

Workshop by the Module

Design Your Own Class • Check Off the Subjects You Want

1 Safety: Developing Confined Space-Lockout Written Procedure.

Safety is number 1. Accident prevention is key. This class defines the hazards around the plant and develops the written procedures required by OSHA . These procedures are designed for the plant operational people to easily write up the procedures for their particular application. Be Safe. Be Compliant.

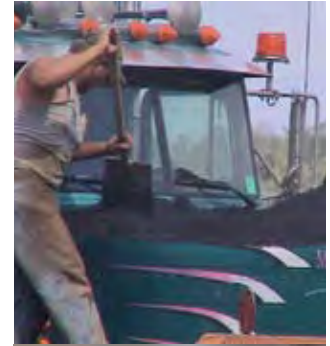
Safety Director, Plants Manager, Plant Technician, Plant Mechanic, Operator, Trainee



2 Safety: Handling Asphalt Oil, Proving Safety Interlocks, Electrically Safe Maintenance Procedures, Damage Control.

Many people in the industry know of people burned by asphalt oil. There is no excuse for it. Burner and Material Handling Interlocks sometimes fail. Don't find out by accident your interlock does not work. Many Interlocks can be checked just by how equipment is operated. Just because you tripped a breaker, does not mean the circuit is safe to work on. Insure your people know that. The drum mixer stops rotating and 2,000 degree gases rush to your baghouse. Asphalt oil saturates the inside of your drum. What do you do first, second, third... ?

Safety Directors, Plants Manager, Plant Technician, Plant Mechanic, Operator, Trainee



3 Drum/Trunnion Maintenance

Balancing the sloped drum on tires is a technique that requires understanding the various load dynamics on trunnions and bearings. Troubleshooting problems and making adjustments ahead of the time bearings, tires, trunnions, drives, motors and switchgear fail reduces preventable downtime. Amp gauges, trunnion and tire wear tell a story—what's happening—what needs doing?

Equipment Buyers, Plants Manager, Plant Technician, Plant Mechanic, Operator, Trainee



4 Batch Plant Operation

Some Batch Plants are unnecessarily running slow while producing lower quality mix. What do you check if you're too rich or too lean? Adjusting the plant running procedure will tell the story. Some plants will produce a dryer batch every now and then. Why, and what can be done?

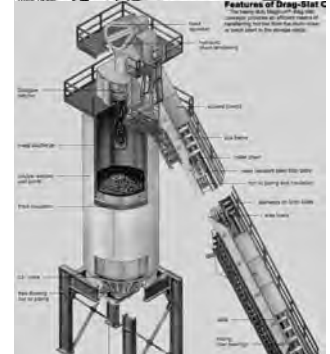
Equipment Buyers, Plants Manager, Plant Technician, Plant Mechanic, Operator, Trainee, QC



5 Aggregate Storage, handling and Feeder Systems 6 Asphalt Mix and Silo Operation

Cold feed Bins, Rap Bins are volumetric feeders and relatively easy to operate. Mineral filler and dust silos can be difficult if not equipped correctly. Now, with SMA and WMA, we are adding all sorts of material to our mix from wax beads to water, or fiber to powders, even liquid chemicals. Venting gets to be a problem with some weighing devices when blowing material in the silo and blowing material away from the silo discharge scale. The Exhaust Fan is a dust feeder. The more the damper is opened, the more dust is taken from the dryer. The dust makes a pit stop in the baghouse before being returned in spurts, partially returned or rejected. Some plants use a dust surge bin to even out the dust flow.

Equipment Buyer, Plants Manager, Plant Technician, Plant Mechanic, Operator, Trainee, QC



7 Scales and Meters

Continuous weigh scales are the most difficult to install, calibrate and maintain. Belt Scales, Flow Scales, Flow Meters etc may be made accurate for the rate the scale was calibrated at but may not be accurate at rates significantly different than that. Learn how to check for that and then correct it. Learn how to spot check problems as the plant is producing. Stop the process before making all that bad mix.

Equipment Buyer, Plants Manager, Plant Technician, Plant Mechanic, Operator, Trainee, QC



8 Control System Operation

Control systems are always changing. When something is wrong and they're not operating correctly, it can be hard to find the problem when you lack proper understanding of the dynamics. A step by step procedure from open loop control through the many closed loop control situations and theoretical plant control problems are introduced. Participants are asked for ideas of the symptoms of the control behavior. The role is reversed later when symptoms are presented and participants are asked what the problems may be. Control systems are made up of all types of electro-mechanical devices.

Understanding electrical helps one become a thorough troubleshooter.

Equipment Buyer, Plants Manager, Plant Technician, Plant Mechanic, Operator, Trainee, QC

9 Burner Operation 10 Hot Oil Heating

Combustion occurs when fuel, air and ignition unite. Complete combustion is achieved under the right conditions. Incomplete combustion reduces production, and increases energy and maintenance costs. Combustion efficiency can be monitored by the CFO when comparing energy bills and production. Learn what's acceptable and when a burner tune up is necessary. Plant Mechanics will learn how to tune the burner with or without a combustion analyzer, and to troubleshoot problems and learn how to fix them.

CFO, Equipment Buyer, Plants Manager, Plant Technician, Plant Mechanic, Operator, Trainee

11 Aggregate Drying

Learn how drying takes place under the many different conditions. Counter flow drying requires bigger and better pollution control equipment than parallel flow drying. Why? Learn about proper temperatures and pressures and compare them to what your plant is running at. Make adjustments or repairs to meet the proper criteria and raise your production. Learn how to measure effectiveness of the veiling flights. Some plants have the paint burned off one side of the stack. Why?

CFO, Equipment Buyer, Plants Manager, Plant Technician, Plant Mechanic, Operator, Trainee

12 Plant Production Troubleshooting

The plant behaves differently with various production rates and aggregates flowing through the dryer at different times of the year. Consequently, it becomes difficult to determine what's acceptable for the equipment and conditions. Learn to size up your situation for the production rate your plant *should* be able to attain, and for the energy consumption your plant *should* require. If you're not reaching these benchmarks, you're losing money. A lot of money is spent at the plant—don't make the operator the only one in charge of your purse strings. The plant is armed with many useful instruments. Teach your operator a profitable, safe way to manage it.

CFO, Equipment Buyer, Plants Manager, Plant Technician, Plant Mechanic, Operator, Trainee

13 Baghouse & Primary Collector Operation

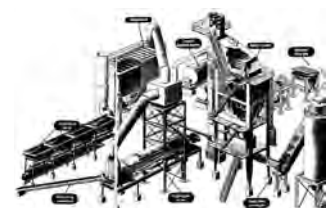
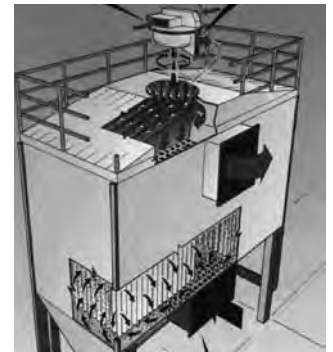
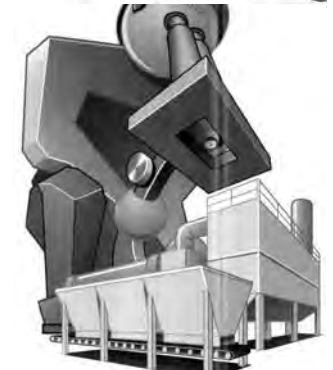
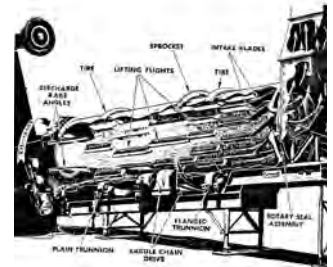
The purpose of this pollution control equipment is to keep the air clean and as discussed in Module 4.0, to return material back to the mix. Reverse Air Bag systems clean large sections of the baghouse over a long period of time compared to the Pulse Jet systems. How do these very different systems affect combustion, production and mix quality. How should these be maintained, operated and protected?

CFO, Equipment Buyer, Plants Manager, Plant Technician, Plant Mechanic, Operator, Trainee

14 Plant Performance Evaluation

Look at the big picture and then focus on the small details. Set up a program to measure daily plant performance while documenting the many variables affecting the plant situation. Make some changes and measure to see if it was a positive or negative. Set up your operation so it uses the least amount of energy while allowing max production. Take snap shots of the plant behavior in different situations. Piece them together for the big picture over time. Plant operation is not an art, it is a science and a business. Run it by the numbers.

CFO, Equipment Buyer, Plants Manager, Plant Technician, Plant Mechanic, Operator, Trainee



□ 1 Basic Electricity

'Understanding electricity has not been made so easy', is a common remark that has been made over the 15 years this Workshop has been performed. We approach this module as if the participant has no idea how electricity works. Many claim they only know enough to stay away from it. If you repeat these next six modules enough times, you will have a good foundation to work from. You will be able to pass along observations to plant controls people over the phone, trouble shoot and make some repairs yourself, working on equipment safely.

Plant Manager, Plant Technician, Plant Mechanic, Operator, Trainee

□ 2 Circuit Analysis

What measurements should we measure in a good working circuit? Once we know that, a circuit not working is again measured then analyzed on the different measurements between a good working circuit and a bad circuit. Directions are determined where to measure next until we make the determination of the fault. This may seem easy. Participants normally need coaxing to measure the circuit under the condition it failed. Participants are tested at the end of each module and are encouraged to repeat the module as many times to make one most proficient.

Plants Manager, Plant Technician, Plant Mechanic, Operator, Trainee

□ 3 Meter Usage

The meters measure resistance, voltage and amperage. Depending on the circumstances, one needs to set these up properly to safely read the value being measured. Some meters are auto ranging while other meters need to be ranged. Know when your meter is reading correctly and when it is not.

Plant Manager, Plant Technician, Plant Mechanic, Operator, Trainee

□ 4 Troubleshoot – Beginner

Every plant has many high voltage motors and motor starters that require troubleshooting, maintenance and repair. It's important the job is done right and safely. OSHA requires circuits to be measured for no voltage when a disconnect is used to isolate the voltage from employees. If your people are in motor control cabinets and rewire motors, this alone is reason enough to be taking this module.

Plants Manager, Plant Technician, Plant Mechanic, Operator, Trainee

□ 5 Troubleshoot – Advance

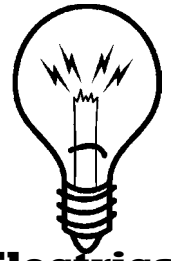
Electrical controls is more than supplying 480 vac or 120 vac to lights, motors and coils, etc. Equipment is also controlled from the varying AC and DC signals from load cells, VFDs, DC Motor controls, tachometers, potentiometers, etc. These circuits are explained and problems introduced into the circuits and then the Symptoms Game starts. This game is very effective in getting our point across and the challenge makes it fun for all.

Plants Manager, Plant Technician, Plant Mechanic, Operator, Trainee

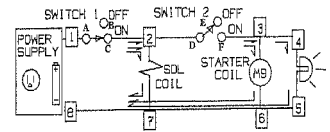
□ 6 Troubleshoot – Expert

A closed loop control system is studied, then analyzed for the resulting symptoms once the system has been given a problem. This Module requires all the knowledge and skill gained from the previous Electrical Modules plus. The problem may not be an electrical one or a mechanical one but parameters programmed on a VFD or Blending control or a Continuous Weigh Scale. The problem may be intermittent or continuous. The problem may be in the control house or at the equipment location or in the motor control room or the cable in between.

Plants Manager, Plant Technician, Plant Mechanic, Operator, Trainee



Electrical



SWITCH 1 AND 2 ON
SOLENOID OFF
STARTER OFF
LIGHT OFF

FIND THE PROBLEM WITH YOUR TEST METER
WHERE IS OUR FIRST GOOD CHECK

