

SCP TRIBUNE[®]

Explosion Proof?

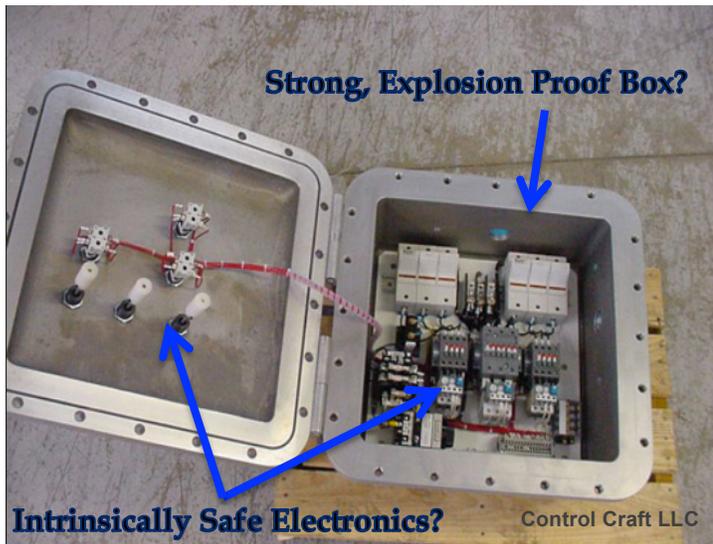
A Port Engineer steps off the gangway turntable onto the tank ship's main deck. His greeting from the Mate On Watch: "Sir, can you turn off your cellphone, please."

The Mate's concern is that a phone's circuitry and power might ignite stray cargo vapors on the main deck, or during work in cargo tanks or in the pump room.

In the words of the Tank Ship's Operations Manual, the Port Engineer's cell phone might not be "**Explosion Proof.**" And what does that mean?

Generally speaking, an electrical machine is "Explosion Proof" when its case is so strong and airtight that no gas vapor can get inside. Also, no heat or sparks made inside are able to escape the "explosion-proof" case.

A related safety label, sometimes confused with



Electrical equipment like this inert gas monitor earns the label "**Intrinsically Safe**" when the manufacturer works hard to design all circuitry, capacitors, energy cells, lighting, magnets, motors, and batteries so that the product can never make (or even store) enough energy to ignite nearby cargo vapor or combustible gas.

However, neither **Explosion-Proof** nor "**Intrinsically-Safe**" solves the Mate's problem. He can't be checking the voltage or construction of every phone, camera or battery-powered drill motor that comes up the gangway. How can he make sure a machine or instrument really is safe? For an answer we went right to the top.

The top is Mr. Bob Henderson, President of GFG Instrumentation and a great friend of the Marine Chemist community. And Bob is an authority on those international safety rules his company must meet before Chemists can use GFG meters to test gassy cargo-tanks.

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TRAINING

Shipyard Competent Person



3-Day Initial

Nov 2-4 @ SSC

Dec 7-9 @ SSC

Jan 4-6 @ SSC

1-Day Updates

Nov 3 @ SSC

Nov 16 @ Fremont

Dec 8 @ SSC

Dec 14 @ Fremont

Jan 5 @ SSC

Jan 11 @ Fremont

Fremont @ Fishermen's Terminal
(SSC: Georgetown Campus
Just off I-5: Corson Ave)
Call Peggy or Bonnie: 206-932-0206

Explosion Proof, Cont.

Bob's advice to the Gangway Watch is pretty short: Don't bother with "explosion proof" or "intrinsically safe." Simply... "Read the label! Either its label says the cell phone is certified for use in hazardous locations, or it doesn't. If the hazardous location has potential of combustible gas, the label must EXPLICITLY say it is Certified for use in that SPECIFIC type of hazard!"

Any gas-safety label, says Bob, whether "Explosion Proof" or "Intrinsically Safe" or "Flame Proof," tells you this: Two industries have worked together: First, makers of the test gear (like Bob's GFG Instrumentation) have made safe instruments. And second, a "Notified Body" like CSA, Underwriter Laboratories, or American National Standards Institute has done exotic testing of the gear's performance and found that yes, it is indeed safe. Some thoughts:

1. The cellphone that started our discussion contained enough energy to ignite hydrocarbon gas. Also, it had a thin case. So that phone was neither "Intrinsically Safe" nor "Explosion Proof."
2. It seems while equipment powered by Lithium-ion technology can be protected by a thick, "explosion proof" case, it can never be made "Intrinsically Safe." First, because the Li⁺ cells have so much energy packed into them. And second, they are structurally fragile to start with.
3. Turning off the phone wouldn't solve the electrical danger. Such equipment may be unsafe whether operating or not. Perhaps the Mate should confiscate that Samsung-6 and store it someplace where a "runaway thermal decomposition" would do no harm.

Unappetizing but Essential



Every crewed vessel has sewage treatment capability, and because such systems are commonly under repair, and the Shipyard Competent Person is absolutely necessary for that safe repair, we at Sound Testing have added this chapter to our Shipyard Competent Person training course: *Sewage Systems*.

First, sewage tanks are tough to clean. Each tank contains serious biohazards; some airborne, some liquid, some in solid deposits. So ventilation, which solves most of our air-quality problems, will not make a sewage tank safe.

Second, the usual tank-cleaning strategy (a pressure-washer) may not clean the sewage tank well enough. This because sewage is not always on the tank surface. Why? Because sewage is so corrosive the tank's steel plate rusts as it was milled: in layers. And under those layers of rust is sewage! To be properly rid of sewage, such rusty spots must be both mechanically scaled (scraped) down to bare metal and then pressure-washed.

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Unappetizing, cont.

Third, there are no real specs to help judge whether black water (sewage) tanks have been properly disinfected. There is no protocol demanding, say, a sterile wipe of 100cm² surface area and the sample sent in for bacteriological assay (then wait 4 days!) And even if there was a recognized test method, there are no standards with which to compare your test results. No PEL of, say, "12 or fewer colonies of shigellosis per square meter...."

And last, Sewage, unlike fuel, is very complex. Testing a single section of the tank is no help: Every inch must be checked.

Philosophy Intrudes

The oxy-acetylene lead stretched from cylinders on the pier up to staging about 10' below the main deck. There, as a worker was flushing a doubler off the sidshell, a stream of white-hot slag flowed from the torch.

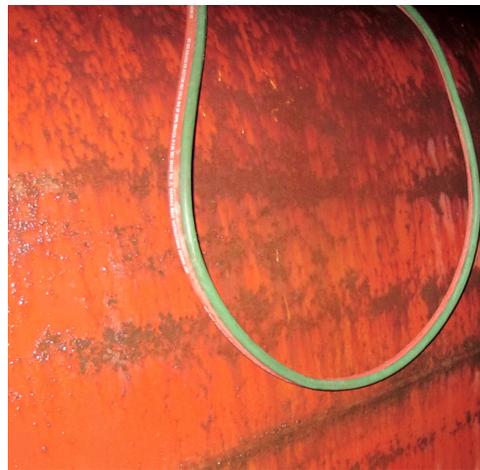
On the main deck a firewatch with charged waterline was keeping the pier and pilings below wet and safe. Suddenly (take your pick) negligence or fate intervened: The torch went out.

A loop of the torch lead lying against the hull had formed a perfect micro-shelf and slag landing on it had burnt it through. The burning lead erupted in a ball of flame and sparks.

The incident made it into the books as a "near miss" and the burner got 2 days of unpaid leave.

The supervisor's philosophy was that every accident can be avoided. Therefore SOMEBODY was at fault, and the boilermaker was handy. But really, what could have been done?

A fire watch had dealt with pier and paint fire dangers, and the loop of torch lead was hidden. An act of God? Not really. Can every accident be prevented? Not a useful discussion because the answer tells us what we already know: Since such unexpected happenings seem part of our industry, we can only agree with Prof. James Reason who in his "The Human Contribution" writes: "Safety is a guerilla war we will sometimes lose. But we can still do the best we can..."



Our work is difficult, jobsites unstable, the hazards always there. It's important that we use workplace rules to be as safe as they can make us. Keep

guards on grinders; Wear faceshields when we should; Calibrate our gear; Check those spaces completely.

Only then do we come as close as possible to that ideal World of Certainty.

Congrats to **Rocky Becker** of **Federal Marine**: Winner of October's quiz.

October's Question:

The Old Mariner complained, "I tried everything, but no matter what I try they stop me. I try this and that and still I'm "2-BLOCKED".

November's Question:

Properly designed, with internal structure inducing periodic fluid resistance to unstable pitching and rolling in heavy seas, a vessel's thwartship "anti-roll" tank may also be called a "_____ " Tank.

Send your answer to newsletter@soundtestinginc.com before November 25, 2016.

All correct answers will be entered into a random drawing and one person will win a \$50 gift card!

One entry per person, please.