

Ammonia Process Safety below 10,000lbs.

If you have an Ammonia refrigeration system with less than the Federal¹ *Threshold Quantity* of 10,000lbs, you are subject to OSHA's & EPA's "General Duty" clause rather than the more widely known PSM/RMP "Process Safety Management & Risk Management Program" requirements.

OSHA: "Each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees." --Section 5(a)(1) of the Occupational Safety and Health Act of 1970

EPA: "The owners and operators of stationary sources producing, processing, handling or storing such substances [i.e., a chemical in 40 CFR part 68 or any other extremely hazardous substance] have a general duty [in the same manner and to the same extent as the general duty clause in the Occupational Safety and Health Act (OSHA)] to identify hazards which may result from (such) releases using appropriate hazard assessment techniques, to design and maintain a safe facility taking such steps as are necessary to prevent releases, and to minimize the consequences of accidental releases which do occur." --Section 112(r)(1) of the Clean Air Act

In practice, what does this mean?

While you aren't required by Federal regulations to have a PSM/RMP program, you will need to meet your General Duty obligations. In practice this means the adoption of some sort of process safety program to ensure that you:

- 1) Identify hazards your facility may present from accidental releases of hazardous substances.
- 2) Design and maintain a safe facility.
- 3) Minimize the consequences of accidental releases which do occur.

The IIAR² has created an "Ammonia Refrigeration Management" program to ensure facilities meet their General Duty Burden. Additionally, item #2 on *Designing and Maintaining a Safety Facility* is addressed by Codes & Standards that apply to all Ammonia refrigeration systems, even if they are below 10,000lbs. These standards are also referenced continuously in the ARM program and routinely cited by OSHA and the EPA when issuing General Duty fines & citations:

- **IIAR 2** - Design of Safe Closed-Circuit Ammonia Refrigeration Systems
- **IIAR 6** - Inspection, Testing, and Maintenance of Closed-Circuit Ammonia Refrigeration Systems
- **IIAR 7** - Developing Operating Procedures for Closed-Circuit Ammonia Refrigeration Systems
- **IIAR 9** - Minimum System Safety Requirements for Existing Closed-Circuit Ammonia Refrigeration Systems

¹ New Jersey, Delaware, and California have different state-level rules.

² The IIAR (International Institute of Ammonia Refrigeration) is the world's leading advocate for the safe, reliable, and efficient use of ammonia and other natural refrigerants. Their standards are incorporated by reference into most Industrial, Building, Electrical and Fire codes. For more information go to IIAR.org

What are the differences between requirements under PSM/RMP and those required by the IIAR's ARM & various IIAR Standards?

PSM/RMP element	Equivalent IIAR ARM	What's the difference?
RMP & Hazard Assessment <ul style="list-style-type: none"> Management System WCS/ACS Scenarios RMP Filing 	Management System Hazard Assessment	There is no RMP CDX filing, but the ARM requires that you calculate the WCS/ACS scenarios and establish a Management System. <i>This is roughly 90% of the RMP burden.</i>
Employee Participation	NONE	While the ARM doesn't require this as a stand-alone element, the PSM/RMP burden for the element is fairly light and it is unlikely that ANY safety program would be functional without adequate employee participation. <i>Functionally identical to PSM/RMP.</i>
Process Safety Information	Refrigeration System Documentation	No significant differences because the ARM references IIAR 2 & 9 which reference the installation standard (IIAR 4) and the startup standard (IIAR 5) and the MI Standard (IIAR 6). <i>Functionally identical to PSM/RMP.</i>
Process Hazard Analysis	Hazard Review	No significant differences because the ARM references the IIAR What-If/Checklists. <i>Functionally identical to PSM/RMP.</i>
Operating Procedures	Operating Procedures	No significant differences because the ARM references the SOP standard (IIAR 7). Only missing requirement is the annual SOP certification. <i>This is roughly 99% of the PSM/RMP burden.</i>
Operator Training	Training Program	No significant differences because the ARM has all the same requirements and references IIAR ARTG. <i>Functionally identical to PSM/RMP.</i>
Contractors	Contractor Program	No significant differences other than the lack of a requirement for a Contractor Injury Log. <i>This is roughly 99% of the PSM/RMP burden.</i>
Mechanical Integrity	Preventative Maintenance Program	No significant differences due to the requirements of ARM and the fact that the ARM references IIAR 2 & 9 which reference the installation standard (IIAR 4) and the startup standard (IIAR 5) and the MI Standard (IIAR 6). <i>Functionally identical to PSM/RMP.</i>
Hot Work Permit	NONE	<i>Since OSHA requires Hot Work outside of the PSM standard, this is nearly identical to the PSM/RMP burden. Functionally identical to PSM/RMP since insurance requires permits.</i>
Management of Change and Pre-Startup Safety Review	Managing Change	No significant differences due to the requirements of ARM and the fact that the ARM references IIAR 2 & 9 which reference the installation standard (IIAR 4) and the startup standard (IIAR 5) and the MI Standard (IIAR 6). <i>Functionally identical to PSM/RMP.</i>
Incident Investigation	Incident Investigation	Very little difference between the requirements. <i>This is roughly 95% of the PSM/RMP burden.</i>

PSM/RMP element	Equivalent IIAR ARM	What's the difference?
Emergency Action / Response	Emergency Planning & Response	ARM doesn't include the new Obama-Era coordination with local responders, but neither does PSM. Until the EPA publishes new GDC guidance we won't know if ARM needs this too. <i>Because the OSHA requirements are outside of PSM, this is all of the OSHA (PSM) burden and roughly 90% of the RMP burden.</i>
Compliance Audit	Self-Audits	Very little difference between the requirements. <i>This is roughly 99% of the PSM/RMP burden.</i>
Trade Secrets	NONE	ARM doesn't require an element for this, but since there are VERY few Trade Secrets in NH3 Refrigeration, it doesn't much matter. <i>Functionally identical to PSM/RMP.</i>

Conclusion

As you can see from the preceding chart, in practice there is very little *functional* difference between the requirements of the OSHA/EPA PSM/RMP and General Duty under the IIAR's ARM program.

This is why we suggest that facilities meet their General Duty requirements with a full PSM/RMP program so they can utilize industry standard templates, program examples, training modules, etc.

If you have any questions, or if there is anything we can do to assist you in your continued success, please don't hesitate to contact me.

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