Part 3

Brewery Safety Bootcamp – *ONLINE*

Heat and Pressure Hazards, Confined Spaces and Lockout/Tagout, and Operating During Covid-19

May 15, 2020
CRAFT BREWERS CONFERENCE & BrewExpo America®

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your partner in craft brewery sanitation

#CraftBrewersCon
Matt Stinchfield
Safety Ambassador
Brewers Association
Boulder, Colorado

@MattStinchfield
#SafetyAmBadAssador
mstinchfield
UNIQUE BREWERY HAZARDS

HEAT AND PRESSURE
KETTLE BOILOVERS
KETTLE BOILOVERS

TASKS

- Wort Boiling
- Hop Addition

OUTCOMES

- Deep Tissue Burns/Fatality
- Permanent Disability
- PTSD
- Production Shutdown and Product Loss

CAUSES

- Overcharging kettle volume
- Lack of foam controls
- Rapid hop addition
- Failure to monitor temp.
Boiling Wort ca. 213 °F - Instantaneous -

Caustic Cleaning 170 °F - ca. 200 ms -

Mash @ Conversion 152 °F - ca. 1.5 sec -
Systemic Effects Beyond the Burn Site

Body Responds to Burn by
- Releasing cytokines and other anti-inflammatory mediators

Results
- Bronchoconstriction
- Increased basal metabolic rate
- Cardiovascular issues
  - Heart contractions decreased
  - Vasoconstriction of organs
- Reduced immune response

ENGINEERING CONTROLS

- Foam shutoff switch
- Anti-foam agent
- Spray hose to cool
- Temperature sensor
- Manway positioning in regard to operator

PROCEDURAL

- Stick to design volumes: 30-50% freeboard
- Avoid “line of fire”
- Gradual hop addition, only after hot break
- Follow an SOP
- Eye protection, insulated gloves, long pants over boots
Thanks to our generous sponsor

ZEE

LOFFLER
MEMBER OF THE VINCIT GROUP
Andy Clearwaters
Health and Safety Manager
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PRESSURIZED SYSTEMS
PRESSURE HAZARD ASSESSMENT

TASKS

• Moving Beer
• Keg Cleaning
• Vessel CIP
• Using Compressed Air and Gases: \( \text{CO}_2, \text{N}_2, \text{O}_2 \)
  • Oxygenating
  • Carbonating
  • Packaging
• Wort Production

OUTCOMES

• Equipment Failure
  • Tank Vacuum Implosion
  • Tank Pressure Explosion
• Flying Objects
• Chemical Spray
• Asphyxiation
• Wort Burns

CONTROLS

• Use gauges
• Primary & Secondary Regulators
• Cylinder Restraint
• Pressure / Vacuum Relief Valves
• Burst Disks
• Proper Fittings

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ENGINEERING CONTROLS

- Safety valve
- Pressure Relief Valve (PRV)
- Vacuum Relief Valve (VRV)
- Burst disk, or Rupture disk
- Correct sizing and pressure/vacuum settings

PROCEDURAL & SWP

- Follow an SOP
- Understand chemical and physical reasons for tank failure
- Inventory valves
- Schedule relief valve inspection and cleaning
PRESSURE RELIEF DEVICES FOR VESSELS

- Conventional Pressure Relief Valve
- Common Spring-loaded Tri-clamp Pressure Relief Valve
- Rupture Disk
- Pressure Relief Valve / Rupture Disk Combination
- Lever Action Pressure Relief Valve
- Storage Tank Relief Device (protects overpressure and vacuum)
• Follow an SOP
• Understand how to depressurize system before uncoupling
• Know correct operating pressure of all equipment
• Regularly inspect, cleaning, replace wearable parts

• Secondary regulators and pressure gauges at point of equipment connection
• Safety valves
• Plexiglas panels
• Proper connections
  • Oetiker clamps
  • Factory installed hose fittings
  • DO NOT USE worm clamps

ENGINEERING CONTROLS

PROCEDURAL & SWP
PRESSURE HAZARDS

DON’T BE A HOSER!

WAY TO GO!!!

NO NO NO!!!
Thanks to our generous sponsor.
Chris Bogdanoff
Head Brewer & BA Safety Subcommittee Chair
Heroes Restaurant and Brewery
Anaheim, California
DRY HOPPING FAILS
<table>
<thead>
<tr>
<th>TASKS</th>
<th>HAZARDS</th>
<th>CONTROLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dry Hopping</td>
<td>• Flying Objects due to Pressure</td>
<td>• Engineering Controls</td>
</tr>
<tr>
<td>• Adding Seasonings or Fruit Flavoring</td>
<td>• CO₂ Overexposure</td>
<td>• Established Procedures</td>
</tr>
<tr>
<td>• PRV Cleaning</td>
<td>• Risk of Falling from Height</td>
<td>• Safe Work Practices</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Working at height</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• PPE</td>
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<tr>
<td></td>
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<td>• Fall protection</td>
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</tbody>
</table>
DRY HOPPING

HAZARD CONTROLS

PRESSURE HAZARDS

- Blow down CO₂ head pressure per an SOP
- Keep pressure gauges and PRVs clean, operational
- Don’t exceed design volume
- Add ingredients slowly
- Consider hop doser or recirculation equip.

WORKING AT HEIGHTS

- Choose best system your resources allow
  - Scissor lift
  - Rolling platform stairs
  - Extension ladder or step ladder
- Harness, Anchor, Tether
- Catwalk
Andrew Dagnan
Environmental and Safety Manager
Wicked Weed Brewing Co.
Asheville, North Carolina
CONFINED SPACES & LOCKOUT/TAGOUT

INCREASE YOUR AWARENESS & SYSTEMATIZE YOUR PROCEDURES
ACCIDENTS

- Confined space accidents are rare
  - Often fatal
  - Often involve more than one person

- Accidents are easily preventable

- Majority of deaths are would-be rescuers
DEFINITION

CONFINED SPACE
• Large enough to bodily enter and perform work
• Limited means of entry or exit
• Not designed for continuous human occupancy

EXAMPLES
• Brewhouse Vessels MT, LT, BK, WP, HLT, CLT
• Fermenters
• Bright Tanks
• CIP Tanks
• Yeast Brink
• Wastewater treatment tanks, sumps
• Grain Silos
### Tasks
- Brewhouse Vessel Cleaning
- FV/BBT Cleaning
- Water and Waste-water Inspection
- Grain Silo Inspection

### Hazards
- Bad Atmosphere, e.g. O₂ Deficiency
- Mechanical Hazards
- High Temperature
- Engulfment
- Falls

### Controls
- Air Monitoring
- Engineering
  - LO/TO
  - Forced Air Flow
- Administrative
  - Hazard Assessment
  - Reclassification
  - SOPs & Training
### PERMIT-REQUIRED CONFINED SPACE QUALIFIERS

<table>
<thead>
<tr>
<th>Potential to contain hazardous atmosphere</th>
<th>Engulfment hazard</th>
<th>Converging walls or floor</th>
<th>Any other serious hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>• O₂ def. atmos.</td>
<td>• Grain</td>
<td>• Fermenters</td>
<td>• Mash mixer</td>
</tr>
<tr>
<td>• Elevated CO₂</td>
<td>• Water</td>
<td>• Silos</td>
<td>• Lauter tun rake</td>
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</tbody>
</table>

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HOW DO YOU PROPERLY ENTER A PERMIT-REQUIRED CONFINED SPACE?

ENTERING MEANS

If any part of the entrant’s body breaks the plane of an opening into a confined space…

YOU MUST HAVE

- Written Program
- Hazard Assessment of Spaces
- Entry Permits
- Atmospheric Testing
- Specific Safe Procedures
- Authorized Entrant, Attendant
- Emergency Rescue Procedures
- Training
IS THERE AN ALTERNATIVE TO PRCS ENTRY REQUIREMENTS?

RECLASSIFICATION

• Space poses no actual or potential atmospheric hazard
• All hazards within the space can be eliminated without entry into the space (LO/TO)

• Useful for Brewhouse Vessels – MT, LT, BK, WP

• Documentation
  • Written Program
  • Hazard Assessment
  • Written Procedure, including LO/TO
  • Training
CONTROL OF HAZARDOUS ENERGY (LO/TO)

LOCKOUT / TAGOUT

- To isolate and control hazardous energy sources
  - Electrical
  - Mechanical
  - Pneumatic, etc.

- LO/TO equipment is specialized
  - Use LO/TO devices only for LO/TO work
WHEN TO USE LO/TO

- Remove or bypass any safety device on a piece of machinery

- Place any part of your body into a point of operation where a danger zone exists during an operating cycle
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<tr>
<th>TASKS</th>
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<tr>
<td>Brewhouse Vessel Cleaning</td>
<td>Mechanical Hazards</td>
<td>Engineering</td>
</tr>
<tr>
<td>Packaging</td>
<td>• Crush/Pinch</td>
<td>• LO/TO Devices</td>
</tr>
<tr>
<td>• Conveyors</td>
<td>• Flying Objects</td>
<td>• Administrative</td>
</tr>
<tr>
<td>• Fillers</td>
<td></td>
<td>• Energy Control Procedures</td>
</tr>
<tr>
<td>• Drop Packers</td>
<td></td>
<td>• SOPs &amp; Training</td>
</tr>
<tr>
<td>• Palletizers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Sources</td>
<td>Fluid Energy Release</td>
<td></td>
</tr>
<tr>
<td>• Electric Cords</td>
<td>• Bodily Injury</td>
<td></td>
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</table>

LO/TO HAZARD ASSESSMENT - ACHIEVE A ZERO ENERGY STATE
TYPES OF HAZARDOUS ENERGY

- Electrical
- Mechanical
- Stored or potential (springs, gravity, etc.)
- Thermal
- Hydraulics (fluid) or pneumatic (air)
- Chemical
- Radiation (nuclear gauges)
ENERGY CONTROL PROCEDURE (ECP)

ECP is an SOP that describes shutdown and startup for systems with multiple energy sources

- Procedural steps
  - shutting down
  - isolating, blocking, and securing
  - restoring

- Procedural steps
  - placement, removal, and transfer of LO/TO devices
  - who has responsibility for them

- Requirement for testing a piece of equipment to verify effectiveness of LO/TO devices – a.k.a. The TRY STEP

“TRY” STEP

- Verifies isolation
- May release residual or stored energy
- Confirms correct energy sources are controlled
- Keep persons safe while performing the Try Step
ENERGY CONTROL PROCEDURE (ECP)

EQUIPMENT-SPECIFIC
- Often includes images
- Color-coded energy control points

ONLINE ECP GENERATORS
- Subscription-based
- Some free tools available
LO/TO DEVICES

LOCKS
- Only used for LO/TO
- Only 1 key
- Key kept by operator being protected by LO/TO

TAGS
- Provide a message

HASPS
- Allow multiple locks
LO/TO DEVICES

LOCK BOXES

• Isolate small equipment from use
• Allow multiple keys to be locked
LO/TO DEVICES

ELECTRICAL TYPES

PLUG LOCKOUT
• Isolates plug end from being plugged in

BREAKER DEVICES
• Isolates energy at electrical panel

DISCONNECT LOCKOUT
LO/TO DEVICES

FLUID CONTROL

VALVE DEVICES

• Ball valve
• Butterfly
• Gate valve
LO/TO DEVICE KITS AND STATIONS
SAFE OPERATIONS DURING COVID-19

EFFECTIVE CLEANING / DISINFECTION, RESTARTING YOUR BREWERY AND THE NEW REALITY OF CUSTOMER INTERACTIONS
COVID-19 VIRUS

FACILITY CONSIDERATIONS

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## COVID-19 HAZARD ASSESSMENT

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<thead>
<tr>
<th>TASKS</th>
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<th>CONTROLS</th>
</tr>
</thead>
</table>
| • Human Interactions  
  • Coworkers  
  • Customers  
  • Suppliers  
• Production Restart  
  • Ingredients  
  • Utilities  
  • Production Equipment | • Viral Transmission  
  • Airborne aerosols  
  • Surface contact  
  • Distancing non-compliance  
• Chemical Cleaners/ Sanitizers  
• Energized Systems  
  • Pumps, mixers, conveyors that have been dormant | • Administrative  
  • Training, new SOPs  
  • Distancing  
  • Signs and Floor Tape  
• Engineering  
  • Chemical cleaners and sanitizers  
  • Facility PM  
  • LO/TO on restart  
• PPE  
  • Face coverings  
  • Gloves |
# COVID-19 - IMPORTANT CHEMICAL ADVICE

## GENERAL PRINCIPLES
- **Cleaning vs Sanitizing**
  - Clean surfaces then use sanitizer
  - Quats do both
- **Where to Use What?**
  - Brewery chems stay in brewery
  - No corrosive chems on humans or human contact surfaces (HCSs)
  - Review SDSs

## PRODUCTION AREAS
- **Inside Brewing Equip.**
  - Typical caustics, acids
  - Oxidizing sanitizers
- **Outer Surfaces**
  - May have become moldy
  - Foaming cleaners and quats
- **Staling**
  - Dump dormant water
  - Dispose of beer appropriately

## FRONT OF HOUSE
- **Cleaning HCSs**
  - Ammonia
  - Citrus-based cleaners
- **Sanitizing HCSs**
  - Quats
  - Alcohol
  - Bleach solution
- **Administrative**
  - SOPs for all staff
  - How to make up/use cleaners/sanitizers
COVID-19 VIRUS

EXCELLENT RESOURCES

www.brewersassociation.org/brewing-industry-updates/coronavirus-resource-center/
On-Premise Establishment Information

- Department of Labor: OSHA Guidance for Restaurants & Beverage Vendors Offering Takeout or Curbside Pickup
- CBC Online Seminar: Crafting a Contactless Hospitality Program
- Brewers Association: Checklist for Reopening Guide
- Brewers Association: Best Practices in Preparation for Re-opening After Extended Draught System Shutdown
- Brewers Association: Draught Quality Recommendations During Extended Bar/Restaurant Shutdown
- Brewers Association: Food Safety Plan for Craft Brewers
- Department of Labor: Occupational Safety and Health Administration COVID-19 Overview
- Department of Labor: Questions about Family Medical Leave Act and Fair Labor Standards Act
- Department of Labor: Families First Coronavirus Response Act Notice (Required to be posted at businesses on April 1, 2020)
  - Families First Coronavirus Response Act Poster (Non-Federal Employees)
  - Families First Coronavirus Response Act Notice FAQ
- EPA-approved list of Coronavirus antimicrobial products
- National Restaurant Association: Coronavirus – Tips for Restaurants
- National Institutes of Health: NIH study validates decontamination methods for re-use of N95 respirators
- U.S. Small Business Association (SBA): Disaster Assistance Loans & COVID-19

Manufacturing Information

- Brewers Association: Best Practices for Responsible Disposal of Beer
- Brewers Association: Cleaning Resources
- Brewers Association: Good Manufacturing Practices for Craft Brewers
- Brewers Association: Sanitation Resources
- Centers for Disease Control and Prevention: Interim Guidance for Businesses and Employers
- Occupational Safety and Health Administration: COVID-19 Control and Prevention

Business Continuation & Communication

- Brewers Association Video Series: Strengthening Your Financial Foundation in the COVID-19 Era
- Brewers Association Power Hour: Forecasting Cash Flow Needs During Times of Turbulence
- Brewers Association Power Hour: Beer in a Time of Disruption: Know Your Legal Options
- Brewers Association: Crisis Communication Template
- National Restaurant Association: COVID-19 Business Continuation Planning Basics
- U.S. Chamber of Commerce: Staying Connected with Customers Through the Coronavirus Outbreak
- U.S. Chamber of Commerce: 5 Resources to Help Your Business Survive the Corona Virus
- U.S. Department of the Treasury: Treasury and IRS Issue Guidance on Deferring Tax Payments Due to COVID-19 Outbreak
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Safety Manager
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COVID-19 VIRUS

TAKE ACTION

STAFF AND CUSTOMER MANAGEMENT

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COVID-19 - IMPORTANT EMPLOYEE RECOMMENDATIONS

TRAINING BEFORE REOPENING

- Internal Staff Policies
  - Distancing
  - Proper PPE use
  - Handwashing
  - Notification of possible illness
  - Pre-shift monitoring
  - Employee rights under FFCRA

- Customer Areas
  - New floor plans
  - Educating customers on your program
    - Website
    - Signs on doors
    - Floor markings
  - Cleaning/sanitizing methods, frequencies
  - Allowable group sizes and occupancy
  - How to handle high touch surfaces
    - Payment systems
    - Doors/Tables/Chairs
    - Restrooms

- Key Documentation
  - Create SOPs
    - Staff handwashing
    - Surface sanitizing
      - What surfaces?
      - What methods?
      - What frequencies?
  - Require Checklists
    - Cleaning frequencies
    - Occupancy counts
The Families First Coronavirus Response Act (FFCRA or Act) requires certain employers to provide their employees with paid sick leave and expanded family and medical leave for specific reasons related to COVID-19. These provisions will apply from April 1, 2020 through December 31, 2020.

PAID LEAVE ENTITLEMENTS

Generally, employers covered under the Act must provide employees:

- Up to 2 weeks (10 days) or, in a part-time employee’s case, the same number of workdays that would otherwise be worked during a pay period, but not more than 10 days in any cumulative period, paid sick leave if:
  - the employee is unable to work or telework due to the employee’s own COVID-19 symptoms;
  - the employee is quarantined or isolated because the employee is subject to a COVID-19 quarantine or isolation order or guideline;
  - the employee is caring for a family member who is quarantined or isolated;
  - the employee is a close contact of someone with COVID-19;
  - the employee’s workplace has declared a public health emergency due to a COVID-19 outbreak;

- 100% for qualifying reasons #1, 3, or 4 below, up to $511 daily and $5,110 total; or
- 2/3rds for qualifying reasons #2 below, up to $200 daily and $600 total; and
- Up to 10 weeks of paid sick leave and expanded family and medical leave paid or after qualifying reason #5 below for up to $200 daily and $10,500 total.

A part-time employee is eligible for leave for the number of hours that the employee is normally scheduled to work over that period.

ELIGIBLE EMPLOYEES

In general, employees of private sector employers with fewer than 500 employees, and certain public sector employers, are eligible for up to 12 weeks of paid family leave and extended family and medical leave for COVID-19 related reasons (see below). Employees who have been employed for at least 12 months prior to the leave request may be eligible for up to an additional 30 weeks of partially paid expanded family and medical leave (see below).

QUALIFYING REASONS FOR LEAVE RELATED TO COVID-19

An employee is entitled to take leave related to COVID-19 if the employee is unable to work, including unable to work remotely, because the employee:

1. is subject to a Federal, State, or local quarantine or isolation order related to COVID-19;
2. has been advised by a health care provider to self-quarantine due to COVID-19;
3. is experiencing COVID-19 symptoms and is seeking medical diagnosis;
4. is caring for an individual subject to an order described in #1, #2, or #3 as described in #2;
5. is caring for the employee’s own child whose school or place of care is closed (or child care provider is unavailable) due to COVID-19 related reasons;
6. is experiencing another substantially similar condition specified by the U.S. Department of Health and Human Services.

ENFORCEMENT

The U.S. Department of Labor’s Wage and Hour Division (WHD) has the authority to investigate and enforce compliance with the FFCRA. Employees may file a complaint with WHD if they believe they are not being paid or are not being granted leave as required by the FFCRA. See WHD’s FFCRA fact sheet for more information on procedures under or related to this Act. In addition, employers in violation of the provisions of the FFCRA will be subject to penalties and enforcement by WHD.

For additional information:

Visit WHD’s website at www.dol.gov/familyandmedicalleave.

WAGE AND HOUR DIVISION
UNITED STATES DEPARTMENT OF LABOR

Rules, core values do not take the place of culture; just a small part of it.

Culture is all encompassing, constantly growing, changing.

Your brewery will have a culture, make it the one you want.

Yeast makes beer, people make breweries.

As you have to pivot your business model, it’s a great opportunity to pivot to a more inclusive, safe, and successful culture.
We Thank You For Your Attention!

Social Media Handles
@BrewersAssoc
#CraftBrewersCon
#BrewerySafety
#BrewSafely

Brewery Safety Bootcamp – **ONLINE**!

We Thank You For Your Attention!