mechanism, determine the root cause, and recommend failure prevention methods. This course will enrich the analytical, technical and scientific knowledge of participants, which will ultimately result smooth operation process and increased profitability for the company. This course covers current practice in production and maintenance management including prevention and maintenance cases in real-life situations. Actual case studies will be conducted, to help participants gain practical understanding of techniques they can take away and utilize in the fields.

COURSE OUTLINE

Failure Analysis procedures

1. Objective of failure analysis
2. Stage of analysis

Modes of failure

1. Ductile
2. Brittle
3. Fatigue wear
4. Creep and stress rupture
5. Corrosion

Stress analysis

1. Static loading
2. Fatigure fatigue loading
3. Impact loading
4. Application of facture mechanics

Fractography

1. Visual analysis
2. Stereo microscopy

Microscopic analysis

1. Optical microscopy
2. Scanning electron microscopy
3. X-ray diffraction
4. Chemical analysis

Sample selection and preparation

1. Sampling Selection and preparation for fractography analysis
2. Sampling and preparation for micro structural analysis
3. Sampling and preparation for chemical analysis
4. Sampling and preparation for mechanical analysis

Analyzing the evidence & formulating for conclusion.

Report & Writing

Case studies

Case study were draw from the real cases that have been solved by metallurgical engineering laboratory. Mechanical engineering department ITB teams. Some of the are :

1. Failure analysis of bolt
2. Failure analysis of pressure
3. Failure analysis of wheel bearing
4. Failure analysis of super heater tube
5. Failure analysis of reformer tube
6. Failure analysis of stator blade
7. Failure analysis of thermo well
8. Failure analysis of sucker rod
9. Failure analysis of pipeline
10. Failure analysis of centrifugal compressor pin
11. Failure analysis of cylinder liner

COURSE FEES | 4 Days	INSTRUCTORS
Rp. 5.950.000 (Regular) Rp. 5.450.000 (Early Bird)	Dr. Ir. Husaini Ardy

ROTATING EQUIPMENT : OPERATION & MAINTENANCE

COURSE OBJECTIVES

- Provides the participant full knowledge of most used rotating machineries, include theoretical and practical discussion.
- Understanding the characteristic of rotating machinery by learning the basic, construction, operation, maintenance, performance and testing, and also trouble shooting and discussion.

BACKGROUND

Oil and gas, power generation, transportation (air and marine) and space sectors all utilize rotating machinery, pump, compressor, turbine, bearing, motors and generators. These machines are crucial for the life line of their industries and any unplanned shutdown can cause severe financial losses, in some cases the entire plant may be lost causing catastrophic incidents. It is just not the proper design of this machinery, but also proper maintenance that enhances its continuous availability allowing the industry to deliver.

While some failures can occur due to unforeseen circumstance, just however are usually prevented through good maintenance management. Understanding the life span of machinery and estimating that life span using modern methods helps in the investigation of any failure and this in preventing such incidents.

It is also vital to know how much of that life span has been used in continuous operation and to able to estimate remaining safe life allowing operators to phase out machine at appropriate time. These interactive course address the dynamic related issues of rotating machinery leading to a better understanding and appreciation of the various maintenance methods and procedures available that events and prevents accidents.

COURSE OUTLINE

Introduction

Pump

a. Basic concept
b. Construction
c. Operation
d. Maintenance
e. Performance & testing
f. Trouble shooting & discussion

Compressor

a. Basic concept
b. Construction
c. Operation
d. Maintenance
e. Performance & testing
f. Trouble shooting & discussion

Gas turbine

Steam turbine

Bearing & lubrication

a. Bearing
b. Lubricant
c. Lubrication
d. Characteristics & operation
e. Case study & maintenance
f. Performance & testing
g. Trouble shooting & discussion

Vibration & monitoring

a. Basic concept
b. Construction & characteristic
c. Sensor & equipment
d. Measurement methods
e. Analysis & interpretation
f. Testing & discussion

WHO SHOULD ATTEND

- Mechanical, rotating, technicians and project engineer.
- Operators and maintenance personnel who involved in installation, testing and maintenance of rotating machineries.

COURSE FEES | 4 Days

Rp. 5.950.000 (Regular)

Rp. 5.450.000 (Early Bird)

INSTRUCTOR

Dr. – Ing. Ir. Tri Yuswidjajanto

MECHANICAL DESIGN AND ENGINEERING

"Peserta akan mendapatkan pengertian dan pemahaman tentang aspek optimasi dalam proses perancangan dan mampu menerapkannya dalam melakukan perancangan suatu produk."

BACKGROUND

Membahas metodologi merancang produk baru dan produk inovatif dengan pendekatan sistematik. Kegiatan merancang produk dimulai dari ditemukannya kebutuhan akan produk, dilanjutkan fungsi yang harus dipenuhi oleh produk, bagaimana fungsi-fungsi tersebut dapat dipenuhi, konsep produk dan beberapa alternatifnya, pemilihan alternatif dan optimasi, perancangan detail, perhitungan kekuatan, sampai akhirnya pembuatan prototype.

COURSE OUTLINE

Introduction to Design

- Design and Design Process
- Problem Formulation and Calculation
- Engineering Model Computer-Aided Design and Engineering
- Engineering Report
- Factor of Safety and Design Codes

Material and Process

- Material Property Definition
- Homogeneity and Isotropy
- Hardness
- Coating and Surface Treatment
- General Properties of Metals
- General Properties of Non-metals

Load Determination

- Loading Classes
- Free Body Diagram
- Load Analysis
- Case Studies of Static Load Analysis
- Case Studies of Dynamic Analysis
- Vibration Load
- Impact Load

Stress, Strain, and Deflection

Stress, Strain, Principal Stresses, Plane Stress and Plane Strain, Mohr's Circle, Applied vs Principal Stresses, Direct Shear Stress, Bearing Stress and Tearout, Beams and Bending Stresses, Deflection in Beams, Castigliano's Method, Torsion, Combined Stresses, Case Studies in Static Stress and Deflection Analysis

Static Failure Theories

Failure of Ductile Material under Static Loading, Failure of Brittle Material under Static Loading, Fracture Mechanics, Case Studies

Fatigue Failure Theories

Mechanism of Fatigue Failure, Fatigue-Failure Models, Machine Design Considerations, Fatigue Load, Measuring and Estimating Fatigue-Failure Criteria, Notches and Stress Consideration, Residual Stress, A General Approach to High-Cycle Fatigue Design, Case Studies

Surface Failure

Surface Geometry, Friction, Adhesive Wear, Abrasive Wear, Corrosion Wear, Surface Fatigue, Dynamic Contact Stress

INSTRUCTORS

Dr. Ir. I Wayan Suweca & Team

COURSE OUTLINE

Rp. 5.950.000 (Regular)

Rp. 5.450.000 (Early Bird)

CORROSION CONTROL MANAGEMENT

"This course is based on material used that around the world in similar courses but has been adapted for those working in practical application of corrosion and its control. It is suitable for a variety of interests and is presented at an easy level to digest should appeal to a wide range of potential participants."

BENEFITS

- Enhance your understanding of corrosion control methods with class exercises
- Learn the basic corrosion cell, which determines all forms of corrosion in the production

BACKGROUND

Corrosion costs company millions every year. The first step in controlling it understands it. The purpose of this course is to present an overview and fundamental understanding of wide variety of corrosion and how to control it. The participant will be able to recognize the various types of corrosion, what has caused the corrosion and its failure, be able to identify the best method to control corrosion, be able to predict remaining life time by computer software application, economic evaluation, and a case study.

COURSE OUTLINE

Introduction To Corrosion Mechanism
a. How and Why Metals Corrode
b. Corrosion and Cost Created
c. Human Factor to Corrosion

Types Of Corrosions
a. Aqueous Corrosion
b. Atmospheric Corrosion
c. Water Corrosion
d. Sea Water Corrosion
e. Soil Corrosion
f. Concrete Corrosion
g. Microbiology Corrosion
h. High Temperature Corrosion
i. Galvanic Corrosion
j. Stress Corrosion
k. Other Corrosion

Failure Caused by Corrosion
a. Failure Modus
b. Investigation Method of Failure Caused by Corrosion
c. Failure Prevention Caused By Corrosion

Maintenance By Inspection And Monitoring
c. Inspection Method
d. Non-destructive Inspection (NDI)
e. Smart Sensing
a. Maintenance Revolution
b. Monitoring and Maintenance Management

Modeling, Life Time Prediction, And Computer Application
a. Modeling and Life Time Prediction
b. Artificial Intelligence Usage
c. Computer-base Training and Coaching

Corrosion Protection methods
a. Surface Coating
b. Coating Method
c. Surface Preparation
d. Inhibitor Injection
e. Inhibitor Classification
f. Inhibitor Protection Mechanisms
g. Inhibitor Selection Methods
h. Cathodic Protection
i. Sacrificial Anode
j. Impressed Current
k. Underground Piping Cathode Protection
l. Anode Protection

Economic Aspect Evaluation
a. Budget and Cost Planning
b. Depreciation

Case study
Practical demos at Metallurgy Lab of Mechanical Engineering ITB

WHO SHOULD ATTEND

Engineers, Technicians, Fields supervisors responsible for planning, implementing and supervising corrosion control systems and programs.

COURSE FEES | 4 Days	INSTRUCTOR'S
Rp. 5.950.000 (Regular)	Dr. Ir. Slameto Wiryolukito
Rp. 5.450.000 (Early Bird)	Dr. Ir. Husainy Ardy

LIFETIME ASSESSMENT & EXTENSION PROGRAM

"This course is design to provide crucial skills of lifetime extension program to develop a sound understanding of maintenance and rejuvenation program as it is applied in real-world production"

BENEFITS

- Gain crucial knowledge of equipment lifetime extension program
- Reduce company downtime cause by unfit/worn-out equipments
- Perform equipments lifetime assessment before it breaks
- Prevent industrial incident due to equipment failure and lack of consciousness
- Improve analytical skills and maintenance know-how efficiently and effectively

BACKGROUND

All Equipments, tools or machines eventually will experience a deterioration process, especially against time and their workload. This phenomenon could not put to a STOP, as we wish!
Instead, what we could do is to slowing it down. Deterioration could have been cause by many aspects such as creep, overheated, embrittlement, fatigue, corrosion and more. Should this phenomenon prolong, it will cost company even greater problems. Such problems lead to machinery failure and company's downtime.
An essential technical knowledge of analytical methods, remaining lifetime assessment procedures, CAE(Computer Aided Engineering), FEM (Finite Element Method), SCC (Stress Corrosion Crack), and predictive maintenance program are the subjects of this course.

COURSE OUTLINE

Lifetime Assessment Program

a. Introduction to Lifetime Assessment
b. Equipment Original Design and Types of Operations Performed
c. Implementation of Maintenance Program
d. Deterioration level, Repair and Rejuvenation Program
e. Remaining Lifetime Assessment

Analytical Methods

a. Stress, Strain and Strength Analysis
b. Mechanical Load Analysis
c. Engineering Material and Standard Analysis
d. Material Degradation Analysis
e. Fatigue Analysis

Finite Element Method (FEM)

a. Basic Concept
b. Structure Analysis
c. Stress Simulation
d. Data Processing

Predictive Maintenance

a. Monitoring
b. Predictive Maintenance Planning
c. Lifetime extension Program

INSTRUCTOR

Dr. –Ing. Ir. Tri Yuswidjajanto
Dr. Ir. Slameto Wiryolukito

COURSE FEES | 4 Days

Rp. 5.950.000 (Regular)
Rp. 5.450.000 (Early Bird)

VALVE TECHNOLOGY

BACKGROUND

This course is case study driven and bought by experts with many experiences of valve. We emphasize on openness of discussions that will offer insight into your need.

COURSE OUTLINE

Introduction to Valves

The valve. Valve classification According to Function. Classification According of Application. Classification According to Motion. Classification According to Port Size. Common Piping Nomenclature.

Valve Selection Criteria

Valve Coefficients. Flow Characteristics. Shutoff Requirements. Body End Connections. Pressure Classes. Face-to-Face Criteria. Body Material Selection. Gasket Selection. Packing Selection.

Manual Valves

Introduction to Manual Valves. Manual Plug Valves. Manual Ball Valves. Manual Butterfly Valves. Manual Globe Valves. Manual Gate Valves. Manual Pinch Valves.

Check Valves

Introduction to CHV. Lift CHV. Swing CHV. Tilting-Disk Check Valve. Double-Disk CHV. Diaphragm CHV. CHV Operation. CHV Installation. CHV Troubleshooting/Maintenance. CHV Servicing.

Pressure Relief Valves (PRV)

Definition. PRV Design. PRV Operation. PRV Troubleshooting. PRV Servicing.

Control Valves (CV)

Introduction to Control Valves. Globe Control Valves. Butterfly Control Valves. Ball Control Valves. Eccentric Plug Control Valves. CV Operation. CV Installation. CV Troubleshooting/Maintenance. CV Servicing.

Actuators and Actuation System

Definition of actuators and actuation. Pneumatic actuation: introduction, pneumatic actuator design, pneumatic actuator installation, pneumatic actuator troubleshooting, pneumatic actuator servicing. Non-pneumatic actuators: electric actuators, hydraulic and electro-hydraulic actuators. Actuator performance. Positioners : introduction, positioner operation, positioner calibration, positioner troubleshooting.

Common-Valve Problem

High-pressure drops. Cavitations. Flashing. Chocked flow. High velocity. Water-hammer effects. High noise levels. Noise attenuation. Fugitive emissions.

INSTRUCTORS

Dr. Ir. I Wayan Suweca & Team

COURSE FEES | 4 Days

Rp. 5.950.000 (Regular)
Rp. 5.450.000 (Early Bird)

VIBRATION ANALYSIS

COURSE OBJECTIVES

- Understand the basic theory of vibration
- Know-how knowledge in deciding the instrument for vibration measurement
- Understand the source of vibration that commonly occur, and the analysis course of action

BACKGROUND

Vibration has extensive use for analysis to determine machine condition. Vibration analysis can be utilized for reciprocating machinery of linear-motion machinery. Knowledge of vibration measurement and data acquired is very important for maintenance or problem troubleshooting. This capability can assist company to reduce downtime occurrence and increase profit, either from production standpoint or from longer machinery life gained.

COURSE OUTLINE

Basic Theory of Vibration
- Preventive maintenance based of vibration monitoring

Free Vibration – One Degree of Freedom
- Free Vibration Undamped
- Free Vibration Damped

Forced Vibration – One Degree of Freedom
- Forced Harmonic Vibration
- Revolving Unbalanced Mass
- Rotor Imbalance
- Pivoted System Movement
- Vibration Isolation
- Shaft Critical Velocity
- Acquiring Damped Rotation Coefficient

Getaran Dua Derajat Kebebasan
- Free Vibration
- Forced Vibration
- Dynamic Dampening

Vibration Many Degree of Freedom

Continuous System

Predictive maintenance based on Vibration Monitoring
- Vibration and machine condition
- Measurement of vibration signal
- Vibration signal analysis equipment
- Basic concept of maintenance technology
  i. Conventional maintenance method
  ii. Predictive maintenance method
  iii. Permanent and periodic inspection
  iv. Measurement parameter

Vibration signal analysis method
- Analysis's practical aspect
- Utilizing phase for analysis
- Addition and subtraction of frequencies
- Velocity normalizations
- Baseline spectrum
- Vibration Standard
- Machine vibration evaluation criteria

Vibration characteristic of damaged
- Unbalance
- Bearing
- Misalignment
- Mechanical Looseness
- Gears
- Blade and Vane
- Resonance
- Electrical Motor

Vibration Analysis
- Digital Signal Processing
- Transducer selection
- Waveform analysis
- Phase analysis

INSTRUCTOR

Dr. Ir. Zainal Abidin

COURSE FEES | 3 Days

Rp. 4.950.000 (Regular)
Rp. 4.450.000 (Early Bird)

FITNESS FOR SERVICE

"Participants can finally determine and make decision based on sound engineering calculation and judgment whether the defected part, components, or equipment should be run, repaired or just replaced."

DESCRIPTION

Fitness for purposes or, sometimes called fitness for services, is a detail engineering evaluation which is performed to demonstrate the structural integrity of an in-service component containing a flaw or damage. It is used to make run-repair-replace decisions to help ensure that the equipment containing flaw which have been identified by inspection can continue to operate safely until predetermined remaining life time or strength (damage tolerance design).

Remaining life assessment is to use metallurgical and/or fracture mechanics methodologies to predict the remaining life of structures, equipment and component that have been in service for an extended period of time, usually close to or beyond the design life, or those exhibit some flaw or damage as describe above. The RLA offers a possible tool to estimate the useful remaining lifetime and avoid premature failure or scrapping of the part. In this course ASME 31.G and API RP 579 as recommended practices, will be discussed.

COURSE OUTLINE

Day 1

Review statistics and probability theory
Review reliability theory on MTTB and MTTF.
Introduction to practical fracture mechanics method.

Day 2

Determining the damage mechanism operative (fatigue, creep, wear, corrosion, etc), temperature, load and material effect will be highlighted.
Determining the failure modes (leak, rupture, buckling, bending, collapse, etc)
Determining the damage or failure rates

Day 3

Overview the fitness for services level I, II and III.
Estimating the component remaining life by using probabilistic method
Estimating the equipment remaining life by using deterministic method

WHO SHOULD ATTEND

Plant and Pipeline Operators, Supervisors, Engineers and Manager, Field engineers, Project manager, Procurement persons

COURSE FEES | 3 Days

Rp. 4.950.000 (Regular)
Rp. 4.450.000 (Early Bird)

INSTRUCTOR

Dr. Ir. Slameto Wiryolukito

MATERIAL SELECTION

"Participants will be expected to have a broad knowledge of materials type and decide the appropriate materials for specific application by considering not only the properties but also the cost and fabrication."

COURSE OBJECTIVES

- Provide the participants a broad knowledge of material types.
- Participants will be able to decide the appropriate materials for a specific application by considering the properties and cost.

BACKGROUND

Metallic and non-metallic materials selection plays an important role not only in the design stage but also in the maintenance stage. The operating conditions of any equipment will determined the materials selection. This training not only discussed the most widely used materials for engineering equipments but also explore the selection criteria for specific equipment such as casing, piping, heat exchanger, boiler and the other process equipment. Consideration will be focused on the mechanical properties, corrosion properties and cost. Fabrication aspects, especially welding, will also be covered the application of international standard such as ASTM, ASME, API , DNV, and NORSK.

COURSE OUTLINE

Engineering Material Properties

1. Engineering Materials Classification
2. Material Properties and Their Inter-relationship With Structure
3. Fundamental of the Mechanical Behaviors of Materials

Properties Of Metals

1. The metallurgy, structure, properties, applications and potentialities of metals and alloys in a wide variety of engineering environments.
2. Review of :
   i. Carbon Steel
   ii. Cast Iron
   iii. Wrought Stainless Steel
   iv. Cast Stainless Steel
   v. Duplex Stainless Steel
   vi. Cooper Alloys
   vii. Aluminum Alloys
   viii. Titanium Alloys
   ix. Nickels Alloys

Properties of Polymers and Composite

1. Review of thermoplastics, thermosets, elastomers, and fiber reinforced polymers.
2. The structure, properties, processing characteristics and applications for the commercially important polymers and reinforced polymers

Material In Applications

1. Materials for Casing and Tubing
2. Materials for Line Pipe
3. Materials for Seawater Service
4. Materials for Boiler Tube
5. Materials for Hydrogen Service
6. Materials for Wear Resistance

Material Selection In Structural Design

1. Principals of materials selection
2. Materials in design
3. Design concepts including function, material, shape and process
4. The translation of design requirements by the identification of functions, constrains, objectives and free variables
5. The screening of materials through the objectives
6. The ranking of materials through the objectives
7. Case studies in materials selection for various practical engineering.

INSTRUCTORS

Dr. Ir. Slameto Wiryolukito
Dr. Ir. Hermawan Judawisastra

COURSE FEES | 4 Days

Rp. 5.950.000 (Regular)
Rp. 5.450.000 (Early Bird)

PREDICTIVE & PREVENTIVE MAINTENANCE

COURSE OUTLINE

WHY PREVENTIVE & PREDICTIVE MAINTENANCE

1. Apprising maintenance performance and effectiveness
2. Typical maintenance controls
3. Reactive maintenance
4. Anticipative maintenance
5. Ascertainment of equipment condition
6. The need for preventive maintenance
7. Why preventive maintenance
8. Preventive Predictive maintenance objectives
9. Preventive Predictive maintenance prerequisites
10. Preventive maintenance feasibility analysis

DEVELOPING THE preventive PREDICTIVE MAINTENANCE PROGRAM

1. Assignment of organizational responsibilities typical maintenance functional assignments operational concepts
2. Equipment to be included
3. Equipment inventory sheet examples
4. Equipment numbering concepts
5. The PM work order
   - o Developing the inspection sheet, ECS rating sheet as cross reference, Sample of equipment components
6. Spare parts and material needs
7. Inspection sheet examples
8. Determining the frequency cycle
9. Developing job safety practices typical examples
10. Considering manual versus computerization
11. Predictive maintenance can determine maintenance requirement
12. Predictive maintenance and its applied techniques as part of the PM program

IMPLEMENTATION OF PREVENTIVE MAINTENANCE PROGRAM

1. Job planning
2. The planning function
3. Planning, Service to do
4. Job planning prerequisite
5. Planners qualifications
6. Duties and responsibilities of planners
7. The hob package
8. Line supervisors qualifications
9. Planning permits Us, to forecast, communicate and measure
10. What job should be planned
11. Time required to perform work labor content
12. Standard defined
13. Consistency of estimating
14. Estimating methods
15. Work backlog
16. Scheduling of maintenance work
17. Manpower requirements forecasting
18. Weekly schedule – Computer and manual example
19. Training of personnel

CONTROLLING THE PREVENTIVE PREDICTIVE MAINTENANCE PROCESS

1. Preventive maintenance administration
2. Equipment availability
3. Control reporting
4. Assurance of work performed
5. Conformance and auditing
6. Feedback evaluation/corrective action cycle

EXAMINING RESULTS

1. Effectiveness of the preventive maintenance program
2. Refining the PM program
3. 3Correlating preventive maintenance to breakdown maintenance
4. Measuring and appraising the PM program
5. Equipment history
6. Analyzing equipment failures
7. Some relevant maintenance control indices

APPLICATION EXERCISE

1. How to organize, develop and implement a successful preventive maintenance program summary
2. Adapting the PM concept at your location
3. Hands-on exercise

INSTRUCTORS

Dr. Ir. I Wayan Suweca & Team

COURSE FEES | 4 Days

Rp. 5.950.000 (Regular)

Rp. 5.450.000 (Early Bird)

INTEGRATED MAINTENANCE STRATEGY

BENEFITS

- Mengurangi frekuensi dan waktu tidak produktif
- Mengoptimasi biaya perawatan
- Meningkatkan produktivitas karyawan
- Menguasai bagaimana melakukan perancangan awal pekerjaan, termasuk pekerjaan darurat, secara efektif
- Memahami bagaimana cara melakukan penjadwalan dan pengorganisasian aliran pekerjaan
- Meningkatkan efisiensi prosedur pelaporan

COURSE OUTLINE

Introduction
Maintainability, Maintainability in Life-Cycle System, Life-Cycle Cost (LCC), Cost Effectiveness (CE), Total Life-Cycle Cost (LCC) Visibility, Commitment of Life-Cycle Cost, Maintainability & Related Interfaces, Maintenance, Maintenance Category, Maintenance Function, Maintenance Time Relationship

Reliability Factors
Reliability Function, Failure rate and MTBF, Series, Parallel and Combined Network, MTTF and MTFF, Probability of Survival, Reliability Growth Curves

KEY REQUIREMENTS FOR EFFECTIVE MAINTENANCE
Gambling With Maintenance, Profit-and Customer-Centered Maintenance, Where is Your CMO? , Key Requirements.

MAINTENANCE CHALLENGES
Four Real Challenges, Challenge One, Challenge Two, Challenge Three, Challenge Four, Validate Results Improvement, Ensure Top Leaders, The Need of PCC Approach, Do not Kill the Goose, Do not Gamble with Maintenance Costs, Do not be a Takeover Target

Maintenance Information
Source of Maintenance Work, Maintenance Work Order, Design of W/O, Types of W/O Form, Field on W/O Form, Repair History Jacket

Managing Preventive Maintenance
Preventive Maintenance, PM Strategy for 3 Equip. Life Cycles, Justifying PM Expenditures, Installing PM Systems, Access to Equipment, PM FREQUENCY: How often to Perform the PM, Common Task, Staffing the PM Effort, Strategies to Get PM Done, Steps to Install a PM System, PM System Increase Professionalism

Planning And Scheduling
What is Planning? , How Much will Planning Help?, Planning Mission, Why Maintenance doest Assign Enough Work, Advance Scheduling is An Allocation, WO Planning Flowchart, Plan Follow Up

Estimating Maintenance Budget
Pendahuluan, Zero-Based Budget (Z-BB), How to Start?, Estimasi Maintenance Budget

Maintenance Store And Inventory Control
Introduction, Maintenance Store Component, Conditions Tending to Increase Maintenance Stores Inventory, Conditions Tending to Reduce Maintenance Stores Inventory, Centralized vs Decentralized Storeroom, Principles of Maintenance Stores Control, Procedural Guidance and Recommendations

Computerized Maintenance Management Systems (CMMS)
Benefits of Improved CMMS, CMMS Justification, Determining the True Need for CMMS, Determining Maintenance Best Practices Needed, CMMS Evaluation and Selection Process, Establish the CMMS Team, Get Outside Help when Needed.

Maintenance Performance Indicators
Performance Measures versus Benchmarking, Benchmarking , Performance Measures, Measuring MPI

Predictive Maintenance
Pendahuluan, Pemantauan Getaran, Thermography, Tribology, Process Parameters, Ultrasonic Monitoring, Visual Inspection, Teknik *NDT* Lain, Program Pd.M Optimal, Implementasi Program Pd.M

COURSE FEES | 5 Days	INSTRUCTOR
Rp. 6.950.000 (Regular)	Dr. Ir. I Wayan Suweca & Team
Rp. 6.450.000 (Early Bird)	

TOTAL PRODUCTIVE MAINTENANCE

COURSE OBJECTIVES

- understanding to system and maintenance management concept
- understanding to equipment failure
- understanding to maintainability and statistic application
- understanding to total productive maintenance
- understanding to spare parts support factor and availability
- understanding to maintenance reliability
- understanding to analysis of maintenance technology

BACKGROUND

Total Productive Maintenance can drastically change the result that industries achieve. This was done by optimizing the relation between operator and equipment at the right condition. Beside that TPM can give contribution to environment conservation program and comforting work condition. Several industries in Japan and U.S. have proven that TPM implemented in their industries improved their high cost effectiveness, continual operation for the long term, and the work-related-accident prevention.

This course will be presenting the philosophies of TPM in detailed manner, including how to implement these programs to Indonesian industries. Hopefully the attendee can absorb complete information regarding TPM and enabling them to explain the necessity of TPM application to their work environment, thus achieving higher level of productivity.

COURSE OUTLINE

This course is case study driven and brought by experts with many field experiences of maintenance program. We emphasize on openness of discussions that will offer insight into your need.

1. Introduction to Pro-Active Productive Equipment Maintenance Oriented Management System.
2. TPM Basic Planning and Subject Implementation to Initiate Pro-Active Maintenance
3. Pro-Active Analysis and Diagnose from the Standard Maintenance of TPM and its Improvement Methods.
4. Procedures in Planning and Management of Pro-Active Equipment Maintenance
5. Personality motivated Pro-Active Maintenance Action
6. Preventive Maintenance Procurement Based on Equipment Engineering Technology
7. Training Interface Improvement Program: Equipment Knowledge Expertise
8. The Importance in Measuring the Affectivity of Preventive Maintenance

WHO SHOULD ATTEND

The technical maintenance, supervisor and operator in charge and responsible for the equipment and system maintenance.

COURSE FEES | 3 Days

Rp. 4.950.000 (Regular)

Rp. 4.450.000 (Early Bird)

INSTRUCTOR

Dr. –Ing. Ir. Tri Yuswidjajanto

GAS TURBINE: OPERATION & MAINTENANCE

"This course covers both practical and theoretical aspects related to gas turbine operation and maintenance. At the end of the course, participants will have obtained sufficient knowledge to make the right decisions concerning the jost appropriate maintenance and operation strategy."

BENEFITS

- Enable to note and evaluate the inconsistencies
- Establish internal reference points
- Building your reporting skills - report conclusions
- Master bore scope inspections aids in determining the extent and prevention of DOD
- Correct any abnormal conditions
- Obtain a sound knowledge of Bore scope Inspection, Object Damage, Prevention, and General Inspection Procedures

BACKGROUND

This course is designed to provide a basic overview of object damage, bore scope inspection, troubleshooting, application and monitoring engines condition. The majority of this course deals with damage evaluation and prevention. The last part is on proper preservation and corrosion control methods for maintaining all gas turbine engines in peak operating status.

COURSE OUTLINE

PENDAHULUAN

Siklus Dasar | Keuntungan Dan Kegunaan Gas Turbin | Kerugian

KONVERSI ENERGI PADA TURBIN GAS

- Tekanan Dan Temperatur Mutlak
- Entalpi Dan Energi Kinetik
- Konversi Energi Pada Kompressor
- Konversi Energi Pada Ruang Bakar
- Konversi Energi Pada Turbin
- Konversi Energi Menyeluruh

ALIRAN FLUIDA PADA MESIN TURBIN GAS

- Pemisahan Aliran dan Stall
- Surge And Rotating Stall
- Gesekan Dan Turbulence
- Aliran Tercekik

APLIKASI

- Propulsi Pesawat Terbang
- Produksi Energi Listrik
- Pipeline Pumping
- Transportasi Non Pesawat Terbang
- Turbin Gas Berbahan Bakar Kayu

KOMPONEN TURBIN GAS

Kompresor | Kompresor Sentrifugal | Kompresor Aksial | Ruang Bakar | Turbin | Mesin Turbin Gas

TEORI TENTANG DESAIN DAN PEMBUATAN KOMPONEN TURBIN GAS

- Sifat-sifat Pembuatan Material
- Kompresor Dan Ruang Bakar
- Temperatur Pada Area Turbin
- Pemilihan Material

PERAWATAN GAS TURBIN

- Pendahuluan
- Penyaringan Udara Masuk
- Erosi Dan Kerak Pada Kompresor
- Kerusakan Karena Benda Asing
- FOD Pada Turbin
- Korosi Panas
- Kebakaran, Getaran dan Bahan Bakar
- Kesimpulan

PERAWATAN GAS TURBIN LANJUTAN

Jadwal Inspeksi | Tindakan Pencegahan | Inspeksi Borescope | Pengujian Retakan | Bantalan | Nosel Bahan Bakar | Saringan

MONITORING

Sistem Kontrol Mesin | Data Operasi | Analisis Diagnostik | Instrumentasi | Sensor Tekanan | Pengukuran Getaran | Pengukuran Kecepatan Rotasi

WHO SHOULD ATTEND

- Maintenance and Operation Engineers
- Supervisors and Superintendents and for those associated with gas turbine operation and maintenance strategy

COURSE FEES | 4 Days

Early Bird : Rp. 5.450.000

Regular : Rp. 5.950.000

INSTRUCTOR

Dr. –Ing. Ir. Tri Yuswidjajanto

BOILER OPERATION & MAINTENANCE

"This training course covers all major facets of steam boiler operations, maintenance & troubleshooting combined with practical suggestions for improving equipment performance"

BENEFITS

- Maximize efficiency in your steam systems
- Reduce fuel consumption and costs
- Learn and improve troubleshooting techniques
- Improve understanding of boiler water treatment chemicals and their applications
- Learn correct boiler room piping practices
- Learn ways to minimize boiler downtime
- Gain an understanding of proper repair techniques and code requirements
- Improve boiler room safety

YOU WILL LEARN

- How heating systems work including combustion, ignition, and electrical wiring and controls, as well as equipment care and maximum-efficiency operation
- How to set up a preventative maintenance program for your boiler

COURSE OUTLINE

SISTEM
- Pembangkit Uap (Boiler)
- Penguapan
- Bagian-bagian Pembangkit Uap
- Auxiliary Pembangkit Uap

PEMBANGKIT UAP
- Prinsip Kerja Pembangkit Uap
- Penggolongan Pembangkit Uap
- Bahan Bakar dan Proses Pembakaran
- Sirkulasi

ALAT PEMISAH UAP & PEMANAS UAP LANJUT
- Separator
- Alat Pemanas Uap Lanjut

PEMANAS AIR & PEMANAS UDARA
- Pemanas Air
- Pemanas Udara

SISTEM TARIKAN API
- Kerugian Tekanan Saluran
- Tarikan Alam

ALAT PENGAMAN
Katup Pengaman, Kaca Penduga, Katup Pembilas, Perawatan Pembangkit Uap dan Operasi

AIR PENGISI PEMBANGKIT UAP
Scaling, Pengkerakan dan Pitting, Keretakan, Erosi, Pengolahan Air, Proses Pelunakan dengan Penambahan Zat Kimia, Proses Pelunakan dengan Zeolite, Proses Pelunakan dengan Hidrogen Zeolite, Deaerator, Pencegahan Canstis Embrittlement

RUANG BAKAR
Pertimbangan Perencanaan Ruang Bakar | Beban Ruang Bakar | Cara Pembakaran | Dinding Ruang Bakar | Pembakaran Bahan Bakar Gas | Pembakaran Bahan Bakar Minyak | Kerugian Panas Dinding Ruang Bakar |Cara Menghidupkan Alat Pembakar

WHO SHOULD ATTEND

- Plant and Facilities Management
- Operations, Maintenance, and Engineering Personnel and for those who have been given the responsibility of the boiler room or its personnel.

COURSE FEES | 4 Days

Early Bird : Rp. 5.450.000

Regular : Rp. 5.950.000

INSTRUCTOR

Dr.-ing. Ir. Tri Yuswidjajanto

DIESEL ENGINE : OPERATION & MAINTENANCE

BENEFITS

- Sound understanding of diesel engine components and functions
- Familiar with diesel engine measurement, such as: efficiency, torque, speed, power and more
- Significantly improve your understanding of combustion system
- Develop troubleshooting skills, repairs and maintenance know-how
- Proper understanding of diesel engine operation

COURSE OUTLINE

PENGETAHUAN DASAR

- Four-Stroke and Two-Stroke
- Motor Diesel versus Motor Bensin

PEMBAKARAN

RANCANGAN RUANG BAKAR

Direct Injection and Regular System

PENGARUH KONDISI OPERASI PADA RUANG BAKAR

- Penyemprotan dan Putaran Motor
- Ratio: Bahan Bakar versus Udara
- Compression Ratio

HEAT RELEASE

- Teori Dasar dan Perhitungan
- Diagram Laju Pencetusan Panas

BAHAN BAKAR

- Bahan Bakar Minyak, Batu Bara dan Alkohol
- Bahan Bakar Tumbuh-Tumbuhan dan Minyak Tumbuh-Tumbuhan
- Bahan Bakar Gas
- Spesifikasi Bahan Bakar

PERPINDAHAN PANAS

- Jenis Perpindahan Panas
- Perhitungan Laju Perpindahan Panas
- Perhitungan Beban Thermal
- Permasalahan

GOVERNOR

- Regulator Components
- Governor Mechanism
- Servo Hydraulic
- Servo Governor Components and Operation
- Governor Function
- Metode Pengaturan Putaran
- Pembatasan Bahan Bakar
- Pengendalian Beban
- Governor untuk Motor Kecil
- Electronic Governor

SUPERCHARGER DAN TURBOCHARGER

- Pendahuluan
- Pembatas Unjuk Kerja Motor
- Daya Motor dan Aliran Udara
- Daya Motor dan Kebutuhan Supercharger
- Motor Diesel Empat Langkah untuk Truk
- Motor Diesel Empat Langkah Putaran Menengah untuk Kapal
- Motor Diesel untuk Kendaraan Penumpang
- Kebutuhan Supercharger pada Tempat yang Tinggi
- Turbocharger Performance
- Penggambaran ulang Karakteristik Kompresor Non-Dimensional
- Unjuk Kerja Kompresor dan Turbin
- Prinsip Sistem Turbocharger
- Prinsip Kerja Turbocharger Tekanan Konstan
- Prinsip Kerja Turbocharger Tekanan Berfluktuasi
- Pemasangan Turbocharger

COURSE FEES | 4 Days

Early Bird : Rp. 5.450.000

Regular : Rp. 5.950.000

INSTRUCTORS

Dr. –ing. Ir. Tri Yuswidjajanto

MAINTENANCE COST ENGINEERING-ASSET MANAGEMENT

Kursus ini akan memberikan kepada peserta pengetahuan yang menyeluruh tentang aspek biaya dalam proses maintenance, termasuk menghitung semua biaya dan keuntungan yang didapat dari setiap proses maintenance. Peserta akan mendapatkan kemampuan untuk membangun sistem maintenance yang baik di perusahaannya sehingga perusahaan dapat meningkatkan profit serta menghindari pemborosan biaya akibat inefisiensi dalam maintenance

COURSE OUTLINE

Maintenance Cost Engineering

- Total Review tentang Maintenance Management
- Kebijakan-kebijakan dalam proses Maintenance : dari kebijakan breakdown sampai kebijakan pembaharuan.
- Keputusan dalam Maintenance : menganalisis kelayakan ekonomi dari keputusan-keputusan yang mungkin dibuat dan mengeluarkannya dalam bentuk yang sesuai.
- Dari kebijakan sampai keputusan menuju ke siklus yang dinamis dari Maintenance Management.
- Biaya (Cost) dalam Maintenance : jenis-jenisnya dan bagaimana mereka timbul dalam proses Maintenance.
- Proses Engineering dalam biaya (Cost) : mencari arah yang baik secara ekonomi untuk biaya-biaya yang muncul dalam Maintenance.
- Teknik-teknik yang telah terbukti efektif dalam mengurangi biaya-biaya dalam Maintenance.
- Prestasi dalam program-program Maintenance

Spare Parts Management

- Pandangan perusahaan dalam inventaris spare part : dari prestasi maksimal peralatan hingga program ekonomi Maintenanance hingga pendekatan menyeluruh perusahaan.
- Hubungan antara program Maintenance dengan penyediaan spare part : bagaimana menghubungkan program Maintenance dengan permintaan spare part serta mengelompokan dan memisah-misahkannya.
- Metodologi A/D (Aggregation/Disaggregation) : langkah-langkah pendekatan dalam pengelompokan dan pemisahan sehingga sesuai dengan kebijakan penyediaan spare part.
- Mengeksplorasi kebijakan penyediaan spare part yang berbeda-beda sesuai dengan karakteristiknya.

Asset Management

- Siklus hidup peralatan : diskusi tentang tahap-tahap hidup suatu peralatan yang digunakan.
- Karakter ekonomi dalam setiap tahap.
- Struktur biaya yang terjadi pada suatu peralatan.
- Perhitungan nilai-nilai ekonomi secara menyeluruh untuk suatu asset.
- Teknik yang optimal untuk memaksimalkan nilai suatu asset.

INSTRUCTORS	COURSE FEES | 4 Days
Dr. Ir. Slameto Wiryolukito	Early Bird : Rp. 5.450.000
Dr. Ir. Hermawan Judawisastra	Regular : Rp. 5.950.000

GAS ENGINE PRINCIPLES AND PRACTICES

BENEFITS

- Vast understanding of gas engine system and supercharger technology
- Gain crucial knowledge of fuels optimization and system
- Gain essential knowledge on appropriate operation and functions related to ignition know-how
- Improve analytical and troubleshooting skills on engine failure and maintenance basic procedures
- Able to conduct proper motor or engine monitoring schedule and basic management
- Familiar with turbocharger design, how it works and its advantages

COURSE OUTLINE

BRIEF HISTORY
Turbine and Combination Cycles

FUNDAMENTAL THEORY OF GAS ENGINE
Introduction, Constant Volume and Pressure, How Engine Works?, General Parameters, Fuels, Combustion Principles and Characteristics

FUELS DISTRIBUTION AND REGULATOR
Gas Regulator System, Gas Regulator Components, Gas Carburetor, Valve Controller and Fuels Distributor

FUELS CONSUMPTION IGNITION PRINCIPLES
Direct Ignition, Torch Ignition, Modern Design

IGNITION
Ignite-Transition, High Voltage Capacitor (HVC), Comparison: HVC versus Ignite-Transition, Power and its Application, Generator and Sensor, Electronic-Controlled Ignition.

SUPERCHARGER TECHNOLOGY
Main Purposes of Supercharger, Turbocharger, Turbocharger-Specific Construction, Pressure Controller and Cooler System, Turbocharger Design

ARRANGEMENT AND ENGINE MONITORING
Air-Fuel Ratio, Motor Load and Rotation, Lubricant Monitoring, Gas Detection, Electric-motor Managemen

DISPOSABLE GAS
Atmosphere Pollution, Three-Phase Catalyst and Catalyst Reduction, Alternative Methods

COMBUSTION TECHNOLOGY

GAS ENGINE APPLICATIONS WORLDWIDE

WHO SHOULD ATTEND

- Mechanical, Rotating, Construction, and Project Engineers
- Operators, Technicians, Maintenance Personnel who involved in installation, testing, and maintenance of diesel engine system
- Any other technically trained individuals that desire a more in-depth foundation in gas engine

COURSE FEES | 4 Days

Early Bird : Rp. 5.450.000

Regular : Rp. 5.950.000

INSTRUCTOR

Dr. –ing. Ir. Tri Yuswidjajanto

CORROSION & IT'S PREVENTION

"This corrosion short course systematically
and thoroughly covers the causes of basic theory of corrosion
and the practice of corrosion control and prevention"

COURSE OBJECTIVES

- To understand why and how corrosion occurs
- To know how to control & prevent Corrosion

BACKGROUND

The course aims to achieve two objectives, namely, (1) to understand why and how corrosion occurs and (2) to know how to control and prevent corrosion. This 3-days course provides an excellent avenue for corrosion practitioners, designers, technical managers, inspection and maintenance engineers, quality control personnel and those involved in failure analysis to update their appreciation of corrosion and the awareness of the emerging technologies for corrosion control, prevention, testing and monitoring.

COURSE OUTLINE

Corrosion & Society

The econornic, social, political & environmental impacts, liabilities due to corrosion, lessons of. history

Basic Concepts Corrosion

a. Terminologies and conventions
b. Why do metals corrode
c. How do metals corrode

Different Forms of Corrosion: Mechanisms,Recognition. & Prevention

a. Uniform corrosion
b. Galvanic corrosion
c. Dealloying and graphitization (graphitic Corrosion)
d. Intergranullar stress corrosion cracking, weld decay and knife line attack
e. Exfoliation
f. Crevice corrosion
g. Pitting corrosion
h. Filiform corrosion
i. Microbiologically-Influenced Corrosion (M1C)
j. Environment; sensitive cracking
k. Hydrogen Damage
l. Corrosion fatigue
m. Fretting
n. Erosion corrosion., impingement attack and cavitations damage

Corrosion in Atmosphere

a. Classification of atmosphere
b. Absolute humidity and relative humidity
c. Calculation of time of wetness (ToW)
d. Effect of moisture thickness on corrosion
e. Effect of air pollutants
f. Corrosion behavior of common metals and alloys in atmospheres

Corrosion of Common Metals and Alloys

a. Cast Irons and carbon steels
b. Stainless steels and nickel alloys
c. Aluminum alloys, copper alloys, titanium alloys

How to Control and Prevent Corrosion

a. Materials Selection and Design
b. Corrosion Resistant Coatings
c. Cathodic 6: Anodic Protection
d. Corrosion Inhibitors
e. Corrosion Testing & Monitoring

INSTRUCTOR

Dr. Ir. Slameto Wiryolukito

COURSE FEES | 3 Days

Early Bird : Rp. 4.450.000

Regular : Rp. 4.950.000

FIBER REINFORCE PLASTIC

"This course is delivered to provide basic concepts and practical knowledge of composite-polymer material design and manufacture"

BENEFITS

- Understand the basic concept of composite material from raw material characteristic aspect.
- Introduce the manufacturing process of composite-polymer and effect of raw material selection.
- Introduce the basic design, mechanics, and characteristic of fiber reinforced composite.
- Understand the behavior of composite for impact load, fatigue, and environment aspects.
- Quality control and basic characterization of composite-polymer material.

BACKGROUND

The application of Fiber Reinforced Plastic (FRP) or Polymer Matrix Composites (PMC) in industry is growing rapidly. Sufficient understanding for basic concept, characteristic, and behavior of composite-polymer material, which differ to metal, ceramic and plastic, is needed to help the operators and engineers to do their job. After all, this course will guide attendants to achieve knowledge and general description of composite material technology by understanding the behavior, design and manufacturing method, and also understanding how to produce a high quality of composite-polymer product.

COURSE OUTLINE

1. Basic concept of composite materials
2. Manufacture of composite-polymer
3. Design for composite material
4. Composite behavior in application
5. Quality control and characterization methods
6. Case studies and software demonstration

COURSE FEES | 5 Days

Early Bird : Rp. 6.450.000

Regular : Rp. 6.950.000

COURSE FEES | 5 Days

Dr. Ir. Hermawan Judawisastra

WHO SHOULD ATTEND

Engineers, Technicians, Fields supervisors responsible for planning, implementing and supervising corrosion control systems and programs, Technical personnel who provide corrosion services.

FLOW MEASUREMENT

COURES OBJECTIVES

- Know the concept of flow measurement
- Know the principles of flow measurement
- List different methods in flow measurement
- Types of flow sensors
- Know configuration in flow control systems
- Explain basic configuration of flow control

YOU WILL LEARN

Flow is one of four major variables that can be found in industries. As flow has different characteristics compared to pressure, level or temperature, it is necessary to understand behavior, type of flow, selection of sensors and transducers and also type of control valve for control purposes. In many applications, it is necessary to understand the types of the flow meters and its property. Flow measurement and training program will present type of probes, measurement methods, flow control system and its elements.

COURSE OUTLINE

- Measurement Concepts
- Flow Sensor and Transducer
- Mechanical Flowmeter
- Electronic Flowmeter
- Mass Flowmeter
- Ultrasonic Flowmeter
- Meter Tube
- Installation
- Flow Control Systems

WHO SHOULD ATTEND

Technicians, Operators working within flow instrumentation and control systems.

COURSE FEES | 5 Days

Early Bird : Rp. 6.450.000

Regular : Rp. 6.950.000

INSTRUCTOR

Endra Joelianto, PhD., Ir.

ADVANCED FLOW MEASUREMENT

COURSE OBJECKTIVES

- Know the concept of flow measurement
- Know the principles of flow measurement
- List different methods in flow measurement
- Types of flow sensors
- Know types of control valves
- Know the selection of control valves
- Know configuration in flow control systems
- Explain basic configuration of flow control

BACKGROUND

Flow is one of four major variables that can be found in industries. As flow has different characteristics compared to pressure, level or temperature, it is necessary to understand behavior, type of flow, selection of sensors and transducers and also type of control valve for control purposes. In many applications, it is necessary to determine the magnitude and/or direction of the flow-velocity at a point in the fluid and how this varies from point to point. Sometimes the qualitative information is sufficiently available from direct visual observation. However, most methods also allow quantitative analysis by inserting velocity probes to obtain accurate point measurements. Flow measurement and instrumentation training program will present type of probes, measurement methods, analysis, flow control system and its elements. The course will give concern to standard AGA 3,7,9,11 and API.

COURSE OUTLINE

- Measurement Concepts
- Flow Sensor and Transducer
- Measurement based on several different variables
- Flow Measurement under AGA
- Mechanical flow meters
- Mass flow meters
- Electronics flow meters
- Ultrasonic flow meters
- Related Standards AGA and API
- Control Valve
- Flow Control Systems

WHO SHOULD ATTEND

Engineers, Supervisors, Technicians, Operators working within flow instrumentation and control systems.

COURSE FEES | 4 Days

Early Bird : Rp. 5.450.000

Regular : Rp. 5.950.000

INSTRUCTOR

Endra Joelianto, PhD., Ir.

PIPING AND INSTRUMENT DIAGRAM (P&ID)

COURES OBJECTIVES

- Understand the symbol of instrument
- Understand ISA S5.1
- Identify the process flow diagram (PFD)
- Understand the line designation
- Use the instrument and control symbols
- Interpret simplified diagram
- Know the implementation of P&ID

YOU WILL LEARN

Covers the principle of piping and instrument diagram. Also provides the reference standard developed by ISA S5.1-5 series. Methods for reading and understanding the diagram.

COURSE OUTLINE

Introduction
- Objectives
- What are P&IDs?
- Why are P&IDs important?
- Who uses P&IDs?

Information on a Typical P&ID
- Kinds of information
- The title block
- The main Drawing
- Line Schedule
- Description
- Zone numbers

ISA S5.1 P&ID
- Overview
- Standard
- Symbol
- Instrument Loop Diagram

Instruments
- Instrument and Control Loop
- Instrument Identification
- Identifying functions

Line Designations
- Piping
- Example Line Label
- Tracing and Insulation
- Instrument Lines

Process Flow Diagram (PFD)
- Process Topology
- Stream information
- Equipment Information

Tracing Process Flow
- Identifying where process begins and stops
- Tracing a process stream

Control Process Operation
- Control Loops
- Function of Instrument in Control Loop

Logic Systems
- Basics
- Alarm
- Interlocks

Interpreting and Understanding P&ID
- Principles of particular processes
- Understanding the P&ID
- Knowing safety in the P&ID

Excercises

WHO SHOULD ATTEND

Engineers, Supervisors, Technicians, Operators working within instrumentation, Production and Operation, Communication and Networking, Information Technology, Reliability who seek innovative and better performance of emerging industrial control and automation.

COURSE FEES | 5 Days	INSTRUCTOR
Early Bird : Rp. 6.450.000 Regular : Rp. 6.950.000	Endra Joelianto, PhD., Ir.

CHOKE AND CONTROL VALVES

BACKGROUND

This course is developed for engineers and technicians who need to have a practical knowledge of selection, installation of choke and control valves. It is for those primarily involved in achieving effective results in industrial processes. This would involve the design, specification and implementation of control and measurement equipment. The workshop focuses on practical applications, with special attention to installation considerations and application limitations when selecting or installing different control valves.

Training Methodology

The latest educational methods and strategies will be employed. The course is designed to maximise benefit from the outset. Questions are encouraged throughout, to provide participants with the opportunity to discuss with the presenter and others, specific problems and appropriate solutions. All delegates take away a detailed and comprehensive copy of the materials, and practical exercise using software will be provided to ensure knowledge retention.

Pre-requisites

No specialist knowledge or skills are required - only a technical background so that there is an understanding for such factors as the difference

COURSE OUTLINE

- Basic physical properties
- Fundamental of measurement
- Fundamentals of flow characteristics
- Control valves
- Realistic Control valve
- Pressure drop
- Flow equations
- Fundamental valve sizing
- Sizing for liquid
- Sizing for gas
- Control valve selection
- Installation
- Standards

COURSE FEES | 5 Days

Early Bird : Rp. 6.450.000

Regular : Rp. 6.950.000

INSTRUCTOR

Endra Joelianto, PhD., Ir.

EMERGENCY AND SHUTDOWN SYSTEMS

BACKGROUND

Most of today's computer controlled industrial processes involve large amounts of energy and have the potential for devastating accidents. Reliable, well-engineered safety systems are essential for protection against destruction and loss of life. This course is an intensive practical and valuable exposure to the most vital, up-to-date information and practical know-how to enable you to participate in hazard studies and specify, design, install and operate the safety and emergency shutdown systems in your plant, using international safety practices. This course will provide you with a broad understanding of the latest safety instrumentation practices and their applications to functional safety in manufacturing and process industries. This course could save your business a fortune in possible downtime and financial loss.

The objectives of the course are to:

- Expand your practical knowledge in the application of safety instrumented systems (SIS) as applied to industrial processes
- Provide you with the knowledge of the latest standards dealing with each stage o the safety life cycle from the initial evaluation of hazards to the detailed engineering and maintenance of safety instrumented systems
- Give you the ability to plan hazard and risk assessment studies, then design, implement and maintain the safety systems to ensure high reliability
- Assist your company to implement functional safety measures to international standards

Although a basic understanding of electrical engineering principles is essential, even those with a superficial knowledge will substantially benefit by attending this course. In particular, if you work in any of the following areas, you will benefit:

- Instrumentation and control engineers and technicians
- Design, installation and maintenance engineers and technicians in the process industries
- Managers and sales professionals employed by end users
- Systems integrators or consultants
- Consulting electrical engineers
- Plant engineers and instrument technicians
- Operations technicians
- Electrical maintenance technicians and supervisors
- Instrumentation and control system engineers
- Process control engineers
- Mechanical engineers

COURSE OUTLINE

1. Introduction to SIS
2. Definitions, Overview, Standards
3. IEC 61508, IEC 61511 and ISA S84
4. Hazards and Risk Reduction
5. Hazard Studies
6. Layers of Protectyion Analysis (LOPA)
7. Safety Requirements Specifications
8. Safety Integrity Level (SIL)
9. Technology Choices
10. Conceptual Design
11. Reliability Analysis
12. Safety in Field Instruments and Devices
13. Engineering the Safety Systems Hardware
14. Engineering the Application Software
15. Overall Planning
16. Installation and Commisioning
17. Validation and Operation
18. Managemenmt of Change
19. Justification of SIS
20. Study Case

INSTRUCTOR

Endra Joelianto, PhD., Ir.

COURSE FEES | 5 Days

Early Bird : Rp. 6.450.000

Regular : Rp. 6.950.000

FAILURE MODE & EFFECT ANALYSIS (FMEA)

YOU WILL LEARN

An FMEA (Failure Mode and Effec Analysis) is a systematic method of identifying and preventing product and process problems before they occur. FMEAs are focused on preventing defects, enhancing safety, and increasing customer satisfaction. Ideally, FMEAs are conducted in the product design or process development stages, although conducting an FMEA on existing products and processes can also yield substantial benefits.

FMEA is used in both design and manufacturing processes can substantially reduce costs by identifying product and process improvements early in the develope process when changes are relatively easy and inexpensive to make. The result is a more robust process because the need for after-the-fact corrective action and late change crises are reduced or eliminated.

COURSE OUTLINE

- What is an FMEA?
- Legal Approach to Liability
- General Overview of FMEA
- FMEA Process
- The FMEA Team
- System FMEA
- Design FMEA
- Process FMEA
- Service FMEA
- Machine FMEA
- FMEA and Computers
- Typical Tools of FMEA
- Six Sigma and FMEA
- FMEA Study Case

WHO SHOULD ATTEND

Everyone works in the companies, industries, institutions etc who wants to find thecause of the problem and to prevent the time and production loss.

COURSE FEES | 4 Days

Early Bird : Rp. 5.450.000

Regular : Rp. 5.950.000

INSTRUCTOR

Endra Joelianto, PhD., Ir.

Some of Our Costumer

PALYJA	CNOOC	Star Energy	Kodeco Energy Co., Ltd
TOTAL	MEDCOENERGI	PUPUK KALTIM	PetroChina
PETROKIMIA GRESIK	TPPI	Gas Negara	LNG BADAK
GMF AeroAsia GARUDA INDONESIA GROUP	Chevron	PUSRI PUPUK UREA PALEMBANG INDONESIA	TALISMAN ENERGY
PT INCO PT International Nickel Indonesia Tbk	KPC COAL FROM INDONESIA PT KALTIM PRIMA COAL	PERTAMINA	TRIPATRA

PT Rekayasa Solverindo
Jl. Batik Jogya no. 54
Bandung 40123, Indonesia
Ph. (022) 250 5474
Fax (022) 250 2378
Email: training@reksolindo.co.id
Web: www.reksolindo.co.id