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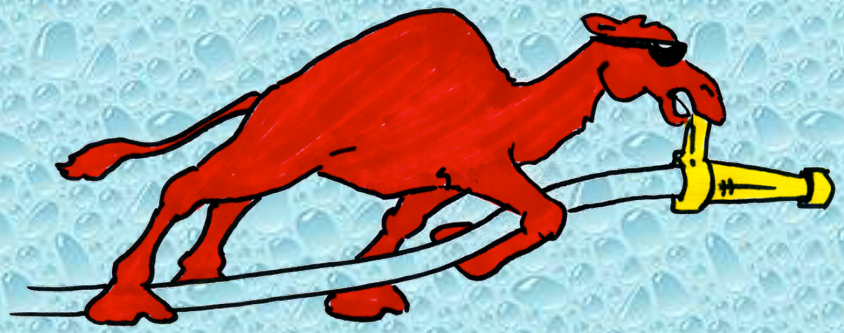


Bulloch County Fire Department
Bulloch County, Georgia

Rural Water Supply Operations Seminar
2-hr Water Supply Drill – November 6, 2011
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 the various stations to work together in a real-life training situation.

The Seminar

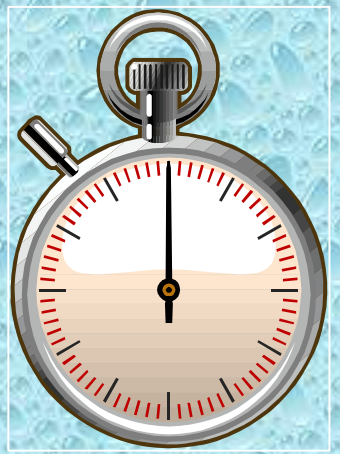
- The seminar started with a 6-hour session to review the basics of rural water supply operations.
- The review session was held at the Bulloch County Center for Agriculture located in Statesboro, Georgia.
- Seminar topics included the history of rural water supply, tanker construction, dump site operations, fill-site operations, tanker shuttle operations, and drafting.
- Seminar participants were from Bulloch County.

The 2-hour Water Supply Drill

- The tanker shuttle drill was held on November 6, 2011, at the agricultural facility in Statesboro.
- 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 six different Bulloch County fire stations and the apparatus was representative of the type of water supply support that would respond to a structure fire in Bulloch County.*

Drill Participants

- Engine 31
  - 1,000 gpm pump w/1,500 gal tank
- Tanker 45
  - 500 gpm pump, w/3,000 gal tank

Drill Participants

- Tanker 55
  - 500 gpm pump w/3,000 gal tank
- Engine 63
  - 1,500 gpm pump w/750 gal tank

Drill Participants

- Engine 83
  - 1,250 gpm pump w/1,500 gal tank
- Tanker 95
  - 750 gpm pump w/2,500 gal tank

Drill Participants

- Engine 24
  - 1,000 gpm pump w/1,500 gal tank
- Engine 34
  - 1,500 gpm pump w/1,500 gal tank

Drill Participants

- Engine 93
  - 1,250 gpm pump w/1,000 gal tank

Preparation

Units began the day at the Bulloch County Center for Agriculture facility where an operational briefing was conducted and crews were given assignments.

The Drill Begins

Engine 34 was the first unit to arrive. The pumper stopped and laid out 100-ft of 4-inch LDH. The timer was started when the pumper came to a stop.

The Drill Begins

Engine 63 was the next unit to arrive on the scene. The crew began setting up for a dump tank operation while the pump operator prepared to support the attack pumper – Engine 34.

Attack Line Stretched

In preparation for water flow, Engine 34's crew stretched a 100-ft, 3-inch hose line to a Hose Monster flow measuring device.

Dump Site Set-up

Engine 34's crew works to get ready to receive water from the dump site via a 4-inch supply line.

Dump Site Set-up

Additional units arrive and around the 2:54-minute mark, crews begin setting up the first dump tank – a 3,000-gallon tank.

Water Flow Begins

At the 5:00-minute mark, water flow begins at 280 gpm using a Hose Monster flow diffuser with a built-in pitot tube for accurate flow measurement.,

Nurse Operations

With water now flowing, the dump site pumper gets ready to supply the attack pumper using a “nurse” operation until the dump site can be made ready.

Dump Site Set-up

Meanwhile, crews work feverously to make the dump site operational. Their quick work resulted in a dump site ready to accept the first load of water.

Dump Site Set-up

With the arrival of additional units, a second, 3,000-gallon dump tank was set up in preparation for moving to a higher flow at some point in the drill.

1st Tanker Dumps

With the dump site all set-up, the first tanker dumps its water and operations transition from a nurse operation to a tanker shuttle operation.

Dump Site Set-up

While working to set up water transfer operations so that the second dump tank could be placed into operation, a small problem arose – two different size fittings. This was resolved fairly quick.

2nd Tanker Dumps

While still just using one dump tank, the next tanker arrives and dumps its 1,500 gallons of water.

Dump Site Expansion

As units from the Tanker Task Force arrive, a third dump tank (2,100 gallons) is set up in order to further expand the operation. Water flow is also moved to 504 gpm around the 21:00-minute mark.

1st Tanker Back

Around the 28:00-minute mark, the first tanker has returned from the fill site and dumps its second load of water.

Dump Site Operations

The dump site now has 8,100 gallons of storage capacity in the three dump tanks and water hauling operations have stabilized some.

Water Transfer Operations

When using multiple dump tanks, water transfer operations become very important. Without a means by which to transfer water, water becomes "trapped."

Water Transfer Operations

A jet siphon is the most common type of water transfer device used today and when properly pumped – its output should look like the output shown above.

Water Transfer Operations

When using a jet siphon, avoid submersing the outlet end because the device will then act as a siphon when the tank is full and the device is no longer pumped. In other words – water will go back to where it came from!

Good Thinking!

Some of the jet siphons used at this drill came “pre-rigged” on the engines and tankers – a great idea!

Fourth Tank Down

Around the 55:00-minute mark, a fourth dump tank (1,500 gallons) is put into position so that flow can be increased once again.

Dump Site Operations

With four dump tanks now in operation, the flow is moved to 750 gpm at the 72:00-minute mark.

Time to Run

When the water level drops to this point in a tanker, it is time to stop dumping and go get more water. In fact, this tanker could have left about a minute or so sooner. Waiting for every last drop to come out actually reduces the tanker's efficiency .

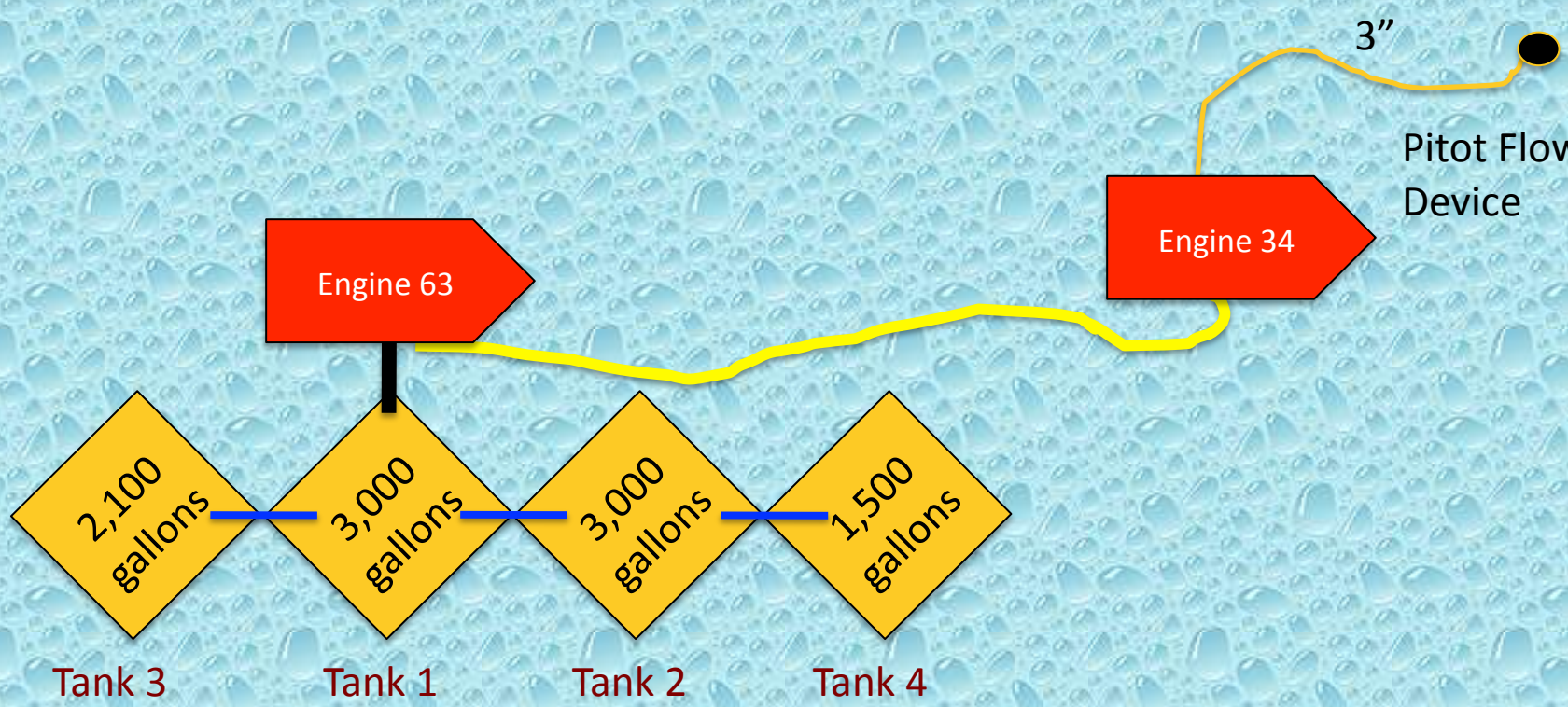
Water Transfer Operations

With the flow now at 750 gpm, Engine 31 was pulled from hauling water at around 104:00 minutes and put into operation helping to pump jet siphons.

It Was Close!!!

The water flow was NEVER lost at the attack pumper during the drill. But…at the dump site, it was very close to running out of water near the end of the drill. Fortunately, a tanker arrived just in time to sustain the operation. The 750 gpm flow rate was the maximum that this arrangement could support.

Dump Site Layout



The Fill Site

- Due to drought issues, one fill site with two fill stations was used for this drill.
- The fill site was a pond located at the Agricultural Center.
- Additional mileage was added to make the travel route a 2.0-mile roundtrip.

Pond Fill Site

Engine 83 arrives at the fill site and immediately goes to work setting up for a drafting operation.

Pond Fill Site

Two lengths of hard suction were needed to reach an adequate depth in the pond.

Pond Fill Site

Crews switch the location of the fill hose from a rear discharge to a side discharge.

Pond Fill Site

With a draft obtained, a second fill line is hand stretched to the tanker loading area. These folks worked hard getting this second line into position.

Pond Fill Site

The fill site was ready by the time the first tanker arrived and crews hustled to load the tanker.

Pond Fill Site

The fill site was set up and operating in just under 11:00 minutes after the arrival of Engine 83. Given the distance between the pond and the tanker loading area, some 4 or 5-inch LDH would have improved fill capabilities – however, this set-up still provided respectable fill times.

Pond Fill Site

Around the 30-minute mark, Engine 93 arrived at the pond to set up a second tanker loading station.

Pond Fill Site

Engine 93's crew decided to use their Turbo Draft device to supply their tanker fill operation.

Pond Fill Site

A two-person crew positioned the Turbo Draft in the pond.

Pond Fill Site

With the Turbo Draft in place, Engine 93's crew hand stretches two more fill hoses for tanker loading. One item to consider is that it may have been easier to "lay in" from the road when the pumper arrived rather than hand stretching back.

Pond Fill Site

In-line gate valves were used as fill control valves. The use of a valve on a tanker fill line is important because it reduces the need for a pump operator to open and close pump control valves.

Pond Fill Site

A traffic cone was used to aid tanker drivers in knowing where to position their rig so that the loading crew did not have to drag fill hose all over the place.

Pond Fill Site

Dual fill lines were used to load the tankers – this helped to improve loading times since LDH was not available for use.

The Results

- The drill was stopped after two hours.
- Water flow was never interrupted – although near the end of the drill, the 750 gpm flow rate proved tough to maintain and was most likely the highest flow that could be supported using the resources provided.
- An estimated 66,677 gallons of water were flowed through the attack engine during the drill - producing an average flow rate of 576 gpm.

The Lessons Learned

- To be effective, tanker shuttle operations need to use people and equipment as efficiently as possible.
- Using large dump tanks permits more on-site storage of water which thus allows more flexibility in operations. At this drill, the first two tanks provided 6,000 gallons of storage, which clearly helped prevent a water flow interruption during the initial stages of flow operations.

The Lessons Learned

- Large diameter hose is the hose of choice for supporting tanker fill operations – especially when the distance from the pumper to the tanker is greater than 150 feet.
- The goal for tanker fill operations should be 1,000 gpm and LDH allows that goal to be achieved much easier.

The Lessons Learned

- The Turbo Draft operation did not work so well because the supply returned to the pumper and the pumper was trying to then move that water 300-feet to the tanker loading station.
- The operation was able to fill tankers at a lower fill rate (<400 gpm) but had the pumper set up in a standard drafting arrangement (with suction hose), the 1,000 gpm fill rate goal most likely would have been met.

The Lessons Learned

- Adaptors and fittings are always critical at any water supply operation. It is important to carry multiple sets of fittings and adaptors so that all phases of water supply operations can be supported.
- Having different size and type of direct fill connections can drive a fill site crew crazy. Standardization of tanker fill connections will help reduce fill time by making the connection process simpler.

The Lessons Learned

- 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.
- 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 interoperability and practice.
- Many thanks to Chief Walker and the Bulloch County Fire Department for sponsoring and hosting the seminar.

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This program was developed by
GBW Associates, LLC

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