



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



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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



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Why focus on safety?

Prevent injuries,
illnesses, and
fatalities

Regulatory
compliance

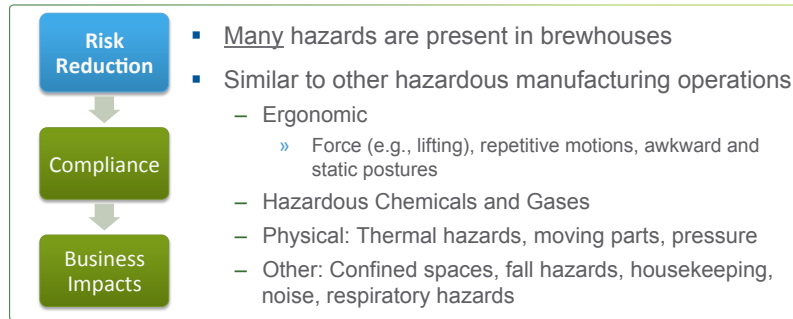
Reduce negative
business impacts



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Why focus on safety?



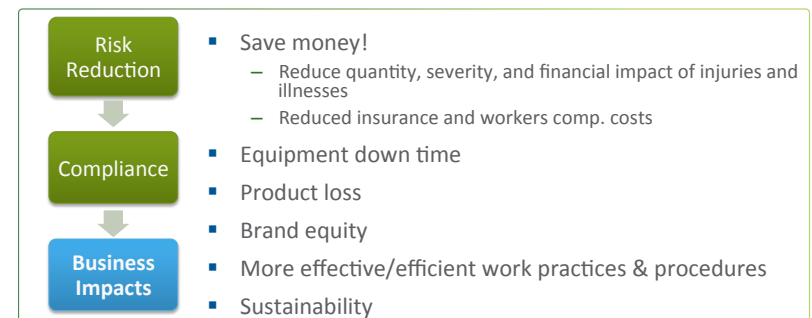
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Top Hazards to Evaluate



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



- National Institute of Occupational Safety and Health (NIOSH) study: *Ergonomic and Safety Climate Evaluation at a Brewery – Colorado (2011)*
- 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 – 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

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!



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...

Alternate 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 us lockout/tagout

Permitted Entry

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

Confined Spaces – Changes in Oregon



- OR-OSHA 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, forklifts, 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

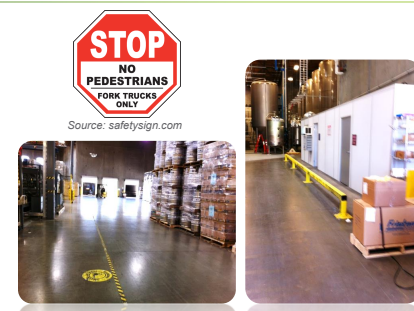


- Written program & documented training
- Daily inspections (each shift if 24-hour facility)
- Various truck requirements including maintenance
- Never load a PIT outside of its rated capacity
- Safe Operation: Seat belt, lower load before moving, etc.

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



Source: www.reflexallen.com



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



Hazard Communication Changes Timeline



Dec 1, 2013	June 1, 2015	Dec 1, 2015	June 1, 2016
<ul style="list-style-type: none"> Employers must train employees on new label elements & SDS format 	<ul style="list-style-type: none"> Chemical manufacturers, importers, and employers must comply with modified provisions the final rule 	<ul style="list-style-type: none"> Distributors shall not ship containers labeled by the manufacturer or importer unless it has a GHS label 	<ul style="list-style-type: none"> Employers to update labeling and hazard communication programs Additional training

PPE – General Requirements



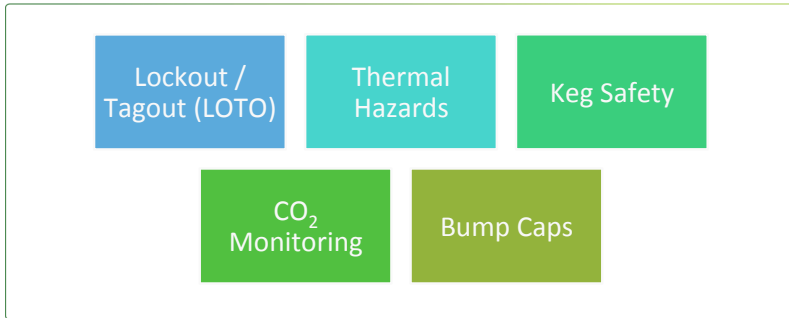
- Personal Protective Equipment (PPE) = last line of defense
- Documented program and training
 - Selection, use, maintenance, limitations, & when to change
- Hazard assessments of tasks
- Provide PPE
 - Ex: safety glasses, goggles, gloves, steel toed boots
- Separate programs for respirators & hearing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



PPE – Chemical Safety



Additional Hazards – Quick Tips!



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



Source: www.labelmaster.com

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 / Committees

Job Hazard Analysis (JHA)

Safety Meetings / Committees



- 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

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

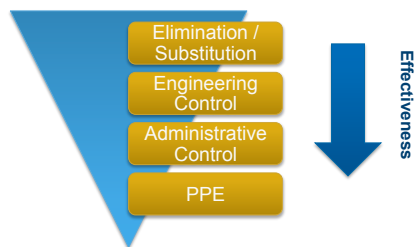


1. Select tasks and prioritize
2. Review procedures, manuals, and/or applicable safety documentation
3. Observe work & interview employees
4. Complete JHA documentation
 - » Develop recommended controls
5. Present & review JHA findings with key stakeholders
6. Prioritize recommendations and assign actions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

JHA Process – Reducing Hazards



- Implement controls based on the following hierarchy:



Where / How to Learn More



- *Brewing Engineering and Plant Operations*, MBAA Practical Handbook for the Specialty Brewer, Volume 3
-
- 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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Thank you!

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