Strafford Fire Rescue Department
Strafford, New Hampshire

Rural Water Supply Operations Seminar & Drill

Tanker Shuttle Drill
October 18, 2009
Summary Report

Overview

- In October 2009, the Strafford, New Hampshire Fire Rescue Department sponsored a rural water supply operations seminar.
- The seminar, which was delivered by GBW Associates, LLC of Westminster, MD was a joint training effort between several local fire departments to practice and improve water supply operations.
- This presentation is a summary of the tanker shuttle drill which was part of the seminar.

The Purpose

- The purpose of the seminar and drill was to review the basics of rural water supply operations and to practice water supply operations in a non-hydranted setting.

The Seminar

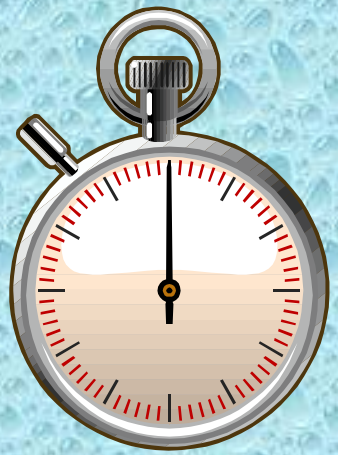
- The seminar started with a 6-hour session to review the basics of rural water supply operations.
- The review session was conducted in the gymnasium of the Strafford School located in Strafford, New Hampshire.
- Seminar topics included the history of rural water supply, tanker construction, dump site operations, fill-site operations, tanker shuttle operations, and drafting.
- Since the Strafford Fire Rescue Department is part of the Lakes Region Mutual Fire Aid Association, other departments in the mutual aid network were invited to participate.

The Drill

- The tanker shuttle drill was held on October 18, 2009, in Strafford's first-due response area.
- The drill attempted to replicate the 2-hour Water Supply Delivery Test used by ISO in their evaluation of fire department water supply capabilities.
- While in recent times, ISO has come under some scrutiny for its rating schedule, the ISO 2-hour test is still a reasonable standard by which fire departments can compare their water supply operations.

The ISO Test

- There are three critical time segments of the ISO 2-hour Water Supply Delivery Test:
  - 0:00 to 5:00 minutes
  - 5:01 to 15:00 minutes
  - 15:01 to 120:00 minutes



ISO Test: 0:00 to 5:00 Minutes

- A drill location is selected and the units due to respond on the first-alarm assignment are dispatched.
- Time starts when the first engine arrives on the scene and comes to a complete stop.
- There is no requirement to flow water during the first 5 minutes, but the crew must be prepared to flow water once the 5-minute mark is reached.

ISO Test: 5:01 to 15:00 Minutes

- At the 5-minute mark, a flow of at least 250 gpm must be started - and it must be sustained.
- During the next 10-minutes, crews can work to further develop their water supply and increase their flow, however…
- At the 15-minute mark (5+10), whatever amount of water is flowing at that time must be maintained for the remainder of the 2-hour test.

ISO Test: 15:01 to 120:00 Minutes

- Once the 15-minute mark has been reached, the remainder of the 2-hour test is really just about ***sustaining*** the flow.
- The ISO test includes the simulation of mutual aid response and allows additional water supply units to arrive and assist in the delivery process as would happen on a real incident.
- The real advantage of the ISO test is that it gives a fire department the chance to see where improvements can be made in their water supply delivery process.

It is one thing to say that your fire department can deliver 500 gpm for two hours – it is another thing to prove it in a real-life drill scenario!

Strafford Drill Participants

The participants for the drill were from eight different fire departments and the apparatus was representative of the type of water supply support that would respond to a fire in Strafford.

Drill Participants

- Strafford 25-Engine-1
  - 1,250 gpm pump w/1,000 gal tank

- Strafford 25-Engine-2
  - 1,000 gpm pump, w/1,000 gal tank and 1,500 gal dump tank

Drill Participants

- Strafford 25-Engine-3
  - 1,750 gpm pump w/3,000 gal tank and 3,500 gal dump tank

- Barrington 10-Tanker-4
  - 2,000 gal tank w/500 gpm pump and 2,000 gal dump tank

Drill Participants

- Gilmanton 9-Engine-2
  - 1,250 gpm pump w/1,000 gal tank

- Gilmanton 9-Engine-3
  - 2,000 gpm pump w/2,500 gal tank

Drill Participants

- Alton 1-Engine-2
  - 2,000 gpm pump w/2,500 gpm pump

- Candia 50-Tanker-1
  - 3,500 gal tank w/1,000 gpm pump and 3,000 gal dump tank

Preparation

Units staged at the Strafford School where an operational briefing was conducted outlining the objectives for the drill. Safety issues were also reviewed.

The Drill Begins

With everything set, units were dispatched for a simulated fire at the National Guard facility on Route 126 in Strafford. The Strafford's 25-Engine-1 arrived on the scene and laid a 600 ft, 4-inch supply line trimmed out with a double-clappered siamese. The stopwatch was started when the engine came to a stop and the driver engaged the parking brake.

Rural Hitch Support

Strafford's 25-Engine-3 was next to arrive and they completed the split lay by connecting to the clappered siamese and laying out toward the dump site location.

Apparatus Positioning

25-Engine-3 is shown above laying out to the dump site area while 25-Engine-1 stretches an attack line in order to begin flowing water.

Attack Line Deployment

At the 3:30 minute mark, a 2-1/2-inch attack line begins flowing 250 gpm using 25-Engine-1's tank water.

Attack Engine Operations

Shortly thereafter, the supply line from 25-Engine-3 is charged and now the 2-1/2-inch attack line can be supported for a longer period of time using both engines' tank water.

Rural Hitch in Operation

The key to this “rural hitch” operation is to use a double-clappered siamese and to support the attack engine at all times. The main support right now is coming from 25-Engine-3 who is pumping the line until the dump site gets set up.

Attack Engine Operations

With the 2-1/2-inch attack line running, the other two members of 25-Engine-1's crew stretch a 200-ft, 4-inch line to support a another flow device.

Dump Site Operations

25-Engine-3's 3,000-gallon tank is helpful in supporting the attack while the dump site gets set up.

Command Structure

Deputy Chief Scott Whitehouse assumed the role of Incident Commander.

Captain Matt Lobdell became the Water Supply Officer.

Dump Site Set-up

As additional units arrive, the dump site begins to grow. 25-Engine-3 has set-up its 3,500-gallon dump tank and is ready for the tank to be filled.

Dump Site Operations

Gilmanton 9-Engine-2 was originally going to dump its water but the decision was quickly made to have the engine report to the fill site at the school so that tanker fill operations could be started.

Additional Help Arrives

Barrington 10-Tanker-4 arrives on the scene and is directed to dump its 2,000 gallons of water.

More Tankers Arrive

Alton 1-Engine-2 and Gilmanton 9-Engine-3 are shown here arriving on the scene.

Dump Site Operations

Candia 50-Tanker-1 is shown dumping its 3,500 gallons of water. In addition, the tanker's 3,000-gallon dump tank (yellow) was set-up as the second dump tank.

Dump Site Expands

Alton 1-Engine 2 is shown off-loading its 2,500 gallons of water by pumping off through a rear discharge.

Dump Site Operations

At the 16:30 minute point, the flow is moved to 500 gpm. The photo above shows no tankers waiting to dump. This is a concern but flow was sustained at this point.

Flow Measurement

With the 2-1/2-inch attack line now shutdown, this flow diffuser device was used to measure flow. This photo shows a 500 gpm flow.

Dump Site Operations

With the flow now at 500 gpm, managing the dump site becomes more of a challenge.

Dump Site Operations

Barrington's 2,000-gallon tanker made numerous trips during the shuttle and proved to be a real workhorse.

Dump Site Operations

Waiting for water to show up. Fortunately, 25-Engine-3's operator was able to use the rig's 3,000 gallon tank to help support the flow when available water got low in the dump tanks.

Flow Moved to 800 gpm

At the 90-minute mark, flow was moved to 800 gpm to see if crews could sustain that level.

Rural Hitch Support

Alton 1-Engine-2 was removed from the tanker shuttle operation and was used to support the rural hitch during times of inadequate supply. This was done because the Alton rig is not equipped with a large dump valve – thus making it better suited to pump off its water.

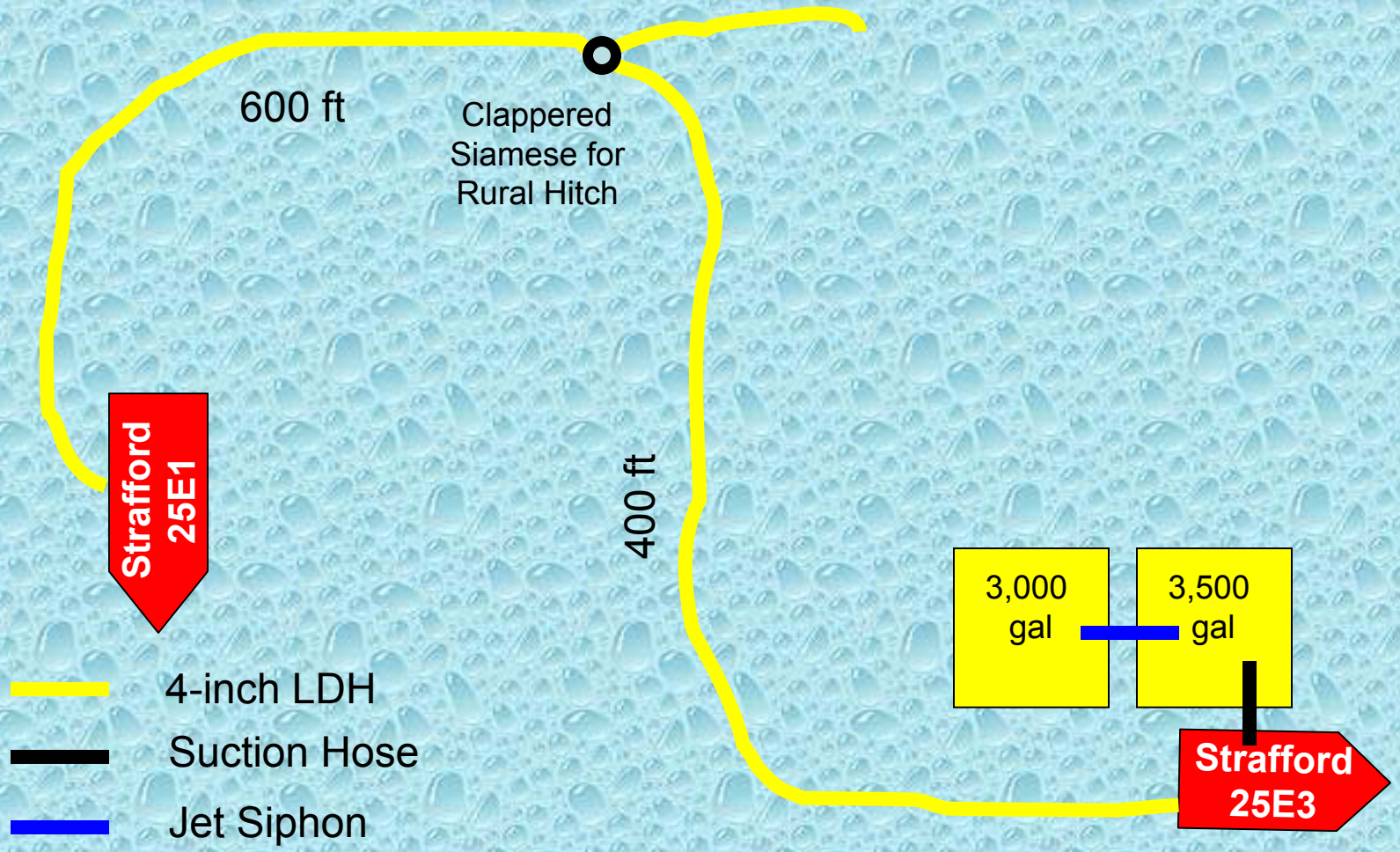
Dump Site Operations

Another load dumped by the Barrington tanker. The rig's all plastic body and tank allow for more water to be carried on a single axle than traditional metal body tankers.

Dump Site Operations

At the peak of operation, the 800 gpm flow became a real challenge and the second dump tank seemed to almost always be empty forcing tankers to dump into the primary tank almost every time.

Dump Site Layout



The Fill Sites

- Two ponds were used as fill sites for the drill; one had a dry hydrant installed and the other was just a regular pond.
- The dry hydrant pond was located near the Strafford School and was the closest fill site. It was supported by Gilmanton 9-Engine-2, a 1,250 gpm pumper. This fill site provided a 0.5-mile round trip for rigs hauling water.
- The second fill site was a pond on RT 126 near the highway department garage and was supported by Strafford 25-Engine-2, a 1,000 gpm pumper. This fill site provided about a 1.0-mile round trip.

School Fill Site

This fill site used an older dry hydrant at a pond near the Strafford School. Gilmanton 9-Engine-2 (1,250 gpm) was assigned as the fill site engine.

School Fill Site

The engine crew worked hard to get the fill site up and running. At the 7:10 minute mark, they were successful and ready to fill tankers.

School Fill Site

With a successful draft and a recirculating line in place, the crew awaits the first tanker.

School Fill Site

Barrington 10-Tanker-4 is shown here getting filled. The two lane road provided sufficient space for the operation.

School Fill Site

The large, direct fill line on the Barrington tanker allowed it to be filled in just under 3:00 minutes.

School Fill Site

Alton 1-Engine-2 is shown being filled at the School Fill Site. Note the leak from the coupling on the fill pumper's rear discharge. A few moments after this photo was taken, the hose line blew off the discharge. The problem was that the quick connect coupling had not been fully connected.

School Fill Site

Crews scramble to get the fill line re-attached so that the filling operation can be completed.

Highway Department Fill Site

Strafford 25-Engine-2 (1,000 gpm) operates this fill site at a pond near the town highway department on Route 126. Again, the two-lane road provides sufficient space to run this tanker fill operation.

Highway Department Fill Site

The engine established a draft and used its pre-piped deck gun as the recirculating line in between filling tankers.

Highway Department Fill Site

A floating barrel strainer was used on 6-inch hard suction hose. Note the use of the butterfly valve (Keystone) on the pumper's suction intake. Pumpers that are expected to draft on a regular basis should have some type of control valve on their suction intakes.

Highway Department Fill Site

In a longer duration operation, another length of suction might be needed in order to locate the strainer farther out in the pond and away from vegetation.

The Results

- The drill was stopped after 2 hours.
- ***Water flow was only interrupted once – for about 1-1/2 minutes at the 31-minute point into the drill.***
- An estimated total of 63,250 gallons were moved during the 115-minute event resulting in an ***average flow of 550 gpm***. (No water was moved for the first 3-1/2 minutes during set-up and then water was lost for 1-1/2-minutes in the first half of the drill)

Lessons Learned

- Four water transport rigs and four pumpers were used to deliver the 550 gpm for the duration of this drill – once again emphasizing the need to call for help early in an incident.
- The use of the “rural hitch” in combination with the dump tank operation provided a sustainable water supply operation.

Lessons Learned

- However, the 500 gpm sustained flow proved to be a challenge as the dump tanks were almost always in need of filling – so the operation functioned very near to its flow limit capability.
- It is also important to note that the travel distances to both fill sites were less than a 1-mile round trip.
- When sending engines to draft sources, attempt to get the larger pumps at the source when possible.

Lessons Learned

- Side dumps in addition to rear dumps provide greater flexibility in tanker offloading operations.
- Designating a Dump Site Leader (officer) to direct dump site operations helps make things go smoother.
- When transitioning from the rural hitch to a dump tank operation it is important to keep the rural hitch as an option to support the attack pumper or to allow rigs that can only pump off a way by which they can do so without blocking the dump site.

Lessons Learned

- All size tankers can contribute to the overall delivery rate – some will just be more efficient in the process than others.
- When setting up multiple dump tanks, avoid setting them up in a manner that requires water to be transferred multiple times before it gets to the primary drafting tank.
- Small fill lines slow down tanker fill operations. Even if a tanker has a 2-1/2-inch direct fill connection – use an adaptor and connect LDH to that connection.

Summary

- The drill was a success. It showed the value of equipment interoperability and revealed that 500 gpm is a reasonable goal for the resources that were used.
- Many thanks to the Strafford Fire Rescue Department for sponsoring the program and to all of the fire departments that provided support to the seminar.

www.GotBigWater.com

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