5th Atlantic Alliance Symposium

Safe Asphalt Plant Design
With Gil Morgan
Overview

- Safety in General
  - Objectives, Obstacles and Opportunities
  - Methods and Mindsets
  - Facing The Challenge

- Safe Asphalt Plant Design
  - Make Safety a Core Value
  - Increase Awareness of Danger
  - Recognize Opportunities to Improve Safety

- Safety Beyond Design
  - Education and Training Are Not Optional
  - Internalize a Safety Mindset and Pass It On
  - Seek Opportunities to Influence Others for Safety
Objectives of Safety

- Safety As an Ideal
  - Has a Cultural Basis
  - Is a Shared Concern
  - Has Many Levels of Implementation
Obstacles to Safety

- Safety Reduced to Perception
  - Decline in Safety Awareness
  - Unspecified Responsibility
  - Lack of Implementation
Opportunities for Safety

- Safety as a Paradigm
  - Building Cultural Adoption
  - Defining Responsibility
  - Programmed Implementation
A Comprehensive Approach

- Embrace The Safety Culture
- Design Safety Into The Product
- Engage Customers and Users
- Exert Influence to Promote The Safety Culture
Emphasis On Safety
The Difficulty With Danger

- Danger Can Be Difficult to Recognize
  - Warnings and Labels Inform of Danger
- Danger Can Be Exposed Suddenly
  - Guards Prevent Exposure to Danger
- Danger Can Be Difficult to Eliminate
  - Training and Restricted Access Can Reduce Exposure to Danger
Are Asphalt Plants Safe??

MULTIPLE SILO SYSTEM
Would More Warning Labels Make It Safer?
Imagine a Beautiful Summer Day…
110 Degrees in Houston Texas and You Have to Wear All of This Just to Look Inside an Electrical Panel.

- PPE is Necessary to Protect From Specific Known Hazards and Conditions.
- Safety Rules Can Create Real Danger If They Only Address a Hazard and Ignore The Consequences of Implementing.
Options:
- Lighting
- Stair To Drag Head

Standard Features:
- Stair To Silo Top
- Stair To Elevator Head
- Enclosed Stairs In Tower

Enhanced Safety Is Sometimes Optional
Safety Measures

- Guards and Shields
  - Prevent Exposure to Specific Dangers
- Warning Labels and Locks
  - Inform and Warn of Specific Dangers
- Training and Personal Protective Equipment
  - Reduces Injury From Exposure to Specific Dangers
- Designing Out Danger
  - Eliminates or Reduces Exposure to Specific Dangers
- Restricting Access
  -Limits Exposure to Potential Dangers
Enclosed Batcher Safety Features

- Top Gate, Automatic Greasing
- Bottom Gate Enclosed
Mixing Chamber Safety Features

- Large Door for Convenient Access
- Hydraulic Rams and Safety Braces
Portable Design Safety Features

- Pre-mounted Stair Folds for Transport
- Reduced Risk of Damage to Guardrails
- Safety Benefit – No Loose Components to Handle
Portable Erection Safety Features

- Self-erecting Duct and Conveyors
- Eliminate Crane and Rigging Hazards
Portable Equipment Safety Features

- Cable & Harness Safety System
- Eliminates Risk of Lost or Damaged Safety Cages
Self Erection Safety Features

- Hydraulic Self-erecting
- Setup Is Fast and Easy
- Reduces Risk In Frequent Plant Take-down and Setup
Safety by Innovation

- Apply Existing Technology
  - Electric Heat Blankets Replace Hot Oil
- Acquire Improved Technology
  - Tandem Solenoid Valve Provides Automatic Safety
- Use Emerging Technology
  - Intelligent Controllers Provide Enhanced Safety
- Promote Advanced Designs
  - Reduced Maintenance Brings Reduced Exposure to Injury
Improved Liner Materials

- Increased Wear-life
- Reduced Maintenance
- Reduced Exposure to Danger
Clearing a Plugged Silo Discharge Gate Opening

- Worker Exposed to Hot Material
- Damage to Ceramic Liner Tiles Is Likely
- Plant Production Delayed
Oil Seal Gate at Storage Silo Bottom Discharge

- Designed to Protect The Product (HMA)
- Reduces Plugging in Discharge
- Reduces Worker Exposure to Danger
Electrical Safety Features

- Warning Labels to Meet Local Codes
- External Controller Mounting for Safe Access
Electrical Safety

- Some Work Cannot Be Made Safe With Today’s Technology
- Restricted Access Can Only Protect Unauthorized Persons
- Training and Personal Protective Equipment (PPE) Are Best Option
Electrical Safety Features

- Intelligent Controllers Enhance Plant Safety
- Overload Protection and Event Data Logging
- Monitors Electric Current and Enables Remote Troubleshooting
Control Safety Features

- Virtual Controllers Replace Switches, Wires and Relays
- Programmable Circuit Control and Safety Interlocks
- Visual Object Based Indicators and Status Confirmation
Batch Plant Process Safety by Design

- Early Designs Dumped RAP Suddenly Into Superheated Batch Mixer
- Sudden Release of Steam Was Often Described As An Explosion
- New Design Gradually Introduces RAP Into Mixer to Achieve a Gradual Release of Steam Using a Conventional Scavenge System
Automatic Sample Collection

**ACCU-SWIPE™**

**Automatic Belt Sweeper**

- Remote Control Option
- Safer For Workers Without The Need To Stop Production

**The ACCU-SWIPE Includes**
- Base Machine
- Header / Chute Assembly
- Curvilinear Support Rollers at Point of Sample
- Operating Manual and Junction Box [Model 90]

**ASTEC INDUSTRIES, INC.**
Pollution Control Systems

- Blue Smoke Emissions Tunnel Capture System
- Highly Effective Collector – Not Popular With Truck Drivers
Pollution Control Innovation

A key benefit of the new Astec Double Barrel® Green system is the substantial absence of smoke emissions during paving and loadout.

- Warm Mix Technology – Water Is The Only Additive
- Lower Mix Temperature Improves Worker Safety For Paving Crew
Safety Encouraged Through Education

ASTEC SCHOOLS

January and February 2008

More than 400 HMA professionals attended the five sessions of the 2008 Astec Advanced Customer Schools.

John Carley, superintendent at Buggs Materials, Ltd., in Montgomery County, Ala., said, “It has been a great learning experience for the students, as well as for people who were already in the HMA business. The training is definitely worth it.”

The new training facility was great. It’s hard to believe that Astec would spend that amount of money to train guys from the outside.”

FOR MORE INFORMATION

about Astec customer service, call Linda Samu at Astec: 423-867-3754
Fax: 423-682-4814 E-mail: astecinfo@astecinc.com

ASTEC INDUSTRIES, INC.
Safety Tips

- Follow Lockout / Tagout Procedures
  - Keep The Key With You
- Stored Energy May Still Be Present
  - Verify That Potential Energy Has Been Neutralized
- Protect Yourself From Burns, Falls, Cuts & Strains
- Avoid Pinch / Crush Points and Entrapment
- Follow Confined Space Procedures
  - Pre-plan Entry and Escape From Dangerous Spaces
  - Don’t Perform Dangerous Work Alone
  - Maintain Communication With Coworkers
- Use Common Sense
  - Avoid Rushing and Risky Situations
Maintenance Tips

- Oil Seal System Tips
  - Reservoir Filling With Pump Instead of Carrying a 5-gallon Bucket up a Ladder

- Inspection and Repair Tips
  - Fill Silo With Cold Rock to Provide a Stable Work Platform for Batcher Inspection

- Silo Cleaning Tip
  - Run Cold Dry Stone Through Silo to Clean Inside Walls and Cone Before Inspection & Repairs
Public Relations Is Another Opportunity To Develop The Safety Culture

HOW IS HOT MIX ASPHALT (HMA) MADE?

Aggregate is divided and placed into bins according to size. Depending on the mixture of aggregate called for, the bins automatically meter out the right amount of each size needed onto a conveyor belt. The belt deposits the aggregate into a rotary dryer. This machine tumbles the aggregate through hot air to dry it thoroughly. A fuel burner is located at one end of the drum to provide a flame for heat. It’s necessary to remove the moisture from the aggregate so the asphalt cement will stick to the rock. Remember, water and asphalt do not mix. After drying, the aggregate is sent to a mixing device where it is coated with heated asphalt cement and thoroughly mixed.

HOW MANY ASPHALT FACILITIES ARE THERE IN THE UNITED STATES?

According to the EPA estimates, there are approximately 3,500 operating Hot Mix facilities throughout the country.

WHY ARE SO MANY FACILITIES NEEDED?

Considering how large the United States is, there really are not a lot of facilities. This amounts to only one facility for every 98.3 square miles. Approximately ninety-four percent of the roads in the U.S. are paved with hot mix asphalt. Road maintenance and construction projects require over 550 million tons of hot mix asphalt each year. Hot mix must be used quickly after being loaded into the haul truck because it hardens as it cools. Cooling occurs during transport from the facility to the paving site. The haul distance needs to be as short as possible to minimize the amount of heat lost during transport because only “hot” hot mix asphalt can be worked (laid down by a paving machine and compacted by rollers). In addition, trucking is a large part of road maintenance and construction costs. Minimizing haul distances will result in lower road paving costs.
Summary

- Safety Can Be a Cooperative Effort Between Manufacturers, Owners and Users
- Buyer Should Consider Safety Benefit As Part of Value in The Cost of Optional Features
- Safety Must Be Implemented On Many Levels To Be Effective
- New Designs Should Incorporate Proven Advances in Safety Technology
- Safety Must Be Deliberately Integrated Into The Design Process
Where to Get More Information


Thank You!