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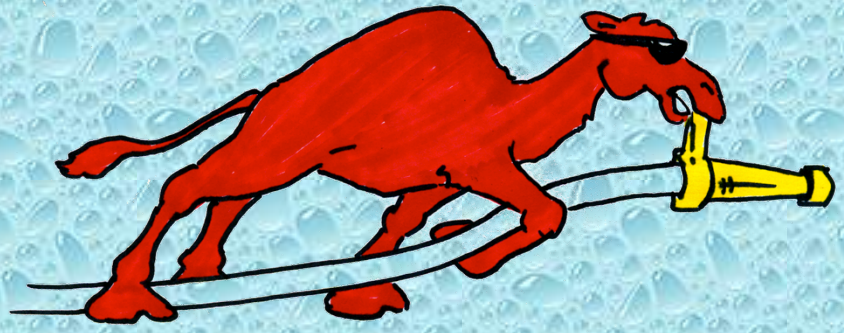


Casco Fire & Rescue Department
Casco, Maine

Rural Water Supply Operations Seminar
2-hr Water Supply Drill – August 25, 2012
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

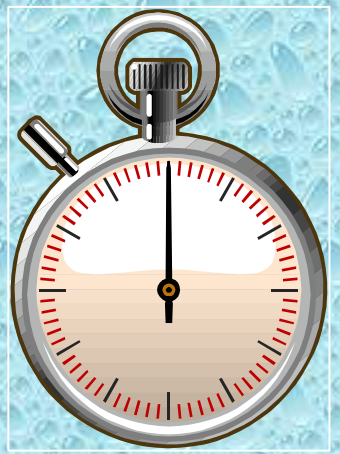
- The 2-day seminar started with a 4-hour classroom session to review the basics of rural water supply operations.
- The review session was held at the Casco Central Station.
- Once the classroom part was done, the seminar continued with 8 hours of practical work on fill-site and dump site operations.
- The program concluded with the 2-hr ISO tanker shuttle exercise and program review.
- Seminar participants were from Casco area.

The 2-hour Water Supply Drill

- The tanker shuttle drill was held on August 26, 2012 in Casco.
- The target hazard used was Hancock Lumber, a large, lumber mill where a tanker shuttle operation would be needed to support the fire attack.
- 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 ISO 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 five different fire departments in the Casco area and the water hauling apparatus was representative of the type of water supply support that would respond to a structure fire in Casco region.*

Drill Participants

- Otisfield Engine 2
  - 1,250 gpm pump w/1,000 gal tank
- Casco Engine 14
  - 1,500 gpm pump w/1,000 gal tank

Drill Participants

- Bridgeton Engine 4
  - 1,500 gpm pump w/1,000 gal tank
- Otisfield Engine 3
  - 1,250 gpm pump w/1,000 gal tank

Drill Participants

- Bridgeton Tank 4
  - 3,000 gal tank
- Raymond Tank 1
  - 1,250 gpm pump w/3,000 gal tank

Drill Participants

- Harrison Tank 6
  - 3,000 gal tank
- Casco Tank 6
  - 1,800 gal tank w/500 gpm pump

Drill Participants

- Casco Tank 7
  - 1,800 gal tank w/500 gpm pump
- Raymond Tank 2
  - 1,250 gpm pump w/3,000 gal tank

Drill Participants

- Poland Tank 6
  - 1,000 gpm pump w/2,500 gal tank

Preparation

Units began the drill at the Casco fire station where a briefing was given by DC Dennis Michaud of the Casco FD. Crews then boarded their rigs and waited for the dispatch of the event.

The Drill Begins

With everyone ready, the drill was started. Otisfield Engine 2 was first to arrive . When Engine 2's driver brought the rig to a stop, the timer was started.

The Drill Begins

Raymond Tank 2 and Casco Tank 6 were next to arrive. Tank 6 moved into position to operate as a nurse tanker if needed and crews began setting up the dump site in order for Raymond Tank 2 to dump its water.

Dump Site Set-Up

Part of the crew hustled to get the first dump tank set-up while the other part of the crew worked to deploy the attack line. The first tank was down at the 1:38-minute mark.

Dump Site Set-Up

With the first dump tank down, Otisfield Engine 2's driver began the drafting set-up.

Dump Site Set-Up

A second dump tank is put into place around the 3:46-minute mark in preparation for expanding the operation.

Dump Site Set-Up

Raymond Tank 2 dumps its 3,000 gallons of water into the first dump tank at the 4:00-minute mark and drafting operations are about to begin.

Water Flow Begins

At the 5:00-minute mark, water flow was started at 280 gpm. A Hose Monster flow diffuser with fixed pitot was used to provide an accurate flow measurement.

Dump Site Set-Up

At the 5:30-minute mark, Casco Tank 6 (1,800 gallons) takes a position to operate as a nurse tanker if needed. The tanker crew sets up to supply the dump site pumper through 4-inch LDH and a double-clappered siamese.

Dump Site Operations

At the 12:00-minute mark, Bridgeton Tank 4 – a 3,000 gallon vacuum tanker – arrives on the scene an offloads its water into the primary dump tank.

Nurse Tanker Operations

With Casco Tank 6 now connected up, nurse tanker operations were used to support the initial dump site operation until additional tankers arrived. The nurse tanker operation proved very helpful during those first few moments. Only a couple hundred gallons of water were used from Tank 6 – but its presence made a big difference in terms of a sustained water supply.

A Third Dump Tank

Around the 12:15 minute mark, a third dump tank was deployed but not placed into service until adequate resources arrived.

More Tankers Arrive

More resources arrive to offload water and crews continue to work to plan for the eventual expansion of dump site operations. Harrison Tank 6 offloads here at the 13:30 minute mark.

Oops!

A slight problem occurred when the attachment rope broke on the corner of the second dump tank. Fortunately, the crew was able to repair the corner so that minimal water was lost.

Flow Increased

With the arrival of the additional tankers, the third dump tank was placed into service and flow was moved to 504 gpm at the 15-minute mark.

Water Transfer Operations

As usual, water transfer operations were critical to the success of the operation. Jet siphons were used to make the transfer of water from the outer tanks to the primary drafting tank.

1st Tanker Back

At the 24:00-minute mark, Raymond Tanker 2 returned with its first load of water from the fill site.

Dump Site Operations

While not that “pretty,” the hose layout was very functional in that Tank 6 was able to supply the dump site pumper if needed.

Water Transfer Operations

Water transfer operations were in full effect . Discussion began to occur about changes to jet siphon operations if the 1,000 gpm flow was going to be attempted.

Dump Site Operations

The low-level drafting strainer on the dump site pumper's suction line got flipped over when a tanker dumped its water in the primary tank. Fortunately, the crew was able to fix the problem without interrupting the water flow.

Dump Site Operations

Around the 38:00 minute mark, all of the dumps tanks were pretty much full and tankers were waiting to dump their water. The decision was made to increase flow.

Water Flow Increased

Flow was increased to 750 gpm at the 51:00-minute- mark.

Dump Site Operations

With the flow now at 750 gpm, crews had to hustle to keep the primary dump tank full and water transfer operations in sync with the demand. Harrison Tank 6 is shown here dumping its 3,000 gallons of water.

Dump Site Operations

Casco Tank 7 offloads its 1,800 gallons of water using a little bit of a different approach before it was relocated to run jet siphons.

Water Transfer Operations

The goal was to try and increase the flow to 1,000 gpm. The dump site pumper was struggling to go above 800 gpm. The decision was made to take Tank 7 out of the water hauling loop and have them draft and run jet siphons.

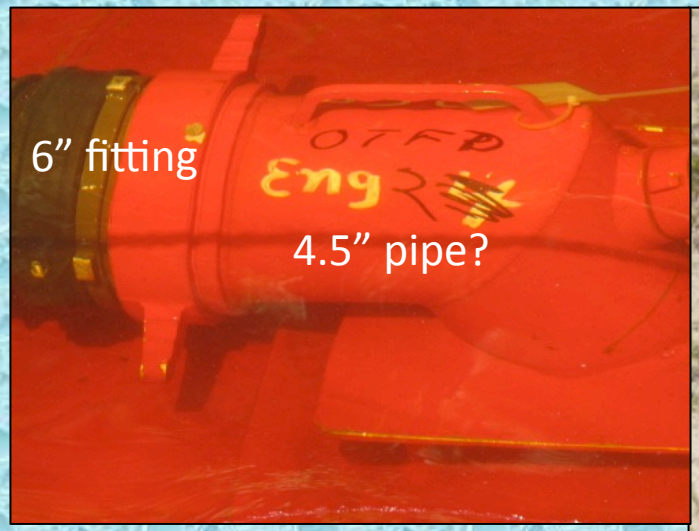
A Flow Problem

A problem occurred at the dump site pumper. Otisfield Engine 2 could not attain a 1,000 gpm flow. Several attempts were made to change the operation but nothing made a difference. The pumper could not get above 800 gpm. The problem? It was the low-level strainer that was being used on the pumper's suction line.

A Flow Problem

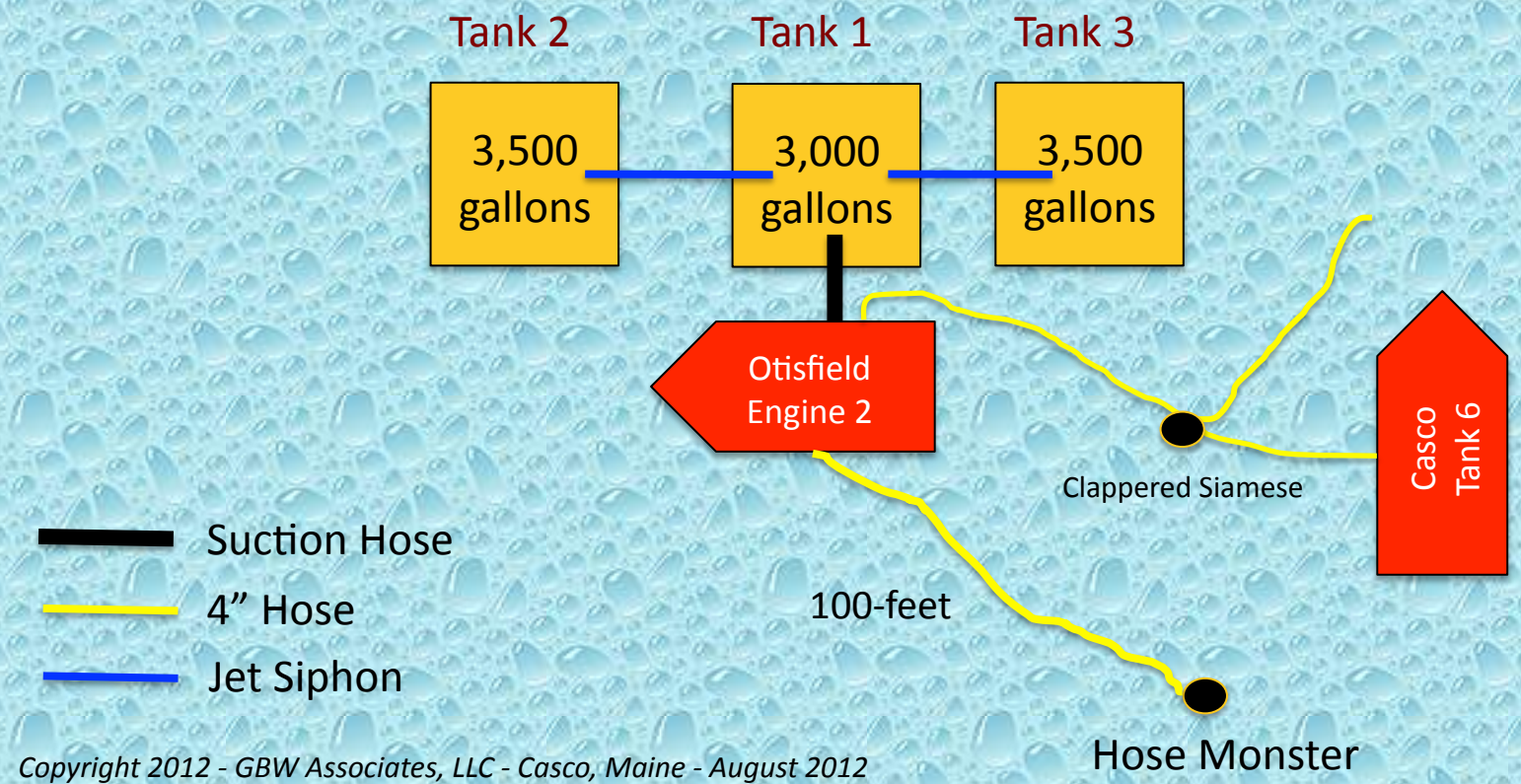
The low-level strainer was replaced with a 6-inch, basket-style strainer and the flow capability was instantly increased to 1,100 gpm!

Strainer Selection



As it turns out, there were two types of low level strainers available. The one shown on the right (above) is the “high-flow” model. It was NOT used.

Dump Site Layout



The Fill Sites

- For this drill – three fill sites were used.
- The first fill site was a pond located on Cooks Mill Road that provided a 1.5-mile round trip for the units hauling water.
- The pond provided ample water volume to support the drill – although access was a little but challenging.
- A single, 1,500 gpm pumper was used at the pond to support the tanker fill station.

The Fill Sites

- The second fill site was set-up at a large lake on Mayberry Hill Road that provided a 7-mile round trip for the units hauling water.
- The lake provided ample water volume to support the drill and access was no problem.
- A single, 1,500 gpm pumper was used at the lake to support the tanker fill station.
- The vacuum tanker also established its own loading station at this fill site.

The Fill Sites

- The third fill site used a small brook along Leach Hill Road and provided an 11-mile round trip for the units hauling water.
- The brook pond provided sufficient water volume to support the drill – although access was also a little but challenging. Additional suction hose was needed before the fill site could be made operational.
- A single, 1,250 gpm pumper was used at the pond to support the tanker fill station.

Cooks Mill Fill Site

Casco Engine 14 (1,500 gpm) was the first engine dispatched to a fill site and the crew had to hustle in order to have the site up and running by the time the first tanker arrived for loading. Access was a bit limited but the crew worked to get the pumper set-up in short order.

Cooks Mill Fill Site

Engine 14's front suction inlet was used as the drafting inlet for the operation and a floating strainer was needed to access the pond water. The disadvantage of using a front suction inlet is that these inlets are not used in the rating of the fire pump and thus – they normally have restrictive flow – often times in the neighborhood of just 60% capacity. A better choice would be to use an extra length of suction hose and draft from a side suction inlet.

Cooks Mill Fill Site

The Casco crew used a 5-inch LDH manifold to load the tankers coming to this fill site. The manifold allowed the loading to be controlled away from the pump panel.

Cooks Mill Fill Site

The fill site crew is shown above loading the tankers as they arrived. The important part of running a fill site is that crews should try and run a site like a NASCAR pit stop.

Mayberry Hill Fill Site

Bridgeton Engine 4 (1,500 gpm) operated the second fill site which was located on a large lake that had plenty of water access. The pumper had good positioning and there was ample room to load tankers.

Mayberry Hill Fill Site

The fill site was established at a dry fire hydrant which provided plenty of water for meeting tanker filling rate requirements.

Mayberry Hill Fill Site

While this loading station arrangement was not pretty, is was quite functional in that the tankers were loaded quickly using LDH - while at the same time, the hose could be drained in order to disconnect from the tanker's direct fill in as short a time as possible.

Mayberry Hill Fill Site

Enjoying the down time a bit in between tanker arrivals.

Leach Hill Fill Site

Otisfield Engine 3 (1,250 gpm) operated the third fill site and also filled tankers using 4-inch LDH.

Leach Hill Fill Site

The crew was supposed to use a dry fire hydrant but it was out of service so they had to resort to drafting directly out of the brook. This required an additional length of suction hose – which the pumper did not initially have.

Leach Hill Fill Site

The loading crew did not have an LDH manifold to use so the pump operator had to be involved in the loading process.

The Results

- The drill was stopped at the two-hour mark.
- Water flow was never interrupted during the entire drill!
- An estimated 74,110 gallons of water were flowed through the attack engine during the drill producing an average flow rate of 644 gpm.

The Lessons Learned

- The nurse tanker mode of operation was used during the early phases of the drill to insure that the attack pumper did not run out of water.
- However, the crews did an absolutely great job of getting the first dump set-up and operational in less than 5:00 minutes and the nurse tanker was never really needed much.
- Interoperability during water supply operations is critical. This means that hose connections and fittings must be easily interchangeable between mutual-aid units. At this drill, there were few, if any interoperability issues.

The Lessons Learned

- The use of LDH for filling tankers is a skill that has to be practiced. The crews at this drill did a nice job of using LDH – much like a NASCAR pit stop!
- Suction strainer selection is very important. The dump site pumper was restricted to less than 800 gpm because of the performance of the low-level strainer that was selected.
- However, it should be noted that this was the first time that GBW folks encountered such a low flow on that style and size suction strainer.

The Lessons Learned

- 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.
- The "bundling" of water hauling mutual aid resources has proven successful in many drills. The tanker task force concept is an effective process for requesting and using additional rural water supply resources.

The Lessons Learned

- Tankers should be marked on all four sides with their unit numbers. When operating at large, mutual aid incidents, group supervisors and command staff may not recognize a tanker – so identification markings are important.

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 Casco Fire and Rescue Department for sponsoring and hosting this seminar.

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This program was developed by
GBW Associates, LLC

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