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IE014:
PLC Overview, Maintenance, Troubleshooting & Problem Solving

Training Description:

This "learn-by-doing" course covers the setup, use, programming, troubleshooting, and maintenance of the Allen-Bradley PLC-5 family of programmable logic controllers. Lab exercises cover field devices, input/output modules, wiring, fusing, and processor programming leading to in-depth troubleshooting and maintenance of the equipment. The exercises are performed on actual equipment setups and are applicable to process control, motor control, level control, and safety interlocking.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Understand plc control principles and applications with field devices
- ✓ Connect and wire field devices to plc inputs and outputs
- ✓ Understand and use basic ladder logic programming
- ✓ Use and configure a delay timer and counter in a controller
- ✓ Connect a power device using an interposing relay
- ✓ Identify Allen-Bradley PLC-5 hardware components and equipment
- ✓ Connect a programming terminal to the plc; KT card, KE card, and PCMK card
- ✓ Use the programming terminal to troubleshoot failed field devices
- ✓ Determine address names for input and output points
- ✓ Add comments to instructions and rungs for program documentation
- ✓ Use symbolic addressing to speed development and troubleshooting
- ✓ Use address and function searches within the program
- ✓ Save ladder logic ladders and data files from the plc to a floppy disk
- ✓ Restore ladder and data files to a processor from a programming terminal
- ✓ Print reports and documentation of the plc system and program
- ✓ Use the force function to troubleshoot and maintain equipment operation
- ✓ Troubleshoot failed input and output field devices, power supplies, and processors

Training Designed for:

This course is intended for all Production Technicians, Maintenance Specialists, and Engineering Technicians who desire a hands-on approach to understanding and troubleshooting the Allen-Bradley line of PLC's. Some background in basic electrical principles is helpful but not a strict requirement. Minimal coverage of theory and mathematical principles is provided with an emphasis on hands-on use of the actual equipment.

Training Program:

DAY ONE:

- ❖ Pre-Test
- ❖ Introduction
- ❖ Introduction to Control Systems
  - An introduction to control systems and ladder logic is provided by building relay logic circuits using batteries, relays, switches, lights, and connecting wires. Fundamental PLC principles are established as the participants work together to perform the functions of a PLC wired with input and output devices

- Allen-Bradley Hardware and Ladder Logic Programming
  - The components of an A-B PLC5 programmable logic controller is covered noting their function and use. Participants attach input switches and output lights to a PLC system and write basic ladder logic to control their operations. Normally open contacts (XIC), normally closed contacts (XIO), output coils, timers, and counters are used to build and/or motor starter, and safety monitoring circuits

DAY TWO:

- Using A Programming Terminal to Monitor and Edit
  - The use of 6200 series software to monitor and edit control systems is the focus as participants practice the use of KE, KT, and PCMK modules to establish communications between their PC and the PLC. After locating the proper address on the data highway, participants log on to the appropriate PLC and check data and program file operation

DAY THREE:

- System Troubleshooting Using the Programming Terminal
  - The programming terminal can shorten the time required to locate and repair failed components. Participants practice using the terminal to locate contacts that are preventing equipment operation, locate the addresses in field hardware, verify proper voltages and current levels, and isolate and repair failed devices

DAY FOUR:

- System Utilities for Maintenance and Repair
  - Steps required to create backup copies of the ladder logic in a PLC and the steps to restore a program to a PLC in the event of a hardware failure or power upset are covered
  - In addition, practice with utilities like printing ladder logic and status reports to a printer is provided. Also included are forcing inputs and outputs, adding symbols and comments to ladder logic, and moving from data files to ladder files while troubleshooting

DAY FIVE:

- Pump Control Operations
  - The use of the plc as a controller for pumps and other electrical and safety equipment is studied. Typical ladder logic as used on offshore platforms is used to demonstrate control and safety principles. Participants will view existing code and have the opportunity to build and enhance control systems during the hands-on sections of the course
- Course Conclusion
- Post-Test and Evaluation

Training Requirements:

"**Hands-on practical sessions, equipment** and **software** will be applied during the course if required and as per the client's request."

Please note that the above topics can be amended as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

As per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:30	Recess (Prayer Break & Lunch)
13:30 - 15:00	Last Session

For training registrations or in-house enquiries, please contact:
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Training & Career Development Department