

# Ammonia-Based Refrigeration Systems

## Regulations you should know

BY SHELL J. BLEIWEISS

Many types of businesses, from grocery stores to chemical manufacturers, utilize ammonia based refrigeration systems. They work well and are often the most cost-effective for a particular cooling job. As with all refrigeration systems, there are regulatory requirements that must be met by the owners of these systems and the contractors who install and maintain them.

While this column is focused on ammonia refrigerant systems, I don't mean to imply that other more conventional systems are not also regulated, because they are. It should be remembered that any system, if not properly installed and maintained, can be quite dangerous.

An ammonia release to the outside can occur in a number of ways, including pressure build-ups in refrigeration systems that could cause a pressure relief valve to open.

Another means of release is a broken pipe that releases ammonia indoors while windows, doors or ventilation systems move some or all of the ammonia to the outside. In most newer systems, however, most of the ammonia piping is placed outside the structure, typically on the roof.

Reportable releases of ammonia usually have to be reported to three different governmental agencies: federal, state and local. All three must be notified immediately following a reportable spill or release.

The Clean Water Act of 1977 brought the federal government into the equation. Under the jurisdiction of the U.S. Coast Guard, the federal government operates the National Re-

sponse Center, which is reachable day or night at 1-800-424-8802.

In addition, state and local agencies in every locale have been identified to deal with chemical emergencies.

There are two federal agencies which regulate the reporting of hazardous chemical leaks, including ammonia: the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA).

Under EPA rules, ammonia is a highly regulated chemical. It is considered a "hazardous substance" under the Superfund law (Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §9601 et seq., as amended) and an "extremely hazardous substance" under the Emergency Planning and Community Right-to-Know Act (42 U.S.C. 11001 et seq. 1986).

The EPA rules require, among other things, that immediate reports be made to various government agencies any time ammonia is spilled or released to the outside in excess of its reportable quantity, 100 lbs per 24 hrs.

When the EPA says "immediate" it means it. The agency has brought enforcement actions against businesses that delayed making the telephone calls to report a release by just a few hours. The EPA can seek up to \$27,500 per violation, per day for failure to make timely reports. However, fines this steep are very rare.

Calling in a release that you later conclude was less than 100 lbs is highly unlikely to be problematic, although it might make for some extra paperwork. In the case of a timely-reported ammonia release, the government typically does not require more than an explanation of how the accident happened, and what safeguards are in place to avoid a recurrence.

For example, a client of mine in the meat-packing business accidentally released ammonia through a venting pipe on the roof that was connected to the pressure relief valve inside the structure. The incident occurred in a

downtown urban setting. Even before being called, the fire department showed up because of widespread public reports. The state agency got involved, and required a full explanation of the cause of the release and the probability it would occur again. That was last year, and the agency has not been heard from since.

In certain cases, complex engineering calculations are required to determine whether a reportable amount has been released. However, in the case of an ammonia spill, it is generally safer to assume a reportable quantity was released and report. Ammonia has a distinct odor, even in small amounts, so it is likely to be noticed by the public whether 50 lbs or more than 100 lbs have been released. Of course, ammonia's distinctive scent could be considered a plus for these systems because detection of a leak is usually immediate.

OSHA rules, which govern employee safety and health in the workplace, also govern ammonia. OSHA has an eight-hr time-weighted average permissible exposure limit for ammonia.

Ammonia is a "hazardous chemical" for purposes of OSHA's hazard communication standard (29 Code of Federal Regulation 1910.1200). When working with ammonia, your employees must be trained in its safe handling methods, and have material safety data sheets readily available.

However, by following proper safety and maintenance procedures, your ammonia-based refrigeration systems should give you years of safe and effective refrigeration.

### INTERNET RESOURCES

Visit the EPA's Website for a complete list of EPA-enforcement regulations: [www.epa.gov/epahome/laws.htm](http://www.epa.gov/epahome/laws.htm). OSHA's site is at [www.osha.gov](http://www.osha.gov).

Search your state government's home page for its Emergency Response Commission (ERC). Most ERC home pages contain important information and links regarding the release of regulated chemicals.

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