IHS Basic Electrical Controls: Agenda

Day and Times	Topic	Delivery Method	Notes
Day 1			
8:00-9:00	Course review and agenda	Group discussion	
	Introductions and operator discussion	Group discussion	Discussion aimed at identifying the experience level of the attendees and what they would like to take away from the workshop.
	Industrial and electrical safety part 1	Group discussion	Industrial safety topics including rotating assemblies and general industrial PPE, LOTO, electrical safety, arc flash safety and PPE. Define safe working practices and procedures for the workshop.
	Day 1 pre-quiz	Interactive Lecture	Pre and post quiz results are used to evaluate the trainer(s) and material's effectiveness. Also used to help the attendees know what topics are to be covered each day. Not used for course credit or individual attendee reporting.
9:00-10:00	Basic electricity	Interactive Lecture	Electrical terminology and engineering units, AC/DC systems, single versus three phase systems, and transformer configurations.
10:00-10:15	**Break**		
10:15-12:00	Electrical components	Interactive Lecture	Introduction to the most common electrical components in pump control panels and their usage.
	Exercise 1: control panel component tour	Exercise/Activity	Attendees will explore the pump panels, identify the installed components, and define their usage.
	Control system types and signals	Interactive Lecture	Introduction to the types of control system components and the most common signaling techniques.
12:00-1:00	**Lunch**		
1:00-2:30	Electrical circuit basics	Interactive Lecture	Reading electrical circuit diagrams, how to draw ladder style wiring diagrams.
	Exercise 2: Control element identification	Exercise/Activity	Identifying control element types.
2:30-2:45	**Break**		
2:45-4:45	Multimeters and clamp meters	Interactive Lecture	Attendees will follow along to learn the basic functions of a digital multimeter and clamp meter.
	Exercise 3: How to use a multimeter	Exercise/Activity	Attendees will use a multimeter to measure electrical parameters in the pump control panels.

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4:45-5:00	Day 1 post-quiz and discussion	Group discussion	See "Day 1 pre-quiz" note for background on how quizzes are used.
Day 2			
8:00-8:30	Opening remarks, day 2 pre-quiz	Group discussion	See "Day 1 pre-quiz" note for background on how quizzes are used
8:30-9:00	Industrial and electrical safety (review)	Group discussion	Industrial safety topics including rotating assemblies and general industrial PPE, LOTO, electrical safety, arc flash safety and PPE. Define safe working practices and procedures for the workshop.
9:00-10:00	Electromagnetism, inductance, and capacitance	Interactive Lecture	Discuss the three phenomenon of electromagnetism, inductance, and capacitance and their relationship to common electrical components.
10:00-10:15	**Break**		
10:15-12:00	Electromagnetism, inductance, and capacitance (continued)	Interactive Lecture	Discuss the three phenomenon of electromagnetism, inductance, and capacitance and their relationship to common electrical components.
	Exercise 4: pump down wiring, part 1	Exercise/Activity	Incoming control and motor power design and wiring.
12:00-1:00	**Lunch**		
1:00-2:00	Exercise 5: Pump down wiring, part 2	Exercise/Activity	HOA switch and starter connection design and wiring.
2:00-3:00	Exercise 6: Pump down wiring, part 3	Exercise/Activity	Float connection design and wiring.
3:00-3:15	**Break**		
3:15-4:45	Exercise 7: Pump up wiring	Exercise/Activity	Float connection design and wiring for pump up (fill cycle) operation.
4:45-5:00	Day 2 post-quiz and discussion	Group discussion	See "Day 1 pre-quiz" note for background on how quizzes
Day 3			
8:00-8:30	Opening remarks, day 3 pre-quiz	Group discussion	See "Day 1 pre-quiz" note for background on how quizzes are used

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08:30-10:00	Maintenance and troubleshooting	Interactive Lecture	Maintenance, calibration, and troubleshooting techniques for common types of industrial control instrumentation.
10:00-10:15	**Break**		
10:15-12:00	Exercise 8: 24VAC secondary control voltage wiring	Exercise/Activity	Float connection design and wiring for pump up and pump down operation incorporating the secondary voltage supplied by the control transformer.
12:00-1:00	**Lunch**		
1:00-2:00	Control strategies	Interactive Lecture	Discuss with attendees the common process control strategies used in industrial control systems.
	SCADA system overview	Interactive Lecture	Attendees will be introduced to the overall concept of SCADA systems and how they operate and gather data.
2:00-3:00	Instructor generated problem solving	Exercise/Activity	The instructor will inject issues in the control panels to simulate component failure for the attendees to troubleshoot.
3:00-3:15	**Break**		
3:15-4:00	Instructor generated problem solving continued	Exercise/Activity	The instructor will inject issues in the control panels to simulate component failure for the attendees to troubleshoot.
4:00-5:00	Day 3 post-quiz and workshop closing discussion	Group discussion	See "Day 1 pre-quiz" note for background on how quizzes
5:00	Adjourn		