Confined Space Entry Basics for Small and Large Brewers

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RUSSELL MCCRIMMON, O.H.S.T.

"Tony"

Safety moment

- Fire exits are:
- Time is short! This presentation is typically 4 hours and longer.
- Please be courteous to those around you and mute your cell phone.
- Any other necessary information? (maybe from Matt?).



What's in this for you?

- See the required steps and documentation for Confined Space Entry.
- What happens; why.
- An Entry will be simulated as if OSHA is watching over your shoulder.
- See and receive example of the required paperwork.
- All three spaces will be addressed: Non-permit, Reclassification of a Permit Required Space, and a Permit Required Entry.
- See the duties of the entry attendant, entrant, and the Entry Supervisor.



Disclaimer:

This is not Competent Person training.

Are your State OSHA requirements more strict?



Surgeon General should say:

- Your goal: never go into a confined space.
- All contaminants in confined space atmosphere are always concentrated,
- because they cannot dilute with fresh air.
- There is a risk of long term health problems.
- The vessel only has an opening for the worker who builds it; WARNING: Chinese vessels have smaller manways.



Who must do this?

Moral:

I will keep my employees and myself safe.



Legal:

If the employer decides its employees will enter Permit Spaces, the employer shall develop and implement a written permit space program.

Headline:

"Seven killed inside brewery tank where Corona beer is made"



Authorized Entrants must:

Know What can hurt you and How.

Know symptoms and behavioral effects.

Communicate problems.

Alert the attendant, or Exit if:

Detect sign, symptom, or behavioral effect.

Something outside space causes danger.

Attendant can't perform their duties.

An evacuation is ordered.

Know proper use of: Gas testing equipment. Ventilating equipment. Communication equipment. PPE. Additional Lighting: headlamps, etc. Equipment for safe entry and exit. Rescue and emergency equipment. Any other Equipment needed.

Attendants must:

Know what can hurt you and how.

Know symptoms and behavioral effects.

Communicate problems.

Don't leave while entry is in progress.

Do nothing except watch your entrants.

Monitor if entrants are safe, evacuate if:

Detect danger inside or outside.

Notice symptom or behavioral effect. You can't perform all your duties. Know who is in your space.

Know how to use non-entry rescue equipment to attempt rescue if it's safe.

Call Rescuers if entrants need help. If unauthorized persons approach, or enter:

Warn them to stay away from the space.

If they enter, tell them to get out. Inform the entrants and entry supervisor.

Entry Supervisors are:

Trained to run a Confined Space Program: Competent Person.

Test the atmosphere and record results on permit before entry.

Provide all equipment necessary to complete the entry.

Sign and authorize entry when all conditions for safe entry are met.

Terminate the entry and cancel the permit when:

 $\circ\,$ The work is complete.

 $\circ\,$ There's an unacceptable condition in or near the permit space.

Make sure entry procedures are followed.

Make sure acceptable entry conditions are maintained.







Confined Space

• It is defined as an entry when you "break the plane of the opening".



1910.146 (b)



Confine

- It is defined a
- With NO actu





Confined Space

- It is defined as an entry when you "break the plane of the openin
- With NO actual or potential hazards is a Confined space.
- WITH actual or potential hazards is a Permit Required Confined space.
- Only enter Permit Space with a Permit or under Alternate Entry Procedures.

Can your Permit Space be reclassified for Alternate Entry?





This doesn't provide a "safe way to enter or exit."



1910.146(d)(4)(vii)

This would be considered safe entry,

but the second person creates a hazard.



Alternate entry is allowed when:

You can eliminate or control all hazards.

Continuous forced air ventilation will control to provide clean atmosphere.

You must verify and document that it stays safe to enter.

If it doesn't remain safe, entrants evacuate immediately.

The entrant must have effective way to communicate and summon help. Example: cell phone or 2-way radio,



Conducting a Permit Space Entry

- When a Permit Space must be entered, a permit shall be completed and authorized by your Competent Person prior to entry.
- Permit certifies the space is safe for your entry.
- Includes date, location of the space, and signature of person certifying it's safe.
- Entry is authorized after all conditions of the permit are met.
- Entrants will sign the authorized permit before they enter.



Plan the Entry

- Create plans and procedures for entry.
- Reuse plans from your previous entries into that confined space.
- Document any changes between your last entry and this entry.
- Create a Checklist, and fill in the blanks for each new entry.
- Use the checklist to account for everything during this entry; and you'll be safe.
- Identify who will prepare the space for entry, and who will work in it.

One Document that: is a Permit, certifies Alternate Entry, or certifies Non-permit.



Example



\bigcirc Confined Space Entry Permit IN CASE OF EMERGENCY CALL: PERMIT NO. PURPOSE OF ENTRY: CIP SHADDWUNDER MANNA Location: FERMENTER #1 Entry Supervisor/PIC - Name: MCCP1 MUMON Date of Approval: Hazards of Permit Space: FILLNG WITH LIQUID; Type of additional document needed: CO2 ATMOSPHERE; OXYGEN ENRICHED ATMOSPHERE; CLEANR AND OR SANITIZER RESIDUES: Other/ Explain: GLYCOL COOLING JACKET: Methods of isolation required: Isolation Permit # Checklist (Yes, No , NA) Yes No NA M/O O Blind/Blank Double Block and Bleed Disconnect LOTO All equipment depressurizied ? M Electric Equipment properly rated for hazardous area: All equipment drained ? Yes No GFCI Required 12 Volt Required V/A Ø All equipment cleaned and purged ? 2 0 Energy isolation complete ? Communication method: ✓ Voice N/A V Emergency procedures in place? Hand Signals Other Radio Horn Space properly ventilated ? Personal Protective Equipment **Emergency Phone Numbers Rescue Plan** Eye/Face: Coggles YY DN Safety Glasses Non-Entry Rescue Plan Ambulance/EMT: 911 Face Shield Respiratory Protection 911 Fire department: If no, should outside rescue be notified? 91 Other Specify: Equipment: Outside rescue: 91 Arms / Hands: Body Harness Air ambulance: Neoprene Gloves Wrist Cuffs Other Specify: NITRILE GLOVES Welding Gloves Attendants Rigid Stretcher ✓ Lifeline **Training Verification:** Entry Supervisor Slicker Suit Entrant(s) Clothing: FR Clothing Personnel Backet Cther Typec Suit Steel Toe Boots Hand Crank Hoist Gas Tester Rescue Team Frequency of testing : 30 MINUTES __hrs/min (Testing shall be done at a minimum every two hours) Atmospheric Testing: * Initial testing shall be done for reclassification to non-permit required confined space entry Yes Yes Direct reading Gas monitoring Equipment: No Model and Unit ID: INDUSTRIAL SCIENTIFIC MX4 Monitor Calibration Date: Model and Unit ID: Monitor Calibration Date: Model and Unit ID: Monitor Calibration Date:







Plan the Entry

Gather general data to assess hazards of your space:

- Identify the space by name, or location.
- The specific reason for entering.
- Can you cool it down, shut off heaters, keep workers from cold?
- Identify contents of the space.
- What chemicals, materials, energy are in the space?
- How will you control vapors, or off gassing of yeast slurry?
- Can you eliminate chemical residues?
- Will hot work will be done?



1. Look closely

Name and location of space Who wrote the document Hazards of the space Steps to make it safe to enter

Со	nfined S	pace Entry P
IN CASE OF EMERGENCY CALL:		PERMIT NO.
Location: FERMENTER #1 Entry Supervisor/PIC – Name: MG	CRIMINO	NPurpose of Entry: CIP Da
Hazards of Permit Space: FILLNG WITH LIQU CO2 ATMOSPHERE; OXYGEN ENRICHED A CLEANR AND OR SANITIZER RESIDUES;	JID; TMOSPHERE;	Type of additional document □ JRA ✓ MSDS □ Other/ Explain:
GLYCOL COOLING JACKET;		
All equipment depressurizied ?	Yes No NA	Blind/Blank Double
All equipment drained ? All equipment cleaned and purged ?		Electric Equipment properly r
Energy isolation complete ? Emergency procedures in place? Space properly ventilated ?		Communication method:
Emergency Phone Numbers	Personal	Protective Equipment
Ambulance/EMT: 91(Eye/Face:	Goggles □ Safety Glasses Face Shield □ Respiratory Pr

Identify the Hazards

Before the entry, the entry supervisor will:

- Measure and record the Oxygen, Flammable gas, H2S, Carbon Monoxide.
- If a toxic substance is found, obtain a Safety Data Sheet or other chemical information.
- Determine what PPE is required,
- What are the potential health effects, and the Permissible Exposure Limits,
- What other information is needed to work safely?

Keep notes of everything.

How long does it take to ventilate and achieve clean air.

Plan your work around any delay, including time to ventilate.



ed Sp	ace Entry Perm	nit
	PERMIT NO.	1
	Purpose of Entry: CIP SHA	DOW UNDEP MANINAY
MACK	Date of Ap	proval:
E;	Type of additional document needed: JRA MSDS Hot Work Other/ Explain:	Rescue Plan I Energy Isolation
No NA	Methods of isolation required: Isolati Blind/Blank Double Block and Electric Equipment properly rated for h	Bleed I Disconnect I LOTO
	Yes No GFCI Required Communication method: ✓ Radio Horn	12 Volt Required ✓ N/A Voice N/A Hand Signals ✓ Other
Personal Pro	otective Equipment	Rescue Plan
Eye/Face: 🗹	Goggles Safety Glasses Face Shield Respiratory Protection	Non-Entry Rescue Plan V N If no, should outside rescue be notified?
Other Specify:		Equipment:
Arms / Hands Other Specify: Clothing: Other	Neoprene Gloves NITRILE GLOVES Welding Gloves FR Clothing Slicker Suit Type: Suit Steel Toe Boots	Body Harness Wrist Cuffs Rigid Stretcher Personnel Basket Hand Crank Hoist

2.

Why did you enter? Information you needed Energy Isolation needed How you communicated The PPE required And the rescue plan and equipment

in equipment around a			Research of				
All equipment cleaned a	ind purged ?	X			2 Yes	🗌 No	GF
Energy isolation comple	te ?	N			Communi	cation n	nethod:
Emergency procedures	in place?	X			Radi	io	Horr
Space properly ventilate	ed ?	N					
Emergency Phone Num	bers		Perso	nal Pro	tective Equ	ipment	and and a second
Ambulance/EMT:	911		Eye/Fa	ace:] Goggles	Ds	afety Glas
Fire department:	911				Face Shield		espirator
Outside rescue: 911	02303-935	333	Other S	pecify:			
Air ambulance: 9	11		Arms /	/ Hands		E] Neopre
Training Verification:	Attendants		Other S	pecify:	NITEIL	E	Welding
Entrant(s)	Entry Superviso	r	Clothi	ng:	FR Clot	hing	Slicke
Gas Tester	Rescue Team	64th	0	ther	Tyvec S	Suit	Steel
Atmospheric Testing:	Frequency of testing	: 3	0	hrs/r	nin (Testing	shall be	done at a
	* Initial testing s	hall be do	ne for r	eclassific	ation to non	-permit r	equired co
Direct reading Gas monitori	ng Equipment:	Yes		0			
Model and Unit ID: MX	4 SEPTAL	#12	344	>		Moni	tor Calibra
Model and Unit ID:	NONE					Moni	tor Calibra

3. Call 911?

Atmospheric Testing Procedures

- 1. Follow the test equipment operating instructions.
- 2. Verify equipment is accurate with cal gas.
- 3. Shut off Ventilation before testing the atmosphere.
- 4. Test the atmosphere at the bottom, top, and middle of all spaces.
- 5. Continuously monitor the atmosphere during work in the space. 6. If you ever leave the space, re-test atmosphere before re-entry.



	Gas Tester	Entry Sup Rescue T	ervisor eam	Clothing:	FR Clothin	g 🚺 Slicke	r Suit Toe Boots	Пн
4.	Atmospheric Testing: Direct reading Gas monitoring Model and Unit ID: INDUSTE	Frequency of * Initial to Equipment: RIAL SCIENTIF	testing : <u>30 MIN</u> esting shall be do V Yes FIC MX4	UTES hrs/n ne for reclassific	nin (Testing sh	all be done at a rmit required co Monitor Calibra	minimum every nfined space en tion Date:	two hou try
Test the air Document it	Model and Unit ID:					Monitor Calibra Monitor Calibra	tion Date: tion Date:	
Permit Required?		TIME	B:DOAM/PM	AM/PM	AM/PM	AM/PM	AM/PM	
Re-classify?	Conditions Tested for:	LIMITS	Initial Test	Test Result	Test Result	Test Result	Test Result	Test F
	Oxygen	19.5% ^{23.5} _%	78.8					
	Flamability	<10% LEL/LFL	0%0					
	Hydrogen Sulfide	<10 PPM	0					
		ррм 35 <u>N/A</u>	0					
	Tester Signature: JPM	Can	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Initials:	Initials:	Initials:	Initials:	Initials
	Will this be a permit-required	confined spac	e entry?	Yes	No No			
	Name(s) of Authorized En	trants		IN OUT	IN OUT	IN OUT	IN OUT	IN
	1) JOHN SMI	TH						

Plan: to Ventilate the Confined Space



Describe your mechanical or natural ventilation procedures.

- Point mechanical ventilation away from personnel, ignition sources, etc.
- Don't create additional hazards.
- Bond mechanical ventilators to the space.



Use your Specific Written LOTO Procedures to Isolate.

• Describe procedures to isolate,

disconnect equipment, and to Lockout.

- Disconnect and lock out mechanical, electrical, or heat-producing equipment.
- Include any pumps that pull fluid from, or pump fluid into the space.
- And your gas supply.
- Who is trained to do LOTO?



Purge or Clean the Space.

Will the confined space be purged?

- Purging with inert gas or oxygen is discouraged, increases your hazards.
- If the space must be purged, describe the procedures.

Indicate your cleaning methods.

- Name chemical cleaners and describe method of use.
- How do you remove them from your space.
- How do you test to confirm the remaining residue is safe?
- Consult your Safety Data Sheets prior to use.
- Hang a bottle of Eye Wash in the manway, in case you need it.



Imploded Grundy: compatibility of chemicals in the space



Check compatibility of your chemical with other contents of the space.

If in doubt, WHO WILL YOU ASK?

If steam is used, bond the hose to the space.

Plan the Cleaning Procedures you need

Cleaning Procedures

If you have to enter and clean to achieve clean atmosphere:

- 1. All entrants must be equipped with an SCBA.
- 2. All entrants must be equipped with designated safety equipment.
- 3. Consider all other specialty equipment, like non-sparking tools.
- 4. Training on all these must be completed successfully.



	Tester Signature: MMCann				
	Will this be a permit-required confined space entry?	Yes	No No		Second
5.	Name(s) of Authorized Entrants	IN OUT	IN OUT	IN OUT	IN OU
	1) JOHN SMITH	XU			
	2)				
Name Entrants	3)				
Are they still inside?	4)				
Name Hole Watch	5)				
Firewatch?	6)				
	7)				
	8)				
	Name(s) of Attendant(s): NOVE REQUIRED	Name(s) of	Firewatch: NEP	FOVI	2ED
	This permit is Approved for <u></u> Hour(s) on th * The Confined Space Permit start time shall	is date/_ be the same as	/	time.	7

Conduct Pre-Entry Briefing

Brief everyone involved on details of the entry plan. Brief no more than one day before entry.

You can use your base plan over and over, unless something is different. Just Explain what's different.

Explain the steps to place the space back into service.

Just before entry, review the rescue plan that is posted at the space.



Rescue Procedures

In event of an emergency, the attendant will:

- 1. Immediately summon the **RESCUE RESPONSE TEAM** by radio or telephone. (Dial 911??)
- 2. Attempt to remove the victim with the retrieval line from outside the space, unless it creates additional hazards for the entrant or the attendant.
- 3. If the attendant is able to remove the victim with the retrieval line, administer aid.
- 4. If the attendant is unable to remove victim by the retrieval line, they must wait for help.
- 5. The attendant is not to enter the confined space for any reason.
- 6. MEET AND GREET!
- 7. Your job is to guide Responders directly to the victim As Quickly As Possible.
- 8. Provide Responders the information they need.



Beginning the Entry

- Prevent unauthorized entry with warning signs, barriers.
- Stage tools, safety equipment, gas testers, etc.,
- Isolate & LO/TO all mechanical and/ or electrical hazards
- Purge or ventilate til air in the space is clean.
- Shut off ventilation before testing the atmosphere.





Test Atmosphere

NO MORE THAN 30 minutes before entry.

- Oxygen from 19.5% to 23.5% continue prep
- Otherwise, ventilate longer.
- Shut off ventilation and re-test oxygen.
- Follow same steps for LEL, and other gases.
- OR, continue ventilation til clean.





The Entry

Entry supervisor gathers all personnel,

- Reviews rescue procedures,
- Provides any additional necessary information,
- Then completes and signs the permit

Notify everyone who needs to know that entry is commencing.



7)			
8)			
Name(s) of Attendant(s): NONE REQUIRED	Name(s) of Firewatch: NONE REOVIDED	Special Requirements: CLEAR MISTS FROM CIP BEFORE TESTING ATMOSPHER	
		ALLOW TANK SURFACE TO COO	
This permit is Approved for 3 Hour(s) on this d	ate //	DRAIN AND RINSE ALL CLEANER	
* The Confined Space Permit start time shall be	AND SANITIZER RESIDUES.		
Signature: Man Pri	nt: MCCPIMMON	Pre-entry review completed	
Entry Supervisor aurhorizing entry		with all personnel.	
Signature: NONE Pri	x Applicable MSDS(s) discussed		
Contractor Supervisor if entering under t	his permit	and attached to the permit	
Cancellation of Permit			
Signature: Prin	nt:	Time:	
Entry Supervisor aurhorizing entry from a	bove		

Any Special Requirements?

Did you discuss the entry?

Did you sign and approve entry?

And has it ended?

6

Don't stop there; How long does it take to ventilate the space?

Get In. Get done. Get out.

•Sign in on the permit every time you enter.

•Perform your work.

•Maintain communication with your attendant.

•When work is finished, make sure to remove everything you took in.

•Leave!

- •And sign out every time you exit.
- •Close the manway, or barricade it from unauthorized entry.
- •Tell everyone the entry is over.

•Make sure your permits are filed for documentation.



Thank You!

Facilities, personnel and support provided by:

Dry Dock Brewing Co. Left Hand Brewing Co.

• YOUR Brewer's Association Safety Subcommittee

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