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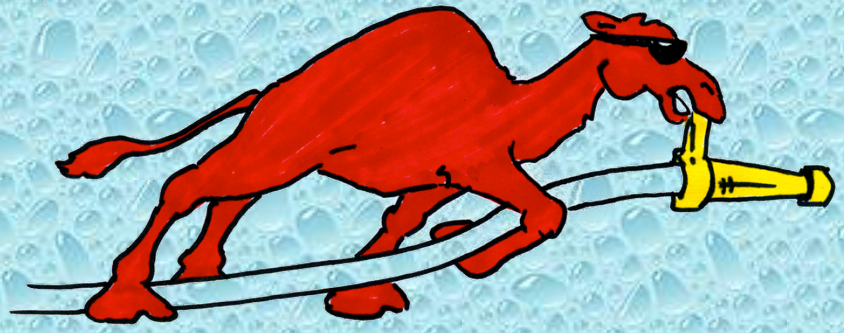


Shelby County EMA

&

The Four Mile VFD

Shelby County Alabama

3rd Annual Rural Water Supply Operations Seminar

2-hr Water Supply Drill – April 29, 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

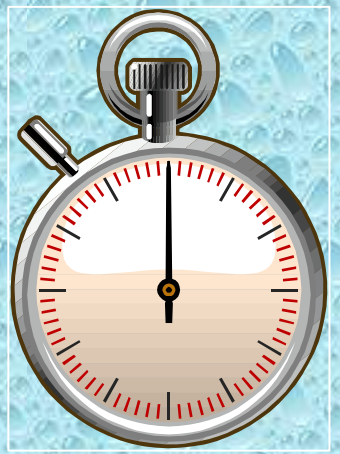
- The 2-day seminar started with a 3-hour classroom session to review the basics of rural water supply operations.
- The review session was held at the Four Mile VFD located in Four Mile, Alabama.
- Once the classroom part was done, the seminar continued with 6 hours of practical work on fill-site and dump site operations.
- The program concluded with the 2-hr ISO tanker shuttle exercise and program review.
- Seminar participants were from the Shelby County area.

The 2-hour Water Supply Drill

- The tanker shuttle drill was held at the Beeswax Creek Park on April 29, 2012.
- 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 nine 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 Shelby County.*

Drill Participants

- Four Mile Engine 261
  - 1,250 gpm pump w/1,000 gal tank
- Four Mile Engine 266
  - 1,000 gpm pump w/1,000 gal tank

Drill Participants

- Four Mile Tanker 262
  - 300 gpm pump w/2,000 gal tank
- Four Mile Tanker 263
  - 1,800 gal tank

Drill Participants

- Kingdom Tanker 272
  - 1,500 gal tank

- Kingdom Tanker 273
  - 1,500 gal tank

Drill Participants

- West Shelby Engine 241
  - 1,250 gpm pump w/750 gal tank

- West Shelby Pumper 243
  - 500 gpm pump w/1,000 gal tank

Drill Participants

- Dry Valley Engine 52
  - 1,500 gpm pump w/1,000 gal tank
- Shelby Tanker 113
  - 250 gpm pump w/2,000 gal tank

Drill Participants

- Shelby Tanker 116
  - 250 gpm pump w/1,000 gal tank
- Brierfield Tanker 206
  - 1,000 gpm pump w/2,500 gal tank

Drill Participants

- Brierfield Tanker 200
  - 3,000 gal tank
- Brierfield Engine 203
  - 1,500 gpm pump w/480 gal tank

Drill Participants

- Wolf Creek Engine 2
  - 1,250 gpm pump w/1,000 gal tank
- County 17 Tanker 213
  - 1,500 gpm pump w/2000 gal tank

Drill Participants

- Vandiver Tanker 124
  - 250 gpm pump w/1,000 gal tank
- Kingdom Engine 275
  - 1,250 gpm pump w/750 gal tank

Preparation

Units began the day at the Four Mile VFD where a briefing was given by the instructors and drill coordinators. The crews then boarded their rigs and drove a few miles to the drill site where they waited for the dispatch of the event.

The Drill Begins

Four Mile Engine 266 arrived on the scene and the crew laid out a 5-inch supply line. The timer was started and the “race to the 5-minute mark” began.

Attack Engine Operations

Engine 266 laid out 300-feet of 5-inch hose outfitted with a double-clappered siamese.

The Drill Begins

Brierfield E203 and County 17 Tanker 213 were next to arrive on the scene. E203 laid out 100-feet of 5-inch hose from the clappered siamese and Tanker 213 connected to the siamese and pumped its water to the attack engine.

Double-Clappered Siamese

The double-clappered siamese was the critical piece in the initial operation. Its use allowed the dump site engine to get set-up while the engine/tankers pumped off their water to the attack pumper via the siamese.

Attack Engine Operations

With the clock now running, the attack engine crew deployed a portable monitor in preparation for flowing water at the 5:00-minute mark.

Water Flow Begins

Water flow was a bit delayed in getting started, but at the 8:04-minute mark, water flow was started at 396 gpm. A hand-held pitot device was used to measure the flow.

Nurse Tanker Operations

With the dump site still being set up, nurse tanker operations were started in order to support the attack pumper. County 17 Tanker 213 was first to pump off its water followed by Brierfield's Tanker 206.

Dump Site Operations

With the dump site now operational, the dump site pumper supplied water to the siamese and the nurse tankers could break free and begin hauling water in a regular, tanker shuttle format.

Dump Site Operations

Tanker 206 remains in position as it off-loads the rest of its water before breaking and switching the operation over completely to a tanker shuttle.

A Problem Arises

At the 15:00-minute mark, water flow was supposed to be increased but the dump site pumper was having drafting issues. A jet siphon line was rigged up to try and fix that problem – but without success.

More Tankers Arrive

Additional tankers began to arrive in preparation for expanding the operation.

Dump Site Operations

The dump site continues to be built out with three dump tanks now down and in operation at the 14:12-minute mark. However, the dump site pumper is still having difficulty increasing its flow.

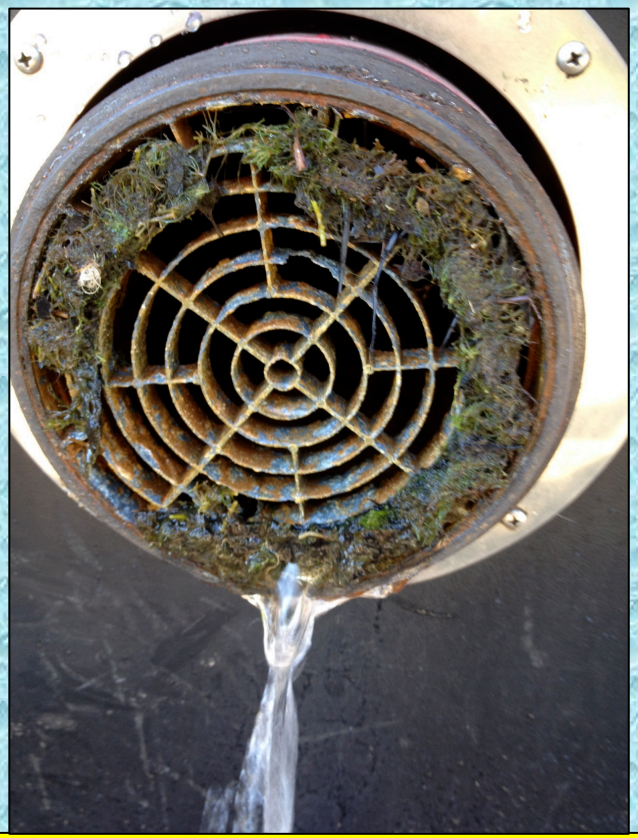
Dump Site Operations

A critical point in the operation – no tankers waiting to dump, no tankers pumping to the siamese, and the dump site pumper can't increase flow. Thus – at the 19:00-minute mark – water flow was interrupted.

Dump Site Operations

Water transfer operations are underway and the drafting problem has been resolved. Water flow to the attack pumper is back up and running at 21:23 minutes.

Dump Site Operations



The suction inlet screen on E203's officer's side was clogged with some aquatic vegetation from drafting earlier in the day. This is a good example of the importance of back-flushing a pump after every drafting operation.

Problem Corrected

The suction hose was disconnected from the officer's side and reconnected to the driver's side and everything worked just fine.

Problem Corrected

With the suction problem now corrected, there was plenty of water available to support the 369 gpm flow…now it was time to raise that flow.

Water Transfer

E203 supported the operation of two jet siphons which were controlled by one person atop E203's hose bed. The jet siphons were controlled by a gated wye placed on the end of a 50-ft section of 3-inch hose.

Water Transfer

One of the issues that arose was the arrival of pumpers that could only off-load their water by pumping it off. The key was not to have them block tankers that were dumping their loads of water.

Pumpers Hauling Water

A plan was implemented that allowed the pumpers to pull past the dump tanks, and pump back to the site via 3-inch hose and discharge elbows attached to the primary dump tank. This process worked out well and kept the pumpers out of the way of the tankers, while still using the water carried on the pumpers.

Water Transfer

As in any multiple dump tank operation, water transfer operations are critical to the success. A homemade PVC jet siphon is used in this dump tank.

4th Dump Tank Set-up

A 4th dump tank (3,000 gallons) was set-up around the 35:00-minute mark.

Flow Increased

Around the 36:00-minute mark, flow was moved to 500 gpm and dump site operations began to stabilize.

Dump Site Operations

The double-clappered siamese is now being fed entirely by the dump site pumper. However, a short length of 5-inch hose was left attached in case the operation had to resort back to nurse tankers (e.g. mechanical failure of dump site pumper.)

Dump Site Operations

Dump tanks were arranged so that all of the tankers could off-load via their rear dumps. While not necessarily the most ideal arrangement, it worked okay at this drill because there was adequate space and many of the tankers could only dump from the rear.

Water Transfer Operations

Around the 41:00-minute mark, Four Mile Engine 261 was brought in to run jet siphons so that Engine 203 could focus on increasing the flow to the attack engine. At 51:00 minutes – the flow was increased to 752 gpm.

Time to Run

When the water level coming out of a dump chute gets this low, it is time to "cut and run" and get another load. The tanker will be a more efficient water hauler if it does not wait for every last drop to come out.

Dump Site Operations

Crews worked to get additional water transfer devices up and running in hopes of getting to a 1,000 gpm flow rate.

Water Flow Is Increased

At the 66:00-minute mark, flow was moved to 1,000 gpm where it was sustained for the remainder of the drill.

Dump Site Operations

Another critical point in the drill – again, no tankers dumping or waiting to dump! Fortunately, a couple of tankers arrived shortly after this photo was taken.

Water Transfer Operations

When moving to 1,000 gpm, the need for transferring water is huge. The folks here had to "jump" a dump tank using a ladder in order to get adequate flow into the primary dump tank.

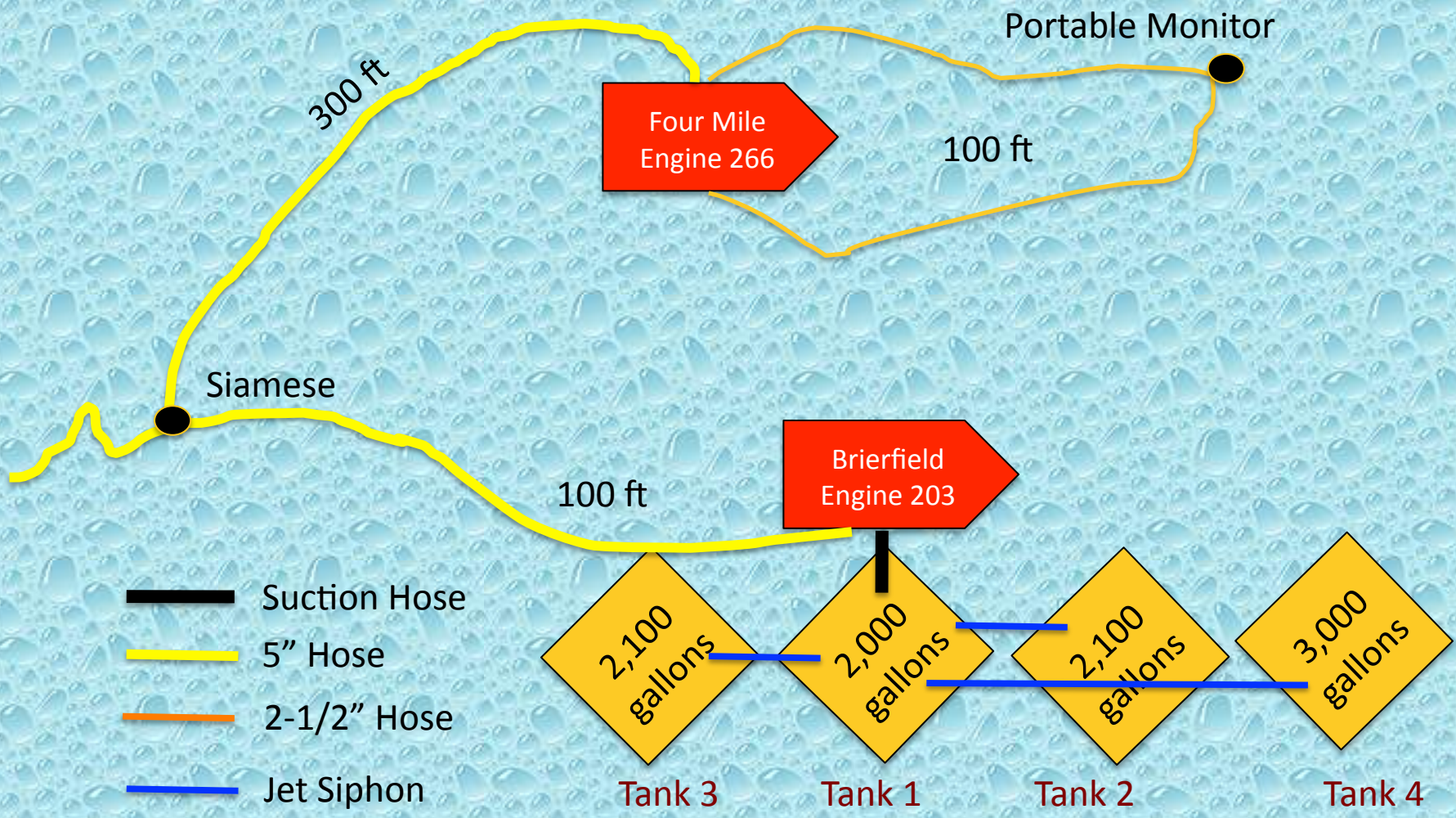
Protecting LDH

On most FD incidents, there is little concern about vehicle exhaust because the pumpers don't spend much time on the scene. However, during a water supply operation, exhaust is something to consider – especially when hose is nearby.

Tanker Staging

Because of traffic and limited space, tankers were staged and then called into the dump site as needed.

Dump Site Layout



The Fill Sites

- For this drill – two fill sites were used.
- One site used a boat ramp on Lay Lake that provided about a 2-mile round trip for the units hauling water.
- The lake provided ample water volume to support the drill and access was not a problem.
- A single, 1,250 gpm pumper was used on the boat ramp to support the tanker fill station.

The Fill Sites

- The other fill site used a dry fire hydrant located along a river causeway which was north of the drill site.
- The DFH provided sufficient water to support the tanker fill station as well as a 4-mile round trip for the units hauling water.
- A 1,250 gpm pumper was used at this fill site.

Lake Fill Site

West Shelby Engine 241 (1,250 gpm) set-up the tanker fill site at the boat ramp.

Lake Fill Site

The 4-person crew hustled to get the tanker fill site set-up before the first empty tanker arrived.

Lake Fill Site

There were a few issues with adaptors, but the crew was able to overcome the issues and the fill site was set-up pretty quickly.

Lake Fill Site

The pumper was positioned in a spot that allowed for easy access to the water. A second suction could have been used off of the driver side suction inlet – however, that was never pursued.

Lake Fill Site

Tankers were filled at the top of the boat ramp which allowed the tankers to get into position without much maneuvering.

Lake Fill Site

Adaptors were also an issue – a number of the tankers had different type of fill connections. The loading crew elected to just "stick" the hose in the fill tower on Vandiver's tanker – probably not the best choice because the hose staying in the tower was solely dependent on the loader being able to hold the hose in place while possibly flowing 1,000 gpm!

Causeway Fill Site

Kingdom Engine 275 (1,250 gpm) established the second fill site along a causeway.

Causeway Fill Site

The crew used a dry fire hydrant as the suction point and then fed an LDH manifold using two, 2-1/2-inch lines because the pumper had no high-flow discharge.

Causeway Fill Site

The fill site crew did a great job of making a variety of fill line choices available. The choices minimized the need for adaptors and allowed the loading crew to make and break connections very quickly. The goal is to run a tanker fill site like a NASCAR pit stop – that happened at this fill site!

Causeway Fill Site

LDH was used to fill Brierfield's Tanker 206 – the fill time was impressive and reinforced the efficiency of using LDH in fill site operations.

The Results

- The drill was stopped at the 2:00-hour mark.
- After a bit of a late start, water flow was interrupted just once when the suction inlet of the dump site pumper became blocked with vegetation.
- 82,865 gallons of water were flowed through the attack engine during the drill producing an average flow rate of 756 gpm during the 109:00 minutes that water was flowing.

The Lessons Learned

- The use of the double-clappered siamese at this drill made a big difference in comparison to prior years. Had the dump site pumper not suffered the clogged suction inlet – water flow most likely would have never been interrupted.
- The problem was that only the first couple arriving tankers had pumping capability – thus when they exhausted their water through the siamese, the remaining tankers had to dump into the dump tanks and depend on the dump site pumper to draft.

The Lessons Learned

- Once again – the drill showed the value of having a fire pump on a tanker. Even a 500 gpm can make a big difference in the early stages of a tanker shuttle operation.
- 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. At this drill, once again tanker fill connections varied and fill times were slowed while crews worked to make the right connection.

The Lessons Learned

- Tankers should be outfitted with quick-connect devices on their direct fill lines and rural pumpers should carry additional quick-connect devices for use at tanker fill sites.
- When using an LDH manifold without a high-flow discharge, take the time to combine (or manifold) multiple small lines into the LDH manifold as opposed to connecting the LDH to a 2-1/2-inch outlet. The Kingdom fill-site crew did a great job applying this practice.

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.
- The distribution of tankers going to the various fill sites needs to be closely monitored so that any one site does not get overloaded. The lake fill site got overloaded a couple times at this drill which impacted the ability to sustain water flow at the dump site.

Summary

- The drill was a success. This was the third year in a row for the water supply drill, and with the exception of the common fill connection issue – improvement has occurred each year.
- 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 once again showed the importance of mutual aid response practices and procedures – and the importance of mutual aid interoperability.
- Many thanks to the Shelby County EMA and the Four Mile VFD for sponsoring and hosting this seminar.

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For more information contact us at
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