

September 26-29, 2017

RETA

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Advantages of Low Charge Ammonia Systems for Operator Training & Regulatory Compliance

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REDUCTION IN LIABILITY & EXPOSURE TO FINES:

Major categories where citations have been issued by OSHA over the last 3 years for PSM violations. The top 4 categories, which comprise 73.1% of all the PSM citations:

- Process Safety Information
- Mechanical Integrity
- Operating Procedures
- Process Hazard Analysis

Packaged systems provide many features, attributes and documentation that will satisfy the requirements and criteria for these PSM elements and as a result will significantly reduce an owner's liability related to these elements & reduce their exposure to fines

All ChemNEP Citations by PSM Element

Element	Description	% of PSM Violations
d	Process Safety Information	23.7
j	Mechanical Integrity	22.5
f	Operating Procedures	13.6
e	Process Hazard Analysis	13.3
l	Management of Change	6.9
o	Compliance Audits	4.1
g	Training	3.5
n	Emergency Planning & Response	3.2
h	Contractors	3.0
m	Incident Investigation	2.6
c	Employee participation	1.7
i	Pre-startup Review	1.5
k	Hot Work	0.4

Advantages of Low Charge Ammonia Systems for Operator Training & Regulatory Compliance

SUPPLIERS CAN PROVIDE:

- Process Safety Information
- Operating Procedures
- Maintenance Procedures
- Complete Submittals
- Product Hazard Review
- Tagging, Labeling & Signage

Complete **Installation, Operation & Maintenance manuals** should be provided by the manufacturer

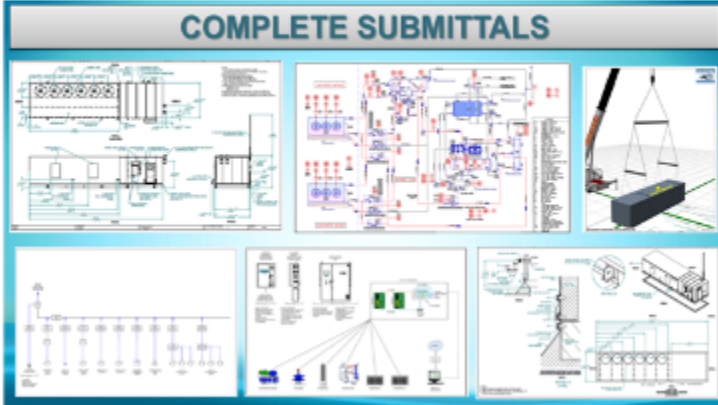
COMPLETE IOM DOCUMENTS



Example of a completed document showing a diagram of a low charge ammonia system.

Sample product **submittals** that can be provided from the manufacturer.

COMPLETE SUBMITTALS



Example of a completed submittal showing a piping diagram.

Sample completed **Hazard Review** for packaged low charge ammonia system that can be provided to the owner to assist with their onsite safety programs.

PRODUCT HAZARD REVIEW COMPLETED



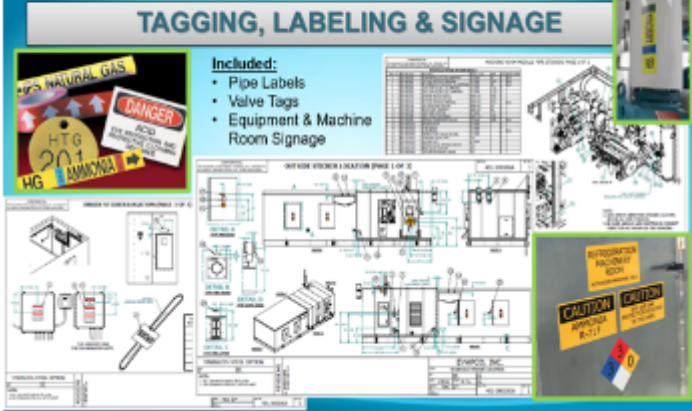
Example of a completed hazard review table.

Sample **pipe labels, valve tags, and equipment & machine room signage** that can be provided

TAGGING, LABELING & SIGNAGE

Included:

- Pipe Labels
- Valve Tags
- Equipment & Machine Room Signage



Example of a completed tagging, labeling, and signage set.

TRAINING EASIER & MORE EFFECTIVE



Advantages of Low Charge Ammonia Systems for Operator Training & Regulatory Compliance

OPERATION AND MAINTENANCE:

Packaged systems can facilitate easy maintenance by the inclusion of such things as:

- Access doors & fan/motor removal davits
- Exterior Service Panel on machinery room including the ability to connect a pump-out unit
- Monorail and hoist for compressor or motor removal
- “Walk-in” machinery room with required maintenance access
- Maintenance is performed indoors on the roof instead of outdoors
- Stainless steel piping, eliminating pipe corrosion
- Isolation valves on major equipment
- Cable tray for wiring for easy access



Advantages of Low Charge Ammonia Systems for Operator Training & Regulatory Compliance

LOWER COST OF OWNERSHIP

Packaged low charge ammonia systems can provide a lower cost of ownership:

- Lower building costs – no central machine room
- Lower refrigerant costs
- Lower regulatory & compliance costs
- Complete Operation & Maintenance procedures
- Easier training and unit operation
- Lower electric bills through energy efficient design plus more effective operators.

