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TRAINING ON
INSTRUMENTATION AND CONTROL DEVICES

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ABOUT US

Welcome to Pertecnica, where knowledge meets expertise! As a leading employee training institute, we specialize in a diverse range of sectors, providing top-notch induction trainings, refresher courses, and elevating skills through our upgradation programs. We take pride in offering mandatory trainings that ensure compliance and safety trainings across various sectors/industries especially in the dynamic sector of Instrumentation and Control devices. At Pertecnica, we are your partners in growth, fostering a culture of continuous learning and development. Join us on a transformative journey.

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INDUCTION TRAININGS
- Instrumentation and Control devices

Introduction to Instrumentation and Control Devices:

- **Fundamental Concepts: Comprehensive overview of basic concepts in instrumentation and control, including sensors, actuators, transmitters, and control systems.**
- **Industry Terminology: Introduction to industry-specific terminology and common abbreviations used in the instrumentation field.**
- **Applications Overview: Understanding the diverse applications of instrumentation and control devices across various industries.**

Safety in Instrumentation Work Environments:

- **Hazard Identification: Training on identifying potential hazards related to instrumentation work, such as electrical risks, chemical exposure, and equipment-related dangers.**
- **Emergency Procedures: Instruction on emergency response protocols, including evacuation procedures, first aid, and the use of safety equipment.**
- **Personal Protective Equipment (PPE): Guidance on the correct selection and use of PPE to ensure personal safety in different work scenarios.**

Basics of Measurement and Calibration:

- **Measurement Principles: In-depth training on measurement techniques, units, and principles relevant to instrumentation.**
- **Calibration Procedures: Instruction on the calibration of instruments and devices to ensure accurate and reliable measurements.**
- **Calibration Documentation: Overview of proper documentation practices for calibration processes, including record-keeping and compliance with standards.**

PLC (Programmable Logic Controller) Fundamentals:

- **Introduction to PLCs: Comprehensive understanding of the role and functions of programmable logic controllers in industrial automation.**
- **Programming Basics: Basic programming skills for PLCs, covering ladder logic, input/output configurations, and troubleshooting.**
- **Hands-On Exercises: Practical sessions for hands-on experience with PLC programming software and hardware.**

SCADA (Supervisory Control and Data Acquisition) Systems Training:

- **SCADA Overview: In-depth explanation of SCADA systems and their role in monitoring and controlling industrial processes.**
- **Data Acquisition Techniques: Training on collecting and interpreting data from various sensors and instruments.**
- **System Troubleshooting: Instruction on diagnosing and resolving issues in SCADA systems to maintain uninterrupted operations.**

Cybersecurity in Instrumentation:

- **Cyber Threat Awareness: Training on recognizing and understanding potential cybersecurity threats to instrumentation and control systems.**
- **Security Protocols: Implementation of security protocols and best practices to safeguard against cyberattacks.**
- **Incident Response: Guidelines on responding to cybersecurity incidents, including reporting procedures and collaboration with IT security teams.**

Quality Control and Assurance in Instrumentation:

- **Quality Standards: Training on industry-specific quality standards and regulations applicable to instrumentation and control devices.**
- **Inspection and Testing Techniques: Understanding techniques for inspecting, testing, and ensuring the quality of instrumentation products.**
- **Documentation for Compliance: Overview of documentation requirements to meet quality assurance standards and regulatory compliance.**

Communication Protocols in Instrumentation:

- **Introduction to Communication Protocols: Explanation of common communication protocols used in instrumentation, such as Modbus, HART, and Profibus.**
- **Network Configuration: Training on configuring and maintaining communication networks for connected instrumentation devices.**
- **Troubleshooting Communication Issues: Practical guidance on diagnosing and resolving communication problems within instrumented systems.**

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REFRESHER TRAININGS

- Instrumentation and Control devices

Advanced Instrumentation Techniques:

- **Cutting-Edge Sensor Technologies: Updating employees on the latest advancements in sensor technologies used in instrumentation, such as IoT sensors, wireless sensors, and smart sensors.**
- **Integration with Industry 4.0: Understanding the integration of instrumentation with Industry 4.0 concepts, including data analytics, cloud computing, and the Industrial Internet of Things (IIoT).**
- **Hands-On Practical Exercises: Engaging employees with hands-on exercises to reinforce their understanding of advanced instrumentation techniques.**

Safety and Hazardous Area Classification:

- **Review of Safety Standards: Refreshing employees on industry safety standards and regulations related to hazardous area classification in instrumentation work environments.**
- **Emergency Response Protocols: Revisiting emergency response procedures specific to instrumentation, including evacuation plans, first aid, and the use of safety equipment.**
- **Case Studies: Analyzing real-world case studies to enhance awareness of potential safety hazards and the importance of adherence to safety protocols.**

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Cybersecurity in Instrumentation:

- Current Cyber Threat Landscape: Providing updates on the evolving cybersecurity threats relevant to instrumentation and control systems.
- Best Practices for Cybersecurity: Reviewing best practices for securing instrumentation systems, including network segmentation, regular software updates, and user access controls.
- Simulated Cybersecurity Drills: Conducting simulated cybersecurity drills to test employees' ability to respond effectively to potential cyber threats.

Instrumentation Calibration and Maintenance:

- Latest Calibration Technologies: Updating employees on the latest advancements in calibration technologies and tools.
- Calibration Best Practices: Reinforcing best practices for calibration, including precision techniques, documentation, and adherence to industry standards.
- Practical Maintenance Exercises: Engaging employees in practical exercises to refresh their skills in instrument maintenance, troubleshooting, and repair.

SCADA Systems:

- Advancements in SCADA Technology: Updating employees on the latest features and technologies in SCADA systems.
- Security Enhancements: Reviewing security enhancements and protocols to protect SCADA systems from cyber threats.
- Case Studies and Troubleshooting: Analyzing case studies and conducting troubleshooting scenarios to enhance practical skills in managing SCADA systems.

PLC Programming and Troubleshooting:

- **Updates in PLC Technology: Providing information on recent developments and updates in programmable logic controller (PLC) technology.**
- **Advanced Programming Techniques: Refining programming skills with advanced techniques and functions in PLC programming.**
- **Real-Life Problem Solving: Engaging employees in real-life problem-solving exercises to enhance their ability to troubleshoot PLC-related issues.**

Quality Control and Assurance:

- **Latest Quality Standards: Updating employees on any revisions or additions to quality standards relevant to instrumentation and control devices.**
- **Quality Inspection Techniques: Reinforcing techniques for quality inspections and testing of instrumentation products.**
- **Continuous Improvement Strategies: Introducing strategies for continuous improvement in quality control processes.**

Communication Protocols:

- **Latest Communication Protocols: Providing updates on any new communication protocols or standards in the instrumentation field.**
- **Advanced Network Configurations: Reviewing advanced network configurations for efficient communication between instruments.**
- **Troubleshooting Communication Issues: Engaging in practical exercises to refresh skills in identifying and resolving communication problems within instrumented systems.**

SKILL UPGRADATION PROGRAMME

- Instrumentation and Control devices

Advanced Process Control (APC) Training:

- **Model-Based Control Techniques: In-depth training on using models for control system design, optimization, and performance enhancement.**
- **Predictive Analytics: Developing skills in utilizing predictive analytics to anticipate process variations and optimize control strategies.**
- **Implementation of APC Strategies: Hands-on experience in implementing advanced process control strategies for improved system efficiency.**

Industrial Cybersecurity Certification Program:

- **Cyber Threat Intelligence: Comprehensive understanding of emerging cyber threats specific to the instrumentation and control devices industry.**
- **Secure Network Design: Skill development in designing and implementing secure industrial networks to protect control systems.**
- **Incident Response Planning: Training on creating effective incident response plans to mitigate the impact of cybersecurity incidents.**

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Wireless Instrumentation Technology Workshop:

- **Wireless Communication Protocols: Hands-on exploration of various wireless communication protocols used in modern instrumentation.**
- **Integration with IoT: Training on integrating wireless instrumentation with the Internet of Things (IoT) for enhanced data collection and analysis.**
- **Security in Wireless Systems: Understanding security measures for wireless instrumentation systems to prevent unauthorized access.**

Real-time Data Analysis and Visualization Training:

- **Data Interpretation Skills: Enhancing skills in interpreting real-time data from instrumentation devices for effective decision-making.**
- **Visualization Tools Mastery: Training on utilizing advanced data visualization tools for clear representation of complex data sets.**
- **Integration with Control Systems: Learning to integrate real-time data analysis into control systems for dynamic process monitoring.**

Instrumentation Calibration Automation Program:

- **Automated Calibration Tools: Training on utilizing automated calibration tools and systems for efficiency and precision.**
- **Calibration Data Management: Developing skills in managing and analyzing calibration data to ensure accuracy and compliance.**
- **Integration with Asset Management Systems: Understanding the integration of automated calibration with broader asset management systems.**

Advanced SCADA System Design and Implementation:

- **SCADA System Architecture: In-depth exploration of SCADA system architecture and components.**
- **Redundancy Strategies: Learning advanced strategies for implementing redundancy in SCADA systems for increased reliability.**
- **SCADA Security Best Practices: Training on the latest security measures and best practices for securing SCADA systems.**

Instrumentation Reliability Engineering Certification:

- **Reliability Analysis Techniques: Comprehensive training on reliability analysis methods for instrumentation devices.**
- **Failure Modes and Effects Analysis (FMEA): Developing skills in conducting FMEA to identify and mitigate potential failure modes.**
- **Root Cause Analysis for Instrumentation Failures: Training on root cause analysis techniques specific to instrumentation reliability.**

Instrumentation Project Management Workshop:

- **Project Planning and Execution: Developing project management skills for planning and executing instrumentation projects effectively.**
- **Risk Management in Projects: Training on identifying and mitigating risks associated with instrumentation projects.**
- **Stakeholder Communication: Enhancing communication skills for effective collaboration with stakeholders throughout project lifecycles.**

MANDATORY TRAINING

- Instrumentation and Control devices

Instrumentation Safety and Compliance Certification:

- **Hazardous Area Classification: Comprehensive training on classifying hazardous areas and understanding safety requirements in instrumentation.**
- **Intrinsically Safe Instrumentation: Ensuring employees are well-versed in the principles and applications of intrinsically safe instrumentation.**
- **Regulatory Compliance: Training on industry regulations and standards to maintain compliance with safety guidelines.**

ISO 9001:2015 Quality Management System (QMS) Training:

- **Understanding ISO 9001:2015: In-depth training on the ISO 9001:2015 standard and its relevance to quality management in instrumentation.**
- **Quality Auditing Skills: Developing auditing skills to assess and ensure compliance with quality management system requirements.**
- **Continuous Improvement Practices: Training on implementing continuous improvement practices within the framework of ISO 9001.**

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Functional Safety in Instrumentation (IEC 61511):

- **IEC 61511 Compliance: Ensuring employees understand the requirements and guidelines outlined in the IEC 61511 standard for functional safety.**
- **Safety Instrumented Systems (SIS): Comprehensive training on the design, implementation, and maintenance of safety instrumented systems.**
- **Failure Mode and Effect Analysis (FMEA): Developing skills in conducting FMEA to identify potential failure modes and assess their impact.**

Instrumentation and Control Documentation Standards:

- **P&ID Interpretation: Training on reading and interpreting Piping and Instrumentation Diagrams (P&ID) accurately.**
- **Documentation Best Practices: Ensuring employees adhere to standardized documentation practices for instrumentation projects.**
- **Version Control Systems: Training on using version control systems to manage and track changes in documentation.**

Instrument Calibration and Metrology Training:

- **Calibration Procedures: Comprehensive training on proper calibration procedures for various types of instrumentation devices.**
- **Metrological Traceability: Ensuring employees understand the importance of maintaining metrological traceability in calibration processes.**
- **Uncertainty Analysis: Developing skills in analyzing and minimizing uncertainties associated with instrument calibration.**

Process Control Systems Integration Certification:

- **PLC and DCS Integration: Training on integrating Programmable Logic Controllers (PLC) and Distributed Control Systems (DCS) for seamless automation.**
- **Communication Protocols: Understanding various communication protocols used in process control systems integration.**
- **System Reliability and Redundancy: Ensuring reliability through redundancy strategies in integrated control systems.**

Cybersecurity Awareness and Training for Instrumentation:

- **Security Threat Landscape: Providing insights into the evolving cybersecurity threats specific to instrumentation and control devices.**
- **Security Policies and Procedures: Ensuring employees are aware of and follow established cybersecurity policies and procedures.**
- **User Awareness Training: Training on recognizing and mitigating cybersecurity risks through user education and awareness.**

Instrumentation Project Management Certification:

- **Project Planning and Scheduling: Developing skills in effectively planning and scheduling instrumentation projects.**
- **Resource Management: Ensuring employees understand how to efficiently manage resources in instrumentation projects.**
- **Risk Management in Instrumentation Projects: Training on identifying and mitigating risks associated with instrumentation projects.**

SAFETY TRAINING

- Instrumentation and Control devices

Instrumentation Safety Awareness Training:

- **Hazard Recognition: Comprehensive training on identifying potential hazards associated with instrumentation devices and control systems.**
- **Personal Protective Equipment (PPE): Ensuring employees understand the proper selection and usage of PPE in instrumentation environments.**
- **Emergency Response Procedures: Training on effective response protocols in case of accidents or malfunctions involving instrumentation systems.**

Electrical Safety for Instrumentation Technicians:

- **Lockout/Tagout Procedures: In-depth training on the importance of lockout/tagout procedures to ensure safe maintenance and servicing of instrumentation equipment.**
- **Arc Flash Awareness: Understanding the risks and safety measures related to arc flash incidents in electrical instrumentation systems.**
- **Grounding and Bonding Practices: Training on proper grounding and bonding techniques to prevent electrical hazards.**

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Process Safety Management (PSM) Certification:

- **Hazard Analysis Techniques: Developing skills in utilizing hazard analysis techniques, such as HAZOP and FMEA, specific to instrumentation processes.**
- **Management of Change (MOC): Training on implementing and managing changes in instrumentation systems while ensuring safety compliance.**
- **Incident Investigation: Understanding the process of investigating incidents related to instrumentation systems to prevent future occurrences.**

Instrumentation Cybersecurity Safety Training:

- **Cyber Threat Awareness: Ensuring employees are aware of potential cybersecurity threats specific to instrumentation and control devices.**
- **Security Protocols: Training on implementing and following security protocols to safeguard instrumentation systems from cyberattacks.**
- **Secure Communication Practices: Developing skills in maintaining secure communication within instrumentation networks.**

Chemical Handling Safety in Instrumentation:

- **Chemical Risk Assessment: Training on assessing and mitigating risks associated with the handling of chemicals in instrumentation processes.**
- **Safe Storage Practices: Ensuring employees understand proper storage and handling procedures for chemicals used in instrumentation.**
- **Emergency Response for Chemical Spills: Training on responding to and managing chemical spills in instrumentation environments.**

Radiation Safety Training for Nuclear Instrumentation:

- **Radiation Hazard Awareness: Comprehensive training on recognizing and mitigating radiation hazards in nuclear instrumentation.**
- **Dosimetry and Exposure Monitoring: Understanding dosimetry techniques and implementing exposure monitoring in nuclear instrumentation settings.**
- **Emergency Response to Radiation Incidents: Training on responding to emergencies involving radiation leaks or exposure incidents.**

Instrumentation Confined Space Entry Training:

- **Confined Space Identification: Training on identifying confined spaces within instrumentation facilities and understanding associated risks.**
- **Permit-to-Work Systems: Ensuring employees are familiar with permit-to-work systems for safe entry into confined spaces.**
- **Rescue Procedures: Training on conducting safe and effective rescue operations in the event of confined space emergencies.**

Instrumentation Equipment Fall Protection Certification:

- **Fall Hazard Recognition: Comprehensive training on identifying fall hazards associated with instrumentation equipment and installations.**
- **Proper Use of Fall Protection Equipment: Ensuring employees are trained in the correct usage of fall protection gear in instrumentation settings.**
- **Anchorage and Rigging Safety: Training on proper anchorage and rigging techniques to prevent falls when working at heights.**