



Module 4: Storage and Dispensing Locations

Objective

Upon the successful completion of this module, participants will be able to discuss common and unusual needs for storage and dispensing of ethanol-blended fuels.

Introduction

- Often fail to think of gas stations when thinking of ethanol-blended fuels
- Believe if there is no bulk storage operation / production operation in jurisdiction, have little to worry about

Terminal Storage of Ethanol-Blended Fuels

- Denatured E-95 most common ethanol blend in storage in terminals & tank farms
- Other formulations blended during loading process for transport:
 - Bottom-loading 2 components into tanker trucks
 - Go through in-line mixing / static mixing systems prior to bottom loading process

Terminal Storage of Ethanol-Blended Fuels

- E-95 typically stored in conventional carbon steel storage tanks:
 - May be smaller than other tanks at terminal
- 3 general types of storage tanks:
 - Cone roof (closed-top) tanks
 - External floating roof (EFR) tanks have open top with a floating pan
 - Internal floating roof (IFR) tanks with closed top & internal floating pan

Terminal Storage of Ethanol-Blended Fuels

- Commonly delivered via tank truck / rail car / barge:
 - Currently no common pipeline delivery method
- E-95 normally stored in IFR tanks



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Terminal Storage of Ethanol-Blended Fuels

- Built-in fire protection systems:
 - Fixed systems:
 - Combination of devices permanently installed
 - Provide fire protection
 - Can be activated manually / by detection device

Terminal Storage of Ethanol-Blended Fuels

- Built-in fire protection systems:
 - Systems may no longer be appropriate
 - Rendered inoperable at onset / during fire or explosion emergency

Terminal Storage of Ethanol-Blended Fuels

- Preplanning for potential events at tank farm facilities extremely important
- Fire departments that help provide protection to tank farm facilities should have:
 - Access to high-flow fire fighting foam equipment
 - Large supplies of compatible foam available on hand

Terminal Storage of Ethanol-Blended Fuels

- Consortiums between multiple tank farm operations & fire department
- Built-in fire suppression systems currently best protection for large storage tanks
- Fire department personnel should be familiar with systems & pre-calculate required flow rates
- Preplan operations supplying systems
- Practice exercise at least annually

Terminal Storage of Ethanol-Blended Fuels

- Challenges:
 - Provide limited access for fire fighting equipment
 - May be inadequate water supplies in area
 - Personnel may have to contend with containment dikes & their systems
 - May be miles of exposed product piping involved
 - May be unprotected loading rack facilities

Terminal Storage of Ethanol-Blended Fuels

- Pre-fire planning extremely important
- Pre-established working relations between fire department & facility operators

Bulk Plant and Distribution Facilities

- Smaller bulk distribution storage facilities may pose greatest challenge to local fire departments
- Flammable liquid fuels stored at facilities in modest quantities

Bulk Plant and Distribution Facilities

- Gasoline / Ethanol-blended fuel normally stored in underground tanks / small volume above-ground steel tanks
- Vertical / Horizontal design
- Most likely E-10 mixture
- Most do not have built-in fire protection systems

Bulk Plant and Distribution Facilities

- Spill diking usually designed to contain largest tank in facility
- Incidents involving multiple tanks in facility may overtax designed containment area

Retail Dispensing Stations

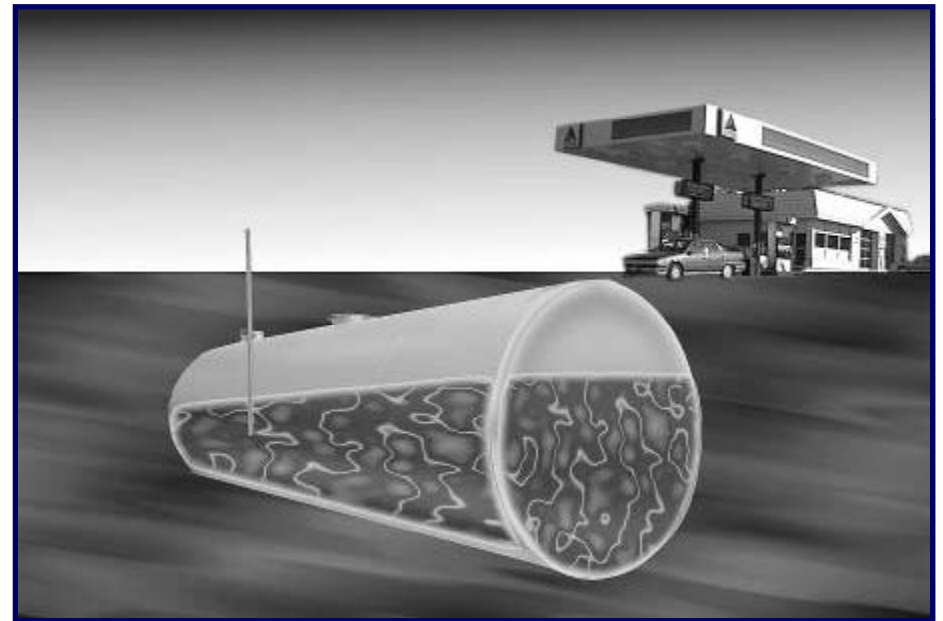
- Majority have underground storage tanks
- Relatively small in storage volume, large in number throughout country
- May / May not have vapor recovery systems associated with sites
- Larger volume gas stations may have above-ground storage tanks

Retail Dispensing Stations

- Filled by tankers
- Early 2008: over 1,000 fueling sites handling E-85
- Thousands more handling E-10
- Number expected to increase

Retail Dispensing Stations

- Stored in horizontal underground tanks:
 - Maximum pressure 0.5 psig
 - Tank capacities
 - Typically constructed of steel & double walled



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Retail Dispensing Stations

- Stored in horizontal underground tanks:
 - Emergency shut-off valves vary
 - Loading & unloading points vary
 - Risers for multiple tanks color-coded / marked to identify product

Summary

- Most commonly found ethanol-blended fuel at terminal facilities is E-95
- Fixed fire suppression systems often rendered inoperable at onset of incident
- Preplanning for potential events at tank farm facilities extremely important:
 - Sources of mutual aid
- Amount of fuel stored at each station small, sheer number may be cause for concern

Activity 4.1 — Ethanol in Your Jurisdiction

- Purpose:
 - To allow participants to determine the potential for ethanol emergency in their jurisdictions.