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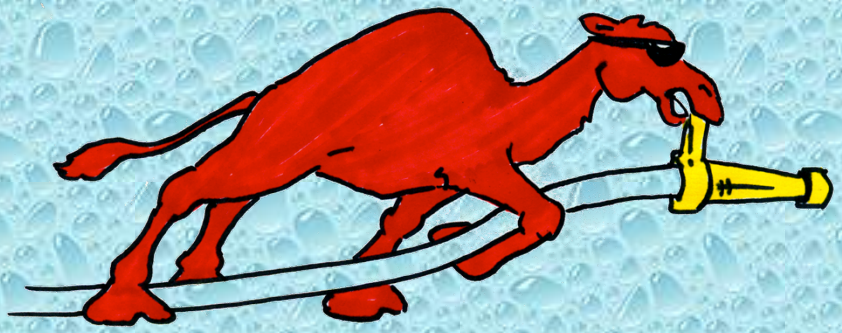


Sumter County Firefighters Association
Sumter County, Alabama

Rural Water Supply Operations Seminar
2-hr Water Supply Drill – March 18, 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

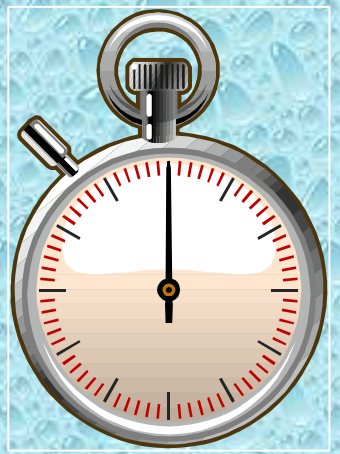
- The 2-day seminar started with a 4-hour classroom session to review the basics of rural water supply operations.
- The review session was held at the Siloam VFD located south of York, Alabama.
- Once the classroom part was done, the seminar continued with 7 hours of practical work on fill-site and dump site operations.
- The program concluded with the 2-hr ISO tanker shuttle exercise and program review.
- Seminar participants were from Sumter County.

The 2-hour Water Supply Drill

- The tanker shuttle drill was held in the small community of Whitfield, Alabama on March 18, 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 six different fire departments in Sumter County - with the majority being from the South Sumter Fire Battalion. The water hauling apparatus was representative of the type of water supply support that would respond to a structure fire in Sumter County.*

Drill Participants

- Whitfield Engine 54
  - 1,000 gpm pump w/500 gal tank

- Whitfield Tanker 52
  - 750 gpm pump w/2,200 gal tank

Drill Participants

- Cuba Engine 51
  - 1,250 gpm pump w/750 gal tank
- Boyd Tanker 1
  - 1,000 gpm pump w/2,500 gal tank

Drill Participants

- Siloam Tanker 51
  - 750 gpm pump w/2,500 gal tank
- Ward Tanker 53
  - 750 gpm pump w/2,500 gal tank

Drill Participants

- Coatopa-Dug Hill Tanker 1
  - 750 gpm pump w/3,000 gal tank

Preparation

Units began the drill at the Whitfield VFD fire station where a briefing was given by AC Dennis Bragg of the Ward FD. Crews then boarded their rigs and waited for the dispatch of the event.

The Drill Begins

With everyone ready, the drill was started. Whitfield Engine 54 was first to arrive with the Whitfield tanker immediately behind it. When Engine 54's driver brought the rig to a stop, the timer was started.

The Drill Begins

The folks chose not to use a nurse tanker operation – thus, the challenge was to get a dump tank set up in as short a time as possible. Six personnel were available to make the dump site operational.

Getting Ready to Flow Water

A portable monitor was deployed in order to flow water throughout the drill. The monitor was outfitted with a set of “stacked tips,” with an 1-3/8-inch being the first tip size used.

Wow!

In just 3:45 minutes, the folks had the dump site set up and ready to receive water.

First Tanker Dumps

At the 4:20-minute mark, Whitfield's tanker dumped its 2,200 gallons of water and operations were now underway.

Water Flow Starts

Water flow was started at the 7:50-minute mark after a little delay attaining a prime. A single, 100-ft, 2-1/2-inch hose line was used to support the 306 gpm flow at the portable monitor.

Dump Site Set-up

A second dump tank was deployed around the 12:03-minute mark and crews worked to set up a water transfer device.

Dump Site Set-up

A jet siphon was set-up to transfer water from the second dump tank into the primary dump tank and now all that was needed was a load of water.

More Tankers Arrive

With the arrival of the next tanker, water could now be offloaded into the second dump tank.

Dump Site Operations

At the 15:38-minute mark, two dump tanks were in operation with a jet siphon in use for water transfer.

Third Dump Tank

Around the 18:00-minute mark, a third dump tank was acquired and placed in position.

Flow Increase

A hand-held pitot was used to verify the flow from the portable monitor. At the 21:30-minute mark, the flow was moved to 346 gpm.

Flow Increase Again

The flow was increased again at 30:00 minutes to 517 gpm.

Water Transfer Operations

With three dump tanks in operation, water transfer capability became critical. The two jet siphons were able to keep up with the demand.

Dump Site Set-Up

With the majority of the tankers being rear dumping units, the dump tanks were arranged to accommodate the rear dump capabilities.

Dump Tank Drains

Dump tank drains can prove problematic if they are not secured properly. Any dump site is going to be a wet mess. A drain spilling its water is only going to make that worse.

Water Transfer Operations

A tie-down strap was used to secure this 5-inch suction hose being used with a jet siphon. An important point is not to have the discharge end submersed – otherwise water can siphon back when the jet is turned off.

Flow Increases Again

At the 67:00-minute mark, flow was increased one last time to 813 gpm where it was sustained through the remainder of the drill.

Dump Site Operations

One “bump in the road” was this 2,500-gallon engine/tanker that had no dump capability. Nobody had any type of fitting that would connect to a dump tank to hold a discharge hose, so the crew rigged up a couple of 2-1/2” lines to a heavy valve. The valve became somewhat of a boat anchor in the middle of the dump tank and the engine/tanker was able to pump off its water and contribute to the success of the shuttle operation.

Dump Site Operations

While not very "pretty," the heavy valve worked to hold down the discharge lines from the engine/tanker. Also – this kept the engine/tanker from blocking out tankers waiting to dump their water.

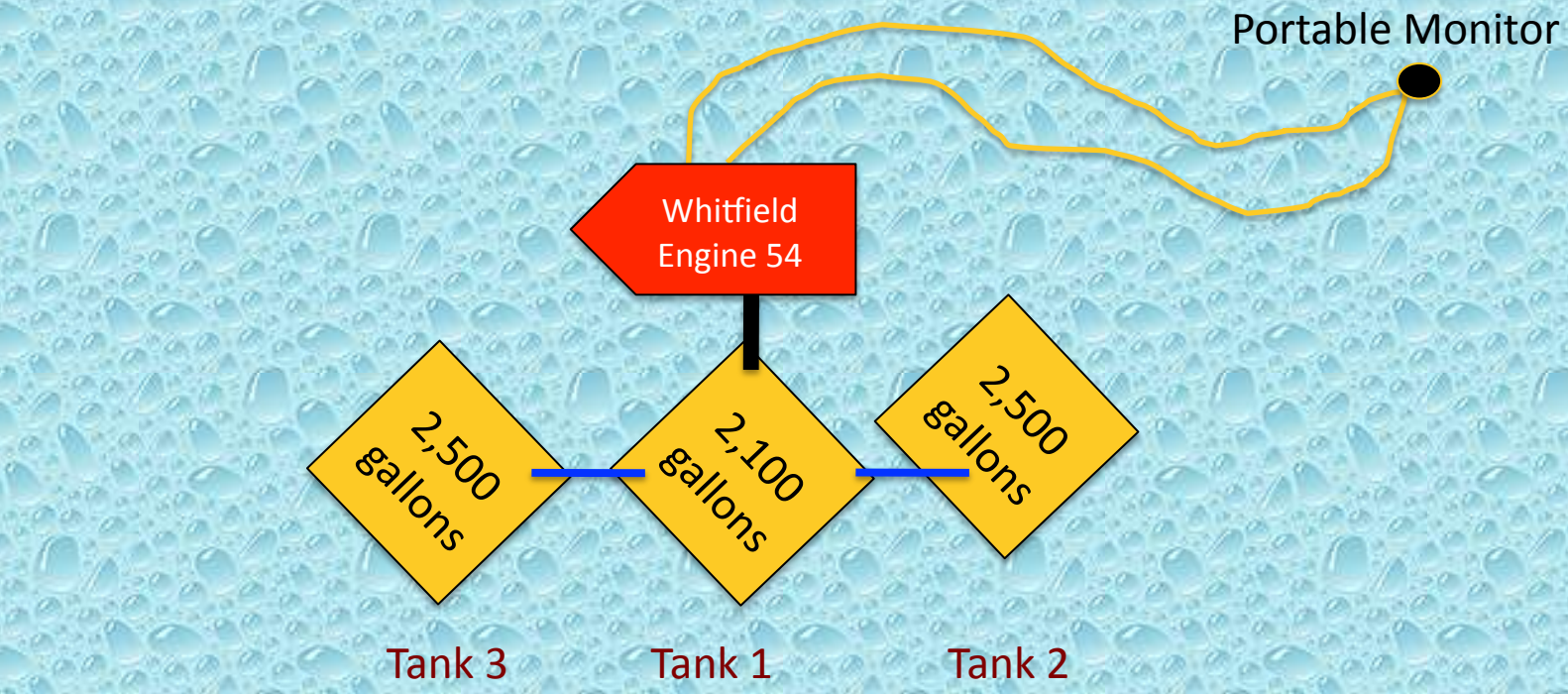
Tankers Offload

With three dump tanks in operation and the flow now at 800 gpm, everyone had to hustle a little bit more in order to sustain the operation.

Time to Ponder

Of course, as operations stabilized, there was some time to ponder about life's complexities.

Dump Site Layout



The Fill Sites

- For this drill – one fill site was used.
- The site was a pond that provided a 2-1/2-mile round trip for the units hauling water.
- The pond provided ample water volume to support the drill and access was not a problem.
- A single, 1,250 gpm pumper was used at the pond to support two, tanker fill stations.

Fill Site Operations

A large pond , equipped with a dry fire hydrant, was used as the fill site for this drill. As happens sometimes in real life, a tanker was the first unit to arrive at the fill site. A point worth noting here is that if the tanker had been a vacuum tanker, it could have self-loaded and been on its way back to the dump site by the time the fill site pumper got set up.

Fill Site Operations

Cuba Engine 51 (1,250 gpm) arrived shortly after the first tanker and the two crews went to work getting a fill site established.

Fill Site Operations

With Engine 51 only carrying 20-feet of suction hose, the suction hose on the tanker became very important.

Fill Site Operations

Because the performance of the dry hydrant was suspect, the crews decided to go the traditional drafting route and put suction hose into the water.

Fill Site Operations

Forty feet of suction hose and a floating strainer were used to establish the draft.

Fill Site Operations

Two, 2-1/2-inch lines were stretched as fill lines. While not as efficient as LDH, by keeping the two lines under 100-ft, the pumper was able to fill tankers at around 1,000 gpm.

Fill Site Operations

After the first tanker was filled and sent back to the dump site, the crew then worked to set up a 5-inch LDH line in order to create a second fill station.

Fill Site Operations

A full tanker heads back to the dump site.

Fill Site Operations

With no high-flow discharge, multiple hose lines were needed in order to support the 1,000 gpm fill rate goal.

Fill Site Operations

A tanker fill site needs to operate like a NASCAR pit stop. Time cannot be made up on the road, so anything that can be done to reduce fill times will enhance the overall shuttle operation.

Fill Site Operations

One of the challenges of filling tankers is managing the discharge pressure of the pump. When filling a large empty container like a tanker, pressure might be hard to develop until the tank is almost full. Then pressure develops all of a sudden!

Fill Site Operations

This tanker was equipped with two, “Fireman’s Friend” valves which save time in terms of having to open and close a valve. However, too much time was still used threading and unthreading the hose lines. A couple of Storz or CamLok fittings would have proven very helpful in reducing the “pit stop” times!

Fill Site Operations

In order to set up a second fill station, 200 feet of 5-inch LDH was used. This set-up greatly improved tanker fill times.

The Results

- The drill was stopped after one hour and 48-minutes when the dump-site pumper suffered a mechanical issue.
- Water flow was never interrupted during the entire drill!
- An estimated 59,596 gallons of water were flowed through the attack engine during the drill producing an average flow rate of 595 gpm.

The Lessons Learned

- An interesting way to examine the results of the drill is to look at the number of people needed to sustain the total water flow.
- In others words, what was the "gpm per person."
- The gpm per person concept becomes important when dealing with minimum staffing issues. If a department is only averaging 20 members on a structure fire incident and it takes 15 people to develop and sustain a water supply, then we come back to that age old question of, "Who fights the fire?"

The Lessons Learned

- At the Sumter drill, there were only about 16 people actively involved in the water supply delivery process.
- The following is a breakdown of personnel and assignment:

Unit	# of People	Assignment
Engine 54	4	Driver/pump operator for drafting and jet siphons plus crew
Engine 51	5	Driver/pump operator, 4 FF's to assist with 2 loading stations
Tanker 51	1	Driver only
Tanker 52	1	Driver only
Tanker 53	1	Driver only
Boyd Tanker 1	2	Driver/pump operator plus 1 crew member for hose hookup
Coatopa Tanker 1	1	Driver only
Dump Site Officer	1	Coordinated dumping of tankers

Note: there was also an Incident Commander – but the IC was not involved specifically in water supply delivery – just like at a real incident.

The Lessons Learned

- Using the "gpm per person" concept, 16 persons supported an average flow of 595 gpm over the duration of the drill. Therefore, the gpm per person result was 37.2 gpm per person.
- During the time period where the drill produced an 813 gpm sustained flow rate, each of the 16 persons contributed 50.8 gpm.
- In both cases, the results show that the higher the gpm per person rate, the more efficient the water supply operation.
- This is the second GBW Associates event where the "gpm per person" concept has been applied – we certainly believe that the measurement has merit and we hope to use it as a quantifying tool in future drills when possible.

The Lessons Learned

- If the nurse tanker mode of operation is not going to be used then crews need to be very proficient at setting up the first dump tank. At this drill, the first tank was down and full of water in less than 5:00 minutes.
- 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, the difference in suction hose size (5" vs.. 6") made additional work for crews trying to expand the operation.

The Lessons Learned

- 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, all fill lines had threaded connections and thus slowed the fill operation as crews had to thread and unthread hose connections.
- 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.

The Lessons Learned

- When using LDH without a high-flow discharge, take the time to combine (or manifold) multiple small lines into the LDH as opposed to connecting the LDH to a 2-1/2-inch outlet. At low flow rates, the small outlet will work, but as flows reach pump capacity, flow restriction will occur and changing hose layouts may not be able to be done without shutting down pumping operations – so plan ahead!
- At this drill, the fill-site pumper did a nice job of using 5-inch LDH without a high-flow discharge. The crew used a manifold to maximize the pump's discharge outlets.

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 Sumter County Firefighter's Association for sponsoring and hosting this seminar.

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This program was developed by
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