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**Hands-On Technical Workshops**

by Ron Beaufort

**The Big Differences In What We Teach**

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This page is intended to give you enough information to make the best possible investment in PLC training. We've made several point-by-point comparisons to show just some of the differences between "what we teach" and "what they teach" based mainly on what we've heard from our customers. Take a look at what we offer - and then check out our competition. After you've made your own comparison, we hope that you'll give us an opportunity to prove that our training is better than anything else available. Then after you've tried us, decide for yourself whether or not you're satisfied. If you're not, we'll give you your money back. Period.

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### **We cover only useful technician-level job skills**

All of the material covered in our "PLC Boot Camp" classes (100% of it) is focused on the needs of maintenance technicians. One of our major objectives is teaching technicians how to interpret the PLC's ladder logic program as an aid to troubleshooting malfunctioning machinery. We present the PLC as one part of an overall system which consists of the field inputs, the PLC controller, and the field outputs. In the days before PLCs, any competent electrician could simply follow the hardwired connections between the system components and eventually track down a problem. In today's systems, following the connections usually involves the PLC. Technicians who have no experience accessing and interpreting the PLC's ladder logic program are at a distinct disadvantage. Experienced maintenance managers realize why it takes so long for some of their technicians to track down the source of a problem to a simple field input. Often it turns out that the technician traced the problem as far as the PLC - and then didn't know how to proceed from there.

Our "PLC Boot Camp" courses cover job skills which are useful for technicians troubleshooting the PLC as part of a complete system.

### **Many competitors concentrate on system specifications**

If you're like most maintenance managers, you're sick and tired of sending your technicians off to "PLC training" sessions which turn out to be nothing more than "sales pitch" seminars. The text book is generally the manufacturer's product catalog - and the course merely compares the specifications and capabilities of Model-X with Model-Y. Another common twist involves the "internal components" courses which cover trivial topics such as the type of Motorola or Zenith chip used inside the PLC processor. Now these sessions might possibly be useful to the engineers who design new systems - but the information in them is absolutely worthless to a maintenance technician troubleshooting a PLC-controlled system when the pump won't run.

The "PLC Boot Camp" courses that we offer are focused totally on usable job skills for plant maintenance technicians. We won't waste your time on anything else.

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### **We fully cover the processor's scan sequence**

One of the very first lessons that we teach in our five-day "PLC Boot Camp" classes is a detailed understanding of the processor's scan cycle. Our students are repeatedly drilled to perform a step by step analysis of how the field inputs are sampled, how the ladder rungs are executed, and how the field outputs are controlled. The effort invested in these exercises is repaid many times during the class and will also form a firm foundation for future learning throughout the rest of the technician's career. We've found that the vast majority of students - even those with years of experience - come into our classes with serious misconceptions about these critical ideas. Once these barriers to understanding have been removed, the student discovers that issues which once seemed so baffling and confusing have suddenly become crystal clear. For many of our students, removing the mystery of what goes on "under the hood" is the all-important key to fully understanding PLCs after years of frustration - and we cover this critical lesson before lunchtime on Monday morning.

Even students with many years of previous experience find our "PLC Boot Camp" courses to be highly enlightening - even during the very first lessons.

### **Many competitors teach popular misconceptions**

Most of the students in our classes have already been through some amount of training provided by a competitor of ours - often with disappointing results. In many cases we find that this training has contained subtle but important errors. A few common examples: "an XIC instruction examines a switch for an on condition" - "an OTE instruction controls an output" - "green highlights on the screen mean that a condition is true" - and more along the same lines. The most confusing thing about these incorrect statements is that they are often "close enough" to work in beginner-level classroom exercises - but unfortunately not much beyond that. The technician who completely relies on these popular misconceptions inevitably runs into situations now and then where the PLC's operation seems to make absolutely no sense at all. Naturally the resulting confusion costs extra troubleshooting time and effort - and also damages the technician's self-confidence. It's hard to get the job done when you start to second guess every move you make.

Our "PLC Boot Camp" courses are specifically designed to correct any misconceptions that the students have previously come to accept.

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### **Our classes develop problem-solving skills and self-confidence**

Students in our classes are continuously exposed to one realistic problem after another. This obviously provides many opportunities to incorporate problem-solving exercises directly into the classroom activities. As the students work through their assigned hands-on projects, the instructor constantly coaches them to develop a systematic approach to finding solutions for the problems they encounter. Lucky guesses and "hunt and peck" methods are discouraged in favor of step by step procedures which are certain to prove more reliable once the students have returned to work at the plant. In addition to developing problem-solving skills, we feel that improving each student's self-confidence is immensely important throughout the training process. All of the knowledge that any student possesses is practically worthless without the self-confidence required to make use of it. Of course, self-confidence is best developed by personally tackling and overcoming obstacles. By exposing each student to one problem after another, our classes present many opportunities for building self-confidence.

Our "PLC Boot Camp" classes improve the students' problem-solving skills and develop the self-confidence required to apply their new abilities on the job.

### **Most competitors neglect problem-solving and self-confidence**

While some of our competitors do offer hands-on classes, the lab sessions in these often turn out to be short, pre-canned affairs which offer little opportunity for the students to develop their problem-solving skills. In fact, most instructors try to prevent any problems from ever occurring in the first place. The lengthy lecture that precedes each lab session usually contains all of the step by step instructions required for the student to proceed flawlessly through the exercise without any trouble at all. In addition, some classes actually provide written instructions - complete with computer screen shots - which detail exactly how to proceed through the exercise. Any student who deviates from the script is usually guided right back onto the appointed path by the instructor - in an effort to keep the class on schedule. So - what happens when the students return to work and have no one handy to guide them?

Our "PLC Boot Camp" courses are specifically designed to develop the problem-solving skills that are neglected by most of our competitors. We provide opportunities for our students to build their self-confidence by overcoming realistic obstacles that other classes fail to provide.

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## **Our classes include wiring exercises for both discrete and analog signals**

Most technicians in today's plants must be able to work effectively with both discrete type and analog type I/O signals. All of our five-day "PLC Boot Camp" classes cover both of these types of signals in detail. Each student completes a series of hands-on wiring exercises to connect various input and output field devices to the PLC. For many students these wiring exercises form a crucial point on their learning curve. What sounds like a simple assignment to connect things such as buttons, switches, lamps, and contactors to the PLC can become quite challenging when a pre-printed wiring diagram isn't provided. For many students, this particular series of exercises brings into sharp focus such critical concepts as how the PLC processor interacts with its input and output field devices - and how the I/O addressing scheme relates to the PLC's data tables. Once the initial wiring has been completed, each student works through several programming projects which make use of the inputs and outputs. Important concepts such as TRIAC leakage current and proper wiring for failsafe operation may easily be demonstrated by simply disconnecting or rearranging a wire or two. Students become familiar with processing analog signals by programming exercises such as mathematical scaling and basic data collection.

Our "PLC Boot Camp" classes use actual hands-on wiring exercises to help the students understand the relationships between field I/O devices and the PLC processor. For some students just physically making the connections between field I/O devices and the PLC provides a crucial mental link between theory and practice.

## **Most competitors neglect wiring exercises completely**

Most of our competitors fail to include any hands-on wiring exercises in their PLC classes at all. Unfortunately their students miss out on many opportunities to tie the PLC system together both physically and mentally. The all-important interrelationships between the field hardware devices and the indications on the computer screen just never really make sense for some students until they actually make the physical wiring connections for themselves. By ignoring real-world exercises such as these, our competitors' "hands-on" classes might more accurately be called "fingers-on" classes instead. When you get right down to it, their students never touch much more than the computer keyboard and the mouse.

Our "PLC Boot Camp" classes use hands-on wiring exercises to provide important learning opportunities that other vendors neglect.

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**Want to know more?**

The comparisons above are just a few of the differences between our "PLC Boot Camp" classes and the "training as usual" approach used by just about everyone else. Whether you're a plant maintenance manager looking for effective PLC training for your technicians - or a PLC instructor at an accredited tech school - or a prospective student - if you'd like to know more, please get in touch with us. We'll be happy to discuss our techniques with you by phone, or possibly offer you a chance to sit in on one of our classes for free. This really works! If it didn't, we wouldn't guarantee it.

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