PETROSYNC
Synchronize Your Skill and Knowledge

PetroSync Global Pte Ltd | PetroSync | PetroSync

Certified Reliability Engineer

Improve Your Certified Reliability Engineer From The Certified Facilitator

10th - 14th August 2026 at Kuala Lumpur, Malaysia | 07th - 11th September 2026 at Bandung, Indonesia
02nd - 06th November 2026 at Bangkok, Thailand | 30th November - 04th December 2026 at Kuala Lumpur, Malaysia

Petrosync Distinguished Instructor

Ahmed D., PHD, CMRP, CRE, PE.

Maintenance and Reliability Expert

Case Studies, Discussion, and many Practical exercises!

Position and Credentials:

- Certified Maintenance & Reliability Professional (CMRP)
- Certified RCM Facilitator (SKF / Aladon)
- Certified through the Institute of Asset Management (UK) as organization preparation facilitator / service provider respectively for the ISO 55000 (Asset Management) and ISO 31000 (Risk Management) standards.
- Certified Reliability Engineer (CRE)
- Certified ultrasonic testing specialist (BINDT)
- Certified vibration analyst level 1 (BINDT)
- Certified Investigator (Taproot)
- Certified Instructor (OSHA (Several areas))
- Certified Fire Investigator (OSHA)
- Certified Thermographic Imaging analyst 3 (FLIR)
- Certified Oil Analyst 3 and lubrication program developer (NOREA)
- Certified RBI Specialist and Inspection program developer (API) (API 580, 581, 570, 510)
- Certified Facilitator (GE)
- Certified Presenter and Public Speaker (GE)

PROGRAM SCHEDULE

08:00	Registration (Day1)
08:10 – 10:00	Session I
10:00 – 10:15	1st Tea Break
10:15 – 12:30	Session II
12:30 – 13:30	Lunch Break
13:30 – 15:00	Session III
15:00 – 15:15	2nd Tea Break
15:15 – 16:00	Session IV
16:00	End of Day

**Schedule may vary for each training*

Supported by

WorldOils OilVoice EnergyChinaForum.com

Certified Reliability Engineer

10th - 14th August 2026 at Kuala Lumpur, Malaysia | 07th - 11th September 2026 at Bandung, Indonesia
02nd - 06th November 2026 at Bangkok, Thailand | 30th November - 04th December 2026 at Kuala Lumpur, Malaysia

Course Overview

This will follow the Body of Knowledge (BOK) of the certified Reliability Engineer (CRE) as set forth by the ASQ, however it will elaborate the areas of reliability analytics, reliability testing and reliability statistical modeling.

1 - RELIABILITY MANAGEMENT

2 - PROBABILITY AND STATISTICS FOR RELIABILITY

3 - RELIABILITY IN DESIGN AND DEVELOPMENT

4 - RELIABILITY MODELING AND PREDICTIONS

5 - RELIABILITY TESTING

6 - MAINTAINABILITY AND AVAILABILITY

7 - DATA COLLECTION AND USE

Course Objectives

- Demonstrate an understanding of the concepts of reliability engineering.
- Measure model times to failure using the appropriate probability distribution.
- Demonstrate an understanding of the relationship between the time to failure distribution, the reliability function, and the hazard rate.
- Determine a life test, estimate reliability values from the test data, and set confidence limits on the results.
- Use the design tools necessary to ensure a reliable product including prediction, allocation, and FMEA.
- Understand the differences in analyzing the reliability of a repairable and a non-repairable system.

Target Audience

- Maintenance and reliability professionals
- Operations managers
- Engineering managers

Certified Reliability Engineer

10th - 14th August 2026 at Kuala Lumpur, Malaysia | 07th - 11th September 2026 at Bandung, Indonesia
02nd - 06th November 2026 at Bangkok, Thailand | 30th November - 04th December 2026 at Kuala Lumpur, Malaysia

Training Agenda

Day 1

RELIABILITY MANAGEMENT

- Strategic management
- Benefits of reliability engineering
- Describe how reliability engineering techniques and methods improve programs, processes, products, systems, and services. (Understand)
- Interrelationship of safety, quality, and reliability
- Define and describe the relationships among safety, reliability, and quality. (Understand)
- Role of the reliability function in the organization
- Describe how reliability techniques can be applied in other functional areas of the organization, such as marketing, engineering, customer /product support, safety and product liability, etc. (Apply)
- Reliability in product and process development
- Integrate reliability engineering techniques with other development activities, concurrent engineering, corporate improvement initiatives such as lean and six sigma methodologies, and emerging technologies. (Apply)
- Failure consequence and liability management
- Describe the importance of these concepts in determining reliability acceptance criteria. (Understand)
- Warranty management
- Define and describe warranty terms and conditions, including warranty period, conditions of use, failure criteria, etc., and identify the uses and limitations of warranty data. (Understand)
- Customer needs assessment
- Use various feedback methods (e.g., quality function deployment (QFD), prototyping, beta testing) to determine customer needs in relation to reliability requirements for products and services. (Apply)
- Supplier reliability
- Define and describe supplier reliability assessments that can be monitored in support of the overall reliability program. (Understand)
- Reliability program management
- Terminology
- Explain basic reliability terms (e.g., MTTF, MTBF, MTTR, availability, failure rate, reliability, maintainability). (Understand)
- Elements of a reliability program
- Explain how planning, testing, tracking, and using customer needs and requirements are used to develop a reliability program, and identify various drivers of reliability requirements, including market expectations and standards, as well as safety, liability, and regulatory concerns. (Understand)
- Types of risk
- Describe the relationship between reliability and various types of risk, including technical, scheduling, safety, financial, etc. (Understand)
- Product lifecycle engineering
- Describe the impact various lifecycle stages (concept/design, introduction, growth, maturity, decline) have on reliability, and the cost issues (product maintenance, life expectation, software defect phase containment, etc.) associated with those stages. (Understand)
- Design evaluation
- Use validation, verification, and other review techniques to assess the reliability of a product's design at various lifecycle stages. (Analyze)
- Systems engineering and integration

Certified Reliability Engineer

- Describe how these processes are used to create requirements and prioritize design and development activities. (Understand)
- Ethics, safety, and liability
- Ethical issues
- Identify appropriate ethical behaviors for a reliability engineer in various situations. (Evaluate)
- Roles and responsibilities
- Describe the roles and responsibilities of a reliability engineer in relation to product safety and liability. (Understand)
- System safety
- Identify safety-related issues by analyzing customer feedback, design data, field data, and other information. Use risk management tools (e.g., hazard analysis, FMEA, FTA, risk matrix) to identify and prioritize safety concerns, and identify steps that will minimize the misuse of products and processes. (Analyze)

Case Study/Exercise: Performing FMEA studies as well as RCA (5 methods)

Day 2

PROBABILITY AND STATISTICS FOR RELIABILITY

- Basic concepts
- Statistical terms
- Define and use terms such as population, parameter, statistic, sample, the central limit theorem, etc., and compute their values. (Apply)
- Basic probability concepts
- Use basic probability concepts (e.g., independence, mutually exclusive, conditional probability) and compute expected values. (Apply)
- Discrete and continuous probability distributions
- Compare and contrast various distributions (binomial, Poisson, exponential, Weibull, normal, log-normal, etc.) and their functions (e.g., cumulative distribution functions (CDFs), probability density functions (PDFs), hazard functions), and relate them to the bathtub curve. (Analyze)
- Poisson process models
- Define and describe homogeneous and non-homogeneous Poisson process models (HPP and NHPP). (Understand)
- Non-parametric statistical methods
- Apply non-parametric statistical methods, including median, Kaplan-Meier, Mann-Whitney, etc., in various situations. (Apply)
- Sample size determination
- Use various theories, tables, and formulas to determine appropriate sample sizes for statistical and reliability testing. (Apply)
- Statistical process control (SPC) and process capability
- Define and describe SPC and process capability studies (Cp, Cpk, etc.), their control charts, and how they are all related to reliability. (Understand)

Statistical inference

- Point estimates of parameters
- Obtain point estimates of model parameters using probability plots, maximum likelihood methods, etc. Analyze the efficiency and bias of the estimators. (Evaluate)
- Statistical interval estimates
- Compute confidence intervals, tolerance intervals, etc., and draw conclusions from the results. (Evaluate)
- Hypothesis testing (parametric and non-parametric)
- Apply hypothesis testing for parameters such as means, variance, proportions, and distribution parameters.
- Interpret significance levels and Type I and Type II errors for accepting/rejecting the null hypothesis. (Evaluate)

Certified Reliability Engineer

10th - 14th August 2026 at Kuala Lumpur, Malaysia | 07th - 11th September 2026 at Bandung, Indonesia
02nd - 06th November 2026 at Bangkok, Thailand | 30th November - 04th December 2026 at Kuala Lumpur, Malaysia

Day 3

RELIABILITY IN DESIGN AND DEVELOPMENT

- Reliability design techniques
- Environmental and use factors
- Identify environmental and use factors (e.g., temperature, humidity, vibration) and stresses (e.g., severity of service, electrostatic discharge (ESD), throughput) to which a product may be subjected. (Apply)
- Stress-strength analysis
- Apply stress-strength analysis method of computing probability of failure, and interpret the results. (Evaluate)
- FMEA and FMECA
- Define and distinguish between failure mode and effects analysis and failure mode, effects, and criticality analysis and apply these techniques in products, processes, and designs. (Analyze)
- Common mode failure analysis
- Describe this type of failure (also known as common cause mode failure) and how it affects design for reliability. (Understand)
- Fault tree analysis (FTA) and success tree analysis (STA)
- Apply these techniques to develop models that can be used to evaluate undesirable (FTA) and desirable (STA) events. (Analyze)
- Tolerance and worst-case analyses
- Describe how tolerance and worst-case analyses (e.g., root of sum of squares, extreme value) can be used to characterize variation that affects reliability. (Understand)
- Design of experiments
- Plan and conduct standard design of experiments (DOE) (e.g., full-factorial, fractional factorial, Latin square design). Implement robust-design approaches (e.g., Taguchi design, parametric design, DOE incorporating noise factors) to improve or optimize design. (Analyze)
- Fault tolerance
- Define and describe fault tolerance and the reliability methods used to maintain system functionality. (Understand)
- Reliability optimization
- Use various approaches, including redundancy, derating, trade studies, etc., to optimize reliability within the constraints of cost, schedule, weight, design requirements, etc. (Apply)
- Human factors
- Describe the relationship between human factors and reliability engineering. (Understand)
- Design for X (DFX)
- Apply DFX techniques such as design for assembly, testability, maintainability environment (recycling and disposal), etc., to enhance a product's producibility and serviceability. (Apply)
- Reliability apportionment (allocation) techniques
- Use these techniques to specify subsystem and component reliability requirements. (Analyze)
- Parts and systems management
- Selection, standardization, and reuse
- Apply techniques for materials selection, parts standardization and reduction, parallel modeling, software reuse, including commercial off-the-shelf (COTS) software, etc. (Apply)
- Derating methods and principles
- Use methods such as S-N diagram, stress-life relationship, etc., to determine the relationship between applied stress and rated value, and to improve design. (Analyze)
- Parts obsolescence management
- Explain the implications of parts obsolescence and requirements for parts or system requalification. Develop risk mitigation plans such as lifetime buy, backwards compatibility, etc. (Apply)
- Establishing specifications
- Develop metrics for reliability, maintainability, and serviceability (e.g., MTBF, MTBR, MTBUMA, service interval) for product specifications. (Create)

Certified Reliability Engineer

10th - 14th August 2026 at Kuala Lumpur, Malaysia | 07th - 11th September 2026 at Bandung, Indonesia
02nd - 06th November 2026 at Bangkok, Thailand | 30th November - 04th December 2026 at Kuala Lumpur, Malaysia

Day 3/Day 4

RELIABILITY MODELING AND PREDICTIONS

- Reliability modeling
- Sources and uses of reliability data
- Describe sources of reliability data (prototype, development, test, field, warranty, published, etc.), their advantages and limitations, and how the data can be used to measure and enhance product reliability. (Apply)
- Reliability block diagrams and models
- Generate and analyze various types of block diagrams and models, including series, parallel, partial redundancy, time-dependent, etc. (Create)
- Physics of failure models
- Identify various failure mechanisms (e.g., fracture, corrosion, memory corruption) and select appropriate theoretical models (e.g., Arrhenius, S-N curve) to assess their impact. (Apply)
- Simulation techniques
- Describe the advantages and limitations of the Monte Carlo and Markov models. (Apply)
- Dynamic reliability
- Describe dynamic reliability as it relates to failure criteria that change over time or under different conditions. (Understand)
- Reliability predictions
- Part count predictions and part stress analysis
- Use parts failure rate data to estimate system- and subsystem-level reliability. (Apply)
- Reliability prediction methods
- Use various reliability prediction methods for both repairable and non-repairable components and systems, incorporating test and field reliability data when available (Apply)

Case Study/Exercise: Data analytics and advanced topics (Markov chains and Monte Carlo simulation)

Day 4

RELIABILITY TESTING

- Reliability test planning
- Reliability test strategies
- Create and apply the appropriate test strategies (e.g., truncation, test–to-failure, degradation) for various product development phases. (Create)
- Test environment
- Evaluate the environment in terms of system location and operational conditions to determine the most appropriate reliability test. (Evaluate)
- Testing during development
- Describe the purpose, advantages, and limitations of each of the following types of tests, and use common
- models to develop test plans, evaluate risks, and interpret test results. (Evaluate)
- Accelerated life tests (e.g., single-stress, multiple-stress, sequential stress, step-stress)
- Discovery testing (e.g., HALT, margin tests, sample size of 1),
- Reliability growth testing (e.g., test, analyze, and fix (TAAF), Duane)
- Software testing (e.g., white-box, black-box, operational profile, and fault-injection)
- Product testing
- Describe the purpose, advantages, and limitations of each of the following types of tests, and use common models to develop product test plans, evaluate risks, and interpret test results. (Evaluate)
- Qualification/demonstration testing (e.g., sequential tests, fixed-length tests)
- Product reliability acceptance testing (PRAT)
- Ongoing reliability testing (e.g., sequential probability ratio test [SPRT])
- Stress screening (e.g., ESS, HASS, burn-in tests)
- Attribute testing (e.g., binomial, hypergeometric)

- Degradation (wear–to-failure) testing

Case Study/Exercise: Working through a system of their choosing to study failure degradation mechanisms (physics of failure) as well as predict using statistical methods the optimal maintenance periodicity.

Day 5

MAINTAINABILITY AND AVAILABILITY

- Management strategies
- Planning
- Develop plans for maintainability and availability that support reliability goals and objectives. (Create)
- Maintenance strategies
- Identify the advantages and limitations of various maintenance strategies (e.g., reliability-centered maintenance (RCM), predictive maintenance, repair or replace decision making), and determine which strategy to use in specific situations. (Apply).
- Availability tradeoffs
- Describe various types of availability (e.g., inherent, operational), and the tradeoffs in reliability and maintainability that might be required to achieve availability goals. (Apply)
- Maintenance and testing analysis
- Preventive maintenance (PM) analysis
- Define and use PM tasks, optimum PM intervals, and other elements of this analysis, and identify situations in which PM analysis is not appropriate. (Apply)
- Corrective maintenance analysis
- Describe the elements of corrective maintenance analysis (e.g., fault-isolation time, repair/replace time, skill level, crew hours) and apply them in specific situations. (Apply)
- Non-destructive evaluation
- Describe the types and uses of these tools (e.g., fatigue, delamination, vibration signature analysis) to look for potential defects. (Understand)
- Testability
- Use various testability requirements and methods (e.g., built in tests (BITs), false-alarm rates, diagnostics, error codes, fault tolerance) to achieve reliability goals (Apply)
- Spare parts analysis
- Describe the relationship between spare parts requirements and reliability, maintainability, and availability requirements. Forecast spare parts requirements using field data, production lead time data, inventory and other prediction tools, etc. (Analyze)

DATA COLLECTION AND USE

- Data collection
- Types of data
- Identify and distinguish between various types of data (e.g., attributes vs. variable, discrete vs. continuous, censored vs. complete, univariate vs. multivariate). Select appropriate data types to meet various analysis objectives. (Evaluate)
- Collection methods
- Identify appropriate methods and evaluate the results from surveys, automated tests, automated monitoring and reporting tools, etc., that are used to meet various data analysis objectives. (Evaluate)
- Data management
- Describe key characteristics of a database (e.g., accuracy, completeness, update frequency). Specify the requirements for reliability-driven measurement systems and database plans, including consideration of the data collectors and users, and their functional responsibilities. (Evaluate)
- Data use
- Data summary and reporting

Certified Reliability Engineer

10th - 14th August 2026 at Kuala Lumpur, Malaysia | 07th - 11th September 2026 at Bandung, Indonesia
02nd - 06th November 2026 at Bangkok, Thailand | 30th November - 04th December 2026 at Kuala Lumpur, Malaysia

Petrosync Distinguished Instructor

Ahmed D., PHD, CMRP, CRE, PE.

Maintenance and Reliability Expert

Ahmed is the CEO and President of Operational Excellence Experts Consultant and Training with 20 years experiences in asset management, technical asset integrity management, asset management, maintenance and reliability.

Ahmed is certified on Maintenance & Reliability Professional (CMRP). He is Founder and Chairman of the board of the Egyptian Society for Asset Management Professionals.

Ahmed Developed Reliability Departments and consulting divisions for GE (Bentley Nevada), Meridium, SKF in Middle East and Africa as well as several customer companies

Position and Credentials:

- Certified Maintenance & Reliability Professional (CMRP)
- Certified RCM Facilitator (SKF / Aladon)
- Certified through the Institute of Asset Management (UK) as organization preparation facilitator / service provider respectively for the ISO 55000 (Asset Management) and ISO 31000 (Risk Management) standards.
- Certified Reliability Engineer (CRE)
- Certified ultrasonic testing specialist (BINDT)
- Certified vibration analyst level 1 (BINDT)
- Certified Investigator (Taproot)
- Certified Instructor (OSHA (Several areas)
- Certified Fire Investigator (OSHA)
- Certified Thermographic Imaging analyst 3 (FLIR)
- Certified Oil Analyst 3 and lubrication program developer (NOREA)
- Certified RBI Specialist and Inspection program developer (API) (API 580, 581, 570, 510)
- Certified Facilitator (GE)
- Certified Presenter and Public Speaker (GE)

Publications:

- Introduction to and implementation of International Standard ISO 14224:2006 – Reliability and Maintenance Data Management and Transfer(Arabic / DPIC Publications 2014)
- Introduction to and implementation of International Standard ISO 55000:2014 – Asset Management (Arabic / DPIC publications Egypt 2014).
- Introduction to and implementation of International Standard ISO 31000:1998 – Risk Management (Arabic / DPIC Publications 2015).

Partial Client Lists:

- Saudi Aramco
- Egyptian Ethyline and Derivatives Company
- GASCO
- ARAMCO - KSA (East West Pipeline)
- ADGAS
- ADMA – OPCO
- OMV Petrom
- Middle East Refining Company
- KNPC
- Khartoum Refining Company
- Alexandria Mineral Oil Company
- Pharonic Oil Company
- Galaya Metal
- Ideal Standard
- Smart Villages Development and Management Company
- Amerya Petroleum Refining Company
- Qatar Aluminum
- Emal
- UGDC
- Raya Network Services

INVESTMENT PACKAGES

Please checklist the package that you are attending!

	Certified Reliability Engineer SCHEDULES	LOCATION	PRICE
☐	10th - 14th August 2026	Kuala Lumpur, Malaysia	USD 3,495
☐	07th - 11th September 2026	Bandung, Indonesia	USD 3,495
☐	02nd - 06th November 2026	Bangkok, Thailand	USD 3,495
☐	30th November - 04th December 2026	Kuala Lumpur, Malaysia	USD 3,495

	Certified Reliability Engineer Exam Schedule	Price (Per Pax)	Admin Fee	Application Deadline
☐	TBA 2026	USD 533	USD 100	TBA 2026

** All prices are subject to change without notice and are not guaranteed, except that prices for an order that have been accepted by PetroSync is not subject to change after acceptance*

** Price is nett excluding Withholding Tax if any and will be quoted separately. Please send us the withholding tax payment receipt.*

** We can help to register CRE exam certification which incur **USD 100** administration fee per application.*

DELEGATE DETAILS

1st Delegate Name _____ Mr ☐ Mrs ☐ Ms ☐ Dr ☐ Others ☐

Direct Line Number: _____ Email: _____

Mobile Number: _____ Job Title: _____

Department: _____ Head of Department: _____

2nd Delegate Name _____ Mr ☐ Mrs ☐ Ms ☐ Dr ☐ Others ☐

Direct Line Number: _____ Email: _____

Mobile Number: _____ Job Title: _____

Department: _____ Head of Department: _____

3rd Delegate Name _____ Mr ☐ Mrs ☐ Ms ☐ Dr ☐ Others ☐

Direct Line Number: _____ Email: _____

Mobile Number: _____ Job Title: _____

Department: _____ Head of Department: _____

**Please fill all the details including mobile number. This help us to contact participant if they are late in class or if there is any urgent update (through whatsapp/call)*

INVOICE DETAILS

Attention Invoice to: _____

Direct Line Number: _____ Fax: _____

Company: _____ Industry : _____

Address: _____ Postcode: _____

Country: _____ Email: _____

Please note:
- Indicate if you have already registered by Phone ☐ Fax ☐ Email ☐ Web ☐
- If you have not received an acknowledgement before the training, please call us to confirm your booking.

PAYMENT METHODS

☐ **By Credit Card**

☐ **By Direct Transfer : Please quote invoice number(s) on remittance advice**

PetroSync Global Pte Ltd Bank details:
Account Name : PetroSync Global Pte Ltd
Bank Name : DBS Bank Ltd
Bank Code : 7171 • Bank Swift Code : DBSSSGSGXXX • Branch code : 288
Account No : 0288-002682-01-6-022 (USD)
Bank Address : 12 Marina Boulevard, Level 3. Marina Bay Financial Centre Tower 3. Singapore 018982

All bank charges to be borne by payer. Please ensure that PetroSync Global Pte Ltd receives the full invoiced amount.

PROGRAMME CONSULTANT

Name : Cay Aagen
Email : registration@petrosync.com
Phone : +65 3159 0800

TERMS AND CONDITIONS

DISCLAIMER

Please note that trainers and topics were confirmed at the time of publishing; however, PetroSync may necessitate substitutions, alterations or cancellations of the trainers or topics or location (classroom / Virtual). As such, PetroSync reserves the right to change or cancel any part of its published programme due to unforeseen circumstances. Any substitutions or alterations will be updated on our web page as soon as possible.

DATA PROTECTION

The information you provide will be safeguarded by PetroSync that may be used to keep you informed of relevant products and services. As an international group we may transfer your data on a global basis for the purpose indicated above. If you do not want us to share your information with other reputable companies, please tick this box ☐

CANCELLATION POLICY

Delegates who cancel after the training is officially confirmed run by email, are liable to pay the full course fee and no refunds will be granted. You may substitute delegates at any time as long as reasonable advance notice is given to Petrosync.

In the event that PetroSync cancels or postpones an In the event that PetroSync cancels or postpones or change the trainer or change the training location (classroom / virtual) of an event for any reason and that the delegate is unable or unwilling to attend in on the rescheduled date, you will receive a credit voucher for 100% of the contract fee paid. You may use this credit voucher for another PetroSync to be mutually agreed with PetroSync, which must occur within a year from the date of postponement.

PetroSync is not responsible for any loss or damage as a result of the cancellation policy. PetroSync will assume no liability whatsoever in the event this event is cancelled, rescheduled or postponed due to any Act of God, fire, act of government or state, war, civil commotion, insurrection, embargo, industrial action, or any other reason beyond management control.

CERTIFICATE OF ATTENDANCE

80% attendance is required for PetroSync's Certificate of Attendance.

DETAILS

Please accept our apologies for mail or email that is incorrectly addressed.
Please email us at registration@petrosync.com and inform us of any incorrect details. We will amend them accordingly.

Find us on Social Media:

PetroSync Global Pte Ltd
PetroSync
PetroSync

CHARGES & FEE(s)

- For Payment by Direct TelegraphicTransfer, client has to bear both local and oversea bank charges.

- For credit card payment, there is additional 4% credit card processsing fee.

COURSE CONFIRMATION

I agree to PetroSync's payment terms and cancellation policy.

Signature : _____

Date : _____

PAYMENT TERMS : Payment is due in full at the time of registration. Full payment is mandatory for event attendance.