

Safety and Compliance Tools

Innovative Solutions

Anhydrous Ammonia

Safe Handling in the Retail
Fertilizer Market



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Safety and Compliance Tools



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Safe Handling of Anhydrous Ammonia

- Total US Production FY 04/05
- 11,800,000 tons
- Imports 8,200,000 tons
- According to the TFI



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Safe Handling of Anhydrous Ammonia

- US usage in 2004
- According to Commercial Fertilizer Report
- 4,068,586 tons directly applied



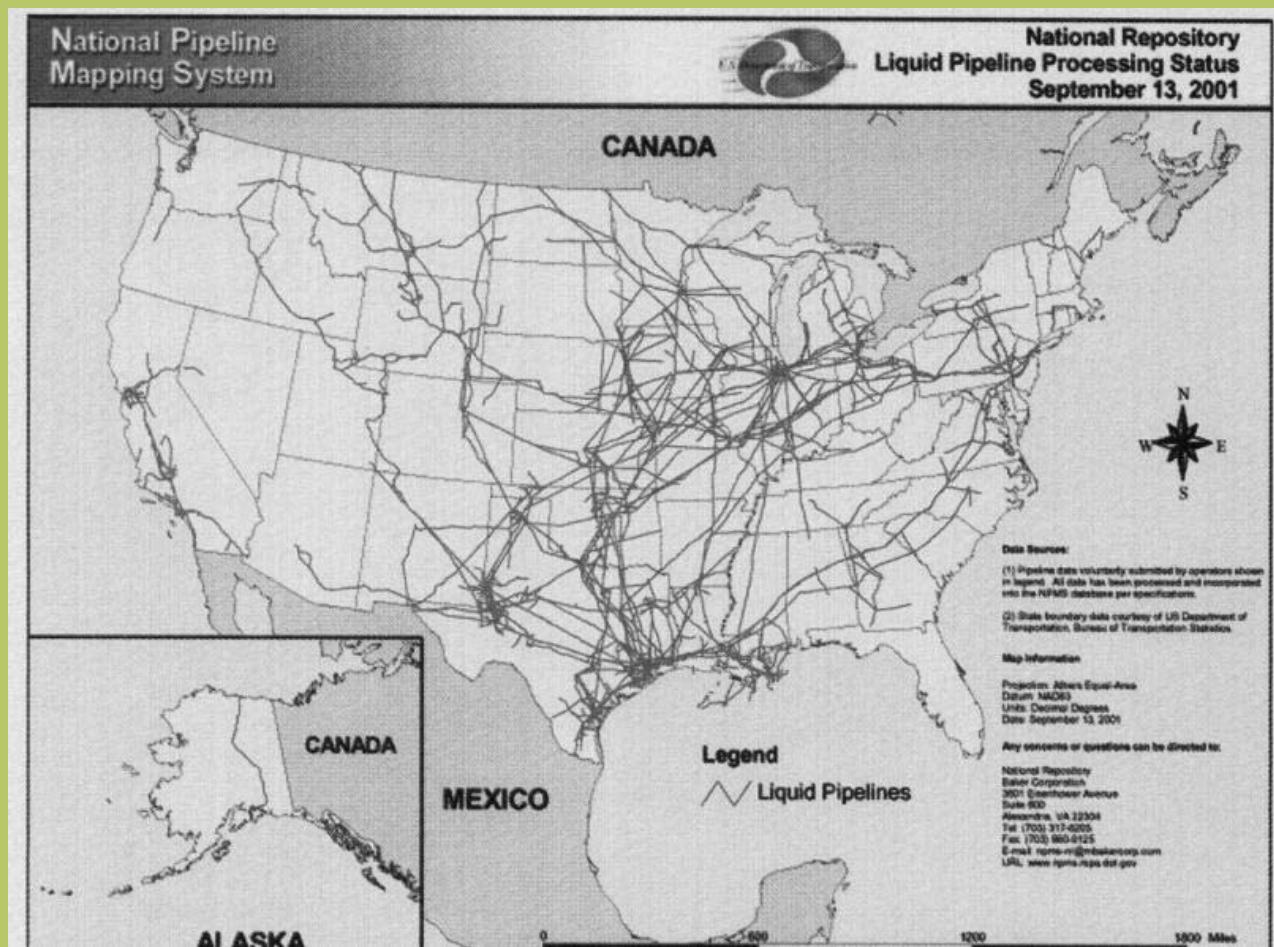
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Safety and Compliance Tools



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Pipelines



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Retail Facility

- Storage tank
- Unloading risers
- Loading risers
- Nurse tanks
- Tool bars or applicators



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Retail Facility

- Facility receives NH₃ by
 - Train car
 - Truck transport



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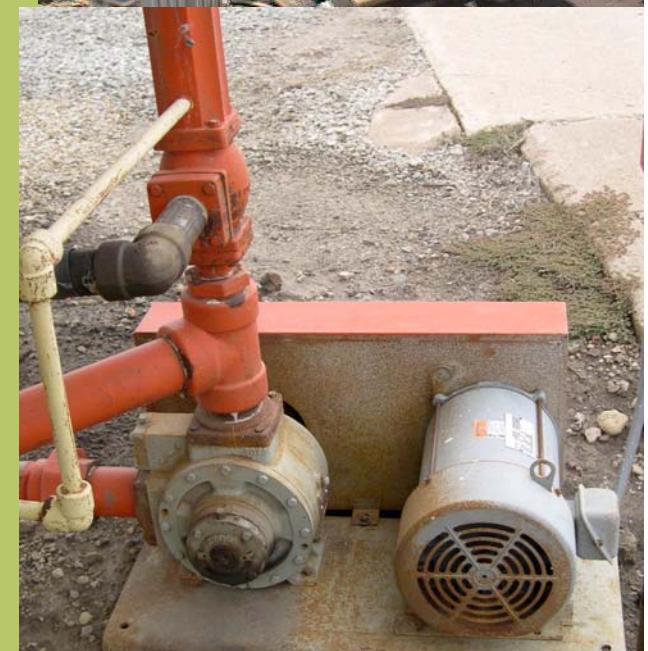
Safety and Compliance Tools



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Transfer Process

- Liquid pump
- Compressor
- Both used to fill nurse tanks



Safety and Compliance Tools



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Transfer Safeguards

- Excess flow valves
- Breakaway couplers

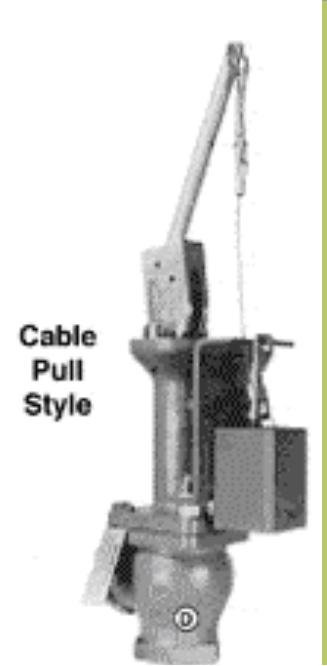


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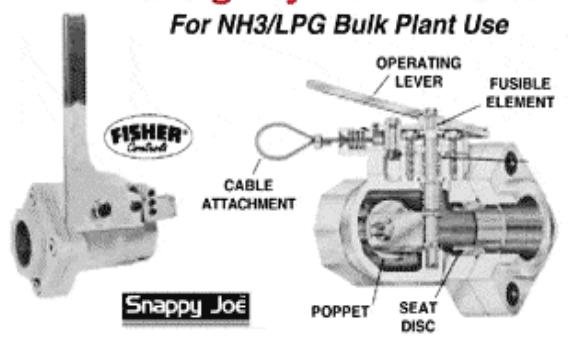
Retail Facility Safeguards

- Equipment
 - Valves
 - Emergency shutoffs
 - Pressure relief valves



Emergency Shutoff Valves

For NH3/LPG Bulk Plant Use



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Retail Facility Safeguards

- Replacement of relief valves:
 - Pressure relief
 - Hydrostatic relief
- Excess flow valves



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Transfer Safeguards

- Pressure by-pass valve
- Emergency shut-off valves in line



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Retail Facility Safeguards

- Annual training required by law
 - Properties and characteristics
 - Safe handling practices
 - Emergency response



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Retail Facility Safeguards

- Annual inspections by State
- ANSI K-61.1 Standard
- Equipment updates
- Routine maintenance



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Safety Equipment

- Ammonia proof gloves
- Non vented goggles
- Canister respirators



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Accidents do happen!



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Safe Agricultural Resource

- Anhydrous ammonia is safe
- When handled properly
- By trained individuals



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