7 KEYS TO A **COMPLIANT PSM TRAINING PROGRAM** FOR AMMONIA REFRIGERATION

WHAT YOUR FACILITY *needs to know* ABOUT THE LATEST OSHA REQUIREMENTS

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7 Keys to a Compliant PSM Training Program for Ammonia Refrigeration
What your facility needs to know about the latest OSHA requirements

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Industrial refrigeration managers know that their personnel must undergo **Process Safety Management (PSM) compliance training** — but how do they know if their current training meets with latest requirements from the **Occupational Safety and Health Administration (OSHA)**?

Simply sending your refrigeration team off for generic training at another facility is not enough. **OSHA 1910.119 mandates being trained on your specific equipment and process.**

So, what does a modern, OSHA-compliant ammonia refrigeration training program include?

need to know

HERE ARE **SEVEN KEY ITEMS:**

1: SAFETY & HEALTH CONSIDERATIONS (INCLUDING THE HAZARDS OF AMMONIA)

Safety and health are the foundation of OSHA's existence — after all, it's in the name. A proper PSM training plan should include an Ammonia Safety Data Sheet (SDS) review and/or information from industry sources such as the **International Institute of Ammonia Refrigeration (IIAR)**.

Such information could include, but isn't limited to:

- **Properties of and hazards presented by ammonia**
- **Precautions necessary to prevent exposure, including engineering controls, administrative controls and Personal Protective Equipment (PPE)**
- **Control measures to follow if physical contact or airborne exposure occurs**

Employees should be able to elaborate on and answer questions such as:

- **What PPM measurements are considered acceptable on a short-term basis?**
- **What are the immediate dangers to life or health (IDLH) values?**
- **What happens with ammonia and water? Why is that important?**
- **What do you do if your skin is exposed to liquid ammonia?**

These are fundamentals any personnel working with your **ammonia refrigeration system** should know.

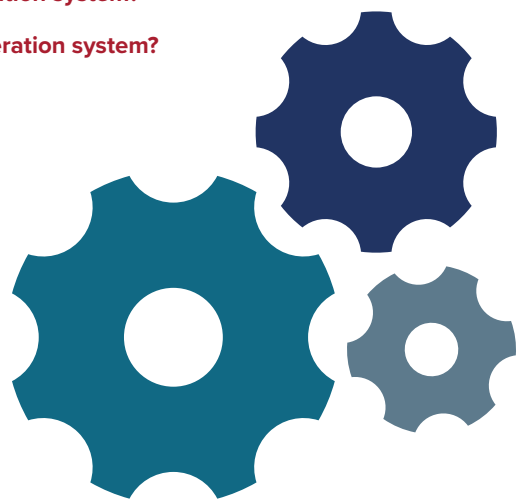
fundamentals

2: AN OVERVIEW OF THE **AMMONIA PROCESS**

Your PSM training should include a general review of the facility's ammonia process. This can be conducted through on-site tours and classroom training on the facility's piping and instrumentation diagrams (P&IDs) and block flow diagram.

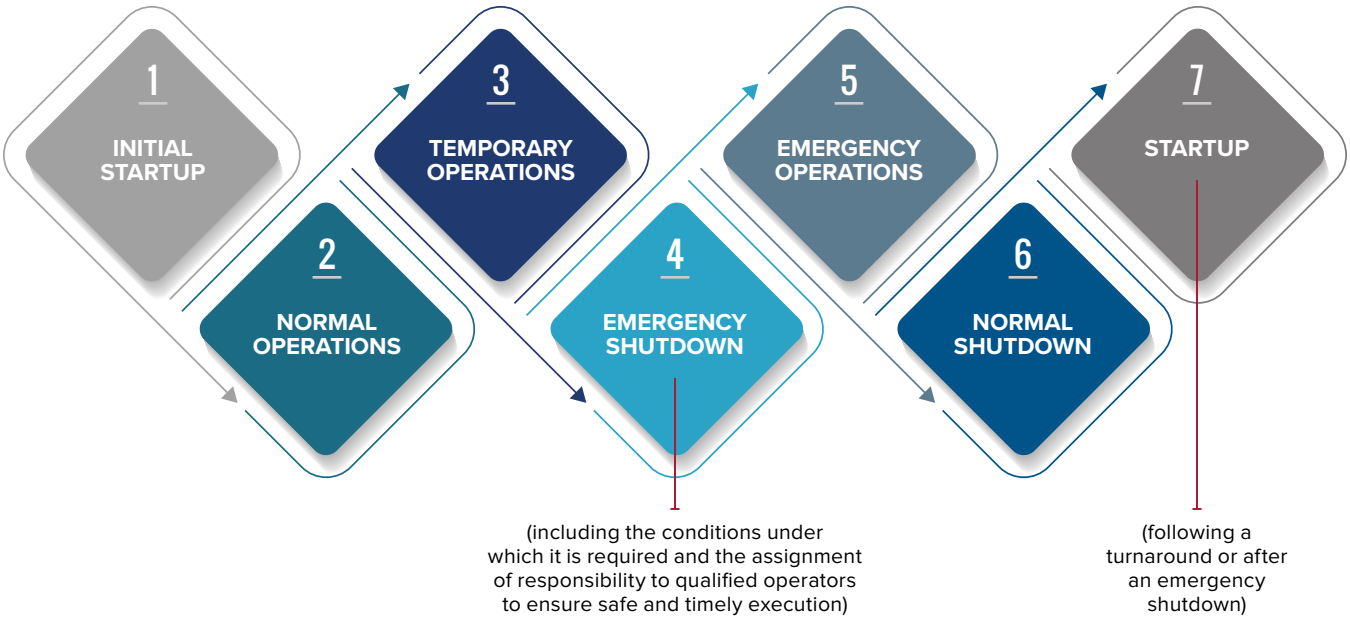
This training should answer questions such as:

- **What are the four basic steps of refrigeration?**
- **What are the basic components of the facility's refrigeration system?**
- **How is cooling accomplished in your mechanical refrigeration system?**
- **How does heat energy always flow?**
- **What does the expansion valve control?**



3: STEPS FOR EACH OPERATING PHASE IN THE **AMMONIA SYSTEM'S WRITTEN OPERATING PROCEDURES**

Training should include explanation of the steps outlined in the equipment-specific standard operating procedures (SOPs). The phases include:

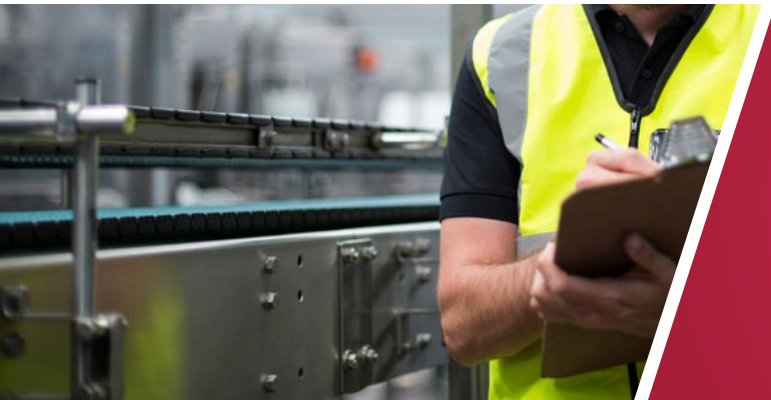


(including the conditions under which it is required and the assignment of responsibility to qualified operators to ensure safe and timely execution)

(following a turnaround or after an emergency shutdown)

PSM training should answer questions such as:

- **What are the site-specific normal operations of the compressor? Condenser? Purger?**
- **When and how is each piece of equipment pumped down?**



THESE TOPICS ARE CRUCIAL TO UNDERSTAND, PARTICULARLY IN *a case of crisis.*

4: EMERGENCY SHUTDOWN PROCEDURES & OPERATIONS

EMERGENCIES HAPPEN, AND YOUR FACILITY'S PERSONNEL MUST BE PREPARED TO ACT *if and when they do.*

Comprehensive PSM training addresses questions including:

- **What are the emergency shutdown procedures for the ammonia system?**
- **What are the emergency shutdown procedures for the compressor?**
- **What are the emergency shutdown procedures for the condenser?**
- **During an emergency shutdown of the ammonia system, does the e-stop shut down the refrigeration system while leaving the ventilation system in operation?**
- **What is the next step after an emergency shutdown has been run?**

Ammonia emergencies, such as accidental releases or unsafe pressures, are **a matter of life and safety** for both your employees and the surrounding community. **Thorough knowledge and a well-prepared response to these potential events is critical.**

proper preparation

5: STEPS TO AVOID & CORRECT DEVIATIONS FROM SYSTEM OPERATING LIMITS

Deviations can occur for a number of reasons such as personnel not adhering to the written operating procedures, system upsets, weather events or even deliberate acts.

DOES YOUR FACILITY STAFF KNOW WHAT HAPPENS IF THERE IS EXTREME HIGH OR LOW PRESSURE IN THE SYSTEM?

THEY SHOULD.

INCLEMENT WEATHER can cause ammonia systems to behave differently, and extreme temperatures may sometimes trigger an automatic shutdown.

EXTREME HOT WEATHER usually causes discharge pressures to increase. During these times, it is imperative that the condensing system be in full operation and correctly maintained so that it can properly control the ammonia system's discharge pressure. High discharge pressures can cause increased superheat and oil breakdown, which can cause increased wear and tear on system components.

EXTREME COLD WEATHER usually causes discharge pressures to decrease due to a lack of load. In these scenarios, it may be necessary for operators to false-load the ammonia system to drive up discharge pressure. Low discharge pressure can cause many issues in the ammonia system, such as inadequate defrost, liquid carry over to the compressor, and shortage of liquid supply throughout the ammonia system.

6: OVERVIEW OF **SAFETY SYSTEMS** & THEIR FUNCTIONS

Personnel should also be trained on general safety systems and be able to answer questions such as:

- **What is the function of the safety systems?**
- **What is the setpoint and capacity of a relief valve?**
- **At what point will the ammonia detector sound an alarm?**
- **What is the purpose of the spring return valve?**

Classroom and site-specific field training are necessary to maximize the understanding and retention of the training.

7: OPERATOR **TRAINING** / MECHANICAL INTEGRITY **SKILLS**

This is to ensure operators are trained in the necessary technical skills to perform all tasks assigned to them. This may include on-the-job training and operator training (i.e., Operator 1, Operator 2 training). A partner like Stellar can provide this instruction at your facility to maximize site-specific training.

NOT OPTIONAL: THE RISK & COSTS OF NOT BEING IN COMPLIANCE

This high-level overview only scratches the surface of the nuanced requirements mandated by OSHA. Catastrophic incidents involving highly hazardous chemicals over a decades-long period of economic growth spurred PSM into existence. Something had to be done to guarantee the safety of employees working with or around these chemicals.

The PSM Standard requires on-site employers and contractor employers to assure that their employees are trained in necessary safe and healthful work practices.

However, while the PSM standard at 1910.119(g) “Training” and 1910.119(h) “Contractors” detail what is expected, they don’t explain how you are to provide it — and these standards can be difficult to understand and implement.

ULTIMATELY, IF YOU CAN’T CHECK OFF EVERY ITEM ON YOUR PSM TRAINING LIST, YOU’RE AT RISK OF INCURRING PENALTIES IF FACED WITH AN OSHA AUDIT.

THESE CITATIONS CAN AMOUNT TO...

→ **$13,653** for Serious and Other-than-Serious violations

→ and upwards of **$136,532** for willful citations.

THAT’S WHY IT’S CRITICAL TO PARTNER WITH AN EXPERIENCED PSM TEAM THAT CAN DELIVER EFFICIENT, EFFECTIVE AND PERSONALIZED ON-SITE TRAINING THAT *doesn’t cut corners.*

THE STELLAR APPROACH TO **PSM**

At Stellar, we offer **all-inclusive PSM, refrigeration, Hazmat and OSHA training courses** that can be conducted on-site at your facility. Unlike other companies that force you to send your personnel to an off-site training location, Stellar's team of professionals come to your plant at your convenience to train your personnel with a program tailored specifically for your refrigeration equipment and your process.

This **tailored, site-specific approach** ensures your staff learns the key information needed to fully understand and capably perform their specific jobs without wasting time on aspects of training that don't apply to your facility.

Other benefits include:

- **SAVING MONEY** on travel expenses compared to attending off-site training
- Receiving all **TRAINING LOCALLY** which enables personnel to point out actual equipment when asking questions.
- **AVOIDING A GAP** in monitoring due to the whole team being off site for a week

tailored

WANT TO LEARN MORE ABOUT OUR PSM TRAINING PROGRAM OR SCHEDULE A FREE CONSULTATION?

Call us at (904) 260-2900 (toll-free: 1-800-488-2900) or email refrigsales@stellar.net

ABOUT STELLAR

Stellar is a fully integrated design, engineering, construction, refrigeration and mechanical services firm that provides the industry's most comprehensive range of self-performed services, including planning, design, pre-construction, construction, refrigeration, mechanical and utility, building envelope, and total operations and maintenance services. More than 750 Stellar employees worldwide design, build and maintain award-winning food processing plants, refrigerated warehouses, distribution centers, commercial buildings and military facilities. In addition to its Jacksonville, Florida, headquarters, Stellar operates support locations and offices throughout the United States. For more information, visit **stellar.net**.

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