Regulatory Framework for NH3 Fuel

Derek Matthiessen, J.D.

derekmatthiessen@hotmail.com

Overview

- Agricultural and industrial commodity—established, extensive body of regulations governing the synthesis, storage, distribution and end use of ammonia.
- For ammonia as an alternative fuel, novel questions will confront to regulators.
- Communication, education and perhaps new legislation (lobbying efforts) may be required to address this challenge.

Current Regulations- Siting an Ammonia Synthesis and/or Storage Facility

- Municipality/County – Local Land Use Law. Your facility must be an “allowed use” or “conditionally approved use” under local zoning.
- Local/State – Building Codes. Building code and conditional use permit likely to require adherence to American National Standard Institute (ANSI) Safety Requirements for the Storage and Handling of Anhydrous Ammonia (ANSI K 61.1- does not apply to manufacturing). American Society of Mechanical Engineers and other standards may also apply.

Is there Federal or State Participation in the Project?

- If the project receives state or federal funding, uses state or federal resources (land, transmission) or requires state or federal approval it may trigger the requirements of the National Environmental Policy Act (NEPA) or a state equivalent (SEPA). NEPA requires a comprehensive assessment of your project, its associated risks and a benefits as well as alternatives.

Current Regulations- Operating an Ammonia Synthesis and/or Storage Facility

1.0 EPA- Clean Air Act (CAA)

- General Duty Clause [Section 112(r)(1) of the Act]- Facilities handling extremely hazardous chemicals (including anhydrous ammonia) have a general duty to assess hazards, design and maintain a safe facility, and minimize the consequences of accidental releases.
- Risk Management Program (RMP) Rule [40 CFR 68] - Facilities that have anhydrous ammonia in quantities greater than 10,000 pounds are required to develop a hazard assessment, a prevention program, an emergency response program, and submit a risk management plan to EPA.

Current Regulations- Operating an Ammonia Synthesis and/or Storage Facility

2.0 EPA - Emergency Planning and Community Right-To-know Act (EPCRA)

- Emergency Planning [40 CFR Part 355] and Hazardous Chemical Reporting [40 CFR part 370]- Facilities that have 500 pounds or more of ammonia must report to their Local Emergency Planning Committees (LEPC), State Emergency Response Commission (SERC) and local fire department and comply with certain requirements for emergency planning.
- Emergency Release Notification [40 CFR Part 355] - Facilities that release 100 pounds or more of ammonia must immediately report the release to the LEPC and to the SERC. CERCLA also requires reporting to the National Response Center.

Current Regulations- Operating an Ammonia Synthesis and/or Storage Facility

3.0 DHS

- The Department of Homeland Security (DHS) “Chemical Facility Anti-Terrorism Standards” Schedule applies to anhydrous ammonia in excess of 10,000 pounds. Certain risk analysis and additional security measures may be required.

Current Regulations- Operating an Ammonia Synthesis and/or Storage Facility

4.0 OSHA

- Storage and Handling of Anhydrous Ammonia [29 CFR 1910.111] provides detailed specifications of NH3 facility infrastructure, tanks, etc.
- Process Safety Management (PSM) Standard [29 CFR 1910.119] Anhydrous ammonia is listed as a highly hazardous substance. Facilities that have ammonia in quantities at or above the threshold quantity of 10,000 pounds are subject to a number of requirements for management of hazards, including performing a process hazards analysis and maintaining mechanical integrity of equipment.
- Hazard Communication [29 CFR 1920.120] - Requires that the potential hazards of toxic and hazardous chemicals can be evaluated and that employers transmit this information to their employees.

Current Regulations – Transport of Anhydrous Ammonia

DOT

- Federal Hazardous Materials Regulations [49 CFR 100-180] provides detailed regulations for the transport of anhydrous ammonia over highways.

Current NH3 Regs at a Glance

Authority	Storage	Transport	End Use
Local	* Land use/zoning * Bldg. code/ANSI	May prohibit HAZMAT on some routes	* Land use/zoning * Bldg. code/ANSI
State	* Bldg. code/ANSI * SEPA	May prohibit HAZMAT on some routes	* Bldg. code/ANSI * SEPA * Energy Facility Siting * 1 ton/year NOx Limit
Federal	* NEPA * Clean Air Act -RMP for + 10k lbs * EPCRA -notice for +500 lbs storage and +100 lbs release * DHS - reg. +10k lbs * OHSA -NH3 facility - hazard comm. - PSM + 10k lbs	DOT Regs.	* NEPA * Clean Air Act -RMP for + 10k lbs * EPCRA -notice for +500 lbs storage and +100 lbs release * DHS - reg. +10k lbs * OHSA -NH3 facility - hazard comm. - PSM + 10k lbs

Summary

- Most regulations governing NH3 fertilizer use could remain for NH3 fuel. Regulation of NH3 as fertilizer is relatively relaxed, however, due to the fact that it is largely used away from highly populated areas. NH3 as a fuel will challenge this.
- When possible, keep it under 10,000 pounds!
- Discuss best practices, consider voluntary standards where appropriate.
- Added aspects for fuel will feature
  - Emissions from combustion
  - Mobile aspects of vehicle storage

Follow-up

- Derek Matthiessen, Regulatory Consultant
- derekmatthiessen@hotmail.com
- 503-348-1540