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

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, CO2
- Other gases may be needed, i.e. H2S
- 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

Test top to bottom and side to side

Poor Air

Deadly Air
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 (CO2) 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