Tender Apparatus Response Plan "TARP"


KEARNY
FIRE DEPT.
ENGINE NO. 5
BERNARDSVILLE
22-135

History

- Water Infrastructure Report
  - Identified several major concerns with the existing water supply infrastructure including:
    - Northern New Jersey is home to some of the oldest communities and cities in the United States.
    - The primary areas of concern are comprised of the following UASI Regions;
      - Bergen, Essex, Hudson, Passaic and Union.
    - These regions are serviced by both municipal and private water utilities.

Report

- Major infrastructure changes have occurred in urban areas of northern New Jersey

- Cities containing transportation hubs (bus, train, light rail) have seen the most change.

Report

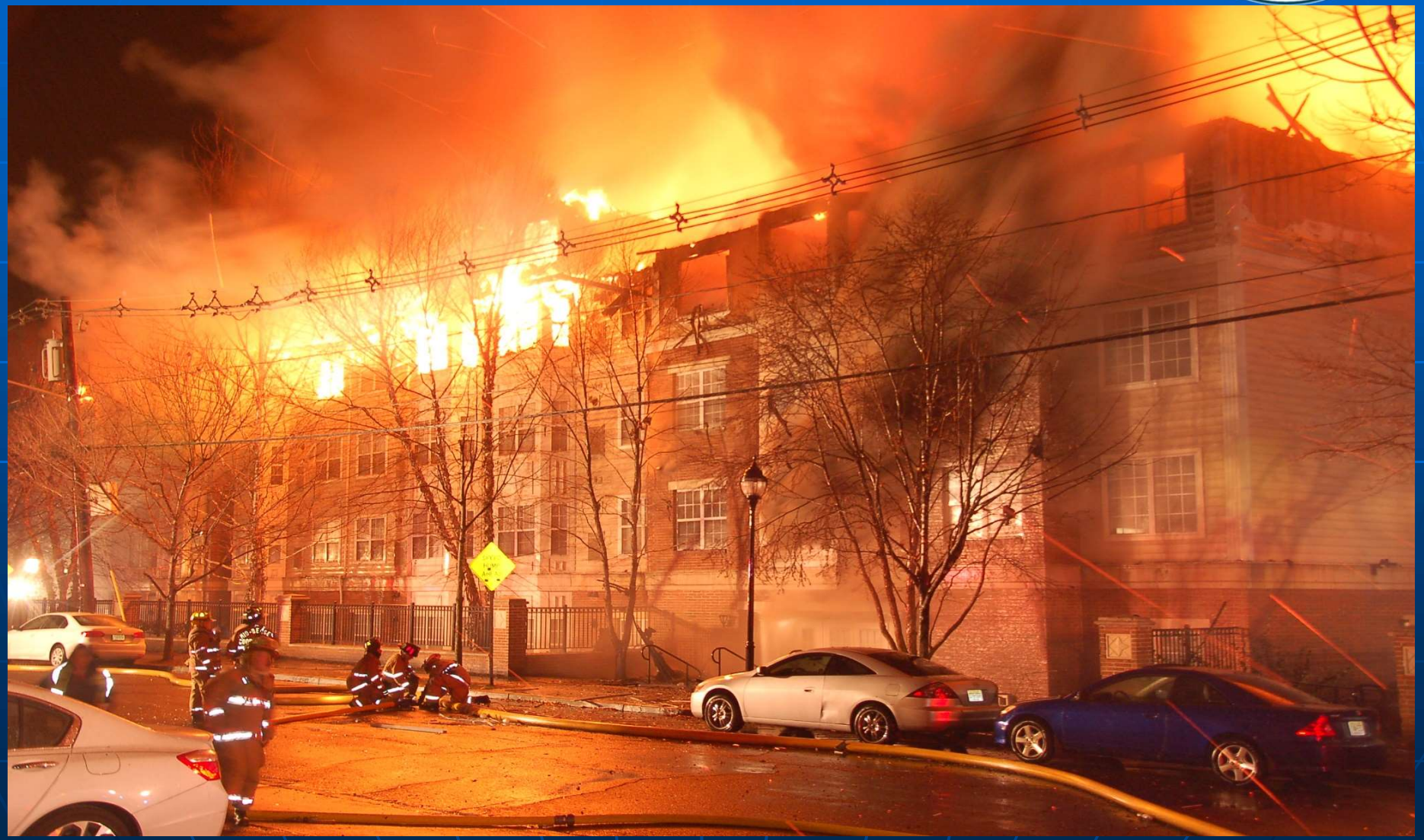
- Downtown areas being developed as large "multi-use" complexes consisting of commercial residential mix buildings.
- Lightweight wood, hybrid, podium type construction has become the norm.
- Exposure protection, life safety, adequate water supply, and fire department access have become critical elements of delivering an effective fire suppression operation.

Urban Area Hubs

Podium Pedestal Construction

Each podium or foundation floor is considered a separate building for fire separation purposes allowing increased height and area

Edgewater 2015



Maplewood, NJ – February 6, 2017

- A massive fire blew through a luxury apartment complex that was under construction before it caught fire around 1:30 a.m. Saturday.
- Town officials say 235 units were planned for the complex overall, and roughly 30 of them were due to be ready for occupancy in about six weeks. Authorities said more than two - thirds of the community was destroyed by the blaze

Report

- Current water infrastructure is old. Many systems lack the required maintenance. This occurs in both private and public systems.
- Loss of water mains will cause significant impacts on water supply for drinking and fire suppression operations for multiple days.
- Many communities lack redundancy in their ability to supply water to their residents and fire suppression operations in the event of a major interruption.

Report

- Identified numerous incidents during which water tenders from rural fire departments in Morris, Sussex, Somerset, Warren, and Hunterdon were moved into urban areas to supplement fire department resources.
- Rural volunteer fire departments are unable to provide adequate staff during extended operations.
- The rural departments sending mutual aid tenders loose the ability to provide water supply and fire suppression operations in their own communities.

Report

- Use of mutual aid tenders in urban areas has been on the rise in recent years.
- The resources required to provide an adequate response of tenders in conjunction with typical mutual aid requests are substantial.
- Proper planning is required.

Report

- This has demonstrated the need for a RESPONSE and OPERATIONAL guideline for the deployment of water tenders into urban areas

- Fire Coordinators from a number of urban and rural communities met to define a solution and develop a response and operation guideline for urban based departments.

Report

- The finalized report made the following recommendations:

  - Deliver a Tender training program coordinated through the Division of Fire Safety and Kean University.
  - Proposed purchase of Tenders for UASI Region.

  - Program would train urban area departments in;
    - tender operations
    - response plan development
    - alternative water supply options.

Scope

- There is a need to identify areas of concern, prior to a water emergency where water tenders will be deployed as the SOLE water supply for fire suppression.
- Every city needs to develop and implement a SOG/ SOP for these types of emergencies.
- These responses can be planned in various ways:
  - A known water emergency without a fire incident.
  - A actual fire incident where water supply has failed.
  - A large scale water main break with long term impact.

UASI Program Purpose

- Train department Chiefs and officers to identify and implement this type of response.
- Understand and support the critical need to assign a "Water Supply Officer" during these events.
- Train other agencies within jurisdictions on how they will be affected and required to assist in this operation. (Police, OEM, DPW, etc.)

UASI Program Purpose

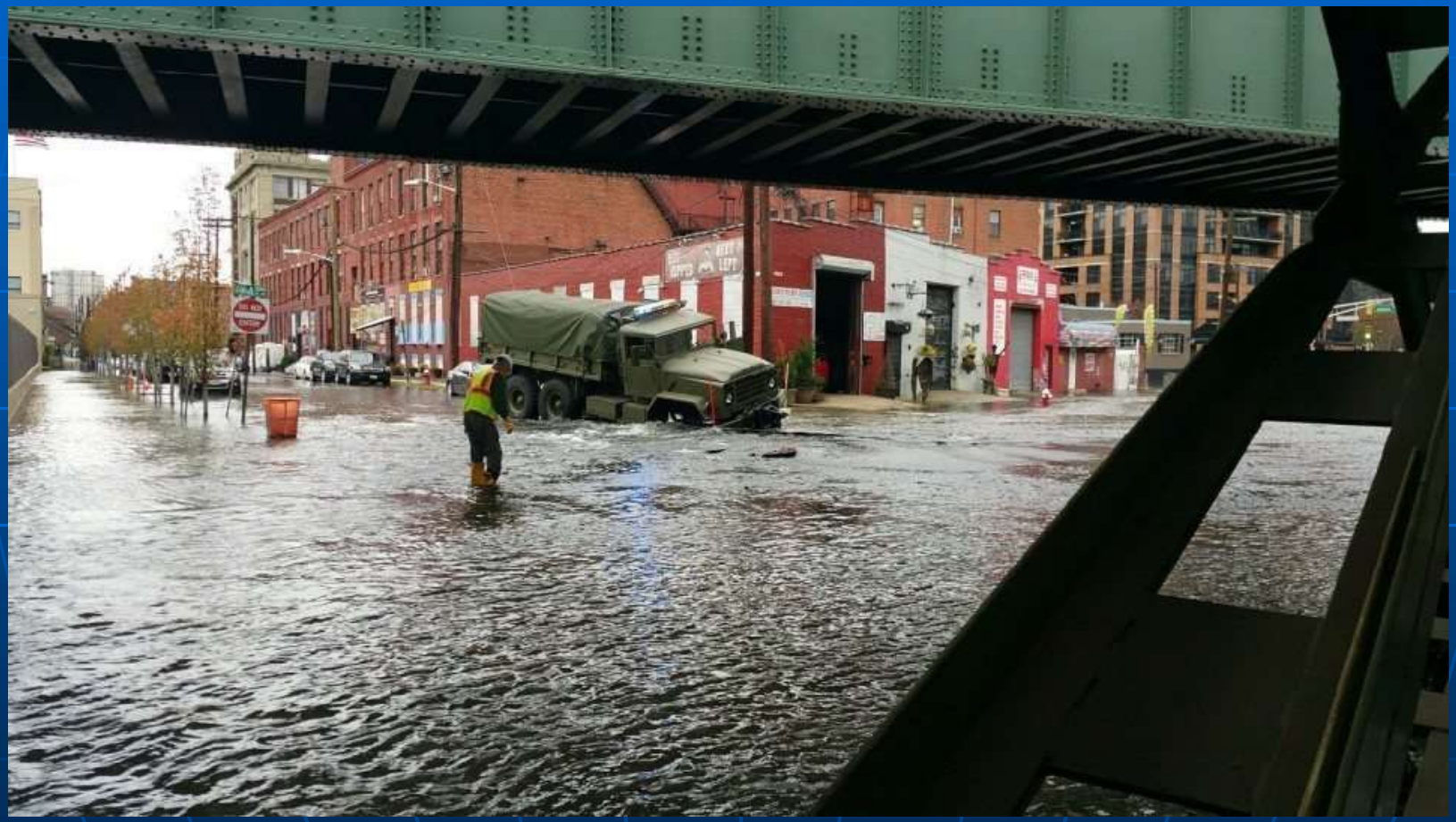
- This program has been designed to make Tender Operations as simple as possible for urban departments in order to avoid large loss fires.
- This program introduces the basic concepts to move water with Tenders from Point "A"(source) to Point "B"(fireground).
- Training – this program is designed to be delivered to fire departments by firefighters trained as TTT instructors.

Preventing Large Loss Fires in Urban Environments

Building a "TARP" Plan

- There should be two types of plans "Non - Emergent" and "Emergent"
- Non - Emergent – Community is experiencing a water emergency. Discussion with water department on extent and duration of outage is necessary.
  - Move tenders into place if prolonged outage.
- Emergent – Fire occurs during an outage or outage occurs during a fire. Request for pre-planned Tender apparatus automatic aid.
- Build plan three alarms deep.

Non - Emergent Water Emergency



If the need arises YES you can draft from a source such as this.

Emergent Water Emergency

Building a "TARP" Plan

- Pre-Planned Tender Selection
  - Do you need a pump on the apparatus and if so what GPM.
  - Does it carry a portable tank?
  - Where are the dump-valve locations – rear, left and right?
  - What is the response time? Many of these tenders will be traveling a long distance and many are staffed by volunteers which delays the response as they have to muster first.

Building a "TARP" Plan

- Tender Selection
  - Can you access the potable water tenders and will they be sufficient and how many?
    - Hudson County
  - Will you need a draft or dump site engine to respond with the group?
  - General rule is one engine for every three tenders.
  - Build a three alarm response and spread the tenders out across different counties as not to deplete their required operations.

Potable Water Tenders

Building a "TARP" Plan

- Water Supply Maps – should be available to all officers to determine next available water source and fill site if needed for tender operations.
- Pre-planned hydrant fill sites, static water sources (lakes/ponds), and dry hydrant locations (if available) shall be identified.
- Road Maps & Plan – if a tender operation is put into service Police, OEM, and DPW will need to be involved with keeping streets open for tender movement.

Building a “TARP” Plan

- Tender Set Up – Decide how to operate. Assign Water Supply Officer.
- Place a tender with first due engine (nurse tender) or place tender at end of street and drop portable tanks to set up dump and supply site.
- Build alarms – Use the tender resource guide to pick the tenders that would best suit your environment. Build the plan three alarms deep.

Building a “TARP” Plan

- Contact information regarding mobile fuel delivery to apparatus shall be identified in the plan.

- The jurisdiction requesting tenders shall have a contingency plan to lodge and feed all members of the task force, at no expense to the responding agencies.

Building a "TARP" Plan

- The jurisdiction requesting the apparatus shall have a water tender plan to house the tenders and fill engine.
- Tenders may be housed outside in a secured facility. However during cold weather these apparatus MUST be housed inside a heated facility.
- The jurisdiction shall assign a "Bird-dog" or "Scout" to escort the tender task force into the jurisdiction and during operations.

Building a "TARP" Plan

<u>Training– once developed the TARP plan should be exercised annually</u>.

- Exercise should mirror real life situations
- Should involve all communities on run cards
- After action report developed to identify and correct complications
- Report should be distributed and reviewed by participating departments

Building a "TARP" Plan

Training– once developed the TARP plan should be exercised annually.

- Individual departments should review and train on internal standard operating guidelines quarterly
- TARP plan shall designate county coordinators as the individuals responsible to provide the required resources (one stop shopping)
- County coordinators will initiate notifications to State officials

Pre - Scheduled Water Disruption

Pre - Scheduled Water Disruption

- Water Utility Authorities should make notification of any planned disruptions of service such as maintenance or infrastructure improvement
- Identify any target hazards within your community such as Hospitals, Schools, High Rises.

- This notification should trigger a Pre - Planning session of all entities involved;
  - Fire
  - DPW
  - Police
  - OEM

Water Emergency

- A water failure may affect an entire community or just a neighborhood, response plans are required throughout the area.
- Consider the impact to your agency and create a plan to include:
  - The impact of water disruption on fire protection systems, water booster pumps, sprinkler systems.
  - More methodical, slower paced than a fire suppression operation. More time to make critical strategic and tactical decisions

Notify the County Fire Coordinator - advise of the incident and request additional resources

Determine Scope Incident

Small scale incident

- Pre - Scheduled maintenance or repairs
- Local impact - NO mutual aid resources required
- Monitor incident through EOC, IC or Command Post
- From past experiences water utilities DO NOT provide accurate real time information.

Determine Scope of the Incident

Large scale incident

- Citywide - mutual aid required
- Multiple towns cities - mutual aid required
- County Fire Coordinator and Chief IC determine the amount of mutual aid resources required for fire protection

Water Emergency

Local Fire Chief Incident Commander will determine

- Extent and impact of the water emergency
- Location of damage, access in area

- Determine availability of local assets
  - Impact area may include immediate mutual aid
  - County Local OEM potable water

- Request Mutual Aid Tenders early due to extensive lead time

<u>Notify</u> the County Fire Coordinator - advise of the incident and request additional resources

Water Emergency

- Tender resource list by county should be readily available as this identifies units that best operate within that cities plan.
- OEM should have an inventory of system resources, maps and schematics of the water system.
- County Fire Coordinator maintains lists of resources, emergency equipment, equipment suppliers, and emergency contacts.

Notify the County Fire Coordinator - advise of the incident and request additional resources

Water Emergency

- Determine the need for mutual aid resources
  - Tender Strike Team
  - Tender Task Force
  - LDH Strike Team

- Identify radio channel to be utilized by Water Supply group.
  - Choose an ITAC/ UTAC Radio Channel
  - Utilize OEM Communications Coordinator

Notify the County Fire Coordinator - advise of the incident and request additional resources

Water Emergency

Potential Large Scale Agency Involvement

- Fire
- Police
- Emergency Management
  - local county state
- Water Department
  - Public / Private
- Utilities
  - Gas /Electric /Phone
- Red Cross
- Housing Authority
- Mayor / City Manager
- Press
- National Guard
- Chamber of Commerce
- Board of Education

Water Emergency

- A Water Emergency can occur at any time of the day or year, determining the scope of the incident is paramount for the Fire Department and other city services.

- A Unified Command Post should be established and staffed as soon as possible with;
  - Operations Section
  - Planning Section
  - Water Supply Officer (WSO)
  - Logistics

Unified Command Post (ICP)

Liaison

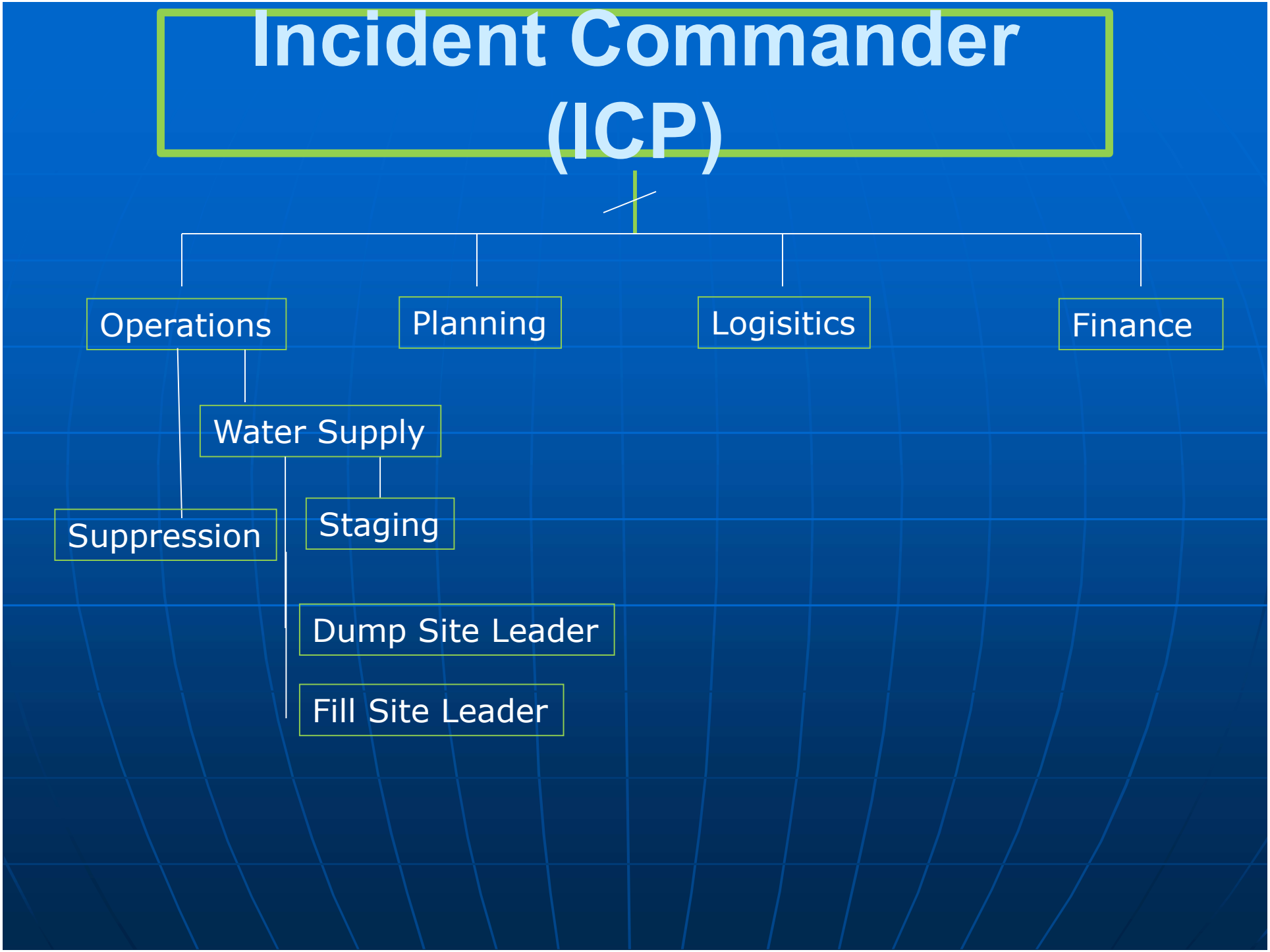
FD Superior
County Fire Coordinator
DFS Representative
Local Traffic Officer
Utility Representative
Target Hazard Reps

Safety

Incident Safety Officer
Fill Site Safety
Dump Site Safety
Fireground Safety

P I O

Municipal Representative
Police Superior OEM
Fire Department Superior
Utility Representative


Incident Commander (ICP)
Operations
Planning
Logisitics
Finance
Water Supply
Suppression
Staging
Dump Site Leader
Fill Site Leader

Duties of the Water Supply Officer

To conduct the tactical operation of providing sufficient water to meet needed fire flows (NFFs) at fire incidents.

Water Supply Group

- Water Supply Officer: Is in charge of all the water supply group and all water supply operations at the incident.
- They determine;
  - Locations and capabilities of water sources
  - If additional equipment/apparatus is needed
  - Establishes and communicates refill points
  - Tender and engine resource needs
- Coordinates with fire ground operations and the IC to ensure sufficient water supply is being provided and requests additional resources as necessary.

Water Supply Group

- Except during relatively simple operations, establishing and maintaining effective responsive water supply operations warrants creating a distinctive functional group command.

Water Supply Group

This functional group, operating under the Operations Section Chief, address multiple issues;

- Estimating anticipated water usage.
- Determining locations capabilities of resources
- Developing an effective traffic circulation plan
- Determining if supply and demand are adequate
- Exchanging information with command staff relevant to changing incident circumstances, priorities, tactics and support needs.

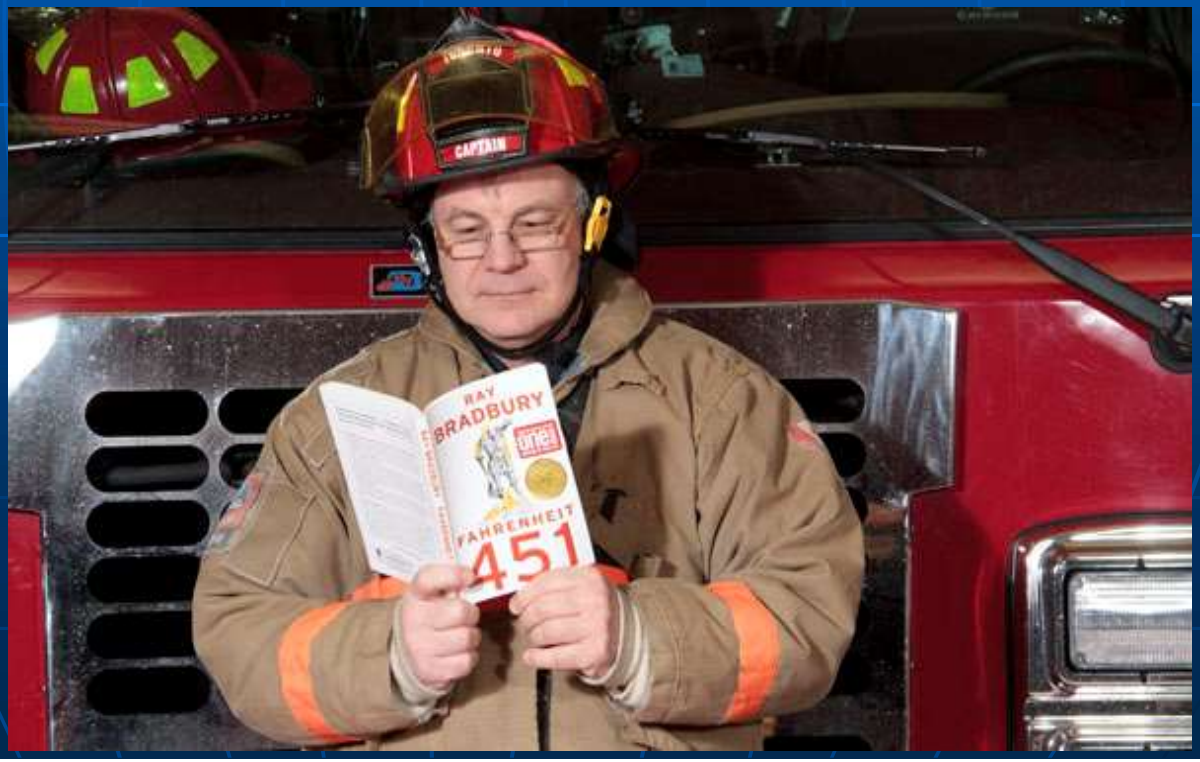
Water Management Team

- Consider developing a team within your Mutual Aid group that can respond and assist the Incident Commander with water supply needs.

- One individual from each county department who understands the concepts of alternative water supply and is capable of operating as a water supply officer should be assigned to the mutual aid team.

Definitions

- To have a better understanding of the fire service nomenclature that will be utilized in this Basic Water Movement Program, the following is a list "Common Terminology" as it relates to this program.



Definitions

In recent years with the surge in wildland firefighting and the adoption of NIMS a conflict has emerged over vehicle terminology, more specifically whether the vehicles are tankers or tenders.

Wildland utilizes Air ***Tankers*** for water drops and then utilizes ***Tenders*** as a truck to haul water during ground operations or to re-supply air units.

Definitions

- Water Supply Officer (WSO)
- Fill Site
- Dump Site
- Shuttle Operation
- Relay Pumping
- LDH Task Force
- Estimated Fire Flow

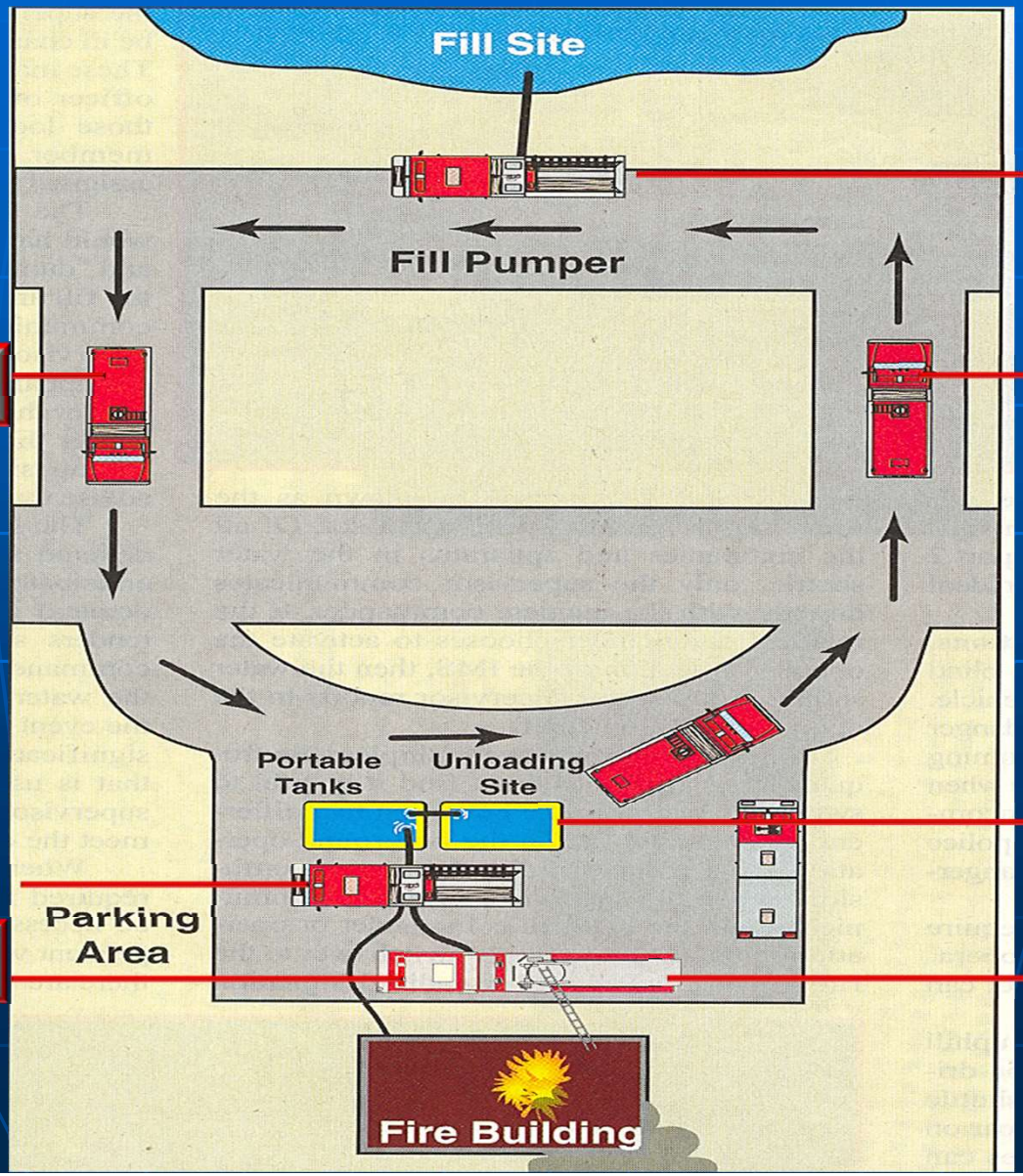
Shuttle Operation

- A tender shuttle is required when command is faced with a fire incident in a non-hydrant area with limited or no drafting sources or during an emergent water supply situation.
- In this case water needs to be delivered to the incident scene via tenders.
- Being prepared to draft isn't as simple as carrying basic suction hose and a barrel strainer on your apparatus.

Shuttle Operation

- **Resources:** Fire Departments and County Coordinators need to implement the pre-planned tender task force response to ensure adequate water supply resources are dispatched to the incident.
- **Practice:** As noted before, carrying out a tender shuttle operation is something that needs to be practiced.
- An after action review (AAR) should be held during annual exercises to improve on future events.

Definitions



Drafting Engine

Tender Shuttle

Tender Shuttle

Dump Site

Nurse Tender

Attack Engine

Aerial Device

Definitions

Tender - Any fire apparatus that has been designed to carry a minimum of 1,000 gallons of water, and is designed and equipped to quickly discharge and fill its tank.

- Height and weight restrictions shall be a considered when developing TARP plan.

Definitions

Nurse Tenders

In using a nurse operation the first due tender is assigned to the incident and located with the attack engine.

- This provides an immediately available water supply for an initial fire attack.

Definitions

Nurse Tenders

- Position dump tanks so they are accessible to

  a) Use more than one portable tank if necessary

  b) Use appropriate water transfer devices to move stored water between portable tanks.

- Have adequate personnel available to safely manage dump site responsibilities:
  - Traffic control
  - Dump site manager
  - Hose handlers / firefighters

Definitions

Tender Crew **-** A water tender crew shall consist of a driver, officer and a crew not to exceed the seating capacity of that apparatus.

- Breathing apparatus for each crew member, not for actual firefighting but that they may be exposed to a hazardous atmosphere while operating on - scene.

Definitions

Fill Engine - A fill engine is an Engine Company that is trained and equipped to fill tenders operating in a water tender shuttle operation.

- The County Fire Coordinator of the responding task force shall be responsible to ensure that there is (1) fill engine for every (3) water tenders.
- A 2ND Engine Co should be co-located in the event of mechanical issues or additional supply.

Water tenders are to be filled with no more than 80 PSI.

Definitions

Fill Sites - The jurisdiction requesting tenders shall have a water tender response plan that identifies fill sites within the area.

- This can be unaffected water systems, lakes, streams, municipal and private swimming pools.

- ***Fill Engine Crew*** - Same guidelines as applicable as the Tender Crew.

Definitions

Fittings and adapters - The jurisdiction requesting the Tenders shall have a contingency plan to provide the necessary fittings and adapters, to provide compatibility with their engines.

- It should be noted that most common tender connections include a 4” and 5” Storz connection, and a 2 ½” **National Standard Thread connection.**

Definitions

Communications - The jurisdiction requesting a tender strike team/task force response shall have a communications plan to provide communications for each tender and fill site engines.

- Each task force apparatus should have a portable radio, and an assigned radio frequency specifically for the water supply operations.

Definitions

Dump site *- Dump Site is the location where tenders are dumping their water into a portable folding tank(s).*

- *Area for dump tank set-up will be compromised by less available space in an urban setting.*

Tender Definitions

- ***Strike Team:*** A set number of resources of the same kind and type with common communications operating under the leadership of a Strike Team Leader.
- This defines a Tender Apparatus (only) Response within the TARP Plan and a Chief or other officer as the Strike Team Leader.

Strike Team

Same kind and type with common communications

Tender Definitions

Task Force **-** A combination of mixed resources assembled for a particular purpose with common communications operating under a Task Force Leader.

- This defines a Tender and Engine Apparatus Response within the TARP Plan and a Chief or other as the Task Force Leader. Under the TARP Plan this Task Force Response would include three (3) Tenders and One (1) Engine.

Strategy and Tactics

Strategy and Tactics

Considering the level of risk, the IC will choose the proper strategy to be used at the fire scene.

- We may risk our lives to protect savable lives.
- We may risk our lives a little to protect savable property.
- We will not risk our lives to save what is already lost.

Strategy and Tactics

The strategy can change as conditions change or when certain benchmarks are obtained.

The strategic mode should be based on:

- The rescue profile (savable occupants)
- The type of construction
- Structural integrity of the building
- The fire load
- The fire and or smoke conditions

Strategy and Tactics

Fires are put out by people and water.

- Limitations on either of these will hinder our ability to meet the demands of the incident.
- Keep in mind that putting the fire out makes all the problems go away.
- Conditions shall dictate actions when considering the most critical issues of the incident
  - when you arrive to a well - involved structure with limited resources, they may be better used in exposure protection rather than in fire suppression.

Strategy and Tactics

- The first arriving officer needs to do a thorough risk to benefit analysis to determine whether or not to commit to an offensive operation based on the visual cues available to them on arrival.
- Additionally, the IC needs to base their tactics and fire flow requirements on the anticipated water supply needs.

Strategy and Tactics Exposures

Offensive/Defensive Mode

- This is utilized when there are tactical problems at the initial stages of the operation or when the firespread has the potential to rapidly outflank the current resources.

- The major portion of personnel are operating on the primary fire problem while a smaller group is working on exposure control and reconnaissance.

Strategy and Tactics Exposures

Offensive/Defensive Mode

- Should be considered at fires in all buildings with ex
  - Row Frames
  - Garden Apartments Townhouses
  - Taxpayers Strip Malls
  - All buildings with Exposure issues

Strategy and Tactics

- A deck gun can empty a 1,000 - gallon tank in one minute and a deployed 2½ - inch remote deluge can empty a tank in under 3 minutes.

- If these tactics are employed with no established water supply, the tactical accuracy of the water application must be very high in order to have enough tank water left to finish extinguishment once the fire has been knocked down.

- Can you get the job done with 500 - 750 gallons of water?

Strategy and Tactics

- Establishing rapid deployment of water from the tank limits interior operations to few minutes.
- It is vitally important to provide protection to crews conducting a primary search of the interior.
- *Once primary searches are complete and prove negative the IC may consider going defensive until a sufficient water supply is established.*

Strategy and Tactics

- When it comes to making a fast attack water supply is the most important consideration.
- In NJ all urban agencies are protected with hydrants in a looped system.
- When this system fails it causes the decision between the use of rapid water vs. available water.

"The Best Water is the Fastest Water."
Chief Alan Brunacini Phoenix, AZ

Defensive Strategy

- Implemented upon arrival when fire conditions do not allow for an offensive fire suppression operation.
  - Large percentage of fire building involvement
  - Exposure involvement
  - Limited or no water availability
  - TARP plan in place and available or is this an unplanned emergent water supply issue?
  - What can you protect with available resources until additional units arrive?
  - What are your target hazards?
  - How much property are you willing to give up?

Decision Making

- The experience level of the Incident Commander and the initial arriving officer are critical components to the decision making process.

- Rapid Primed Decision Making (RPDM) may not have a role during an incident involving a water emergency due to limited occurrences and level of experience dealing with limited or no water on arrival.

Decision Making

- Strategy and Tactics must be determined with consideration of sustainability of the water source.
- As the Supply Rate and reliability of water is increased the number of tactical options is also increased.

Decision Making

- There are four factors that if properly managed will create a coordinated fire scene: response time, water supply, apparatus positioning and staffing.
- During a Water Emergency in the urban environment we have 3 of the 4 in our favor.
- The proper deployment of each will dictate the end results of the fireground.

Urban Water Supply

- Traditional Urban Water Supply is straightforward, usually 2 Engines are assigned to secure a primary and secondary water supplies.
  - Urban Engine Companies typically contain 500 - 750 gallon tanks

- In times of Water Emergencies when the supply is limited the IC must rapidly develop an independent water supply.

Additional Alarm Requirements

- IC must forecast fire potential and water supply needs early in the incident. Requests for tender strike teams and/or task forces should not be delayed.

Paterson Mill Fire

A quick decision by Paterson firefighters may have saved several city blocks from burning

PATERSON — Saturday's fire on Straight Street would have engulfed several city blocks if fire commanders on the scene hadn't made the right call, said Fire Chief Brian McDermott.

Fire commanders Capt. Jose Castro and Battalion Chief John Butero got to the scene and within minutes switched the mission from offensive to defensive in order to prevent the fire from spreading throughout the neighborhood.

"When they got there it was already an advanced fire," McDermott said. "It became a conflagration in nine minutes."

Fire personnel arrived at Straight & Narrow and quickly evacuated dozens of civilians from the three-story addiction recovery facility. At first their thought was to quickly extinguish the blaze, but after they opened the door and came face to face with a "ball of fire," the mission changed.

"At that point we knew we couldn't control it," McDermott said. "They made a great call."

https://www.northjersey.com/story/news/passaic/paterson/2019/08/29/paterson-nj-fire-commanders-made-right-call-and-saved-several-city-blocks/2131089001

Water Supply Officer Responsibilities

Guesstimating Needed Fire Flows

- Knowledge of Fire Flow is required for effective decisions on number of handlines and the personnel to extinguish the fire.

- There is a variety of methods to establish required fire flow for fire protection. All are based on mathematical formulas and range from simple to sophisticated. There is no single "correct" formula or method for fire flow calculations

Water Supply Officer Responsibilities

Guesstimating Needed Fire Flows

- There are numerous formulas intended to calculate the theoretical fire flow for an interior fire attack.

- IOWA method
- National Fire Academy Formula
- NFPA 1142
- Common sense (big fire, big water)

Iowa Fire Flow Formula

$$\frac{\text{Length X Width X Height}}{100} = \text{Required Flow in GPM}$$

- Since the formula considers only the size of the building and not the occupancy and fire load, the dimensions of the entire building or floor are used

NFA Fire Flow Formula

$$GPM = \frac{L \times W}{3}$$

$$GPM = \frac{40' \times 30'}{3} = \frac{1{,}200'}{3} = 400 \text{ or}$$

Fire Flow = 400 GPM

Photo NFA

NFA Fire Flow Formula

- GPM = L x W ÷ 3

  100 x 30 = 3000 ÷ 3 = 1000 gpm

- GPM = 1,000 for total involvement

- If there is less than 100% fire involvement on one floor, reduce the fire flow proportionally.

- If more than one floor is well involved, increase the fire flow accordingly

Fire Flow Formula

- Fully involved: 1,000 GPM.
- 50 percent involved: 500 GPM.
- 25 percent involved: 250 GPM.

Photo NFA

Fire Flow Formula

- Exposure protection.
  - GPM = $\frac{L \times W}{3}$ x 25 percent for each exposure.
  - Fire building = $\frac{30' \times 100'}{3}$ = 1,000 GPM.

NFPA 1142

Standard on Water Supplies for Suburban and Rural Fire Fighting

NFPA 1142

Standard Includes

- Calculating minimum water supplies
- Classification of occupancy hazards
- Classification of construction
- Water supply Dry hydrant design
- Alternative water supplies
- Large diameter hose

Standard is better suited for use in developing fire flows for target hazards and new construction

NFPA 1142

What Does This All Mean?

- Uses the following information to calculate the minimum water supply required for a structure:
  - Occupancy hazard
  - Type of construction
  - Structure dimensions (length width height)
  - Exposures (if any)

This methodology shall be used to calculate the required minimum water supply for structural firefighting

NFPA 1142 Fire Flow Formula

The Calculation

- The **total enclosed volume in cubic feet** of the involved structure including any attached structures divided **by the occupancy hazard classification** multiplied **by the construction classification number.**

Will we have this information available and is this a workable calculation to determine on the fireground?

NFPA 1142 Flow Formula

What Does This All Mean?

The standard identifies the following minimum fire flows. Plan for attaining these minimum levels in your water supply operation upon arrival.

4.2.2 The minimum water supply required for any structure **without exposure hazards** shall be not less than 2000 gpm.

4.3.2 The minimum water supply required for a structure **with exposure hazards** shall not be less than 3000 gpm.

Responses

Plan For:

- Water Tenders should be built into the city water tender response plan based on response time, size, equipment needed. (i.e. pump no pump, discharge locations, physical size and weight of tender)

- There are various tactics that can be deployed once the Tenders are in place and ready for duty.
  - Attack Tender Operations
  - Nurse Tender Operations
  - Water Shuttles
  - LDH Relay Pumping

Attack Tender Operations

- The strategy and tactics chosen must match the the available water supply in gallons available and flow rate.
- When the available water supply is insufficient the IC must utilize basic incident priorities in the decision making process.
  - Life Safety
  - Incident Stabilization
  - Property Conservation

Attack Tender Operations

- The approach to water supply for structural operations is based on the idea that rapid establishment of a reliable and expandable water supply is essential to fast coordinated fire attack.
- Initial fireground operations should not be hampered by a lack of water supply.

Attack Tender Operations

- Initial fire suppression operations may require the 1st and 2nd due engines and 1st due tender combining their capabilities to initiate an attack.

- Depending on tank and tender size this may bring between 4,000 - 5,000 gallons of water to the scene.
  - 2 Engine Co's. with a minimum 500 gallons tanks plus a 3000 Gallon .

- This deployment should provide sufficient water for initial search and fire attack operations.

- Remember, as the first line goes, so goes the fire.

Urban Water Supply

- Developing water supply operations are complex they take time to build and they are resource intensive.
- The IC must appoint a Water Supply Officer as soon as practical, this will allow the IC to focus on the fireground instead of the water supply.

Water Supply Officer Responsibilities

As the incident expands the following water supply strategies can be implemented by the water supply officer.

"The Best Water is the Fastest Water."
Chief Alan Brunacini Phoenix, AZ

Alternative Water Supply

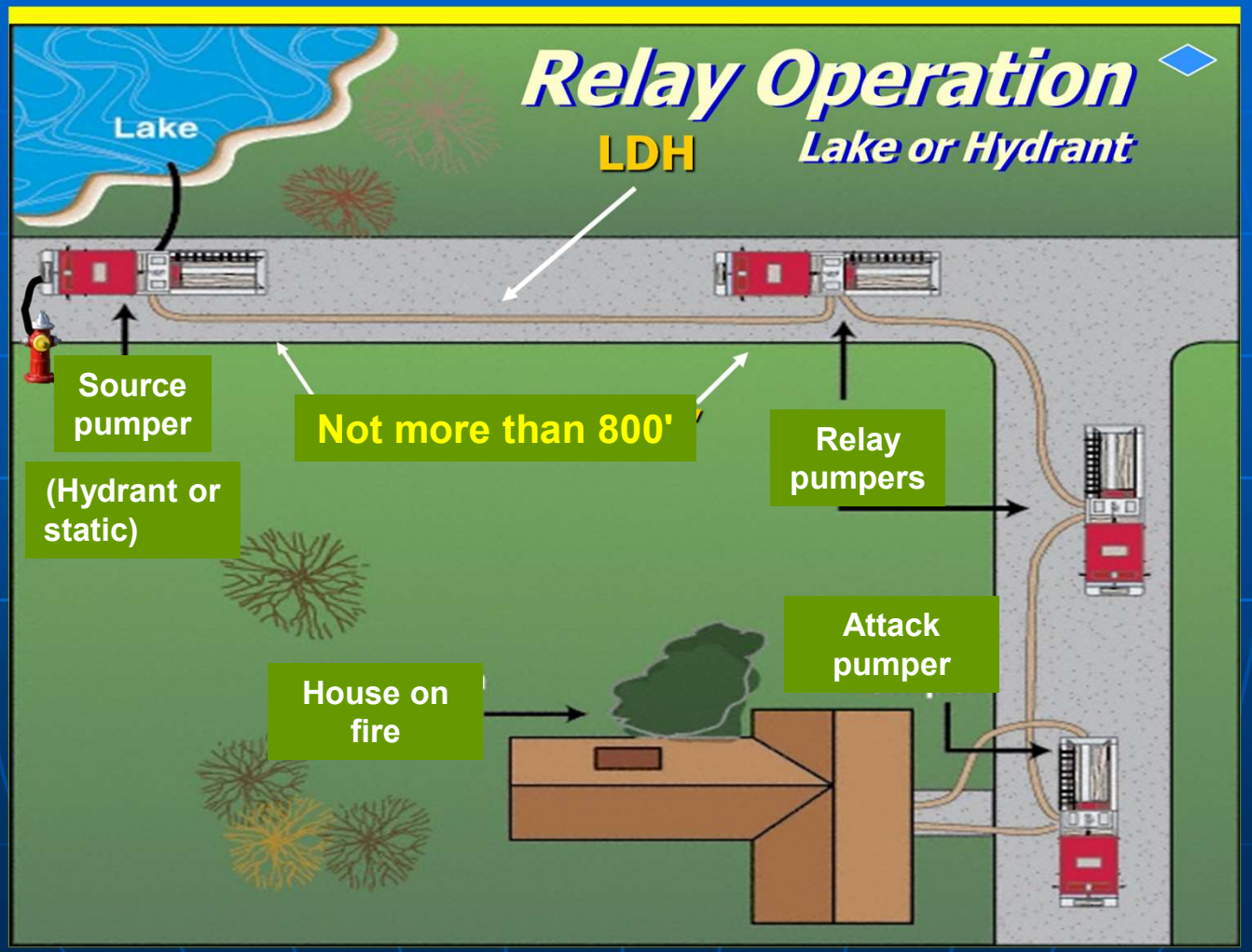
- When the fire begins to overpower the calculated fire flow the IC should consider enhancing the water supply using;
  - On - Site Water (hydrants, additional engines)
  - Tender Shuttle Operations
  - Relay LDH Operations
  - Neptune system/fireboats

Additional Alarm Requirements

LDH Strike Team

- The goal of the LDH Strike Team is to provide at least 1,000 GPM over a long distance.
- To accomplish this, several apparatus may be used to assist in moving the water through 5 inch supply hose.
- This more readily available resource can be requested through county fire coordinators for large scale incidents.

Relay Pumping



should be based on topography and flow needed

Additional Alarm Requirements

LDH Task Force

- If access to fire scene is compromised consider laying large diameter hose out to water source.

Fire Boat Support

Fire boats can be used as a drafting unit to supply a relay, supplement an established water supply or supply a fill site for a shuttle operation.

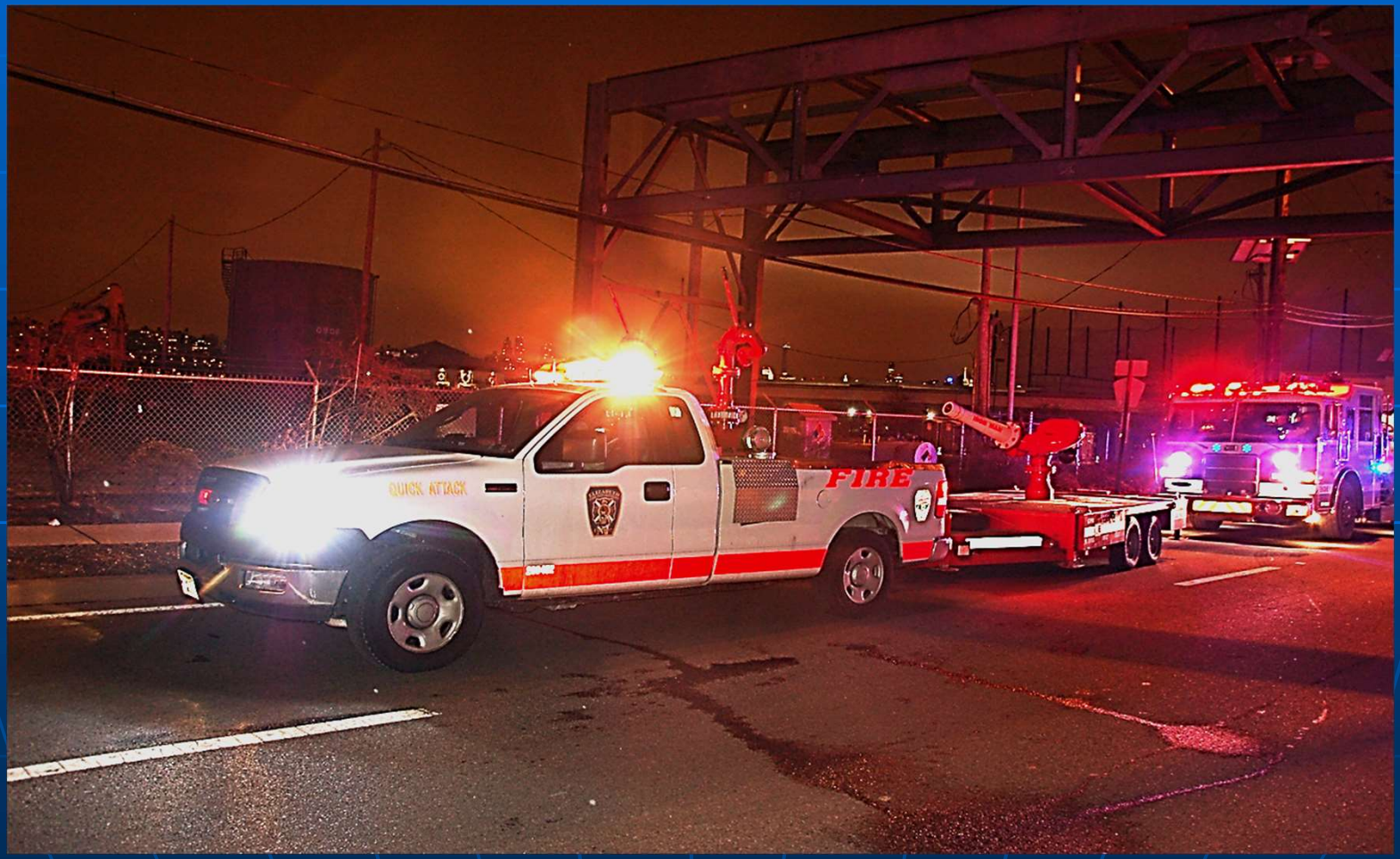
Command should consider setting up a land based water supply operation by calling for a relay operation due to the limited access to fire boats

Fire Boat Support

Neptune System

Neptune System

Neptune System



Neptune System Being Fed

North Brunswick 2015. 3 WSP Feeding 5 5” lines@ 4400 GPMs.

Water Supply Officer Responsibilities

- Directs all water supply operation as a component of the incident management system
- Requests additional resources as required
- Establish and identify fill sites, dump sites, and a travel routes for tenders shuttling water and communicate each to responding units.
- Assign dump and fill site managers

It's a Lonely Job That Nobody Wants

Technical Knowledge Is a Must!

Water Supply Officer Responsibilities

- Determine immediate availability of water that can be mobilized locally.
- Determine strategy for moving more water into community (LDH strike team, Tender operations)
- Utilize the jurisdictions "**TARP**" plan for tender based water supply operations

"The Best Water is the Fastest Water."
Chief Alan Brunacini Phoenix, AZ

Water Supply Officer Responsibilities

- Consider adding additional engine company to all 1st alarm responses
- In Case of Fire = Calculate minimum initial flow needed (determine the # of tenders needed)
- Discuss and determine incident water supply needs with the Incident Commander

"The Best Water is the Fastest Water."
Chief Alan Brunacini Phoenix, AZ

Determine Needs of the Incident

- With a compromised or non-existent hydrant system the immediate need for a tender operation is imperative.

Examples of Tender Set - Ups

- Most important - try not to deviate from your normal initial everyday response
- Lay in / out as normal to incident.
- Have a tender pull down with 1st due assignment as a water supply & feed to it from the corner placing 3000 gallons in front of the building.

OR

Examples of Tender Set - Ups

OR

- Stage a tender at the end of the block picking up the supply line and pumping to your scene.

OR

- Drop portable tanks also at the end of the street laying a supply line from 1st Due.

Establish a Fill Site

- The closest suitable water source should be considered.
- When a hydrant is not available the Fire Department will utilize a static water source.
  - Pool, Lake, Pond, River
- A dedicated Drafting Engine Co will be assigned to this position to support the tender shuttle.
- Water supply officer shall assign a fill site supervisor

Fill Site Location

- Where are your drafting sites alternative water sources?
- How do you access them?
- What equipment do you need to access the alternative water supplies you have available?
- Will it be easy to use, and provide the highest flow capability possible

WSO - Establish a Fill Site

- The closest water source may not be the most viable consider;
  - Traffic issues or unsuitable roads
  - Water flow requirements
  - Access to water source
    - Can the drafting engine get close enough to the water source?
    - Consider the stability of the terrain in the immediate area
  - Can other apparatus maneuver the site easily?
    - Fill - N - Go

SAFETY is Paramount to ALL Operations

Fill Site – Many different methods to establish this.

Fill Site – Many different methods to establish this.

Water tenders are to be filled with no more than 80 PSI.

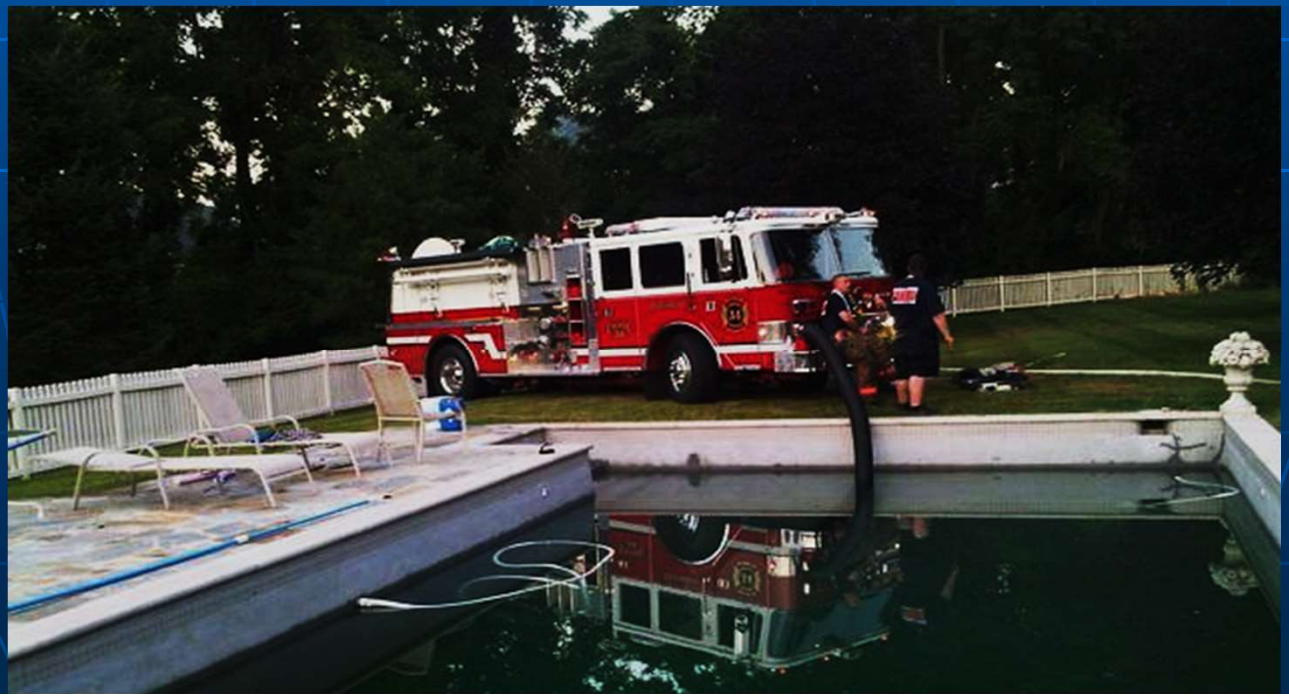
Filling From Hydrant

Water tenders are to be filled with no more than 80 PSI.

On Site Static Sources

On - Site Static Sources

- When there is a large enough non - pressurized water source immediately available at the incident location.



Off Site Static Sources

Off - Site Static Sources

- When this is a large enough non - pressurized water source available close to the incident to rapidly obtain, pump and flow or to fill other tenders in a shuttle operation.

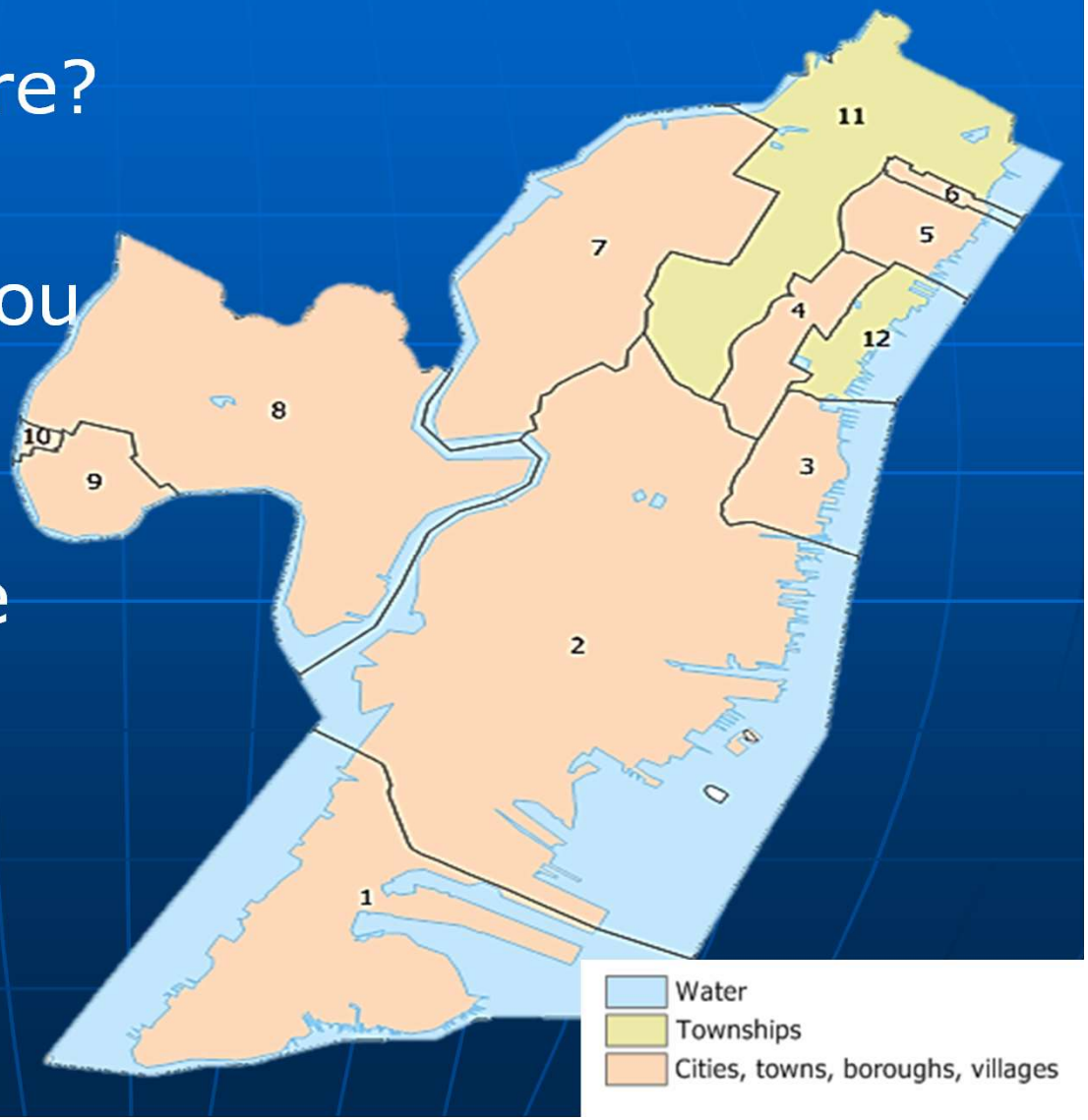
Drafting Operation

Mandatory Use of PFD's near bodies of water


ROCKAWAY TOWNSHIP
512
512

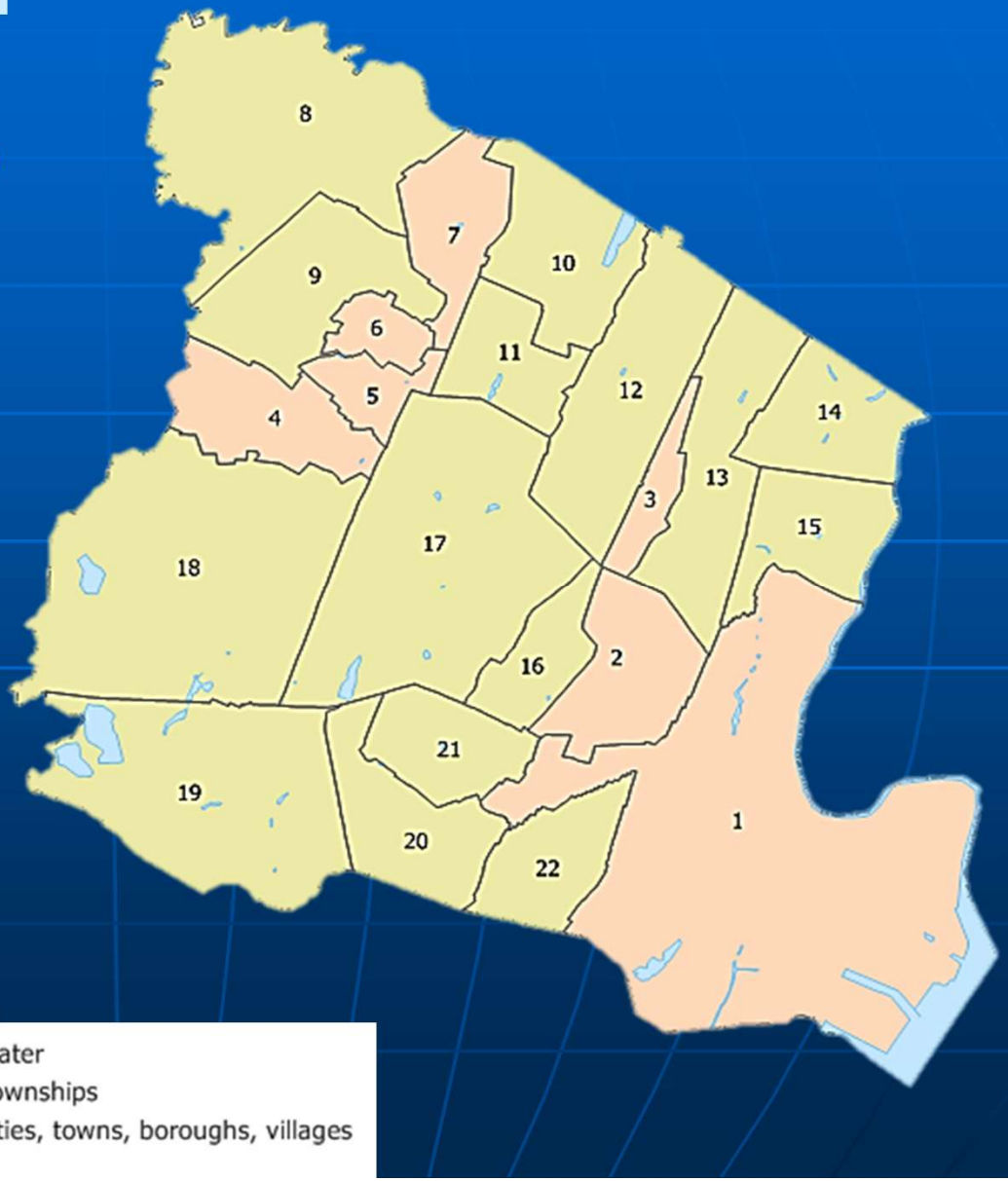
Drafting Ops – Hudson Co.

- Water Everywhere?
- How much can you access?
- How far from the fire scene is it?



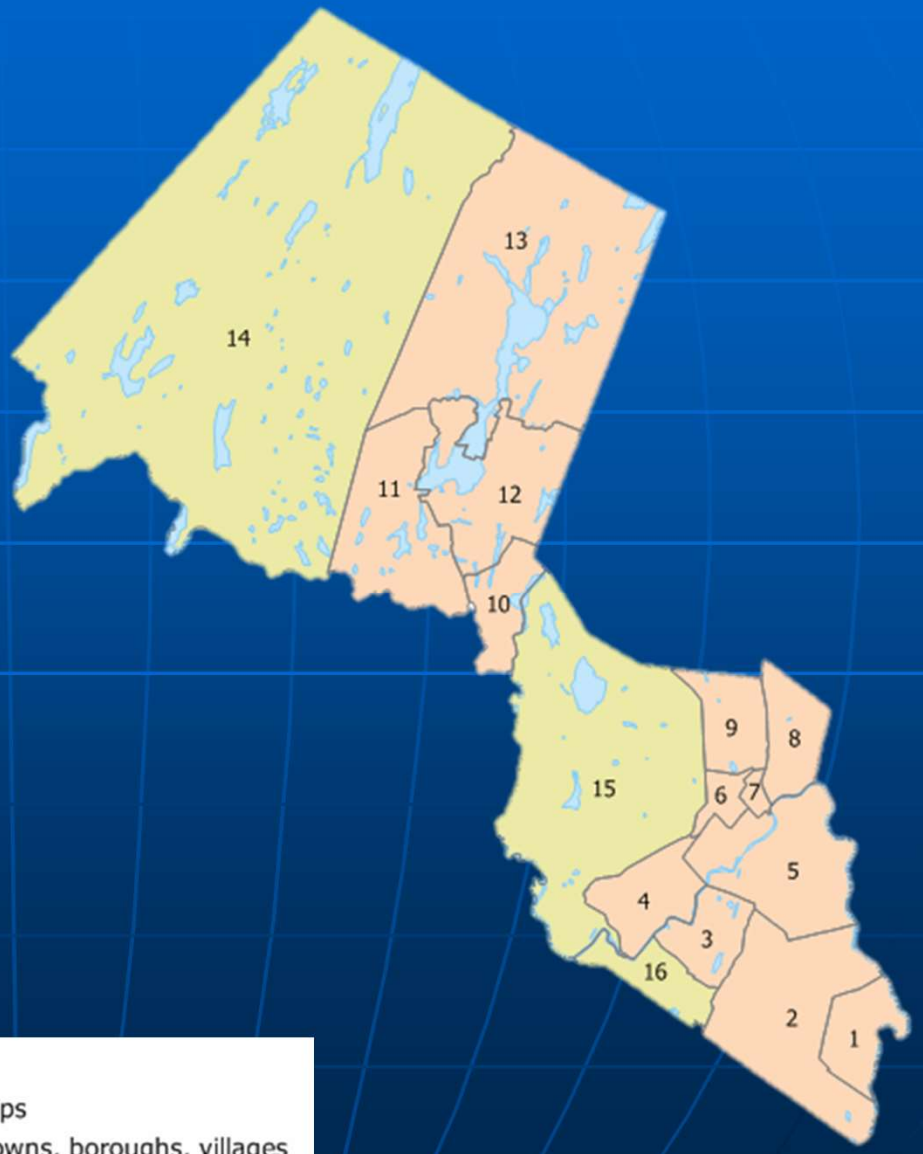
Drafting Ops - Essex Co.

- Water Everywhere?
- How much can you access?
- How far from the fire scene is it?



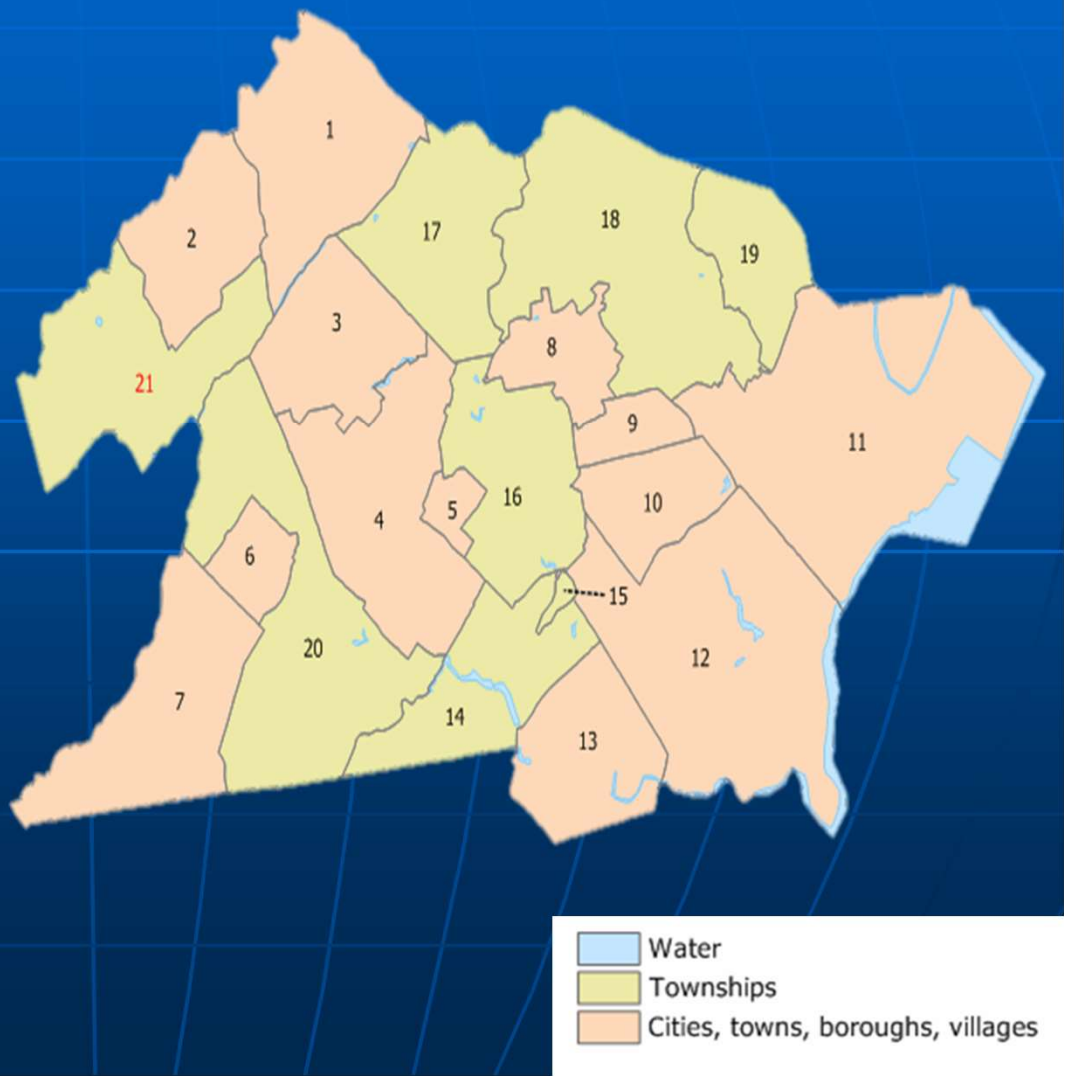
Drafting Ops - Passaic Co.

- Water Everywhere?
- How much can you access?
- How far from the fire scene is it?



Drafting Ops - Union Co.

- Water Everywhere?
- How much can you access?
- How far from the fire scene is it?



Dump Site

On - Site Static Sources

- Dump Tanks create an on - scene static water source
- More than one tank should be set up (redundancy)
- An effective tender shuttle operation will maintain adequate source of water
- Multiple dump sites may be required to meet required fire flow.

Dump Site

- Dump Site is the location where the tenders are dumping their water into a portable folding tank
- Water from the portable tank must be pumped to the fire location by an engine
- This suppression operation can have multiple fill and dump sites utilizing multiple portable folding tanks and apparatus.

Dump Site

Dump Site

- The dumpsite has been designated as part of the incident command system (ICS) organizational structure in operations involving tender operations

- Remember since this is a functional unit is a group within the ICS system, and it should be designated as such

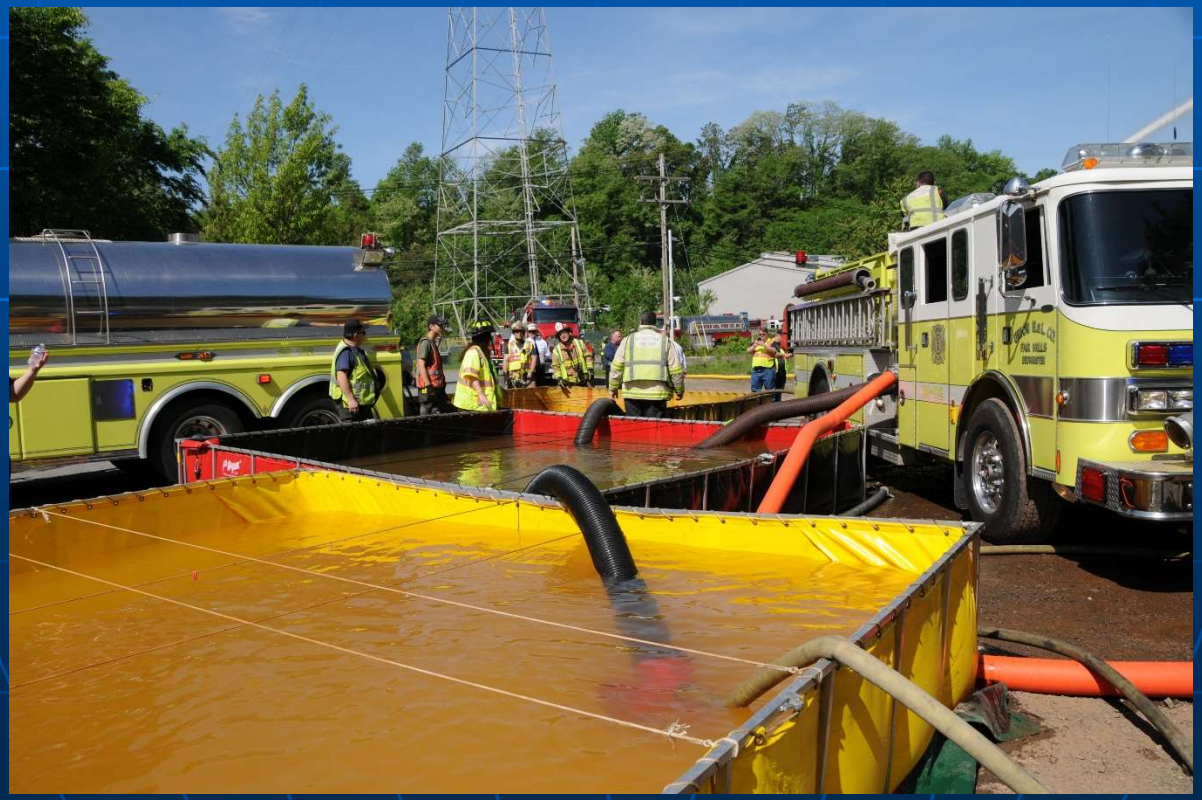
- Water supply officer shall assign a dump site supervisor

Dump Site

- In a city environment space is limited.
- A written SOG based on your jurisdiction needs to be developed to design a method to offload the tenders at dump sites.
- This SOG is separate from the TARP Plan
- Choosing the appropriate dump site in an urban setting is critical to the water supply operation.

Dump Site Operations

- Effective Dump Sites require a commitment of personnel and an assigned dump site manager to supervise the operation.

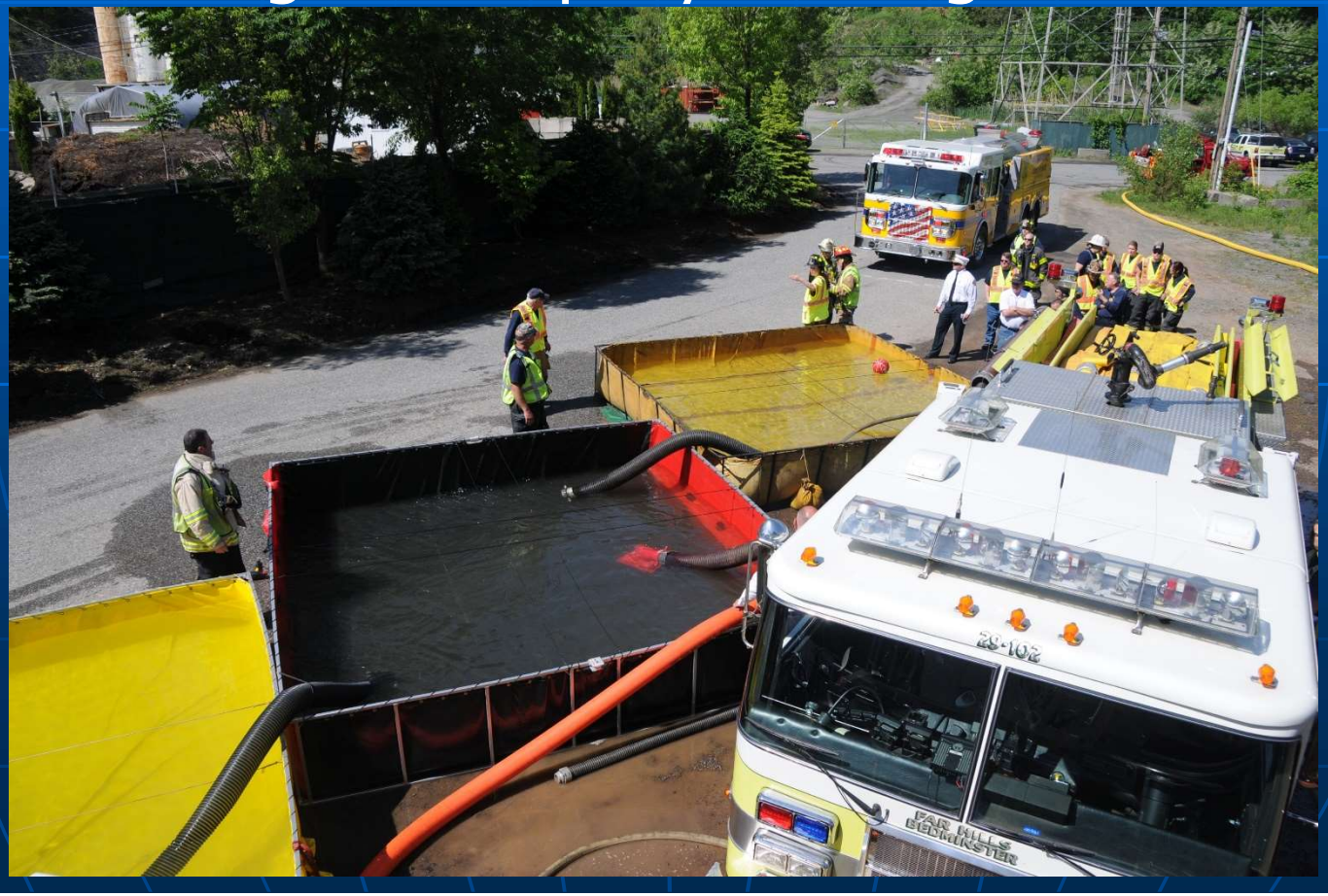


Portable Drafting Tanks

- When the drafting tanks are dropped and set up as the dump site, we have determined that an engine company will be assigned to that site to support the operation.
- Set up of multiple drafting tanks may be required to supply the proper fire flow to the incident.
- Setting up two drafting locations for redundancy at either end of the incident should be considered.

Dump Site Operations

- Portable Tanks are set up at a designated location with an engine company drafting from the tank.



Portable Drafting Tanks

Dump Site

- The crew at the dumpsite needs to be very cognizant of scene safety when setting up and running operations.

- As they move in to the dumpsite area they need to get close enough to the drafting tanks to dump their water.

- Establishing the ability to rapidly dump water into the tanks is critical to maintaining an effective fire flow.


BERNARDSVILLE
TENDER
12
22-185
DANGER
New Jersey
MG65845
MUNICIPAL
Pierce


NEW VERNON
VOLUNTEER FIRE DEPARTMENT
29
132

Dump Site Supply Engine

Tender off - loads water for supply Engine
to relay pump to fireground.


AKRON

Dump Site Operations

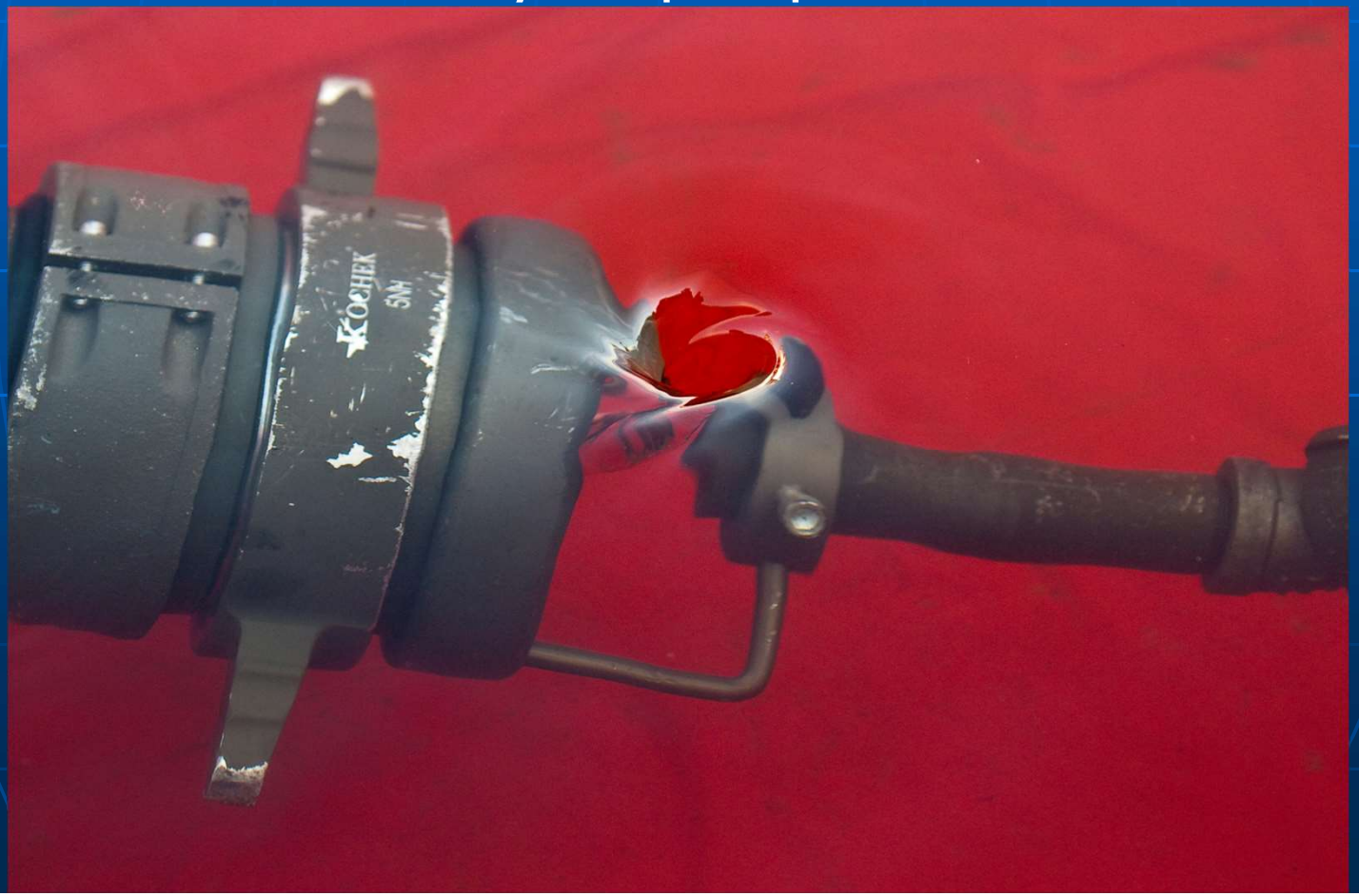
The drafting engine will supply the Attack Engine Fireground with either a 5” line or gated manifold.

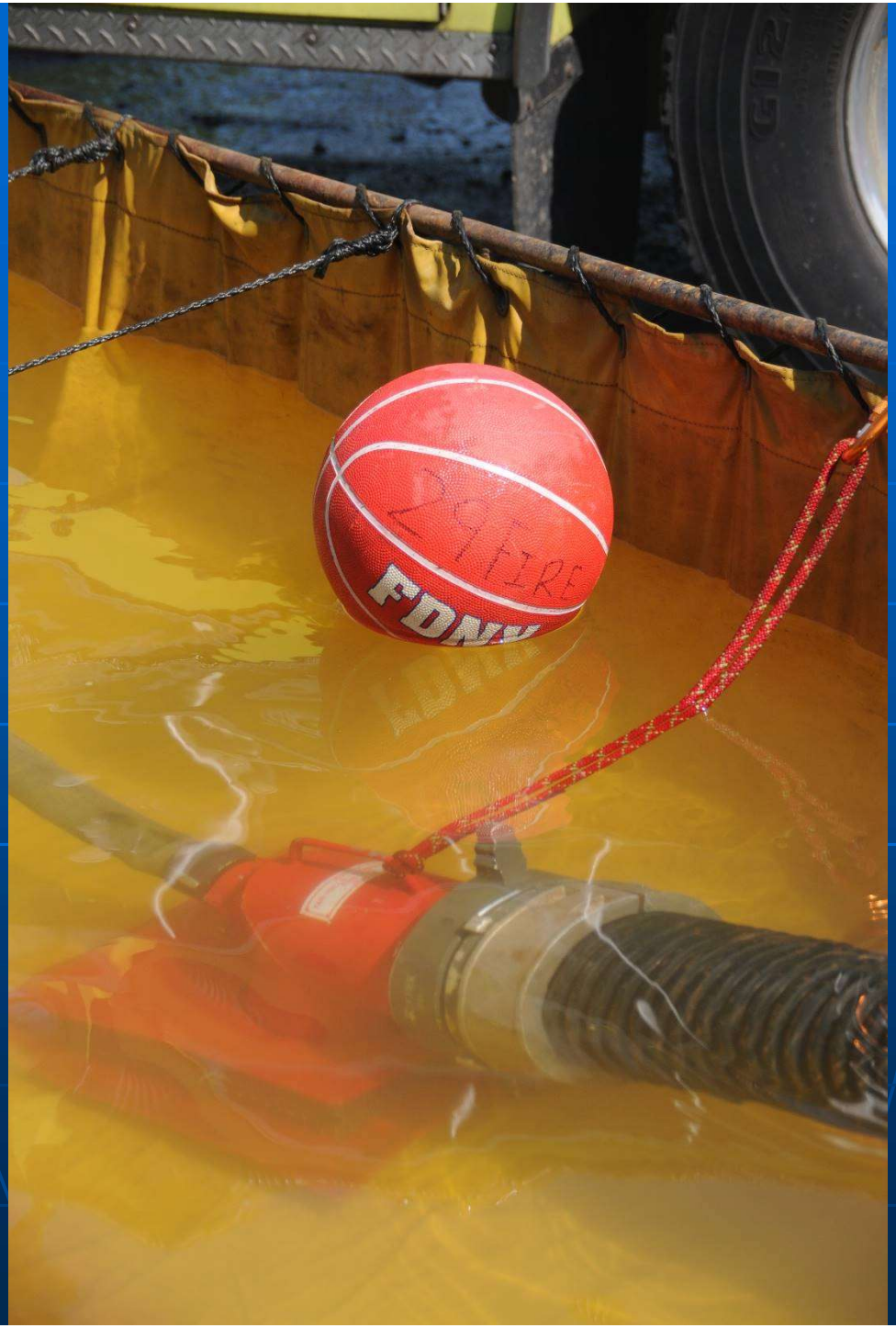
Dump Site

- When drafting from a folding tank, you want to be able to draft the tank as low as possible.
- Unfortunately, doing so can often create a whirlpool, which can pull air into the pump and hurt the draft.

Dump Site

- Placing a basketball, volleyball or similar floating object in the tank can eliminate that whirlpool venturi effect that will draw air into your pump.




FDNY

Staging Areas

Establish Staging Areas

- Determine staging area location (winter weather requires tenders to be housed inside)
- Notify Regional Fire Coordinator to implement the designated staging area locations in your TARP plan.
- Tender request must be made quickly as these units will be traveling long distances.
- Have city maps available with viable accessible water sources for filling operations.

Staging Areas

- Identify a staging area for incoming units early as they may have to be escorted to the scene.
- Assign a Staging Area Manager to coordinate these units.
- The staging area should be large enough for the vehicles to park until needed – (large parking lot)
- Have this location designated as the refueling location for all tenders operating.

Staging Area Concerns

Staging Concerns

- Accessibility
  - Where is the staffing for these units
  - Centrally located in response area
- Weather
  - Think Seasonally
- Security
  - Protection of manpower and equipment
- Environmental Impact
  - Noise
  - Refueling

Staging Concerns

Maintain the Following Apparatus in Staging and Readily Available at All Times

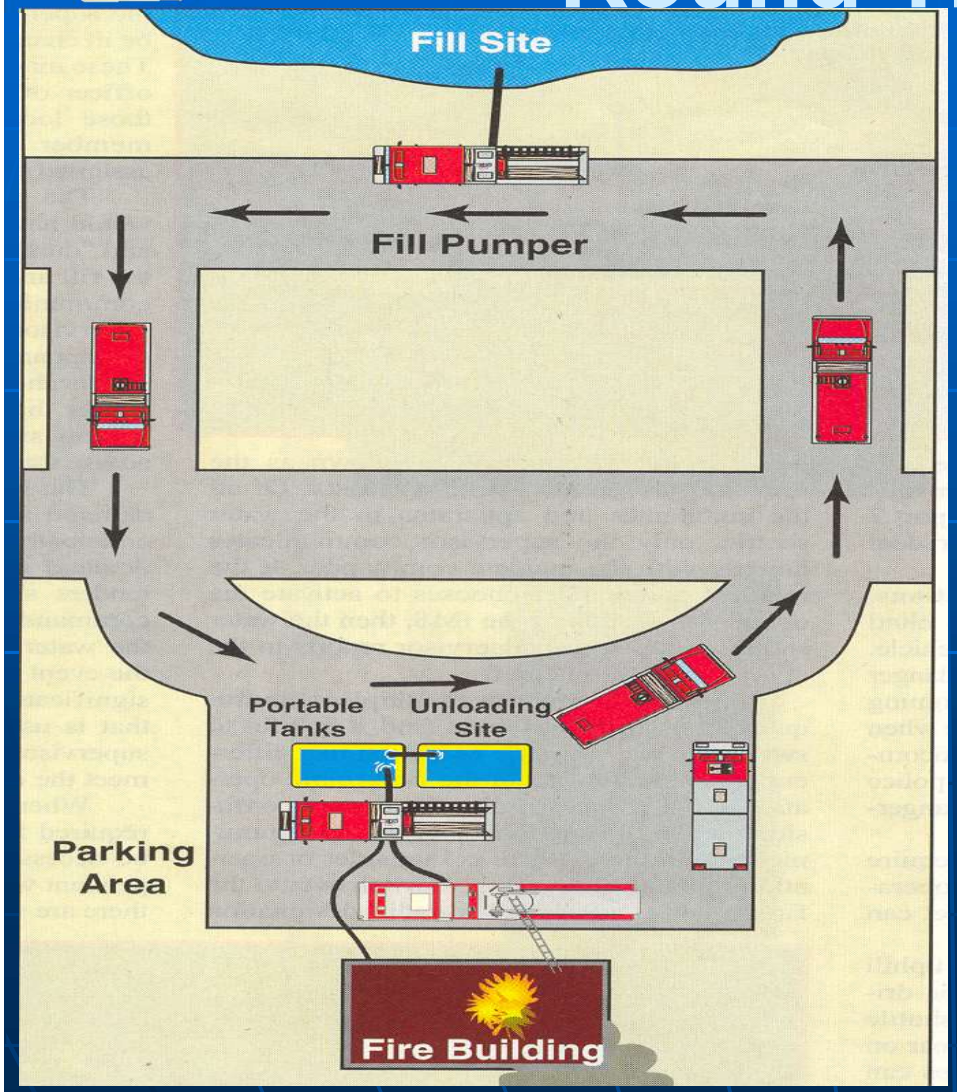
- 3 Water Tenders on a Strike Team
- 1 Tender support engine – to assist with tender fill, dump sites, or supply operations
- Additional engine company in case assigned engines experience mechanical or other issues
- Support Staff
- Minimum deployment of 10 hour operational period

Mandatory Use of PFD's near bodies of water

Estimating the Resources Needed

- Some simple arithmetic should be applied to calculate the number of water tenders likely required in order to conduct a successful shuttle operation.
- A roundtrip involves the total (in minutes) time to fills site, plus time to refill, time to refill and travel time to unload to the portable tank

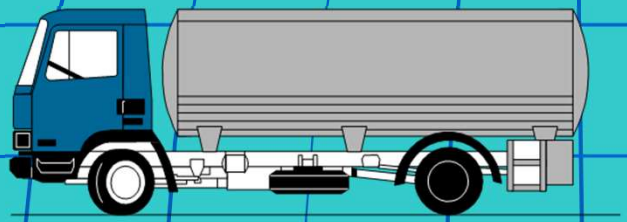
WSO - Establish a Clear Round Trip Route



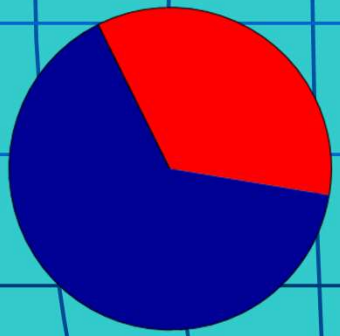
- Local police must be incorporated into the Shuttle Plan.
- Best access to and from the incident location staging area.
- Dedicated roadways during Tender Shuttling.

Water tenders are to be filled with no more than 80 PSI.

TENDER DELIVERY RATE



2,500 Gallon
Tender

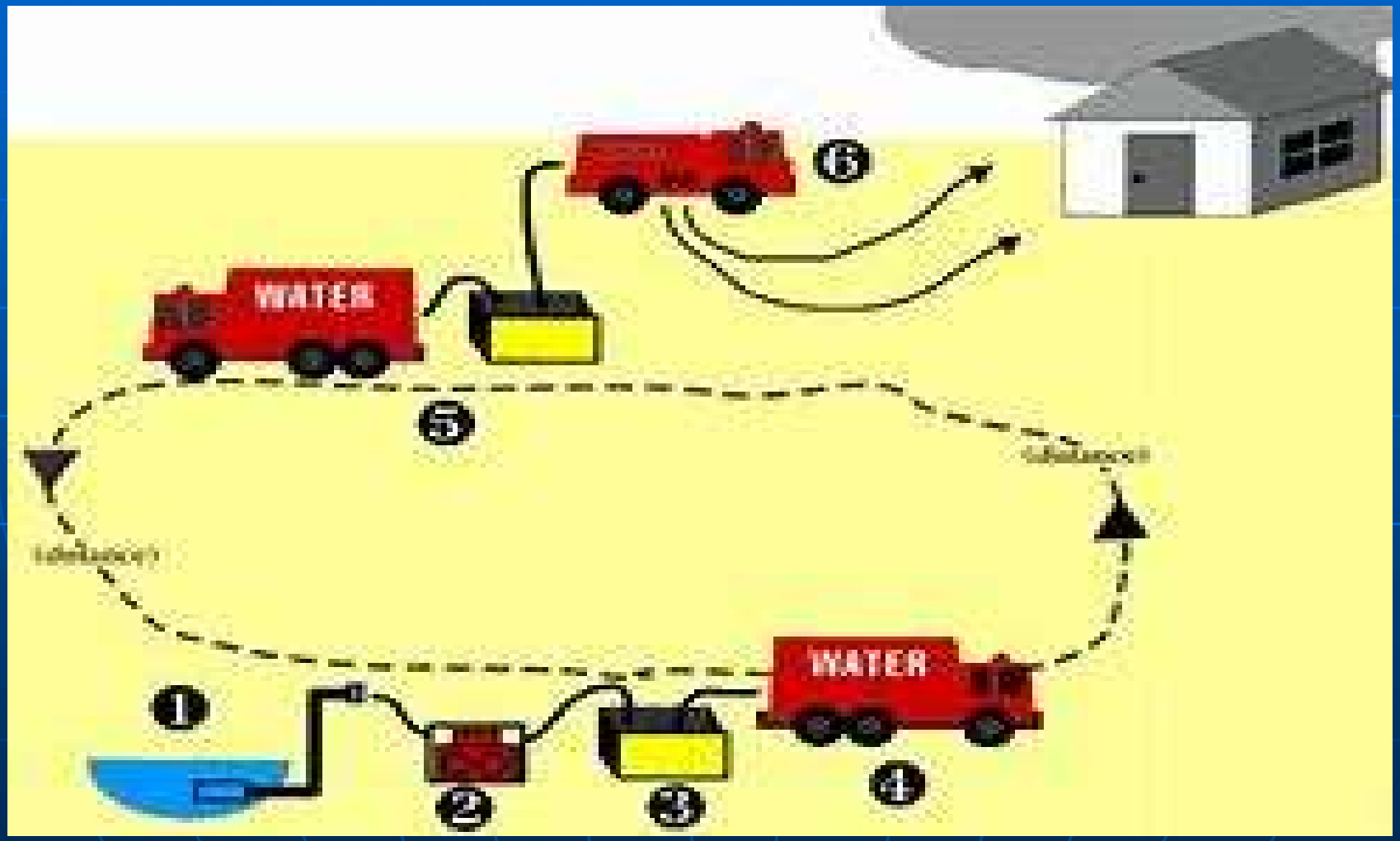


20 Minutes
To Dump, Travel, Fill,
Travel Back

$$TDR = \frac{2{,}500 \text{ Gallons}}{20 \text{ Minutes}}$$

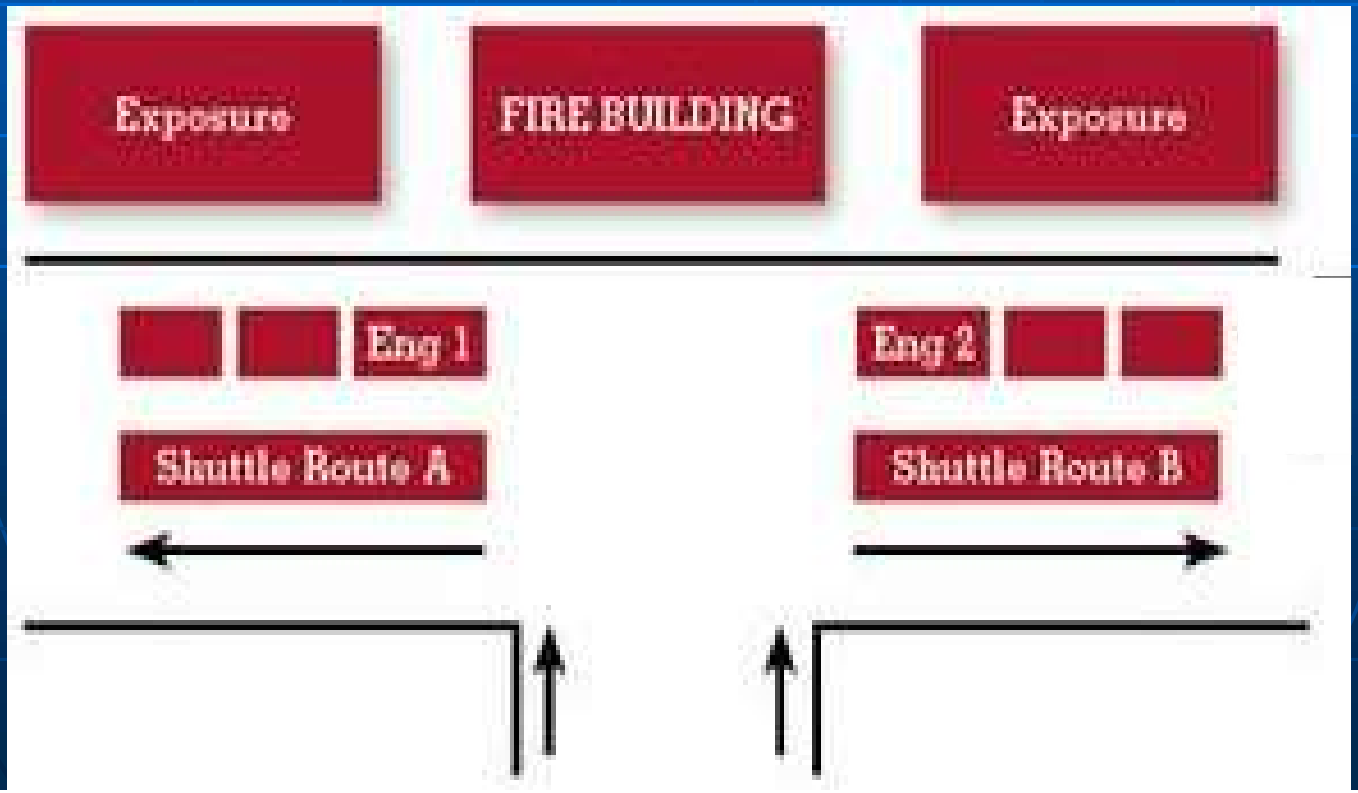
$$= \frac{125 \text{ Gallons}}{\text{Minute}}$$

Basic Concept



WSO - Establish a Clear Round Trip Route

- Multiple Exposures on fire may need separate water sources depending on direction of fire travel and street access.



Water Shuttle Operations

Dedicated Fill and Dump Site Safety Officers

- PPE Requirements shall be determined by local FD policies
- Reflective Vests Shall be worn whenever on active roadway
- Turnout gear may be limited in proximity of static water sources
- Utilize Police for dedicated traffic patterns

WSO - Establish a Clear Round Trip Route

Water Shuttle Operations

These operations will be apparatus and labor intensive, there will be a lot of radio chatter and motor vehicle movement in the area it is most important to account for **EVERYONE'S SAFETY** at all times.

- Dedicated Site Safety Officer
- Dedicated Radio Frequency
- Dedicated Water Supply Officer

Water Shuttle Operations

Dedicated Radio Frequency

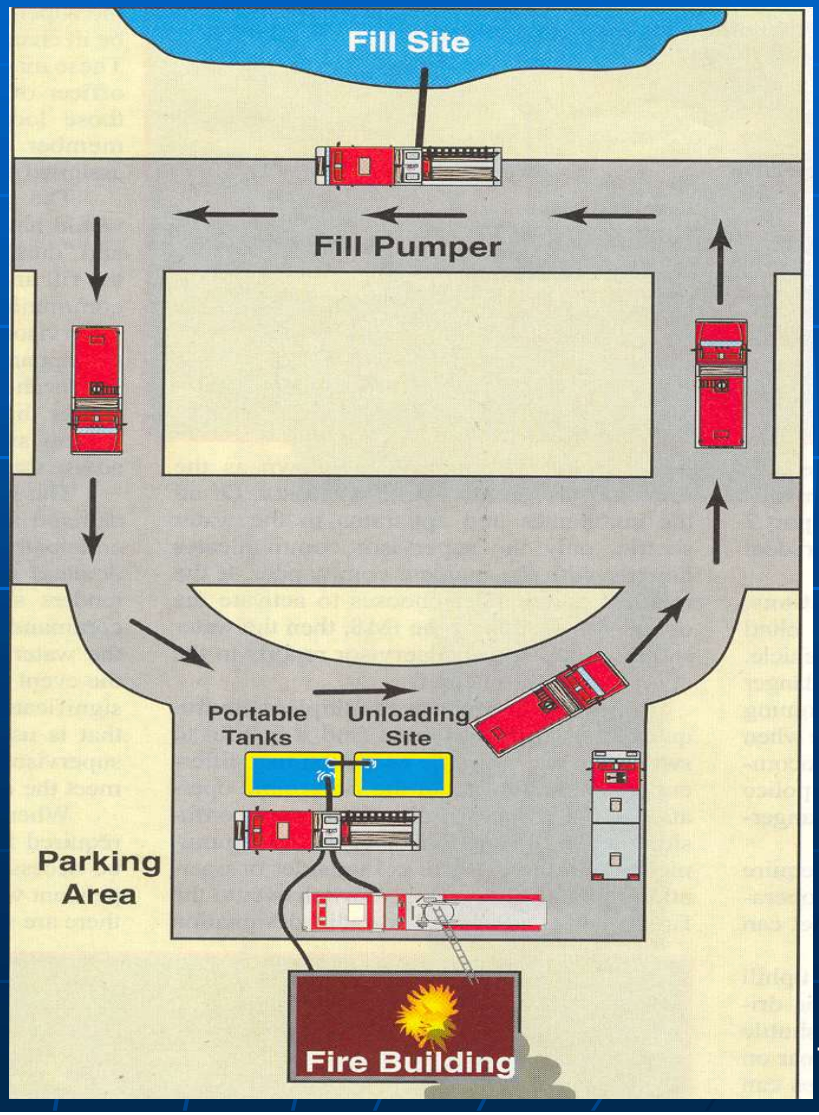
- Assign a dedicated radio frequency to water supply operations. Consider use of county communication resources.
- Water Supply Officer is the only one communicating and coordinating the tactical operations of shuttle units and attack engine.
- The WSO should have the capability to transmit on both this tactical channel and the Command Channel.

Water Shuttle Operations

- Dedicated Fill and Dump Site Safety Officers
- The number of tender accidents with related injuries and deaths to firefighters is very high.
- This is very much the one piece of apparatus that, when it goes out of the station, needs to have an experienced safe driver operator assigned to it.

TENDER DELIVERY CYCLE

The time it takes a tender to set up, dump the water, travel to the fill site, fill up, and return to the dump site.



Water Supply Officer Responsibilities

- If incident continues to escalate or additional GPM flows are required request additional tenders from your plan.

- These apparatus are traveling a long distance, so it is imperative you identify a method for refueling these vehicles as early as their arrival and throughout the incident.

Tender Safety

FROM 1990 TO 2001 A USFA STUDY DETERMINED APPROXIMATELY 22 PERCENT OF FIRE APPARATUS COLLISION FATALITIES OCCURRED IN TENDERS.

Safety

- Operating around a water tender shuttle operation is **extremely dangerous**
- Safety vests, traffic cones, and traffic officers will all need to be utilized.
- Staff operating at both fill and dump sites need to be very aware of the moving vehicles.
- Use local police for scene security and traffic control

Safety

- When directing apparatus be sure that you are not behind the tender but off to the side so the operator can constantly see you.
- Traffic will be a huge challenge when moving tenders through the city from a fill site to the dump site.
- Protecting the scene by closing a roadway and using the mandatory (DOT) traffic vests and other traffic safety devices will provide additional safety.

Wellfleet

Wellfleet

Wellfleet

Wellfleet

Wellfleet

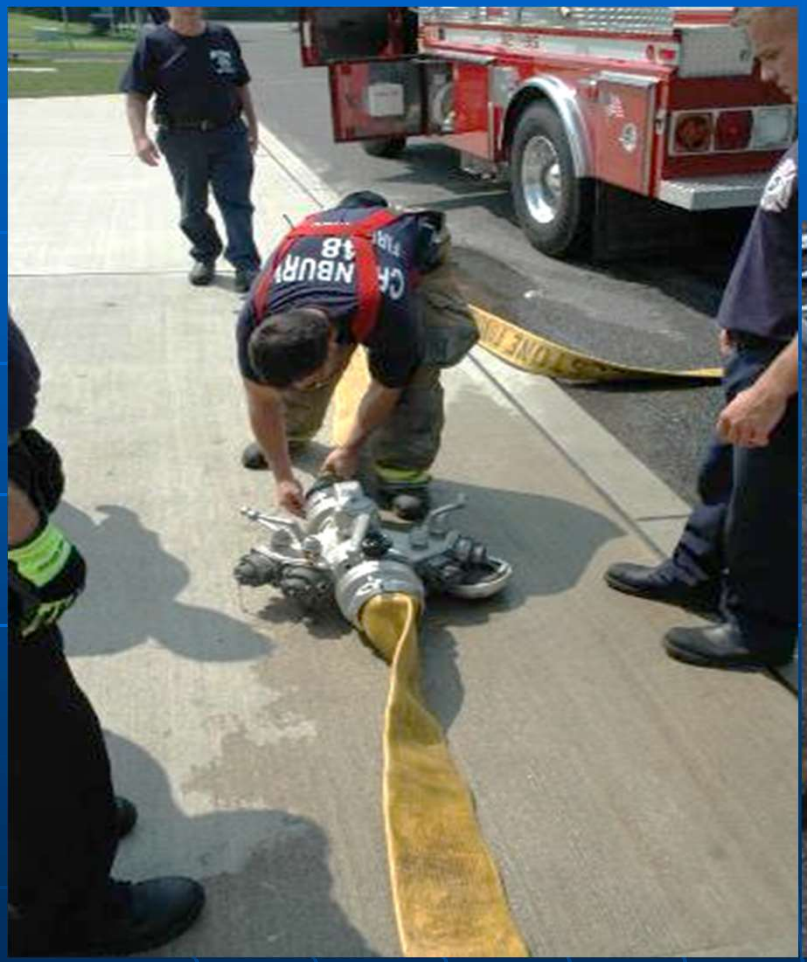
Various Fittings

- There are numerous fitting associated with tender operations.
- Each department may use a different fitting but all work somewhat similar.
- The response plan should identify what fittings and threads will be necessary when outside agencies are responding that are not part of the normal every day mutual aid.


E-ONE


OPEN
150
100
200
50
250
psi
300
SIDE

Reverse Valve For Tender Filling



Water Handling Equipment

Turbo Draft:

Help access hard to reach draft sites.

Hose Holders: Use to hold hose lines to drop tanks.

OASIS
HYDRANT ASSIST VALVE
TO FIRE

Floating Dock Strainer:
Use at fill sites requiring drafting from bodies of Water.
Can be use when Low Level Strainer is not available.

Jet Siphon:

Use to transfer water from one drop tank to another, with a 1.75 inch Hose line. Some times called Transfer Jet.

Low Level Strainer: For drafting from Drop Tanks.

Summary

- Preparation and planning for potential water emergencies is critical to an effective fire suppression operation
- Individual departments must develop local SOG's concerning these events
- Included in these should be pre - established TARP plans
- County Coordinators must be involved in TARP plan development. They are an asset to the operation and a direct link to state and regional resources

Summary

- Understand the difference between emergent and non - emergent water emergencies
- All water emergency events should include strict command and control, effective use of an IMS, and the establishment of a unified command post
- Understand the importance of the water supply group and the assignment of a water supply officer
- Identify the differences between dump and fill sites and the operational procedures of each

Summary

- Recognize the strategy and tactics necessary to be effective during limited water supply occurrences
- Acknowledge alternative water supply options (Fireboat, Neptune System, LDH Task Force)
- Understand the need to establish and the resources required to initiate an effective tender delivery rate
- The goal of your TARP plan should be to move water from point “A” (source) to point “B” (fire) in a rapid and effective manner

REFERENCES

- NFPA 1002 – Standard for Fire Apparatus Operator Professional Qualifications.
- NFPA 1142 – Standard on Water Supplies for Suburban & Rural Fire
- Jones & Bartlett Third Addition – Fire Apparatus Driver Operator
- IFSTA Third Edition – Pumping Apparatus Driver Operator Handbook
- USFA Report – Safe Operations of Fire

REFERENCES

- FEMA FA - 248; Safe Operations of Fired Department
- Montgomery County (MD) Fire & Rescue Services
- Anne Arundel County (MD) Fire & Rescue Services
- Barnstable County (MA) Fire Chiefs Association

CREDIT

- This program was developed by;
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HAVING GOOD FRIENDS WITH
THE SAME MENTAL DISORDER
AS YOU IS PRICELESS!

Questions


NEW JERSEY
DIVISION OF FIRE SAFETY


URBAN AREAS SECURITY INITIATIVE
Newark
Jersey City
UASI
BERGEN ESSEX HUDSON MIDDLESEX MORRIS PASSAIC UNION