



SCP TRIBUNE[®]

Adventures With Hydrogen

Sometimes regulations may seem troublesome.

So, when surveyors spotted the deformed, rounded bulkhead of an inaccessible void, the engineer felt the repairs should be straightforward. Just cut the plate free and fabricate in place. After all, a void is a void.

But, in ship repair we got rules. You don't repair a space without testing its interior, starting with the atmosphere. Drill that hole.

Amazing. Took 20 minutes for the pressure to vent. And it didn't smell too good, either.



As he tested the vent stream the SCP got a shock: Absolutely explosive!! Call the Marine Chemist!!

Before workers could safely cut access the Chemist pumped inert gas into the void. But how to make the cut? The oxygen stream of a cutting torch would destroy the small void's inert status. (Continued)

TRAINING SCP CLASSES

Full 3-Day Courses

JAN 9-11 @ SSC*

JAN 22-24 @ Anchorage

FEB 6-8 @ SSC*

MAR 6-8 @ SSC*

1-Day Update Courses

JAN 10 @ SSC*

JAN 17 @ Fishermen's Terminal

JAN 23 & 24 @ Anchorage

FEB 7 @ SSC*

FEB 14 @ Fishermen's Terminal

MAR 7 @ SSC*

MAR 14 @ Fishermen's Terminal

DIRECTIONS:

Fishermen's Terminal:

Nordby Conference Room

*SSC: Georgetown Campus very close to I-5, Michigan St. Exit, straight to Corson Ave. S.

OSHA 10 Maritime:

10-hour training on 29 CFR 1915 provides methods on recognition, avoidance, abatement, and prevention of safety and health hazards in workplaces specific to the maritime industry.

Adventures With Hydrogen, Cont.



Openings Cut to Remove Zincs

So, the Chemist opted instead for sidewheel grinders with cutting wheels.

It took an hour to cut 12" squares between each of the 5 frames. And those openings revealed what the drawings had missed; The small void held hundreds of bars of fixed ballast.

But, that wasn't the whole story. The vessel's builders had obtained their fixed ballast from a recycle bin. Instead of lead pigs or rebar, the builders had installed hundreds of used zincs!

Chemists recognize zinc as an active metal. And metallic zinc in a neutral or slightly acidic space

will react with moisture to generate seriously explosive hydrogen gas.

In this instance, because the space had no vent, that hydrogen had built up pressure. At 10-15 psi, those square inches added up to a total force which deformed the bulkhead. A random access cut would have ignited the void's hydrogen to catastrophic effect.

And that's why Competent People make every effort to deal in the world of certainty. Before steel repairs they test all spaces and (especially the inaccessible ones) to keep their hot work safe.



Used Hull Zincs in the Void

Inert Gas



Tools for Inerting a Fuel Tank

OSHA's wisdom about hot work and fuel (Subpart B: "Hot Work") emphasizes how hot work in, on, or even near a space that has contained fuel must have a Chemist Certificate "Safe For Hot Work."

So, Marine Chemists work closely with their Tank Cleaner friends, deciding how much cleaning it takes to make oily spaces "Safe."
(Continued)

Inert Gas, Cont.

But sometimes the fuel can be left in place. If repairs are brief, and cleaning very burdensome, then the airspace above the oil may be "inerted": That is, the Marine Chemist can arrange that an "inert" gas (usually argon or carbon dioxide) be pumped into the airspace above the oil. The inert gas pushes out the air. And without the air's oxygen, the fuel cannot burn, even though the tank bulkhead may get white hot.



Monitor Inert in Process at the Vent



Inerted Tanks Must Be Posted Even Though Bolted Shut

Static electricity, improper venting and possible fuel spillage can make "inerting" a tricky business. Which is why the NFPA rules governing both your insurance (and the Chemist!) say the Chemist is to supervise putting the inert gas in the tank's airspace. Only then can the certificate say Safe for Hot Work.

Congratulations to **STEVE TUCKER** of **PACIFIC FISHERMEN SHIPYARD** winner of December's quiz.

Honorable Mention to Luke Johnson and Rob Hodge

Q: Complete firewatch instruction rhyme, using OSHA language:

He saw the smoke and onto the ship he went.

"Hey! Call 911, if it's not **INCIPIENT!**"

January's Question: Though inert gas can be useful, it may also be harmful. Please list two instances where workers may be harmed by exposure to inert gas.

Please send your answer to newsletter@soundtestinginc.com or admin@soundtestinginc.com before January 25th, 2019. We enter every correct answer in a bowl. Young Evan Liu selects the \$50 gift card winner in random fashion. (Everything Evan does is random...)

