



# Confined Spaces in Breweries

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# Confined Spaces

- Between 2005 and 2009 there were 481 confined space deaths in the US
- 61 percent due to physical hazards, 33 percent due to hazardous atmospheres
- 60 percent of deaths were rescuers
- From 2005-present OSHA has inspected 251 breweries.

# Confined Spaces

- A confined space is defined by OSHA as:
  - An area large enough and so configured that an employee can bodily enter and perform assigned work, and
  - Has limited or restricted means of entry or exit and
  - Is not designed for continuous occupancy.
- All three conditions must be present to be a confined space



# Permit Required Confined Space

- A permit required confined space has at least one additional hazard:
  - Contains or has the potential to contain a hazardous atmosphere
  - Contains a material that has the potential for engulfing an entrant
  - Has an internal configuration that might cause an entrant to be trapped or
  - Contains any other recognized serious safety or health hazards.

# Confined Space Flow Chart

\* Space large enough to bodily enter and;  
\* Limited or restricted entry or exit and;  
\* Not designed for continuous worker occupancy.

**NO**

**Not a confined Space**

**YES**

**Confined Space**

**Permit-  
Required  
Confined  
Space**

**YES**

**Hazardous Atmosphere**

**Or**

**Engulfment Hazard**

**Or**

**Configuration Hazard**

**Or**

**Any other recognized  
serious hazard**

**NO**

**Non  
Permit  
Required  
Space**

# Confined Space Classification

- There are different categories of confined spaces:
  - Permit Required Confined Space
  - Reclassified Confined Space
  - Alternate Entry Procedure Confined Space
  - Not Classified as a Confined Space

# Brewery Examples





# OSHA Requirements

- Identify and classify all confined spaces
- Label confined spaces and notify employees
- Train employees on confined spaces and the hazards of each space
- If no entry to PRCs needed, secure access points to prevent entry
- If entry to PRCs needed, develop PRCs written program and entry procedures

# OSHA Requirements for PRCS

- Written program
- Confined space entry procedures
- Confined space entry permit
- Entrants, Entry Attendant, Entry Supervisor
- Training
- Equipment – air monitoring, retrieval, etc.
- Rescue procedures, equipment and training
- Procedures for coordinating with contractors entering confined spaces



# PRCS Reclassification Example

- Example mash tun with steam jacket, powered rake and inlet/outlet piping.
- To reclassify
  - perform lockout/tagout of rake
  - Turn off steam, lockout/tagout steam line, and allow tun to cool
  - Disconnect inlet/outlet piping
  - Allow tun to ventilate
  - Test atmospheric conditions inside tun
  - Certify in writing that tun is now safe to enter
- Entry into reclassified space must still be approached with caution

# Managing PRCS

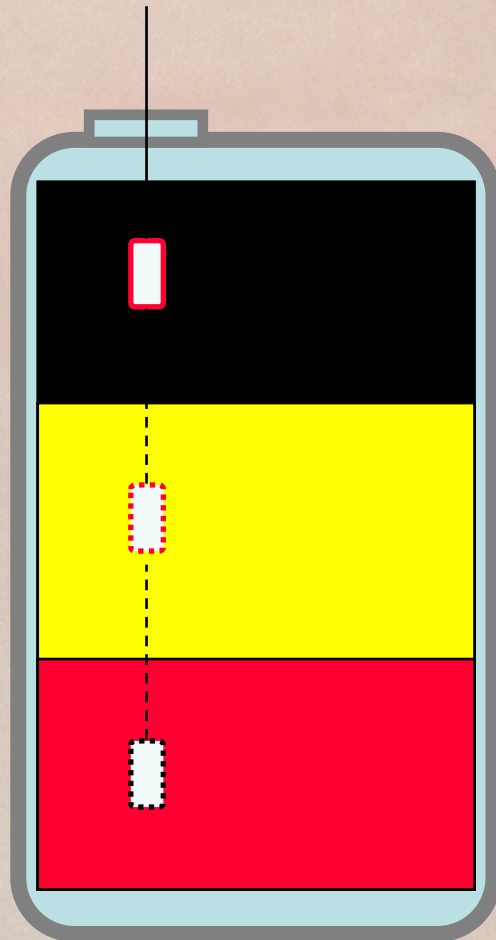
- Requires careful planning and development of standard operating procedures
- Employees must be trained and knowledgeable
- Best option for most breweries is to not enter permit required confined spaces.
  - Perform work from outside space
  - CIP systems
  - Portable CIP equipment for hard to reach areas
  - Long handled tools and grabbers
  - Hire experienced contractor for PRCS work

# Atmospheric Testing

- Multi-gas meter with Oxygen, LEL, CO, CO<sub>2</sub>
- Other gases may be needed, i.e. H<sub>2</sub>S
- Must be calibrated and bump tested
- Users of the meter must be properly trained

# Atmospheric Testing

- Be aware of response time of meter
- Atmosphere in space may be layered, test multiple points.



**Good Air**

**Poor  
Air**

**Deadly  
Air**

Test top to  
bottom and side  
to side

# Confined Spaces - Other Issues

- Safe access
- Fall exposures
- Burns and scalds
- Chemicals



# Confined Spaces BMP

- Developed by the BA Safety Subcommittee
- Coming October 2014





Jeff Fanno  
EH&S Manager  
Stone Brewing Co.



# Confined Spaces - Reclassification Process

- Initiated by Cal/OSHA Consultation visit in February 2012
- Two hazards identified during the inspection with one hazard related to having onsite rescue services related to confined space entry.
- However, Cal/OSHA consultation offered us a way out by reclassifying as a non-permit space if all the hazards are removed, as defined in Section 5157 (c )(7).

# Confined Spaces - Reclassification Process

- A thorough review of Cal/OSHA's Confined Space regulations was undertaken with the focus on what makes a confined space a Permit Required Confined Space and what constitutes acceptable onsite rescue services
- Dialing 911 is not considered an acceptable onsite rescue service

# Confined Spaces - Onsite Rescue Services

- The local fire department was invited to our site to evaluate, identify and develop potential rescue scenarios.
- The primary vessels of concern were our Brewhouse vessels – Lauter Tun and Whirlpool as these are most commonly entered tanks and our yeast propagation tanks due to the difficulty of egress



# Confined Spaces - Onsite Rescue Services

- The fire department determined a rescue plan could be devised
- However, the time for rigging up the equipment and completing the rescue would be considerable and also dependent on the station's availability – so no guarantees of a timely rescue

# Confined Spaces - Onsite Rescue Services

- In addition, a representative of Capital Safety (DBI Sala) was brought in to identify which equipment would be necessary to obtain and deploy should a rescue be needed in our confined spaces.
- An inventory of the necessary equipment was developed that would allow trained employees to rig and put to use should a rescue be required.

# Confined Spaces - Hazard Assessment

- A description of the brewery process, cleaning processes and various maintenance activities around confined spaces were provided to Cal/OSHA
- In regards to the atmospheric hazards, it was explained to Cal/OSHA that in our brewery the primary atmospheric hazard (CO<sub>2</sub>) is not present or eliminated prior to entry in our tanks.

# Confined Spaces - Isolating the space

- In addition, hazards such as engulfment and mechanical hazards (rotating parts) are eliminated through our lock out tag out (LOTO) program
- Your LOTO program must compliment your Confined Space Entry Program – these go hand in hand
- Simply stated Lock Out Tag Out ensures that any and all energy sources are secured, drained, and/or isolated to prevent unintended start up





# Confined Spaces - Examples of energy sources related to confined space entry

- Steam
- Grain
- Rakes or agitators
- Chemicals –from CIP systems
- Water (hot or cold)



# Confined Spaces - When the hazard(s) cannot be eliminated

- Finally, if a tank must be entered where the atmospheric hazard could not be eliminated or was introduced (welding), our preferred method would be to delegate that activity to a contractor that was competent in permit confined space entry

# Confined Spaces - Reclassification

- The justification of reclassifying our confined spaces to non-permit confined spaces was submitted to Cal/OSHA Consultation in writing in March of 2012
- Shortly thereafter I received a phone call from the inspector along with his manager to walk through the process one more time and they agreed with our analysis and assessment

# Confined Spaces - Reclassification with Permit

- Despite the acceptance with Cal/OSHA of reclassifying our permit spaces to non-permit spaces, Stone Brewing Co. still utilizes a permit system, and follows the standards for Permit Required Confined Space Entry
- We are also strongly considering purchasing the rescue equipment and identifying key team members to receive thorough training for performing onsite rescue

# Zero Tolerance Safety Policy

Violation of **Confined Space Entry** procedures is considered one of our most serious safety offenses.



# Confined Spaces - In six basic steps

## Basic Steps:

1. SECURE the space
2. Check the ATMOSPHERE
3. Complete an entry PERMIT
4. INFORM Brew Crew of the task
5. Complete the task SAFELY
6. CELEBRATE the success