



**Session 501**

**Using Lean Manufacturing to Solve Problems and Improve a Safety Program**

**Bill Schneider – GT Environmental, Inc.**  
**Chuck Chirdon – The Bilco Company**

**#501 Using lean manufacturing to solve problems and improve a safety program**

Chuck Chirdon and Bill Schneider, CHMM, authorized OSHA outreach trainer

Thursday, March 31, 2011  
8:15 to 9:15 a.m.

**Biographical Profile**  
**Bill Schneider**  
*Senior Manager – EHS Programs*  
**GT Environmental, Inc.**  
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Bill Schneider is a Senior Manager with GT Environmental, Inc. located in Westerville, Ohio.

He has over 30 years of experience with the development and implementation of environmental, health and safety (EHS) programs.

During his career he has worked as an EHS Manager for two multinational companies, as an EHS consultant, and as a regulator with the Ohio EPA, BUSTR and MDNR.

Bill has provided EHS compliance services to clients in many industry sectors including manufacturing (appliance, electronics), foundries, chemical plants, steel mills, composting, aggregate mining and processing, electroplating, bulk storage terminals and R&D. His work has taken him to locations around the US, Canada, Mexico and Europe.

**Biographical Profile**  
**Chuck Chirdon**  
*Contract Molding Manager*  
**The Bilco Company, Zanesville, Ohio**  
chuckc@bilco.com

Chuck Chirdon is the Contract Molding Manager and prior Plant Manager for The Bilco Company manufacturing facility in Zanesville Ohio. The Bilco Company manufactures basement egress Doors and basement egress Window Well systems in the Zanesville facility. Bilco also has a number of very large molding machines that supply contract customers with their molding needs. Bilco has operated it's manufacturing plants through Lean methods for over 8 years.

Chuck has over 35 years of experience in design, build and operations of manufactured products and plants both in the USA and in Europe.

These product design and build activities range from Water Pressure Vessels, Refrigerated Water Coolers, a Variety of Custom Molded Products for commercial use including the Construction Industry as well as Window Well systems.

**Challenges Facing EHS Professionals**

- Tight or shrinking budgets
- Loss of staff that helped implement safety (EHS, Maint. & Prod.)
- Inheriting additional responsibilities
- Upper management support
- Harder to tap into Maintenance Dept to get safety projects done.
- Maintaining compliance

**Challenges Facing EHS Professionals**

- Poorly designed, Unorganized or messy work areas can:
  - Cause ergonomic injuries
  - Create slip, trip and fall hazards
  - Increase travel distance which means more opportunity to slip, trip and fall, get struck by, etc..
- Injuries can:
  - Use up lots of time to deal with the injured person.
  - Time to investigate the incident
  - Property damage

## Possible Solutions for Survival

- Share the burden
- Share the responsibilities
- Share the accountability
- Push EHS responsibilities out to the shop floor .....but how?

## The Lean Way

- Lean is not something that is done. This would imply that there is an end.
- Lean is a Way, a Method to operate your business and it works!

## The Visual Workplace Vision

In a visual workplace anyone will know the who, what, when, where, why, and how of an area within five minutes.

## What Is 5S?

- Foundation for all improvement programs
- A focus on organization, simplification, and waste reduction

## Benefits of 5S

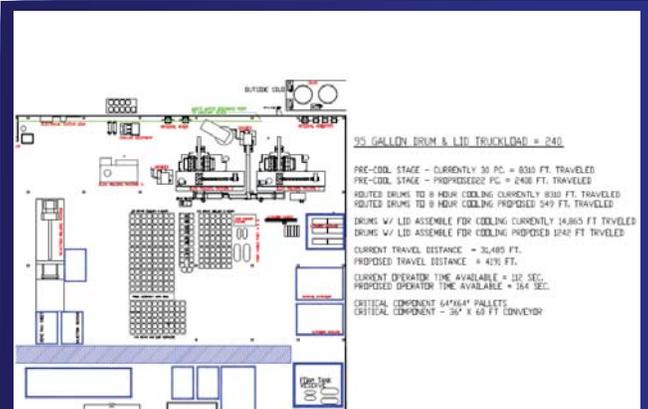
- Cleaner and safer work environment
- Reduction in non-value added time
- Effective work practices
- Efficient processes



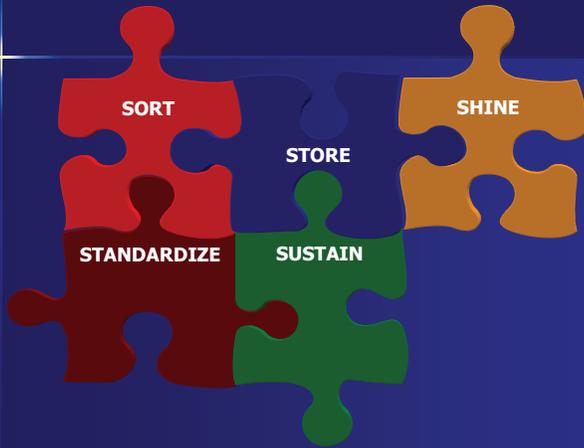
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**-Increase Revenues**  
**-Drive Down Costs**  
**-Stay Competitive in the Market**

## Process Kaizen



## What Are the 5S's?



## What is Sort?

- Sorting the needed from the unneeded
- Create Space
- Tool- "Red Tagging"



sorting means leaving only the bare essentials: *When in doubt, throw it out, or place it in a (planned) long-term storage area.*

## What's the big deal about Sorting?

- Valuable factory space is taken up
- Time is wasted on searching for things
- Unneeded Inventory means money wasted on extra inventory management
- Excess stock-on-hand tends to hide other types of problems

## Sort- Fixtures, Tools, Parts



## Sort - Action Items

- Assign zones 2-4 Assoc. per Zone
- Do an initial cleaning
- Identify needed from unneeded
- Red Tag items and put in holding area
- Clear out an area



## Store

- "A place for everything and everything in it's place"
- Simplify storing and retrieval of parts, and materials
- Tool: physical map

Before



After



## Store – Action Items

- Determine a location for each item.
- Outline locations of equipment, commonly used materials, safety areas.
- Develop shadow boards.
- Labels with Min/Max quantities.



## SHINE



## Shine Action Items



- Establish acceptable levels of performance
- Develop visual controls
- Mark equipment locations
- Who and when cleaning plan



## Standardize

- Standardization is the practice of setting, communicating, following, and improving standards.
- Standardization promotes consistency.
- Tools: labeling, instructions



## Standardize – Action Items

- Training – Everyone must understand
- Document the new approach
- Verify items are being handled in similar ways
- Drive out opportunity for errors
- Share best practices



## Sustain

- Keeping the gains and further progress
- Maintaining the first 4 S's
- Plan-Do-Check-Act
- Audit



Audit



## Sustain – Action Items

- Determine desired level of achievement
- Perform routine checks
- Photos – Before and after
- Develop action plans from audits
- Measure progress and plan for continuous improvement



## Summary

- Sort: What is needed ... not needed
- Store: Place for everything ... always
- Shine: Clean ... and keep clean
- Standardize: Monitor and maintain
- Sustain: Stick to the rules

## Challenges of 5S

- Participation
- Time
- Maintaining the progress
- Communication across shifts
- Conflict with SH&E and Other Corporate Priorities



## Why the need for 5S Audits?

1. **Create an expectation for Continuous Improvement.**

Auditing reinforces the need to sustain progress, and work towards regular improvement. The audit process also recognizes associates for their efforts.

## Why the need for 5S Audits?

2. **Inventory Reduction and Accuracy**

- Reducing inventories is important to our future success.
- 5S can help drive improvements to the accuracy of inventory locations and counts.



Requires the joint efforts of multiple departments

## Why the need for 5S audits?

### 3. Reduction in set-up and changeover times.

The trend toward smaller lots, and greater product customization, requires us to complete changeovers with speed and accuracy.

5S reduces set-ups by organizing the changeover process.

## Basic #1

- Are machines free of dust, dirt, and oil buildup?



## Basic #2

- Is the break and or locker area clean?



## Basic #3

- Is departmental office clean and organized?



## Basic #4

- Are the aisles and areas around machines free of dirt, dust, pellets, oil and metal shavings?



## Basic #5

- Are all items properly stored and not in aisles, around fire extinguishers or safety equipment?



## Basic #6



- Red tag area cleared out?

## Why does the Safety Dept. like Lean so much?

### ...Results May Vary...

- Raises the levels of employee Participation and Awareness
- Safety topics discussed at Lean Team meetings.
- Build new and stronger relationships with production
- Production ownership of safety activities

## Lean Benefits for Safety

- Employee participation increases.
  - Studies show that as employee participation increases, injuries go down!
  - Safety Awareness increases
  - You gain dozens of eyes and ears on the shop floor looking out for safety
  - Increases your opportunity to build relationships with production staff, maintenance staff, manufacturing engineering staff.

## Benefit: Safer Working Conditions

- "I can see all the fire extinguishers" (actual quote by COO)
- Eye wash stations are accessible
- Reduced slip, trip and fall hazards
- Aisles are open and clear for emergency egress
- Better organization reduces Associate travel time and distance, thus reducing the "opportunities" for accidents.

## Safer Working Conditions

- Reduces Incident/Accident Rates and Severity
- Reduces Costs of Accidents (Direct & Indirect)

## Lean Eliminates Waste

- Repair a die to remove sharp tip on bracket.
- Use of pneumatic tilt mechanism
- Alternate plastic boxes for panels
- Replace Coasters for pushing products

## Accident Rates

|                | OSHA Recordable Accidents | Total # of Accidents |
|----------------|---------------------------|----------------------|
| <b>Year #1</b> | 33                        | 53                   |
| <b>Year #2</b> | 16<br>52% less            | 31<br>41% less       |

## Accident Costs - Self Insured

|                | Direct Cost of Accidents<br>(\$)<br>(a)(b) | Indirect Costs of Accidents<br>\$ (c) | Total Cost of Accidents<br>\$ |
|----------------|--|---------------------------------------|-------------------------------|
| <b>Year #1</b> | 73,017                                     | 91,271                                | 164,288                       |
| <b>Year #2</b> | 22,990<br>68% less                         | 28,737                                | 51,727                        |

Notes: (a) Direct annual costs do not include payments made for previous years accidents.

(b) Source – Gates/McDonald

(c) Multiplier of 1.25 used to represent indirect costs.

## TRW Automotive Example

- TRW Lean initiatives combined with Humantech BRIEF Survey.
- Over a two year period
- 90% reduction in severity rate
- Plant throughput went up by 15%.

## How does production take ownership of safety activities?

- Lean is Production Driven.
- Inject some routine Safety Measures into the Lean program.

## How does production take ownership of safety activities?

- Regular safety inspections
  - ...after EHS training
  - They even document it!!
- Daily Safety Checks Poster
- Monthly Fire Extinguisher Inspections

## How does production take ownership of safety activities?

### Hazard Communication:

HMIS Posters

HMIS labels or appropriate markings

MSDS books kept up to date.

## How does production take ownership of safety activities?

- **Evacuation maps** need to be posted in a conspicuous location, and assembly areas highlighted.
- **Evacuation Monitors** and Assembly Area Attendance forms
- **Tornado maps** need to be posted in a conspicuous location.
- **Emergency phone #s** and communication procedures posted next to phones

## How does production take ownership of safety activities?

- Safety Procedures
- Forklift Rules of the Road
- LO/TO Machine Specific Procedures
- PPE requirements
- Emergency shutdown procedures

## How does production take ownership of safety activities?

- Safety and warning signs posted on machines and in appropriate areas.
- Machine Guards in Place
- Welding shade levels for specific operations.

## Lean Benefits for Safety

- Upper Management is supporting the effort!!
- Shop floor **shares** EHS responsibilities
- Safety elements have similar priority as production elements.
- The Compliance Team now includes production staff.

## Lean Benefits for Safety

- Safety procedures longevity will be longer because the ownership is now with production.
- Safety becomes a routine part of the production environment.
- Cultural change?

## Recommendations

Life and work are about relationships:

- Don't be a Safety Nazi.
- Be Part of the "Team".
- You will find out the "whole story" behind why things get done (or not).

## Recommendations

- Be a **Problem Solver** – “there is more than one way to skin a regulation”
- Be a **Facilitator** and let the Lean Teams try different solutions they come up with.

## Recommendations

- Help the Lean Teams come up with “their” solutions ..... with your guidance.
- Likelihood of production staff implementing their idea over time is better than if it was your idea, right?
- Be Patient

**“Safety is everybody’s responsibility”  
....Lean makes it happen!!**

**Questions?**

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