Brewery Safety: Top Hazards and How to Reduce Risk
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Agenda

- EORM Introduction
- Why focus on safety?
- Top Hazards
- Additional Hazards – Quick Tips
- Proactive Risk Reduction
  - Safety Committees
  - Job Hazard Analysis (JHA) Overview

About EORM

- Multidisciplinary Environmental, Health, Safety, and Sustainability consulting team
- We make a positive impact on the world every day
- We do this by enabling companies to be socially and globally responsible, protecting employees, preserving the environment, and building long-term sustainable solutions

Why focus on safety?

- Prevent injuries, illnesses, and fatalities
- Regulatory compliance
- Reduce negative business impacts
Why focus on safety?

- Many hazards are present in brewhouses
- Similar to other hazardous manufacturing operations
  - Ergonomic
    - Force (e.g., lifting), repetitive motions, awkward and static postures
  - Hazardous Chemicals and Gases
  - Physical: Thermal hazards, moving parts, pressure
  - Other: Confined spaces, fall hazards, housekeeping, noise, respiratory hazards

- Reuters Data from OSHA Records 2009 - 2012
  - At least 4 deaths in US craft brewery accidents
  - 2 deaths at large breweries that brew 10x more beer
  - Nearly 4x more safety violations at craft breweries than at large breweries
  - Safety oversight at smaller companies worse than statistics show, so injuries often go unreported

- Occupational Health and Safety Administration (OSHA)
  - Federal & State OSHA (OR, WA, CA, etc.)
  - General Duty Clause
  - Must provide a safe and healthy place of employment
  - Example applicable regulations:
    - Hazard Communication, PPE, Confined Spaces, Lockout / Tagout, Powered Industrial Trucks, Fall Protection

- Save money!
  - Reduce quantity, severity, and financial impact of injuries and illnesses
  - Reduced insurance and workers comp. costs
- Equipment down time
- Product loss
- Brand equity
- More effective/efficient work practices & procedures
- Sustainability
Top Hazards to Evaluate

- Ergonomics
- Walking and Working Surfaces
- Fall Protection
- Confined Spaces
- Powered Industrial Trucks (PIT)
- Chemical Safety
- Personal Protective Equipment (PPE)

Ergonomic Hazards

- Many breweries categorized this as a top hazard
- Repetitive motions: Packaging line
- Lifting: malt bags, moving hoses
- Awkward postures
- Leaning / reaching / bending
- Forceful grips

Source: www.lni.wa.gov:

Ergonomic Hazards – Lifting Controls

- Reduce / Eliminate lifts
  - Automate processes
  - Keg robots
  - Hoists / lifts
  - Conveyors
  - Bulk (silos, super sacks)
- Two-person lifts
- Training on proper lifting
- Employee stretching program


Some conclusions from the study:
- Employees at increased risk for upper extremity (shoulder and wrist) Work-related Musculoskeletal Disorders (WMSDs)
- Employees exposed to combination of ergonomic risk factors
- Survey indicated that 50% of employees felt safety training received was not adequate and safety procedures in place don’t work
### Ergonomic Hazards – General Controls

- Redesign tools / areas within appropriate heights
- Height adjustable tools / tables
- Training (e.g., how the body works, how lifting affects the body, why certain movements cause injuries, etc.)
- Employee rotation
- Encourage micro breaks
- Encourage employees to report injuries and near misses

### Walking and Working Surfaces – Hazards

- Wet / slippery floors
- Trip hazards (e.g., hoses)
- Tight spaces
- Improperly stacked items
- Tools and other items left out

### Walking and Working Surfaces – General Requirements

- Workplaces must be kept clean, orderly, and sanitary
- Workroom floors must be maintained as clean and dry as possible
- Must keep aisles clear and free of obstructions that could create a hazard
- Aisles must be sufficiently wide where mechanical handling equipment is used

### Walking and Working Surfaces – Controls

- Marking aisle ways
- Implement general housekeeping procedures
  - Keep aisles, stairs, and platforms free of clutter
  - Store materials properly
  - Store items on shelves safely and securely
- Cleanup spills immediately
- Monthly walk-throughs looking for hazards
Fall Protection – General Requirements

- Generally...fall protection required when working at heights above 4 ft.
- Elevated work platforms
  - Handrails with a midrail
  - 4” toeboard
  - Guard openings with a swing gate
- Stairways
  - Usable width of ≥22 in. with slip-resistant treads
  - Angled between 30 - 50 degrees
  - Railings on open sides of exposed stairways, if ≥ 4 steps

Fall Protection – Prevention is Key!

Confined Spaces

- Prevalent in brewhouses
- Conditions can rapidly change from non-hazardous to life-threatening
- Confined Space:
  - Large enough to bodily enter and perform work
  - Limited means of entry or exit
  - Not designed for continuous human occupancy
- Permit Required Confined Space
  - “ Permit Space”
  - Confined space with certain hazards
Confined Spaces – Entry Methods

- “Entry” = any body part crosses plane of opening
- Only enter if absolutely necessary!!
  - Create non-restricted access (e.g., add stairs or walkway)
  - Perform tank inspections from outside space
  - Clean-in-place (CIP) systems
  - Add to tanks without entering
  - Design area for human occupancy

Permit Spaces – If You Must Enter…

Altarernate Entry
- Only hazard is atmospheric
- If hazard is controlled, may use less restrictive alternate entry procedures
- Control by ventilation and air monitoring

Reclassification
- No potential for atmospheric hazard
- Reclassify as non-permit required if all hazards eliminated
- Example control: Isolate power and use lockout/tagout

Permit Entry
- Most restrictive
- Permit system with training, monitoring, rescue services, etc.

Confined Spaces – Changes in Oregon

- OR-OHSA proposed changes coming soon!
- Biggest change to general industry regulations involves reclassification and entry procedures
  - Additional changes for construction industry
- Keep an eye out for changing regulations

Powered Industrial Trucks – Hazards

- Mobile, power-propelled truck used to carry, push, pull, lift, or stack materials
- AKA: forklifts, pallet trucks, rider trucks, fork trucks, or lift trucks

- Compact design causes instability
- Overloading or unstable stacking causes instability
- Obstructions or pedestrians in pathway
- Propane forklift use indoors

Source: www.craftbrewingbusiness.com
**Powered Industrial Trucks – General Requirements**

- Written program & documented training
- Daily inspections (each shift if 24-hour facility)
- Various truck requirements including maintenance
- Never load a PIT outside of its rated capacity
- Safe Operation: Seat belt, lower load before moving, etc.

**Powered Industrial Trucks – Controls**

- Designate areas / aisle ways
- Inspect pallets before moving
- Train all employees on safely working around PITs
- High-visibility vests in PIT areas
- Limit access to PIT areas
- No speeding!!

**Chemical Safety – Common Chemicals**

- Caustics: potassium hydroxide, sodium hydroxide, sodium hypochlorite
- Acids: phosphoric, nitric, iodophor, and peracetic acid
- Gases: CO₂, oxygen, ammonia, ozone
- Flammables: isopropanol, aerosols
- Glues
- Oils & lubricants
- Refrigerants

**Chemical Safety – General Requirements**

- Documented program and training – “Hazard Communication”
- Chemical inventory
- Storage: Cabinet or containment pallet
- Separate incompatibles (e.g., acids / bases)
- Label all chemical containers
- Must have for each MSDSs for each chemical
- NOTE: Always add chemicals to water!
Hazard Communication Changes

- U.S. adopted UN standard for labeling and communicating chemical information
  - Referred to as the “Globally Harmonized System (GHS)”
- MSDSs renamed SDSs (Safety Data Sheets)
  - New SDS format will be implemented over next several years
- Updated labeling requirements
- Additional training requirements

PPE – General Requirements

- Personal Protective Equipment (PPE) = last line of defense
- Documented program and training
  - Selection, use, maintenance, limitations, & when to change
- Hazard assessments of tasks
- Provide PPE
  - Ex: safety glasses, goggles, gloves, steel toed boots
- Separate programs for respirators & hearing protection

Hazard Communication Changes Timeline

Dec 1, 2013
- Employers must train employees on new label elements & SDS format

June 1, 2015
- Chemical manufacturers, importers, and employers must comply with modified provisions the final rule
- Distributors shall not ship containers labeled by the manufacturer or importer unless it has a GHS label

Dec 1, 2015
- Employers to update labeling and hazard communication programs

June 1, 2016
- Additional training
Additional Hazards – Quick Tips!

- Lockout / Tagout (LOTO)
- Thermal Hazards
- Keg Safety
- CO₂ Monitoring
- Bump Caps

Lockout / Tagout (LOTO) – Control of Hazardous Energies

- Prevent injury to employees working with hazardous energies
- Example situations to use LOTO:
  - Permit required confined space entry
  - Remove a guard or bypass a safety device
  - Perform maintenance on automatic starting equipment
- General Requirements
  - Written program with equipment specific procedures
  - Training
  - Equipment: ID tags and locks that are uniquely keyed for each individual

Thermal Hazards

- OSHA Requirement
  - Cover or guard steam & hot-water pipes within 7 ft. of floor or working platform or within 15 in. of stairways, ramps, or fixed ladders to prevent contact
- Example Controls
  - Steam and hot water pipe insulation
  - Label hot surfaces
  - Written procedures for employees
  - Training: Ensure employees familiar with systems
  - PPE: long sleeves and pants, safety glasses, and gloves

Keg Safety

- Brewers Association Performance Guidelines for Refillable Kegs (2014)
  - Never alter or tamper with safety devices
  - Never tamper with keg valve
  - Systems connected to kegs should have a pressure regulator and pressure relief valve
  - Maintain pressure, temperature, volume, and flow settings on wash/fill equipment according to the manufacturer
- Only use kegs from your own brewery
- Enclosed pressurized cleaning procedure
- Always inspect kegs, sankey valve, steel ball, and o-ring
CO₂ Monitoring

- Ensure adequate ventilation throughout brewhouse
  - Even in large rooms, CO₂ can accumulate
- CO₂ area monitors/alarms
- Personal O₂ / CO₂ monitors
- Develop protocols for evacuations, posted at each monitor
- Train employees on alarms and evacuation procedures

Bump Cap

- Head injuries (e.g., bumps, cuts) common, especially near bottling lines
- Bump cap: http://www.northernsafety.com/Product/11207/NS-Head-Face-Protection-Baseball-Bump-Cap
- Looks / feels like regular baseball cap
- Customizable with brewery logo

Proactive Approach to Reducing Hazards

- Safety meetings or committees required based on company size
- Use meetings to proactively identify and fix hazards
  - Discuss accidents and near misses, develop recommendations, and assign actions
- Empowers all employees to have a voice and share responsibility in maintaining a safe working environment
- Creates and promotes a safety culture

Safety Meetings / Committees
Job Hazard Analyses (JHA)

- **JHA**: Proactive method for identification, evaluation, and mitigation or prevention of hazards
- **Job**: A typical “job” includes numerous “tasks”
- **Hazard**: Potential for harm
  - If left uncontrolled, can result in an injury or illness
- Good for observing and eliminating hazards and meeting regulatory requirements

JHA Process

1. Select tasks and prioritize
2. Review procedures, manuals, and/or applicable safety documentation
3. Observe work & interview employees
4. Complete JHA documentation
   » Develop recommended controls
5. Present & review JHA findings with key stakeholders
6. Prioritize recommendations and assign actions
7. Update JHAs as necessary

JHA Process – Reducing Hazards

Implement controls based on the following hierarchy:

- Elimination / Substitution
- Engineering Control
- Administrative Control
- PPE

Where / How to Learn More

- Brewers Association Safety Committee recently formed
- GOSH 2015 Conference: Craft Beer Safety Track
- Insurance carrier and/or vendors
- Contact me!
In Summary…

- Breweries have many hazards
- Safety should be a state of mind
- Report, track, and investigate accidents and near misses
- Train...Train...TRAIN!
- Documentation / program writing important for compliance
- Proactively identify and control hazards
  - Don’t wait until an injury or death before developing safe procedures!!

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