

WHAT YOUR SAFETY MANAGER NEEDS TO KNOW BEFORE STEPPING INTO THE ENGINE ROOM

I guess one of the first things a safety manager needs to know before stepping into your engine room, is that the term “Engine Room”. As a new safety manager in a food plant, this one question I had. Come to find out, “Engine Room” was originally a nautical term, that dates back into the early 1800s.

On a ship, the **engine room** is the compartment where the machinery for propulsion is located. The engine room is generally the largest physical compartment of the machinery space. The engine room is usually located near the bottom, at the rear or aft end of the vessel. Much like today, engine rooms are typically located in the bowels of the plant.

Many Safety Managers may not be involved with the day-to-day activities that take place in the Engine Room or the Ammonia Refrigeration System, but they need to know 3 basic Rules. I came up with these simple rules years ago, and they still hold true today.

Rule #1. Ammonia can kill - See it, smell, feel it on your skin and eyes and immediately you know that something bad is happening.

- If you see a yellowish looking cloud coming your way, run, up wind..... **Report it**
- If you smell a strong Ammonia odor, get out of the area and head up wind to fresh air..... **Report it.**
- If you feel it on your skin or in your eyes, leave the area, head up wind, get under an emergency safety shower and eye-wash..... **Report it**

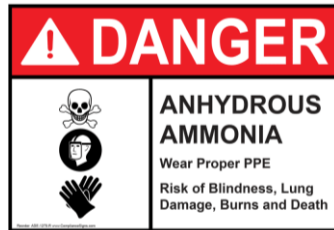
Rule #2. Don't Touch - - - **Anything**. You may think that you are trying to help, but you know what? You're not, you're just in the way.

Rule #3 – Refer to Rules 1 & 2

Now that we have a basic understanding of the Dos and Don'ts of Refrigeration, there is a lot more that your Safety Manager needs to know.

There are several safety systems that apply to both inside and outside the Engine Room. You can find all of these safety systems in the PSM program / RMP manuals. If your facility utilizes Anhydrous Ammonia as a Refrigerant, and you don't have a PSM or RMP program, well you've got much bigger problems.

As a former Safety Manager in a food plant myself, I know there are several safety programs that apply to both the manufacturing side of the business and the Refrigeration System. Administrative Controls “IE” signage is one such program. The Engine Room Entry Room Door signage is one example.



Signage is used extensively throughout manufacturing facilities. Rarely will you find an entry point adorned with so many signs and emergency information as you'll at the entry to an Ammonia Refrigeration Engine room. Along with the signs, you should also find Emergency Ventilation Switch, Emergency Shutdown Switch, and a bunch of other critical information that can save your life.

Here's your sign. Read them, understand the meaning behind each word, symbol or graphic is telling you.

Another program common to refrigeration is Lockout / Tagout (LOTO).

There may be some very distinct differences between LOTO in the production areas and LOTO in the Engine Room. Let's start with some basics information of what is LOTO?

Lockout/Tagout is the isolation of a machine's energy sources to prevent a sudden, unexpected release of stored energy that could injure or kill you. LOTO does not simply mean throwing the main breaker or switching the machine control switch to the off position.

Understanding the complexity of LOTO in an Engine Room can be the difference between a catastrophic release or even life and death. One complexity to realize is where the LOTO procedures are documented. In the Engine Room, many time LOTO Procedures will be incorporated into the equipment's Standard Operating Procedures "SOPs".

When I took over as a safety manager, I thought it would be a great idea to augment the LOTO Procedures with the Brady LOTO procedures. Oh boy, let me tell you, I had no idea what I just stepped off into by wanting to change, or add to a SOP. The first minor

roadblock I ran into was this Gene, my lead operator, he kept referring to thing called a MOC. I was management, and I wanted to make a change, so what's the big deal. Hmmm not that simple, as I soon discovered.

There were several potential Hazards with LOTO in the Engine Room that I needed to learn, as far as that goes, there were lots of potential hazards associated with the entire Refrigeration System that I needed to learn about. I had no idea there were so many hazards just lurking around just waiting to try and kill me. Deenergizing or bringing refrigeration equipment to a Zero Energy State is delicate balance between Know-how, skill and Science.

Trapping liquid Ammonia in an isolated run of pipe is a hazard, therefore it has to be bleed off. You can't just open a valve to atmosphere and bleed off residual pressure. Ammonia has to be Pumped-Out or evacuated, which can take several hours, and in some cases days to remove all residual Ammonia. Even after evacuating all the Ammonia, there is still residual Ammonia that will off-gas from compressor oil along with any vapor left behind in pipes and equipment. Just as a side note. Don't allow your ammonia operator bleed residual ammonia into a 55-gallon barrel of water, with a water hose running wide open. We ended up with ammonia water flowing across the parking lot, down a storm drain and ended up discharging into a major waterway. Not a good day when the Fire Department, City Officials, the EPA and local news media showed up at the plant. Lesson learned, the hard way.

Process Safety Management (PSM) The next safety program I to learn about was 29CFR1910.119 "PSM". I had been in industrial safety for several years at this point. I had the entire Code of Federal Regulations to worry about, not just a few pages of the 1910.119. I've been an OSHA Authorized Instructor for the past 23 years. I've completed the OSHA (500) Train-the-Trainer Course, OSHA (501) General Industry Trainer Course and Construction (510) Trainer Course, along with all the OSHA required updates. Not once during any of these training sessions, was there any mention of Process Safety Management (PSM), Risk Management Planning (RMP), nor was the 29CFR1910.119 ever brought up. Oh my gosh, I had no idea how much PSM would change my life and my career path. I didn't know what I didn't know. In less than a year of taking over as safety manager, I knew I had educated myself on Ammonia Refrigeration.

Where should a you start?

My advice to Safety Managers, if you are new to refrigeration in the food industry or a seasoned professional, continue to educate yourself. Taking some Ammonia Refrigeration training classes. I started with the Operator 1 Course. Also, if you're not already involved, get involved with your Process Safety Management (PSM) Team. You don't have to lead the team, just show-up to the monthly meetings and get involved. A safety manager needs to know what their ammonia operators face on a day by day, sometime, moment by moment. You don't know what you don't know.

If, or should I say when, an Authority Having Jurisdiction (AHJ) Regulatory agency like OSHA, the EPA or a state regulator comes knocking on your door, you had better be able to answer their questions, or at least know where to find the information they are looking for. I learned this lesson the hard way, when my boss shut the conference room door with just me, my PSM contractor and an EPA Compliance Officer sitting around a table with a set of books that I had never seen before in my life. OMG that was a long and day.

I don't teach Ammonia Operator training classes, but if you want a couple of references, please don't hesitate to give me a call.

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