Atmospheric Storage Tank
Fire Protection
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Main Types of Atmospheric Storage Tanks

- **Fixed Roof**
  - Roof does not move
  - Typical for smaller tanks (<50 ft. diameter)

- **Floating Roof**
  - Roof floats on liquid surface
  - **External**
    - Area above roof open to atmosphere
  - **Internal**
    - Fixed roof over floating roof
Tank Fire Scenarios

- Rimseal Fire
- Spill on Roof Fire
- Full Surface Fire
- Bund Fire
- Pontoon Explosion
Fighting Fires in Atmospheric Storage Tanks

- Foam/water is required for hydrocarbon fires
  - Forms layer of foam “bubbles” on surface of burning liquid to extinguish fire
- Larger tanks = more foam
- Largest Sunoco crude storage tank requires 11,000 gpm of foam/water solution (330 gallons of foam concentrate at 3%)
- 20 minutes of application requires 220,000 gallons of water and 6,600 gallons of foam concentrate
Foam Proportioning Systems

Fully Fixed System  Semi Fixed System
Seal Foam Application
“Over the Top” Foam Application
Case Study
Operating & Service Data

- Xylene at the 26’ level (36,000 bbls)
- Cone Roof
- 100’ diameter
- 40’ height

Tank 15
Full surface fire with roof blown off and slightly hinged to the East
Strategy was offensive with a one point of application non aspirating nozzle utilized.
Incident Emergency Response

Volunteer Organizations

Participating Companies:
- STA 6-1 Thorofare
- STA 6-2 Verga
- STA 6-3 Colonial Manor
- STA 6-6 Greenfields
- STA 15-1 Woodbury Heights
- STA 21-1 Gibbstown
- STA 9-2 Deptford (Tacoma Blvd station)

Staging outside of West gate:
- STA 13-1 Wenonah
- STA 22-2 Mantua
- STA 17-1 Paulsboro
- STA 18-1 Bridgeport
- Deptford Canteen 1
- Cherry Hill FD Canteen

Industry Mutual Aid:
- STA 21-4 Valero Refinery Fire Department
Sunoco NER Fire Department Response “Tank Taskforce”

**Eagle Point Refinery**
- Pipeline 1
- Tanker 67
- Engine 9

**Philadelphia Refinery**
- Engine 4
- Truck 7
- Tanker 9
- NER Fieldcom 1

**Marcus Hook Refinery**
- TAC 80
- Tanker 80
- Engine 10
- Rehabilitation 1
Incident Emergency Response
State/Local Agencies

- New Jersey Division of Fire/Safety
- State Fire Marshal (Larry Petrillo)
- Captain Mike Gallagher
- Gloucester County Mobile Communications (Fieldcom 1)
- Gloucester County OEM
- New Jersey DEP
- New Jersey State Police
Tactical unit at the 6 O’clock position capable of delivering 5,000 GPM
Engine 9- 6,000 GPM pump which supplied the Water and foam proportioning for the appliances and apparatus at the tank
Total time from ignition to fire out 3.5 hours, with actual 20 minute foam time. Replenishing of the foam blanket continued until the tank was emptied by operations. A great portion of the tank and product were saved. Sunoco NER facilities participated with suppression activities. Manning 12 response vehicles, 65 trained personnel, and 15 additional providing coverage in the event of an emergency within NER.
The Next Day
What made it safe and efficient?

- NER tank fire task force General Order
- Frequent EOC drills
- Frequent ERT training
- Frequent interaction with Local and State emergency response agencies
- Pre-plans
- Specific tank training seminars/schools
- Organized Communication Center
- “Around-the-pump” delivery technology