

Course Syllabus: Control Panels for Remediation Systems – INTRODUCTION Level

Audience: Designed for anyone who may interact with remediation systems, including groundwater sampling crews, project managers, assistant project managers, office support staff, engineers, and geologists. This course is essential for anyone entering a system compound or managing a project involving a remediation system.

Note: This is not a troubleshooting course.

MODULE 1 – Core Concepts (4–6 hours)

1. What Is a Control Panel?

- What it does
 - Why it matters
 - What you should and should not touch
- ### 2. Panel Safety Basics
- Safe distance: the “3-foot rule”
 - When not to open a panel (buzzing, humming, hot)
 - “No gloves = No touch”
 - Off ≠ safe (voltage may still be present)
- ### 3. Hour Meters
- Mechanical vs. digital meters
 - How to read tenths of an hour
 - How to recognize a stuck or failed meter
- ### 4. Alarms
- What red or amber lights mean
 - What to check when a light is on
 - Importance of taking photos and documenting status
- ### 5. Switches: Hand-Off-Auto (HOA)
- What each position means
 - Why you should never switch without instruction
 - Common mistakes (e.g., leaving the switch in "Hand")

6. Emergency Stop (E-Stop)

- What it looks like
 - Its purpose and when it’s used
- ### 7. System Awareness: Sights, Sounds, and Smells
- How a malfunction looks (broken belts, oil leaks)
 - How a malfunction sounds (unusual noise, grinding)
 - How a malfunction smells (burnt wiring, overheating)
- ### 8. Touchscreens & Digital Displays
- How to activate ("wake up") the screen
 - What common messages mean: “Run,” “Fault,” “Ready”

9. Clearance and Obstructions

- Never block panel access with drums, tanks, or hoses
- NEC minimum clearance requirements

10. Reading an Electrical Utility Meter

- How to verify if utility power is present

11. Breaker Disconnect: Shut-Off and Turn-On

- Identifying the breaker disconnect
- Proper procedure to shut off and re-energize (observation only)

MODULE 2 – Field Scenarios & Practice (2–3 hours)

Participants will walk through common scenarios that require field awareness and proper communication.

Scenarios Covered:

- System shutdown for groundwater sampling
 - System shutdown for oil changes
 - Restart after a short-term shutdown
 - Restart after a long-term shutdown + reporting
 - How to report system status during a routine site visit
- Participants are encouraged to bring real-world field scenarios or panel-related observations for group review and discussion during this final module.

Course Syllabus: Control Panels for Remediation Systems – MID Level

For field technicians, project managers and engineers, who direct troubleshooting or troubleshooting systems on the field. For those, who opens the “magic” control panel cover door

What students will get: basic to in depth understanding of components that comprise control panel, their specific purpose, troubleshooting tips.

Materials: a copy of study materials with troubleshooting flow charts, field support tips, the industry specific range of data, completion certificate

Module 1 - Fundamentals:

- Lock Out Tag Out
- Fire Extinguisher

Module 2 – Core Components:

- Control Panels
 - Fuses
 - Breakers
 - Overloads
 - Motor Starters
 - Soft Starters
 - Motor Savers
 - Combined Breaker Overloads
 - Hour Meters
 - Hand Off Auto
- Motors (general, for troubleshooting purposes)
 - VFDs
 - Wire Sizing
- Single and Three phases (general, for troubleshooting purposes)

Module 3 - Specialty

- Use of Multimeter
- Troubleshooting Flowcharts
- Diagnosing Faults via Readings (amps, volts, ohms)
- Visual Clues: Burn marks, corrosion, component age
- Using AI to troubleshoot

Module 4 - Scenarios

- Participants are encouraged to bring any field scenarios or panel-related issues they've encountered for group review and troubleshooting discussion during this final module.

Course Materials:

- Printed study materials
- Field support tips
- Certificate of completion

