Module 5:

Storage and Dispensing Locations

RFA
RENEWABLE FUELS ASSOCIATION

TRANSCAER℠
TRANSPORTATION • COMMUNITY AWARENESS • EMERGENCY RESPONSE

Objective

Upon completion of this module, participants should be able to discuss common locations for storage & dispensing of ethanol-blended fuels and will provide a basic understanding of these storage/ dispensing sites.

Introduction

Recognition of storage locations in the community:

- Production facilities
- Liquid product terminals
- Transload facilities
- Construction sites
- Retail fueling stations

Storage Tank Types

Storage Tank Design

- Typically stored in conventional carbon steel storage tanks
  - May be smaller than other tanks at terminal
- 4 general types of storage tanks:
  - Horizontal storage tanks (above and below ground), possibly with built in containment systems
  - 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 (most common storage type for denatured fuel ethanol)
    - IFR tanks may also have been retro-fitted from EFR with a geodesic dome type design instead of a conventional carbon steel metal roof and may be used for storage of ethanol-blended fuels

Storage Tank Design

Internal floating roof (IFR) tanks:

- Closed roof
- Internal floating pan
- Eyebrow venting
- Fire protection

Spill Containment

Spill containment dikes usually designed to contain largest tank within the contained area

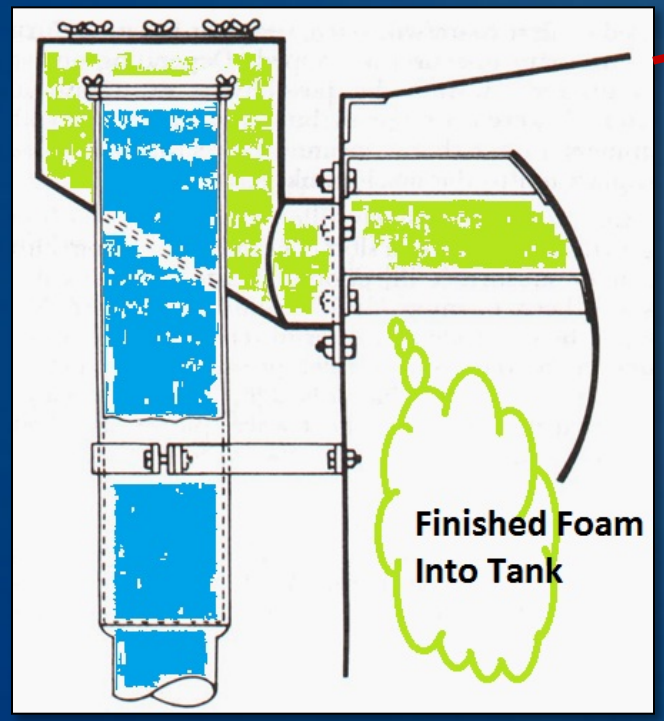
Fire Protection Systems

Fixed (Built-in) fire protection systems:

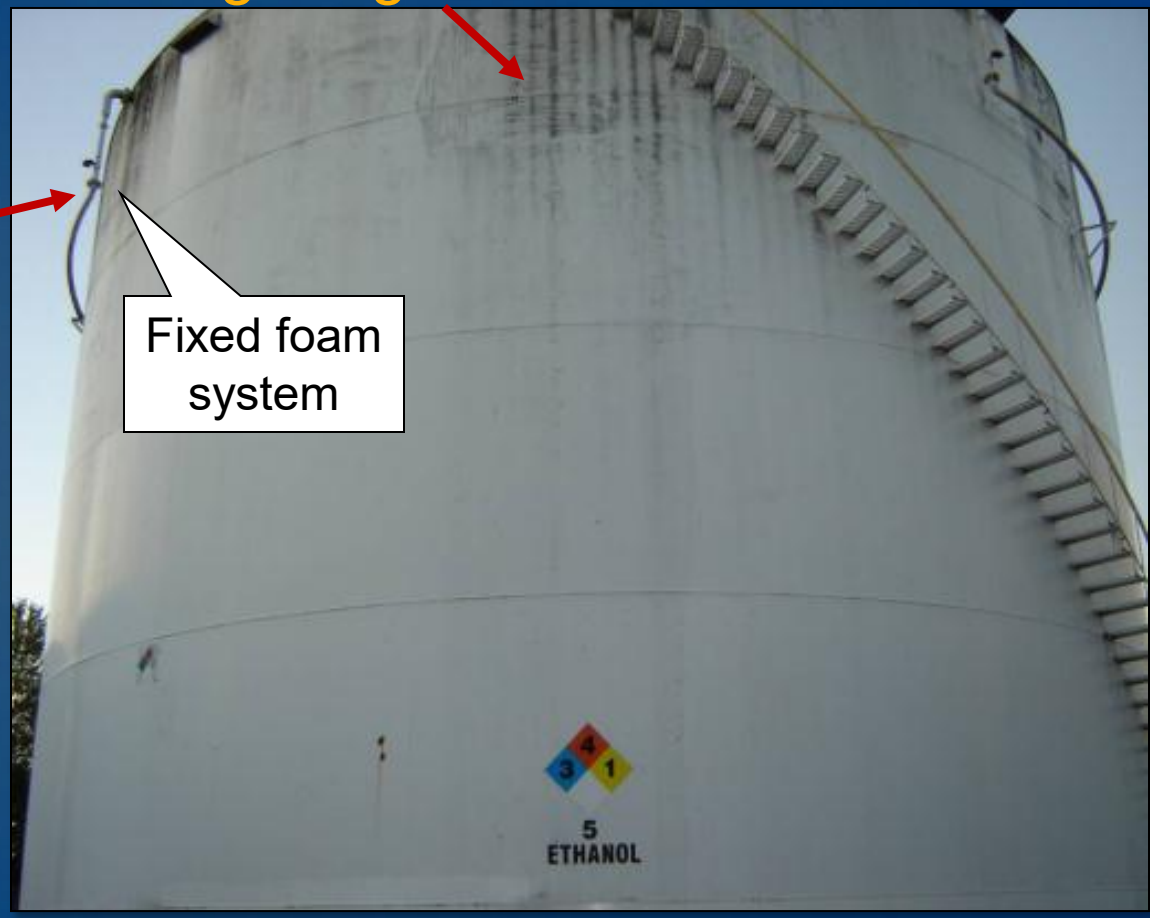
- Can deliver water, foam or a combination of extinguishing media
- Combination of components permanently installed
- Can be activated manually &/ or by detection device
- Fire protection systems should meet current industry standards & codes

Built in Fire Protection Systems

Fixed foam system



Biological growth



Foam Deflector Device

Emergency Response

Pre-planning

- Pre-planning for potential incidents at liquid product terminals is extremely important
- Fire departments that help provide protection to liquid product terminals should have:
  - Access to high-flow fire fighting foam equipment
  - Access to large supplies of compatible AR-AFFF foam available

Emergency Response Planning

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

Key Considerations

Emergency response challenges:

- Limited access for fire fighting equipment
- Inadequate water supplies in area
- Containment dikes & their systems
- Miles of exposed product piping
- Loading rack facilities

Working Relationships

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

Terminal Size Considerations

- Smaller bulk distribution storage facilities may pose unique challenges to local fire departments
  - Possibilities include:
    - No fire protection
    - Unstaffed
    - Limited site resources
- Flammable liquid fuels stored at facilities in modest quantities

Terminal Size Considerations

- Large distribution storage facilities also pose unique challenges to local fire departments
  - Possibilities include:
    - Size of fire emergency
    - Multi-dimensional emergency situation
    - Multiple type and large quantities of resources needed
- Flammable liquid fuels stored at facilities in significant quantities

Group Discussion

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Storage at a Production Facility

- Ethanol storage at production facility:
  - Ethanol tanks (1 & 2)
  - Denaturant tank (3)
- Tanks are identified by markings

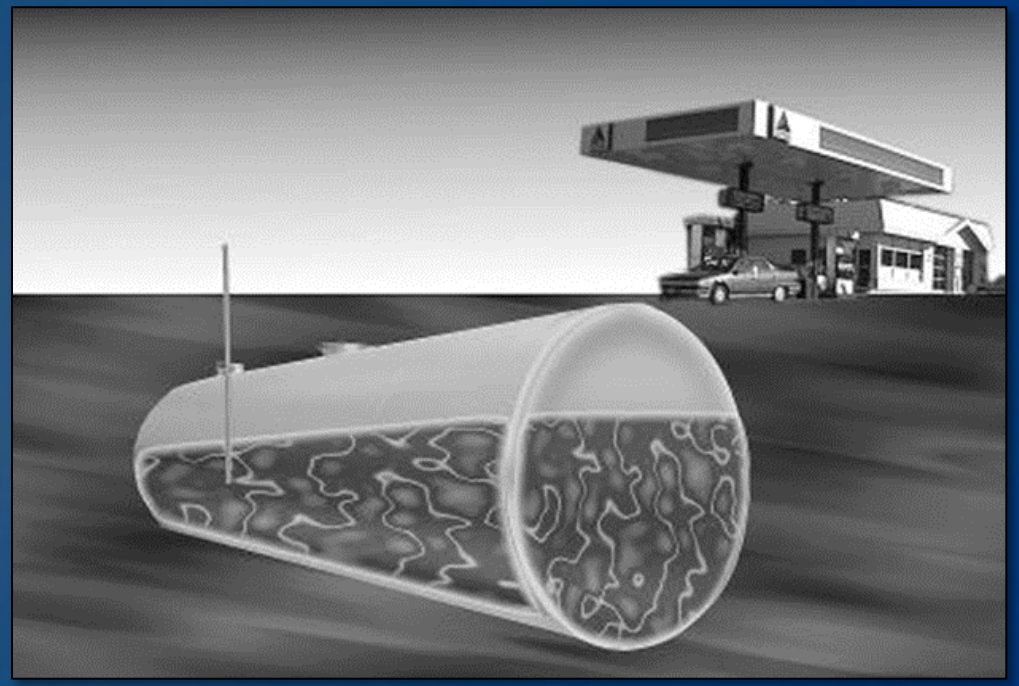
Retail Dispensing Stations

- ~115,000 retail fueling stations
- Retail fuel storage configurations:
  - Most common underground tanks
  - Small volume above-ground steel tanks
- Tanks are vertical or horizontal design
- Filled by highway cargo tank trucks

Retail Tank Configuration

Most common tank configuration is a horizontal underground tanks

- Emergency shut-off valves
- Loading & unloading points
- Risers for multiple tanks color-coded/ marked to identify product



Summary

- Denatured fuel ethanol is commonly found at liquid product terminals
- Pre-planning for potential events at liquid product terminals is extremely important
- Facility familiarization & relationships
- Liquid product terminals vary greatly in capacity & the types of products stored
- Retail fueling stations have many different storage tank configurations

Activity 5.1:
Ethanol in Your Jurisdiction

Purpose:

- To allow participants to determine the potential for an ethanol emergency in their jurisdictions