



PB INSTITUTE OF RESEARCH AND TECHNOLOGY

P.O Box 21457-00100

Nairobi - Kenya

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Asset Reliability for Port Operations: Maintenance, Risk & Performance

Duration: 10 days

On-Site

01 Who Should Attend

- Supply Chain and Logistics Professionals
- Procurement and Contract Management Professionals
- HSE and Safety Professionals
- Operations and Technical Managers
- Port Authority and Maritime Agency Officials
- Shipping and Terminal Operators
- Infrastructure and Transport Professionals
- Consultants and Asset Management Professionals

02 About the Course

Ports depend on complex assets such as cranes, cargo-handling equipment, conveyors, terminal operating systems, warehouses, vehicles, marine infrastructure, power systems, and security equipment. Effective asset management and maintenance are therefore essential for reducing downtime, controlling operating costs, improving safety, and maintaining efficient cargo flows. This course provides a practical framework for managing port assets throughout their lifecycle—from **asset planning, acquisition, commissioning, and operation to maintenance, renewal, replacement, and disposal**. Participants will explore preventive, predictive, condition-based, and reliability-centred maintenance approaches while learning how to use asset performance data to support better operational and investment decisions.



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03 Workshop Objectives

- Understand the principles and importance of effective asset management in port operations.
- Learn how to identify, classify, and record port assets throughout their lifecycle.
- Master various maintenance strategies, including preventive, predictive, and condition-based maintenance.
- Develop skills in conducting condition assessments and prioritizing maintenance activities.
- Understand how to utilize Computerized Maintenance Management Systems (CMMS) for efficient maintenance planning and tracking.
- Learn how to apply risk management principles to port asset management and maintenance decisions.
- Develop strategies for optimizing asset lifecycle costs and making informed replacement decisions.
- Understand the role of technology and data analytics in enhancing port asset management and maintenance.
- Learn about safety regulations and environmental considerations related to port asset management and maintenance.
- Develop key performance indicators (KPIs) to monitor and improve asset management and maintenance effectiveness.
- Understand the principles of inventory management for spare parts and consumables in a port environment.
- Learn how to develop and implement a comprehensive asset management plan for a port.
- Understand the importance of collaboration and communication between different departments in asset management and maintenance.

04 Module Topics

Module 1: Principles of Port Asset Management



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- Defining asset management and its strategic importance in the port industry for your module.
- Understanding the asset lifecycle and its stages in a port context.
- Identifying different categories of port assets: infrastructure, equipment, and systems.
- Exploring international standards and best practices in asset management (e.g., ISO 55000).
- Understanding the link between effective asset management and overall port performance.

Module 2: Port Asset Identification and Data Management

- Establishing systems for accurate identification and registration of all port assets for your module.
- Understanding the key data attributes required for effective asset management.
- Implementing data collection and management processes for asset information.
- Utilizing tagging and labeling systems for efficient asset tracking.
- Ensuring data accuracy, accessibility, and integrity for informed decision-making.

Module 3: Maintenance Strategies for Port Assets

- Understanding the principles and application of preventive maintenance in ports for your module.
- Exploring the techniques and benefits of predictive maintenance (PdM) for port equipment.
- Learning how to implement condition-based maintenance (CBM) using monitoring technologies.
- Analyzing the advantages and disadvantages of reactive maintenance.
- Developing a balanced maintenance strategy based on asset criticality and risk.

Module 4: Condition Assessment and Maintenance Prioritization



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- Learning methods for conducting visual inspections and functional testing of port assets for your module.
- Understanding non-destructive testing (NDT) techniques for assessing asset condition.
- Utilizing data from monitoring systems for condition evaluation.
- Developing criteria for prioritizing maintenance activities based on risk and criticality.
- Creating maintenance schedules and plans based on condition and priority.

Module 5: Computerized Maintenance Management Systems (CMMS) in Ports

- Understanding the features and functionalities of CMMS software for port maintenance for your module.
- Implementing CMMS for work order management, scheduling, and resource allocation.
- Utilizing CMMS for tracking maintenance history and asset performance.
- Generating reports and analytics from CMMS data for informed decision-making.
- Integrating CMMS with other port management systems.

Module 6: Risk Management in Port Asset Management and Maintenance

- Identifying potential risks associated with port asset failure and downtime for your module.
- Assessing the likelihood and impact of different asset-related risks.
- Developing risk mitigation strategies and contingency plans.
- Implementing risk-based maintenance planning and resource allocation.
- Understanding the role of insurance and risk transfer mechanisms in port asset management.

Module 7: Asset Lifecycle Costing and Replacement Decisions

- Understanding the principles of lifecycle cost analysis (LCCA) for port assets for your module.
- Calculating the total cost of ownership over an asset's lifespan.
- Determining optimal replacement times based on cost, performance, and risk.
- Evaluating different asset procurement options and their lifecycle cost implications.
- Developing capital expenditure (CAPEX) plans for asset renewal and replacement.



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Module 8: Technology and Data Analytics for Enhanced Port Asset Management

- ▶ Exploring the use of IoT sensors and remote monitoring for real-time asset condition data collection for your module.
- ▶ Utilizing data analytics techniques to identify trends, predict failures, and optimize maintenance schedules.
- ▶ Understanding the application of digital twins for asset performance simulation and optimization.
- ▶ Exploring the potential of AI and machine learning in predictive maintenance and asset health monitoring.
- ▶ Implementing mobile technologies for efficient maintenance operations and data capture.