

OSC | 11
Ohio Safety Congress & Expo



#133 – Conducting effective safety inspections

Connie Muncy, CIH, REM, MS, EHS

Wednesday, March 30, 2011
11 a.m. to Noon



Conducting Effective Safety Inspections

OSC 2011
Columbus Convention Center
Columbus, Ohio
March 30, 2011



Connie L. Muncy, CIH, REM, MS EHS Mgmt.
Montgomery County Water Services
1850 Spaulding Road, Kettering, OH 45432

Goal

To enhance your safety inspection skills to optimize workplace hazard identification through practical advice, actual case studies, and visual exercises (and have fun doing it)!

“An ounce of prevention is worth a pound of cure”

No Inspection Program?

- A company with \$100,000 of (direct) costs related to workplace injuries will have to produce an additional \$2 million in revenue just to cover the expense, assuming a 5% profit margin. (Liberty Mutual).¹
- What are “indirect costs”?

¹ http://www.kleentex.co.za/dirty_facts.htm

Good Inspection Program

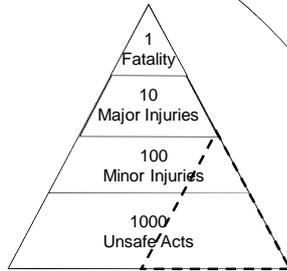
Identifies Safety & Industrial Hygiene Hazards to prevent:

- Employee Injury
- Property Loss
- Third Party Loss
- Vehicle Accidents
- Escalating Workers Comp, Fines, Other Costs
- Intentional Tort
- Criminal Prosecution

Good Inspection Program

- Decrease in morale
- Lost productivity, efficiency, quality
- Damaged equipment or facility
- Bad PR/damaged relationships/loss of goodwill
- Increase in turnover rate

Inspections Help Prevent Accidents



7

Hazards to be Identified

- Safety hazards; e.g., unsafe workplace conditions, unsafe work practices.
- Biological hazards caused by organisms such as viruses, bacteria, fungi and parasites.
- Chemical hazards caused by a solid, liquid, vapor, gas, dust, fume or mist.

8

Safety Hazards to be Identified

- Ergonomic hazards caused by anatomical, physiological, and psychological demands on the worker, such as repetitive and forceful movements, vibration, temperature extremes, and awkward postures arising from improper work methods and improperly designed workstations, tools, and equipment.
- Physical hazards caused by noise, vibration, energy, weather, heat, cold, electricity, radiation, slips/trips/falls, and pressure.

9

Safety Hazards

29 CFR 1910, 1926, other

- Chemical safety
- Fire safety
- PPE
- Electrical safety
- Emergency action
- Lab safety
- Hazcom
- Walking/working surfaces
- First aid & BBP
- Compressed gases
- And so on...



Safety Hazards

- State and Local Requirements
- Nationally recognized consensus standards specific to your operations (ANSI, NFPA, etc.)

11

Daily Inspections

- Employees and their Supervisors should be inspecting their work areas (on and off-site) on a daily basis
- A formal Safety Inspection therefore should (theoretically) reveal few surprises

12

Periodic Inspections

- Periodic inspections are regular, planned inspections of critical components of equipment or systems that have a high potential for causing serious injury or illness. The inspections are often part of preventive maintenance or hazard control programs.
- The law specifies that qualified persons periodically inspect some types of equipment, at regular intervals. These include things like elevators, boilers, and more:

13

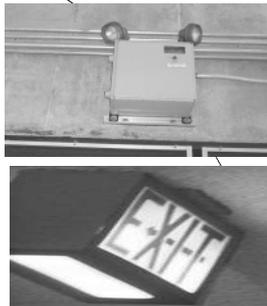
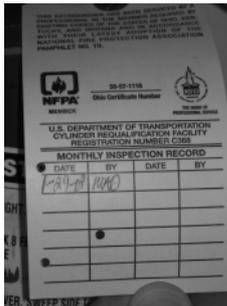
Regular Periodic Inspections

- OSHA & state regulations and consensus standards (NFPA, ANSI, etc.) also specify periodic inspections of various safety equipment items.



14

Regular Periodic Inspections



15

Regular Periodic Inspections



16

Regular Periodic Inspections



17

Regular Periodic Inspections



Daily

18

Reports

- Inspection records are important.
- They show trends and weaknesses.
- The inspection report can draw attention to hazards and areas for improvement. Don't fixate on previous inspections. Use the reports to determine whether previous recommendations were implemented and move on.

19

Reports

- A picture is worth a thousand words. Be prepared to take photographs. Have a good quality camera with extra batteries handy.
- Flag IDLH issues for immediate corrective action; don't bury in a report
- Reports leave a document trail of needed corrective action so be sure to also document planned corrective action.
- Contact your legal counsel for further information (privileged & confidential?)

20

Reports-Clearly Identify Hazard and Location

Secondary Clarifier Area

No. 1 LCP-E13 and 3 LCP-E15. GFCI not working; please correct. Open neutral; please correct on both outlets.



21

Inspection Planning

- Plan ahead to gain access to ALL areas
- On-shift vs. off-shift inspections
- Announced vs. unannounced inspections
- Inspection PPE and other safety equipment
- Inspection team (buddy system) vs. solo
- Report format (PowerPoint seems to work best)
- Useful inspection tools
- Former reports
- Checklists...

22

Fire Protection

ITEM	YES	NO
General Requirements: Has a fire protection program been developed? 1926.150(a)(1)		
Is firefighting equipment conspicuously located? 1926.150(a)(3)		
Is firefighting equipment periodically inspected and maintained in operating condition? 1926.150(a)(4)		
Is firefighting equipment selected and provided according to the listed requirements? 1926.150(c)		
Have employees been trained not to use gasoline to start fires to burn trash etc.?		
Has an educational program to familiarize employees with the general principles of fire extinguishers use and the hazards involved been provided? 1910.150(c)(5)(a)		
Flammable and Combustible Liquids: Are all flammable and combustible liquids stored and handled in approved containers and portable tanks? 1926.152(a)(1)		
If more than 25 gallons of flammable or combustible liquid is stored in a room, is it in an approved cabinet? 1926.152(b)(1)		
Is at least one portable fire extinguisher with a rating of not less than 20-B-C located within 75 feet of each pump, dispenser, underground fill pipe opening and lubrication or refueling service area? 1926.153(e)(11)		

Convenient, comprehensive checklists available for General Industry, Construction, Fire Service at <http://www.scohsa.llronline.com/index.asp?file=checklists.htm>

23

Safety Inspections Can Be Inherently Dangerous

- Unfamiliar areas
- Multitasking in hazardous areas
- Don't identify hazards the hard way—exercise caution
- Consider using the buddy system/escort and wear your PPE



24

Don't Get Overwhelmed

- Think positive - "continuous improvement cycle"
- Prioritize; first shoot for the biggest bang for the buck and low-hanging fruit
- Subsequent inspections can focus on different areas or different hazards
- An inspection team approach may be helpful- consider including Safety Committee members, supervisors, experts, etc.

25

Use All Four Senses (No Tasting!)



Touch (overheating electrical, vibration, etc.)



Smell (burnt electrical insulation odor; garlicky acetylene odor; air contam)



Hearing (compressed gas or fluid leaks, etc.)



Vision (broken grounding pin stuck in outlet, asbestos-containing material) 26

What you are about to see are actual inspection photographs

- Some will give you a good chuckle
- Some close calls (I hate snakes!)
- Expertise through experience
- I've seen it all; now you will too!

Actual inspection photographs

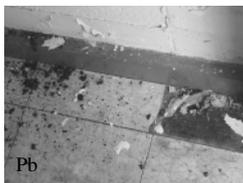
27

Are you ready? Here we go...

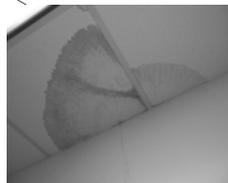


28

Some Common IHI Issues



Pb

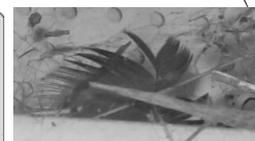


Standing water



29

Some Common IHI Issues



30

Some Common IH Issues



Asbestos



31

Inspect During All 4 Seasons



Winter-emergency exits blocked with snow/ice



Spring-new slip hazards



Summer-new insect hazards



Fall – new lighting hazards

32

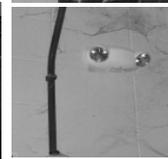
Inspect During All 4 Seasons

Case Study: Sodium Bisulfite pump room has choking fumes on a windy spring day. Air monitoring is finally conducted on a calm summer day; no odor and colorimetric tube shows zero air contaminants. No process changes have occurred. What happened?



33

Clues-Areas Requiring More Scrutiny



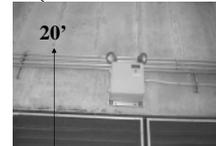
34

Clues-Areas Requiring More Scrutiny



35

Clues-Areas Requiring More Scrutiny



36

Clues-Areas Requiring More Scrutiny



37

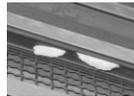
Look Behind, Under, & Around



Open knockout holes underneath electrical box not readily visible



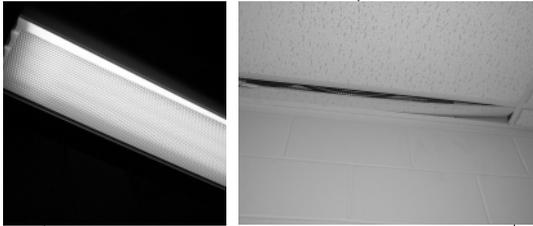
Unguarded rotating shaft protruding behind machine; guard removed years ago and remained unreported



Multiple wasp nests tuck up under slats covering air exchange screen outside generator room; area subject to heavy foot traffic & visitors

38

Look Up



39

Look Up



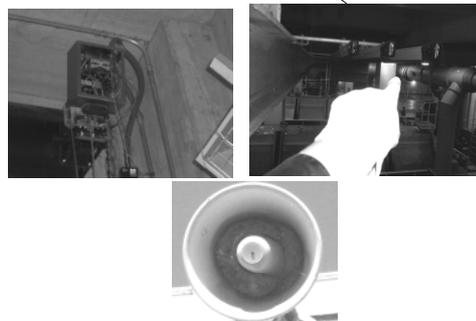
40

Look Up



41

Look Way Up



42

Look Down



Slip trip fall issues common
Other issues



43

Look Way Down

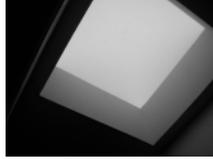
“Abandoned” pits can harbor unmarked confined spaces, slip/trip/fall hazards, biological hazards, attractive nuisance



44

Boldly Go Where “Nobody Goes”

Rooftops can present machine guarding, electrical, hot work (fire), slip/trip/fall hazards



45

Boldly Go Where “Nobody Goes”

Case study: rarely used, dark equipment shaft. Over time, substantial force required to open large, heavy metal door until it “lets loose” revealing unexpected fall hazard - a 4-story drop.



Boldly Go “Where Nobody Goes”

Case study: Innocuous looking closed office storage cabinets sometimes improperly used as electrical cabinet, yielding hidden fire risk



47

Boldly Go Where “Nobody Goes”

Case Study: There’s nothing to look at in that footlocker...



+ metal hinges = ?

48

Boldly Go "Where No Man Has Gone Before"

Case study: Makeshift shelter: hidden under sheet of plastic hung over the cubby hole under stairs, an unapproved heater is plugged into an unattended, energized power strip in contact with plastic sheeting; other combustible materials (mattress)

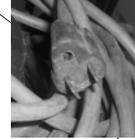


49

Minor/Not Worth Mentioning?



Missing tile (at top of staircase)



Missing grounding pin



Poor lighting (location?)



A little melted insulation on hotplate electrical cord

50

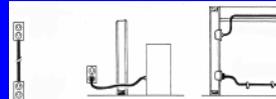
Cranes



51

Electrical

Prohibited Uses of Flexible Cords Examples



Substitute for fixed wiring

Run through walls, ceilings, floors, doors, or windows

Concealed behind or attached to building surfaces

OSHA Office of Training and Education 24

Common!



52

Electrical (cont'd)



No 3' clear radius around electrical boxes



Uncovered electrical box, exposed conductors



Damaged insulation on arc welder

53

Electrical (cont'd)



54

Electrical (cont'd)



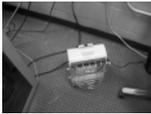
Open electrical box



Damaged cords



Electrical faults-
older buildings,
corrosive areas



Defective/improper heater/
plugged into power strip

Power strips
overloaded /
strung together /
underrated

55

Electrical (cont'd)



NFPA 70E - what's that?

56

Flammable Combustible

Remove potential fuel
sources from flammable
storage area



Oily rag containers to be
emptied nightly



No improper flammables
storage



57

Hazard Communication



Evidence of food/drink where
chemicals are in use (trash cans
can be revealing!)



Unlabeled bulk
chemical storage,
storage containers

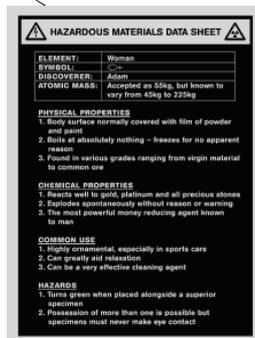


Unlabeled process chemical lines

58

Hazard Communication

- MSDS Book present/accessible
- Evidence of recent update
- Covered in layer of dust = clue!



Lockout Tagout



- Tag without lock
- Lock without tag
- Tag or lock not substantial
- No periodic inspection
- No ready visual evidence of Energy control placard, or LOTO equipment

60

Safety Lockout / Tagout
AIR DRYER
EASTERN WWTP - MAINTENANCE BUILDING
LOCKOUT MUST FOLLOW WORKSHEET LOCKOUT PROCEDURE AND BE SUPERVISED BY AT LEAST ONE PERSONNEL ONLY

LEGEND

- 1 - Lockout Point
- 2 - Lockout Point
- 3 - Lockout Point
- 4 - Lockout Point
- 5 - Lockout Point

REMEMBER LOCKOUT!

- Lockout must be performed by the person performing the work.
- Lockout must be performed on all energy sources.
- Lockout must be performed on all energy sources.
- Lockout must be performed on all energy sources.

ALWAYS PERFORM CONTROLLED SHUTDOWN BEFORE LOCKING OUT AND/OR DEENERGIZING ENERGIES.

ENERGY TYPE AND SOURCE	LOCKOUT LOCATION	PROCEDURE FOR LOCKING OUT AND/OR DEENERGIZING ENERGIES	VERIFY PROCEDURE
Electrical 480 Volts	Panel Breaker	1. Shut down equipment in the safe manner and allow energy to dissipate. 2. Lockout and tagout the main disconnect switch.	1. Verify that the equipment is deenergized. 2. Verify that the equipment is deenergized by testing the equipment with a properly rated voltage tester.
Pressure 150 PSI	Panel Valve	1. Shut down equipment in the safe manner and allow energy to dissipate. 2. Lockout and tagout the main disconnect switch.	1. Verify that the equipment is deenergized. 2. Verify that the equipment is deenergized by testing the equipment with a properly rated pressure tester.
Compressed Air Variable PSI	Panel Valve	1. Shut down equipment in the safe manner and allow energy to dissipate. 2. Lockout and tagout the main disconnect switch.	1. Verify that the equipment is deenergized. 2. Verify that the equipment is deenergized by testing the equipment with a properly rated pressure tester.

ALWAYS FOLLOW OPERATIONAL PROCEDURES FOR STARTUP OF THE EQUIPMENT.
IF SYSTEM CANNOT BE LOCKED OUT OR IF SYSTEM FAILS VERIFICATION CONTACT YOUR SUPERVISOR.

APPROVAL NAME: _____ APPROVAL DATE: _____

Emergency Egress

Maintain 3' clear aisle escape route

No hazard in emergency exit route

Current Posted emergency escape route maps

Emergency Egress

63

Fire Protection

- Sprinkler valves not locked open
- Fire Dept. hookup outside blocked
- Red Tag system not used

Fire Protection

65

Fire Protection

- Storage within 18" of ceiling sprinklers

66

Fire Protection



67

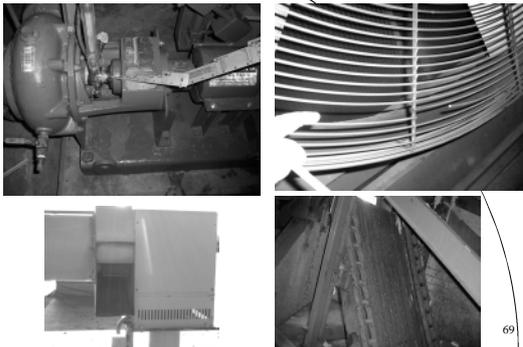
Fire Protection



68

Machine Guarding

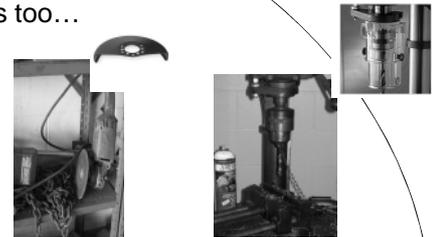
“But they don’t make a guard for that...”
“But we’re grand-fathered...”



69

Machine Guarding

- Tools too...



70

Machine Guarding

- And that ongoing perennial nemesis...



71

Tools

- Employee-owned tools brought into the workplace are fair game (employer's responsibility)



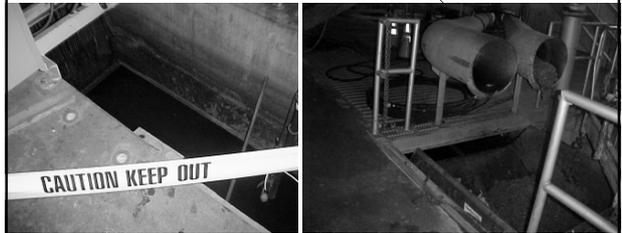
72

Walking Working Surfaces:
“#1 Bang for your Buck”



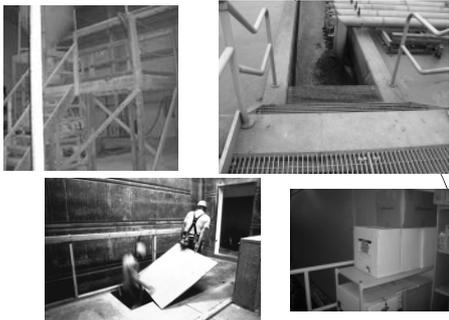
73

Walking Working Surfaces:
“#1 Bang for your Buck”



74

Walking Working Surfaces:
“#1 Bang for your Buck”



75

Outside and Out Back



76

Compressed Gases



77

Compressed Gases



78

Compressed Gases



79

Compressed Gases



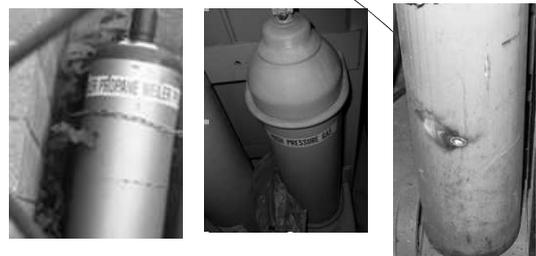
80

Compressed Gases



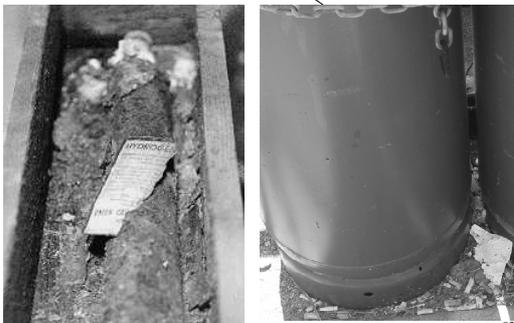
81

Compressed Gases



82

Compressed Gases



83

Compressed Gases



84

Confined Space



85

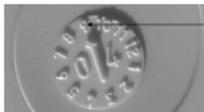
PPE

TYPICAL PPE SERVICE LIFE

- **Hard Hat** – 5 years
- **Hard Hat Suspension** – 2 years
- **High Visibility Vest** – based on maximum number of washings listed on the tag; or 6 months if worn on a daily basis; otherwise up to 3 years
- **Ear Plugs (single use)** -dispose of after every use
- **Ear Plugs (multiple use)** – dispose of after 4-6 weeks
- **Banded ear plugs/canal caps** – change pods after 4-6 weeks
- **Ear Muffs (headset)** – replace ear cushions every 3-4 months with heavy use; otherwise replace every 6-8 months
- **Fall protection harness** - 5 years unless otherwise specified by the manufacturer (ANSI A10.32-2004).
- **Fall protection lanyard** - 5 years unless otherwise specified by the manufacturer (ANSI A10.32-2004).

86

PPE



Note the year is lit and the arrow points to 9, meaning the hat was manufactured in September, 2004



87

PPE

Robust employee concerns; example -

- Fall protection for employees >310 lbs loaded;
- Personal flotation vest over chest size 52
- ANSI Class 3 Vest and hip waders up to Size 5X,
- Chairs/Ladders (Type IAA: 375 lbs.)
- Other

88

Contractor Work Areas

- Contractor work areas are fair game and yield some very interesting findings
- Dumpster diving is highly recommended



89

Broken Windows Theory



90

**AN OUNCE OF PREVENTION
IS WORTH A POUND OF
CURE**

91

Thank You

For more information please contact:

Connie L. Muncy, CIH, REM, MS EHS Mgmt.
Montgomery County Water Services
1850 Spaulding Road
Kettering, Ohio 45432

937.781.2565
muncyc@mcoho.org



92

Points of view, ideas, products, demonstrations or devices presented or displayed at the Ohio Safety Congress & Expo do not constitute endorsements by BWC. BWC is not liable for any errors or omissions in event materials.

OSC | 11
Ohio Safety Congress & Expo