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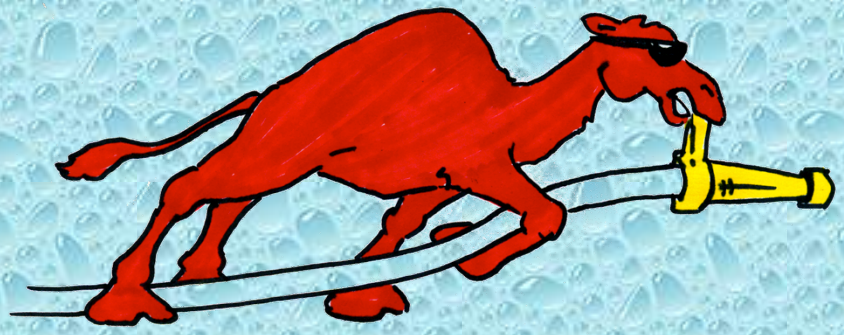


Stratham Volunteer Fire Department
Stratham, New Hampshire

Rural Water Supply Operations Seminar
2-hr Water Supply Drill
June 23, 2013
Summary Report

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 drill also allowed mutual aid companies to work together in a real-life training situation.

The Seminar

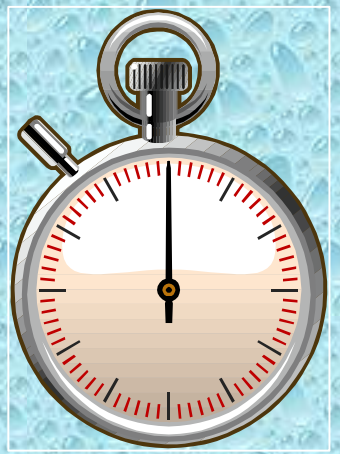
- The 2-day seminar started on Saturday with a 4-hour classroom session to review the basics of rural water supply operations.
- The review session was held at the Stratham VFD in Stratham, NH.
- Once the classroom part was over, the seminar continued with several hours of practical work on fill-site and dump site operations.
- The program concluded on Sunday with the 2-hr ISO tanker shuttle exercise and program review.
- Seminar participants were from the Stratham area.
- Instructors for the seminar were Mark Davis and Shane Darwick.

The 2-hour Water Supply Drill

- The tanker shuttle drill was held on June 23rd at Stratham Memorial School in Stratham, NH.
- 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 everyone in the fire service may not agree on ISO's evaluation of fire department capabilities, the 2-hour test is still a reasonable standard by which fire departments can compare their water supply operations.

The ISO Test

- The ISO 2-hour Water Supply Delivery Test has three critical time segments:
  - 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 automatic 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!

Water Supply Drill Participants

- *The participants for the drill were from three different fire departments and the water hauling apparatus was representative of the type of water supply support that would respond to a structure fire in the Stratham area.*

Drill Participants

- Stratham Engine 1
  - 1,500 gpm pump w/1,000 gal tank
- Stratham Engine 3
  - 1,500 gpm pump w/1,000 gal tank

Drill Participants

- Stratham Tanker 8
  - 2,000 gpm pump w/3,000 gal tank
- New Market Tanker 4
  - 1,500 gpm pump w/2,500 gal tank

Drill Participants

- Greenland Tanker 1
  - 1,250 gpm pump w/3,000 gal tank

Preparation

Units received a briefing at the Stratham fire station and then staged in the station parking lot and awaited dispatch.

The Drill Begins

Stratham Engine 3 served as the attack engine and arrived at the school parking lot where it laid out a 5-inch LDH supply-line trimmed out with a double-clappered siamese (the “rural hitch” concept).

Dump Site Set-up

When Stratham Tanker 8 arrived on the scene, its 3,000-gallon dump tank was removed and placed next to Engine 3. The position of the dump tank was changed soon after, because the folks wanted to simulate a more congested area.

Water Flow Begins

At the 5-minute mark, water flow was started at 280 gpm using a Hose Monster flow diffuser for flow measurement. The diffuser was supplied by a 100-ft section of 5-inch LDH from Engine 3's high-flow discharge.

Nurse Tanker Operations

Stratham's Tanker 8 made a huge difference in the early stages of this drill by operating as a nurse tanker. The unit's 3,000 gallons of water in conjunction with the attack engine's 1,000 gallons allowed for enough time to build out the dump site without the stress of immediately needing water.

Nurse Tanker Operations

Tanker 8 – with its 2,000 gpm pump – supplied water to Engine 3 via 300-feet of 5-inch LDH until such time that the first dump tank could be placed into operation.

Dump Site Transition

At around the 18-minute mark, New Market's tanker arrived and the operation transitioned to a dump site operation. The flow was also increased to 500 gpm.

Dump Site Operations

At the 22-minute mark, three dump tanks were down - with two in operation.

Dump Site Operations

With the dump site now operational, Tanker 8 broke free from nurse tanker ops and dumped the remainder of its first load of water into the dump tanks.

Dump Site Operations

Three dump tanks in operation, a flow of 500 gpm, and NO tankers in sight! No problem however, a tanker showed up soon after this photo was taken and flow was not interrupted.

Dump Site Operations

When setting up a dump tank, be sure to take a moment to straighten out the tank material – otherwise uneven loading can occur as shown in this photo.

Water Transfer Operations

At the 50-minute mark, water flow was moved to 750 gpm and jet siphons were re-configured to improve flow. A ladder and additional suction hose were used to "jump" the red tank.

Strainer Issues

When attempting to raise the flow above 750 gpm, the low level strainer proved problematic. The first strainer seemed to peak at around 950 gpm (750 gpm plus two jet siphons). Water flow was interrupted whiles crews tried other strainers – without much success

Strainer Issues

The bottom line is that strainer selection is critical to the success of a dump tank operation. Each strainer shown in this photo had a different flow limit.

Dump Site Operations

The Devil Duck took the place of a ball in helping to prevent the creation of a vortex.

Dump Site Operations

Drains that still use rope as their securing mechanism need to be tied up on the inside of the tank in order to reduce the “mess” created when they spill over.

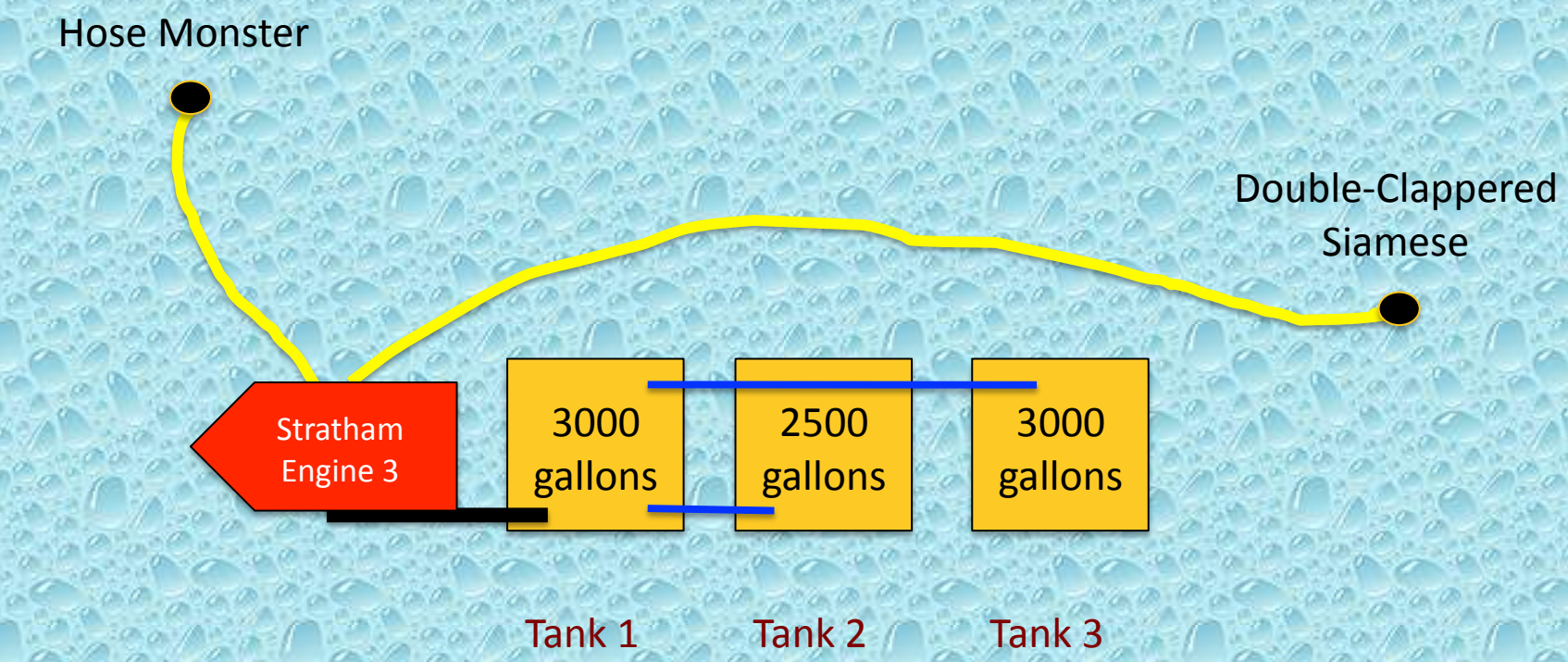
Dump Site Operations

With a final change in strainers and the reconfiguration of the jet siphons – the flow peaked at 900 gpm. Flow seemed most stable at around 750 gpm.

Dump Site Operations

The arrangement of tanks was a bit different but it worked out just fine and flow was not restricted because suction was taken using the driver side suction inlet.

Dump Site Layout



The Fill Sites

- For this drill – one fill site was used.
- The fill site was located at a pond on Gifford Farm Road and provided about a 2.2-mile roundtrip for the units hauling water.
- The fill site required a pumper to locate near the pond's shoreline and take suction using a 6-inch dry fire hydrant.
- The pond provided ample water volume to support the drill and access was not a problem.
- A single, 1,500 gpm pumper was used to support the tanker fill station.

Fill Site Operations

Stratham Engine 1 arrived at the pond and quickly went to work setting up the site with the goal of having the fill site set up by the time the first tanker arrived.

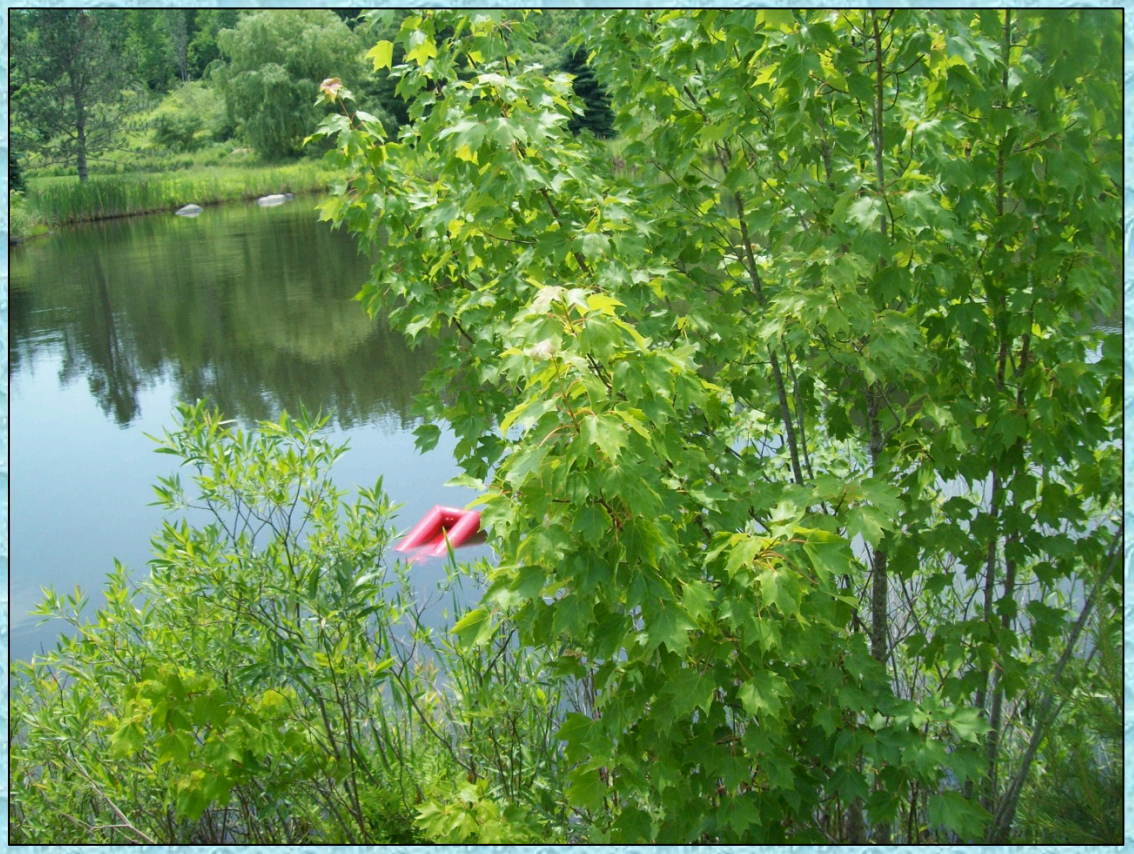
Fill Site Operations

In order to maximize the capability of the 1,500 gpm pumper, two suction lines were used. The dry fire hydrant was used first and then the additional 6-inch suction line was added several minutes later.

Fill Site Operations

The second suction line was able to be added without having to shut down the operation - once again showing the value of outfitting a pumper with suction inlet control valves.

Fill Site Operations



A floating strainer was used on the second suction line. The pond provided an ample quantity of clean water.

Fill Site Operations

The fill-site was located in a residential neighborhood and therefore the road was somewhat narrow. Space management and tanker travel route control were important.

Fill Site Operations

4-inch LDH was used to fill the tankers with an average fill rate in the neighborhood of 950 gpm to 1100 gpm.

The Results

- The drill was stopped at the 2-hour mark.
- Water flow was interrupted twice during the drill – once because of an increase in flow that caused issues with the low-level strainer's capacity.
- The second interruption occurred because of trying to flow more water than the shuttle could support.

The Results

- An estimated 62,240 gallons of water were flowed through the attack engine during the drill producing an average flow rate of 622 gpm – which was VERY GOOD for just using two pumpers and three tankers.
- There had been some initial skepticism that a 500 gpm flow could be sustained – that was proven wrong.

The Lessons Learned

- The use of Tanker 8 as a nurse tanker in the "rural hitch" early on provided valuable time to the dump site crew. There was no need to rush around and hastily set-up dump tanks. There was ample time to think through the process and not run out of water.
- A tanker fill-site needs to run like a NASCAR pit stop. Anything that slows down the loading of tankers is going to reduce the efficiency of the tanker shuttle.

The Lessons Learned

- The flow capability of low level strainers varies from manufacturer to manufacturer. It is in a FD's best interest to drill with their strainers to learn what maximum flows can be obtained.
- Jet siphons, suction hose, and dump tanks are needed at most every dump tank operation – therefore, it is wise to carry those items on every tanker.

Summary

- The drill was a success. For the new folks, they got to see how dump tank operations work.
- For the older, experienced folks, it was a chance to practice their "craft."
- The success of the drill showed the importance of mutual aid response practices and procedures – and the importance of mutual aid interoperability.
- Many thanks to the Stratham VFD for sponsoring and hosting this seminar.

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For more information contact us at
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