Safety Clicks

Learning from others' mistakes

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Confined Spaces and Drills

By Shannon Smith

You may have noticed on your Drills Tracking sheet that a new drill has come into play for Confined Spaces. Confined space entry is one of the most dangerous activities one can conduct on any vessel. Because it is a high risk/ high fatality activity, domestic and international organizations have established strict criteria for this type of work.

TDI-Brooks has recently conducted a thorough review of all spaces on all vessels. As a result, we have identified **3 types of spaces on the vessels** and written specific procedures to identify how/ when they may be entered. These may be found in recently updated **SOP-GEN-007G** and **SOP-BMC-2016C**.

We are now conducting **monthly confined space drills** to familiarize crew with these entry procedures and new equipment specifically purchased for confined space entry teams.

For your drill scenarios, come up with situations that could possibly arise on your vessel and train to those. **Go through every step of the confined space entry procedure** from filling out the form to gearing up in full SCBA to determining the method of communication. Discuss what could possibly go wrong and how you would rescue the entrant.

This is potentially the most deadly activity one can do on a vessel, so make it as real as possible and plan for potential complications. A genuine crisis is no time to find out that you can't get the SCBA mask to fit or don't know how to work the retractable lifeline. Your life may be the one at risk!

As you will see in the following article, confined spaces can be dangerous even if you don't enter them. Let's work together to make sure everyone gets home safe.

SafeSpace Replay 2:
More 'Confined space that wasn't' incidents

Maritime accident Casebook (MAC) has already mentioned one example of a 'confined space entry incident that wasn't' , now another example has been highlighted by the International Marine Contractors Association on an offshore installation. In both cases, crew were enveloped in an oxygen deficient atmosphere, even though they were in the "open air", while standing over an open hatch/manhole cover to test the confined space below. In both cases a crewmember was rendered unconscious. Although the were no serious injuries, there is still potential for them.

The paper permit isn't the point...

"A shortfall in the present 'safety systems' is that they rely on form-filling, an activity seen as an end in itself rather than a means of safety working.

Increased training and education will not, by themselves, resolve the enormous problems of confined space entry deaths."

- Bob Couttie- Maritime Accident Casebook

Your Turn

Safety Cards– Do they work?
We'd like to hear your thoughts on this HSE tool. Is it effective in preventing accidents? Does it provide an easy method of communicating issues up the chain of command? What can be done to improve them?

Send your comments—anonymous if you like—to HSE@tdi-bi.com.

TOP 3 Safety Card Hits

(Fleetwide last month)

Safety Attitude	**5**
Housekeeping	**4**
Pre-job inspections	**4**

SafeSpace Replay 2: More 'Confined space that wasn't' incidents (cont'd)

A member has reported a serious confined space incident in which a crew member was injured. The incident occurred during quarterly planned maintenance of the leakage detection system in the base of one of the legs of a semi-submersible accommodation unit alongside fixed production platform. A crew member lifted the manhole cover to gain access to the tank to undertake planned maintenance.

The crew member was working next to his supervisor who began to lower gas sampling equipment into the tank as part of normal pre-entry checks. Within a minute of the manhole cover being lifted, the gas sampling equipment (which was 3m down into the 6m height of the tank) gave an alarm, and the crew member lost consciousness.

Subsequent gas sampling during the investigation was undertaken and recorded unexpectedly high levels of hydrogen. The presence of hydrogen can be explained by the electrolytic reaction between the sacrificial anodes and the steel within the ballast tank below the tank being worked upon. The crew member who lost consciousness recovered fully with no residual ill health effects. The company involved made the following recommendations:

Vent ballast tanks regularly in order to prevent hydrogen build-up;
Ensure appropriate steps are taken to purge gases from ballast tanks prior to tank opening;
Using appropriate equipment, conduct tests for the presence of hydrogen before tank entry;
Remain mindful of the potential for build-up of hydrogen in ballast tanks where sacrificial anodes are used;
Review gas sampling procedure."

What went wrong?

While preparing this newsletter, yet another story of a confined space fatality came across my desk. See if you can spot the multiple warning signs and "STOP WORK" opportunities that were missed.

The atmosphere was found to be 20.6% oxygen, with hydrocarbon at 26% LEL. The Master approved the risk assessment and work plan for two crew members to enter the space with emergency escape breathing devices. When they reached the tank bottom, the men felt dizzy; one exited but the other collapsed. Despite being warned not to, the Master entered the tank and was overcome. Although both men were brought out by crew wearing breathing apparatus (SCBAs), the Master could not be revived.

An oil sampler was accidentally dropped into a tank and had to be retrieved. Once empty, the tank was ventilated. Gas testing showed normal oxygen levels, but the Lower Explosive Limit (LEL) of the gases was high at 57% on day one and 38% on day two. (LEL indicates that gases are concentrated enough to combust or burn. Typical gas monitors are set to begin alarming at 20%.)

The next morning, the oxygen was normal at 20.6 and the LEL was 26%. The Chief Officer brought the permit to the Master.

Master: "the 26% will not get down more, O2 is ok. Go in with EEBD and it will be ok".
Chief Officer: "are you sure it's ok?"
Master: "take another sharp person with you"
Chief Officer: "[Cadet]?" Master: "yes good choice"

Entry equipment was placed near the tank access hatch; breathing apparatus (SCBA) sets, emergency escape breathing devices (EEBDs), stretcher and heaving lines.

Chief Officer briefs Cadet on safety when inside the tank:- 1. Oxygen is ok. 2. If personal gas alarm sounds

What went wrong? (continued)

put on EEBD and get out quick 3. Be careful not to slip over. [No other items from either the risk assessment or enclosed space work permit were discussed with the Cadet.]

Two Chief Officer and cadet entered the cargo oil tank with an EEBD carried over the shoulder (not worn), a flashlight and a personal gas meter. Several other crew members and the Master were in attendance at the tank access hatch. The Chief Officer proceeded down and checked the atmosphere across the first platform with his gas meter. The cadet then proceeded down the stairs to meet him.

This was repeated for the remaining platforms until they reached the tank bottom almost 20 metres below the main deck. The Chief Mate then reported feeling dizzy and heard his personal gas meter alarming. The cadet reached the tank bottom and instantly felt the effects of the gas inhalation; he also heard his personal gas meter alarming. The Chief Officer shouted and gestured to the cadet to put on his EEBD and leave the tank. The Chief Officer felt dizzy and immediately proceeded to exit the tank. The cadet attempted to don his EEBD and activate it but collapsed soon afterward with the EEBD partially on.

The attendant noticed the cadet behaving strangely. The Master tells the attendant to inform the bridge and entered the tank with an EEBD carried over his shoulder. The pumpman shouted at the Master not to enter, but Master ignored him.

The attendant helped stand by rescue team put on the SCBAs. The Chief Officer passed the Master during his exit. By the time he reached the deck, both the Master and cadet were passed out at the bottom of the tank. Confined space rescue alert made on public announcement system. The 2nd engineer took command of the rescue team. Despite heroic attempts by the crew, the Master could not be revived.

E	C	F	T	S	D	E	H	A	Z	A	R	D	O	U	S	K	U	T	S
R	S	T	Q	A	P	D	E	F	A	S	W	V	U	P	W	O	H	Z	F
Z	U	W	P	H	V	I	C	R	L	D	S	E	M	U	T	Q	A	S	D
G	O	O	L	E	P	X	A	J	B	N	I	N	F	O	R	B	Q	S	E
J	I	G	U	B	E	O	P	K	B	X	S	T	E	C	B	C	R	R	R
G	C	B	G	C	I	N	S	X	A	R	Y	R	K	G	E	J	E	J	U
A	S	C	H	D	O	O	D	J	F	Q	L	Y	D	I	O	S	Z	V	J
S	N	T	T	T	F	M	E	Z	X	H	A	S	Z	L	C	R	U	X	N
M	O	A	B	Q	K	N	S	Q	C	C	N	U	D	U	V	M	D	H	I
O	C	T	K	C	T	O	O	U	U	I	A	P	E	U	S	L	Y	Y	I
N	N	M	T	E	Z	B	L	A	J	K	Y	E	C	C	G	C	Z	Z	H
I	U	O	N	O	U	R	C	T	I	A	T	R	X	D	K	N	N	T	O
T	N	S	A	F	E	A	N	T	D	T	E	V	K	I	X	F	Z	D	X
O	Z	P	R	D	J	C	E	E	K	A	F	I	X	L	K	O	Q	L	Y
R	Z	H	T	E	B	Q	Z	N	M	J	A	S	C	P	H	A	O	V	G
S	S	E	N	R	A	H	H	D	C	K	S	O	J	M	Z	V	F	Q	E
P	Y	R	E	S	Z	R	Y	A	X	D	B	R	X	W	Z	M	Z	I	N
J	A	E	C	A	R	B	O	N	D	I	O	X	I	D	E	L	W	E	M
E	V	F	X	Q	A	M	M	T	E	D	J	E	L	B	J	B	S	E	Y
U	M	O	J	D	R	B	P	D	B	P	J	D	A	E	T	Z	V	U	J

Safety Tips– Crossword

Find the highlighted words in the following paragraphs.

Before entering an **ENCLOSED SPACE**, the **ENTRY SUPERVISOR** will conduct a **JOB SAFETY ANALYSIS** with the **ATTENDANT** and the **ENTRANT**. A **GAS MONITOR** will be used to determine if the **ATMOSHPERE** in the space is **SAFE**.

OSHA defines **OXYGEN** levels below 19.5% or above 23% as **HAZARDOUS**. Normal oxygen levels in the atmosphere average about 20.9%. Many hazardous gasses encountered in confined spaces on vessels, like **CARBON MONOXIDE**, **HYDROGEN** and **CARBON DIOXIDE** cannot be detected by smell.

The entrant will wear a **HARNESS**, which can be used to **RESCUE** him from the space if he becomes **UNCONSCIOUS** or **INJURED**.