

ACCIDENT REPORT

AN ACCOUNT BY

ROY TAYLOR

Origins

This happened when I had just started work as a youth. It's not often you get an accident that is so bizarre that everyone just stands around wondering exactly what they are seeing. Since then, accidents have seemed rather mundane

Accident Report

Copyright © Roy Taylor 1992

This edition was published via the Internet.

The author grants you permission to copy and print this story free for personal and non-commercial purposes only. This story may not appear in compilations without the author's written agreement. All other rights are reserved.

Roy Taylor asserts his right to be identified as the author of this work.

Contact - email: retfiction@aol.com - post: BCM 3754, London wc1n 3xx, United Kingdom



Accident Report

This is no story, but a true account of an accident so bizarre that everyone I have told it to thinks it is just a clever technical tale. Anybody who has worked with liquefied gases will know the truth of this account, and probably have their own stories to tell. This accident happened some thirty years ago. Safety regulations have probably become more stringent to prevent this sort of thing happening again.

When I was a youth, going through college, I had a job of sorts as a research assistant in a cryogenics laboratory. It did research at very low temperatures. Liquefied gases such as oxygen, air, nitrogen, hydrogen, and helium, were our resources, and all sorts of clever equipment were the tools of our trade. We calibrated and measured all sorts of things, and generally played around with the physics of very low

temperatures. We had what my old physics teacher would describe as a 'thrashing good time'. And they paid us too.

The centre of this story is a vacuum flask, a rather special one called a 'dewar', after the man who invented it, Mr. Dewar. A dewar has layers of insulation and reflective materials as well as vacuum to increase its cold-keeping qualities. We used them to hold liquid gases, they probably still do. That phrase seems a contradiction, a 'liquid gas'. What we mean is the liquid form of a substance that is a gas at normal room temperature and pressure, like oxygen, helium, nitrogen, hydrogen, air itself.

A liquid of such a gas is very cold, so cold that there is no way to compare it with everyday experience. If a mere drop of liquid air, nitrogen,

Accident Report

or oxygen fell on your hand, you would get a tiny white patch of frozen skin. It's not harmful in itself. The skin warms up again immediately and you might suffer no more than a blister. More than a drop would cause a dangerous cold burn, like frostbite. Liquid hydrogen or helium would be deadly, frostbite and gangrene being the least of your worries. (As an aside, liquid oxygen has a beautiful blue colour. Imagine that someone has put some sky in a bottle. That's the colour you'll see.)

The dewar of our story was larger than the usual kind, holding 500 litres (a hundred gallons in round figures) of liquid hydrogen. It was six feet high on its wheels, about six feet in diameter. This dewar came with a built-in siphon, a tube about four feet long that reached to the bottom of the inner vessel. The siphon had a valve at the bottom, operated by a steel rod about four feet six inches long. The steel rod was held in place by a screw mechanism on top of the dewar. It's useful to know that the temperature of the liquid hydrogen inside this dewar is only twenty-odd degrees Celsius above absolute zero. No matter

how good the insulation, heat always gets in and boils the liquid away. The gas is collected via a vent at the top and stored in a gas holder.

One day, someone left a dewar containing liquid hydrogen outside our building. He used the dewar in the morning and went to lunch in a hurry. He didn't bother to reconnect the dewar to the gas holder, leaving the vent open to the air. (Those deluded optimists who believe that humankind can survive the nuclear age should have their heads examined. We are all doomed. The apocalypse will start because someone forgot to plug something in or switch something off before going to lunch.)

Where was I? Oh yes. Air got into the vent tube. The temperature inside the vent was cold enough to liquify the air. The liquid air dribbled down the vent tube until it reached a point where the temperature was cold enough to freeze the liquid air into an ice-like solid. More air was sucked in to replace the air that had condensed, and so it continued, with air continuously sucked in to condense and solidify. The vent tube became blocked with a plug of solid air. Liquid

Accident Report

hydrogen continued evaporating, so pressure began to build up inside the dewar.

Along came an unsuspecting operator. He closed the vent valve, a useless act as the vent was blocked anyway. He started to unscrew the siphon valve, a needle-sharp steel rod over four foot long. The pressure inside the vessel was now tremendous. The strain on the screw thread was also tremendous. After three or four turns of the valve, the pressure stripped the remaining thread and blew the steel rod high into the air. The operator was taken aback, which was lucky because a plume of liquid hydrogen spewed forth just inches from his nose.

I had come from a nearby building just as the operator began unscrewing the valve. I saw the launch of the rod, the plume of liquid hydrogen, and the dumbfounded operator in the twinkle of an eye. I watched the steel rod fly high into the sky. The operator jumped down from the dewar and watched nearly three hundred litres of liquid hydrogen spew skyward in a white, softly whooshing plume. The rod was coming down again. I pointed at it and shouted a warning to the

mesmerized operator.

“Agh, umum, er, um,” I shouted, just the sort of thing that we all shout in dire emergencies.

The operator looked skyward and realization dawned on him. He threw himself from a standing position to safety. Clever stunts like this are performed in films with a spring- or explosive-powered platform. This operator’s launching pad was an intense sense of self preservation.

A pointed steel rod must be an almost perfect aerodynamic shape, unaffected by air resistance and able to attain deadly velocity after several seconds of free fall. It came down and embedded itself in the solid concrete of the ground. It quivered like an arrow in a target just inches from where the operator stood.

Neither of us had any time to contemplate the casual whims of fate and falling steel rods. At that moment we were distracted by a sight I am sure has never been seen before on the face of this planet. Liquid hydrogen was spewing from the dewar. It plumed skyward as a white feathery

Accident Report

stream that was colder than anything you can imagine. If the operator had been leaning a few inches forward, not only would he have been pierced by the launching of the steel rod, he would have been frozen solid in a trice. As it was, the operator was safe, if shaken, and staring in fascination at what was coming out of the plume of cold hydrogen.

Out of the plume that feathered up into the blue and cloudless summer sky came a blizzard of pure white flakes, swirling like moths around a summer lamp. The flakes looked exactly like snowflakes. The blizzard grew, and swirled around us. The first flakes floated down like autumn leaves reluctant to touch the earth. They landed on the concrete and exploded with a pop, leaving not a wisp, not a strand of vapour, not a single patch of damp. The first pops were followed by an irregular machine gun stutter of exploding flakes. We stood and stared in total incomprehension. Flakes snowed down on us, exploding as soon as they touched us. The sting on my ears, face, and hands was familiar. It was the little patch of stinging white skin they left as a

remembrance of their touch that told me what they were. I shouted at the bemused operator, who was standing with his arms out, almost in supplication. He stared as if thousand dollar bills were floating out of the blue.

“Frozen air,” I shouted, “It’s snowing frozen air.”

“I know,” he whispered in awe.

We both moved into shelter and stood watching for several minutes as the display continued, until nearly three hundred litres of liquid hydrogen had finished turning into gas so cold it was freezing the air it passed through. No time for liquid phases, no time for anything but swirling flakes of frozen air that popped into oblivion when they touched the relatively hot concrete.

Someone had called a manager, who in turned had called the site emergency brigade, and we all stood around watching. There was absolutely nothing we could do but stand, watch, and wonder, on the day it snowed frozen air.