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# Autauga County Volunteer Fire Fighters Association
# Autauga County, Alabama

## Rural Water Supply Operations Seminar
## 2-hr Water Supply Drill – October 14, 2010
## 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

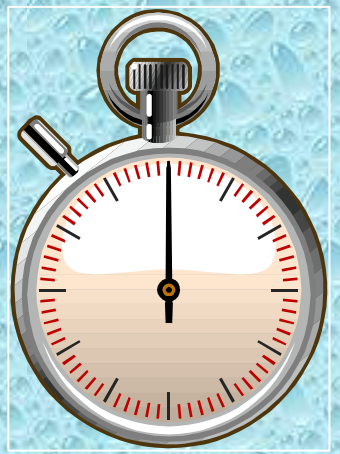
- The seminar started with a 6-hour session to review the basics of rural water supply operations.
- The review session was held at the Old Kingston VFD located in Prattville, Alabama.
- Seminar topics included the history of rural water supply, tanker construction, dump site operations, fill-site operations, tanker shuttle operations, and drafting.
- Seminar participants were from Autauga County.

# The 2-hour Water Supply Drill

- The tanker shuttle drill was held on November 14, 2010, at a park near the Old Kingston VFD.
- 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 eight different fire departments in Autauga County and the water hauling apparatus was representative of the type of water supply support that would respond to a structure fire in the Old Kingston area.*

# Drill Participants

- Old Kingston Engine 1102
  - 1,250 gpm pump w/750 gal tank
- Old Kingston Tanker 1180
  - 500 gpm pump, w/2,100 gal tank

# Drill Participants

- Independence Engine 902
  - 1,500 gpm pump w/1,000 gal tank
- Independence Engine/Tanker 901
  - 1,250 gpm pump w/3,000 gal tank

# Drill Participants

- Independence Tanker 982
  - 350 gpm pump w/3,000 gal tank
- Booth Tanker 382
  - 1,500 gal tank


# Drill Participants

- Pentecost Tanker 281
  - 500 gpm pump w/2,000 gal tank
- Billingsley Pumper 601
  - 1,250 gpm pump, w/1,000 gal tank

# Drill Participants

- Pine Level Engine 701
  - 1,250 gpm pump w/750 gal tank
- Pine Level Tanker 781
  - 400 gpm pump, w/2,000 gal tank

# Drill Participants

- White City Tanker 880
  - 500 gpm pump w/2,000 gal tank
- Marbury Tender 180
  - 750 gpm pump, w/2,500 gal tank

# Preparation

Units began the day at the Old Kingston Volunteer Fire Department where an operational briefing was conducted and crews were given assignments.

# The Drill Begins

With everyone ready, the drill started. Independence Engines 901 and 902 arrived on the scene and the clock started. The crews worked to advance a 3" line to begin water flow while also starting to set up for nurse tank operations.

# The Drill Begins

A 150-ft, 3-inch line was stretched to a Hose Monster device which was outfitted with a fixed pitot for accurate flow measurement.

# Nurse Tanker Operations

With the clock running, the two engines switched positions in order to improve the dump tank set-up choices. E901 with its 3,000 gallons of water began nurse tanker operations and supplied E902 via dual, 3-inch lines.

# Water Flow Starts

At the 5-minute mark, water flow begins at 282 gpm through the fixed pitot device.

# Nurse Tanker Operations

With nurse tanker operations underway, crews began work on setting up a dump tank so that a transition could be made when flow rates increased.

# 1st Dump Tank

A 3,000-gallon dump tank was the first tank placed thus providing ample storage capacity for transitioning to a dump site operation. When possible, try to get the largest tank placed first.

# Incident Command

Chief William Stoudemire from the Old Kingston VFD assumed the command and began managing the operation.

# Transitioning to Dump Site Operations

With nurse tanker operations underway, Booth's tanker arrives and the crews get ready to switchover to a drafting operation – however, a couple of issues arose.

# 1st Load of Water

Booth's tanker dumped the first load of water so that Independence's engine could obtain a draft and begin the dump site operation.

# Changing Over to Drafting

One problem that occurred was that Engine 901 did not have a control valve on either of its suction intakes and since it was being used as a nurse tanker for Engine 902, flow had to be interrupted in order to connect the suction hose.

# 2nd Dump Tank Arrives

Meanwhile, Old Kingston's engine arrived on the scene bringing another 3,000-gallon dump tank with it. Booth's tanker finished its initial dump of water and got ready to head to a fill site.

# In Need of a Strainer

Another issue that arose at the dump site was the lack of a low level strainer. One was quickly found, but a delay occurred. The use of a low level strainer allows access to more water in a dump tank than using a traditional strainer.

# 2nd Tanker Arrives

Independence's Tanker 982 (3,000 gallons) was the second tanker to arrive on the scene. The crew dumped their water into the primary dump tank in support of maintaining the fire flow.

# Dump Tank Operations

With the dump tank now in operation, the flow was restored to the attack engine and work was started on getting a second tank set up. By keeping the 3,000-gallon tank on Engine 901 full, this served as another dump tank – just on wheels.

# Dump Tank Operations

As more units arrived at the dump site, a second low level strainer (with jet siphon capability) was located and placed in the second dump tank to begin water transfer operations.

# Additional Dump Tanks

A third, 3,000-gallon dump tank arrived and was set up in preparation for expanding the flow.

# More Tankers Arrive

Now with additional tankers arriving, the focus was turned to making the second dump tank operational.

# All About Drains

While there is no "written rule" for how to secure dump tank drains, it seems that the better practice is to tie the drains up on the inside of the tank. Doing this allows the weight of the water to hold the drain closed. Tying the drains up on the outside of tank often leads to leakage – and an eventual mess at the dump site.

# More Tankers Arrive

Pine Level's tanker arrived next and dumped its water. This 2,000-gallon tanker has a short wheelbase which makes it quite maneuverable on the back country roads of Autauga County.

# Dump Site Operations



Marbury's 2,500-gallon tanker (tender) brought water to the site "just in the nick of time" as the second tank was close to being empty.

# Water Transfer Operations

A 6” low level strainer equipped with a built-in jet siphon was used to transfer water from the second tank into the primary drafting tank.

# Water Transfer Operations

When Pentecost's tanker arrived at the dump site, an additional low level strainer/jet siphon became available – it however, was 4-inches in diameter and therefore required the use of 4-inch suction hose.

# Dump Site Operations

With the dump site now fully operational, the flow was moved to 470 gpm around the 35-minute mark.

# Mobile Dispatch Center

FD Communications – Mobile Repeater System.

# Dump Site Operations

Around the 40-minute mark, the flow was moved to 504 gpm where it was sustained for quite some time.

# Dump Site Operations


Although E901 never hauled a load of water in the shuttle, its use as a nurse tanker helped provide an uninterrupted flow for most of the 2-hr drill.

# Dump Site Operations

E902 also had no control valve on either of its steamer intakes – therefore, the 3-inch supply lines had to be connected to the auxiliary intakes. While this worked out okay for this drill, direct connection to the steamer intakes will provide much more flow capability to the pumper.

# Dump Site Operations

At the 102-minute mark, the flow was pushed to 647 gpm where it was maintained for the remainder of the drill.

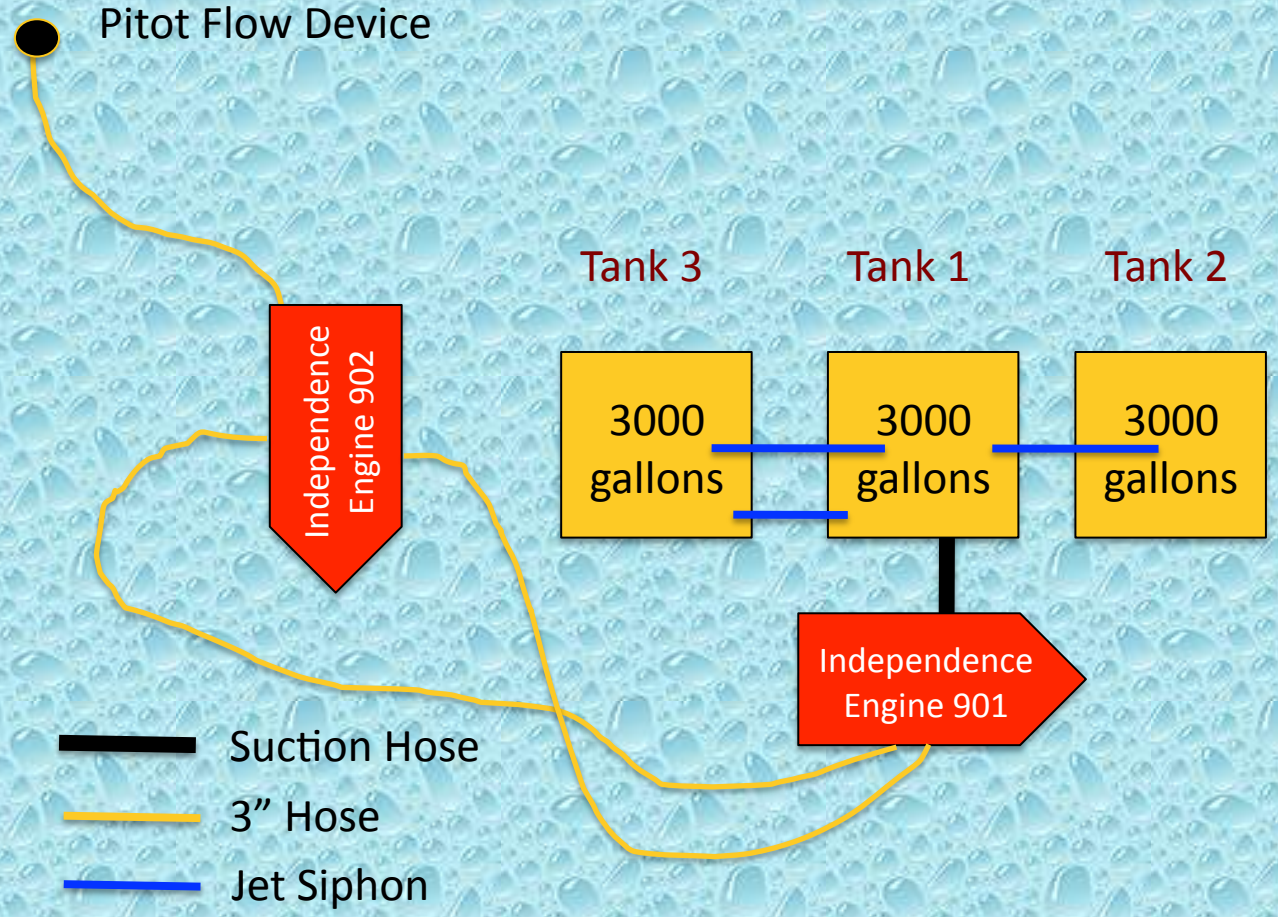
# Water Transfer Operations

Of course, the key to any multiple, dump tank operation is the ability to transfer water to the primary drafting tank. Jet siphons seem to be the best practice for this transfer of water. Many pump operators ask about the pressures needed to run a jet siphon – the answer is simple – pump the jet siphon line until the flow looks like the flow in the photos above.

# Water Transfer Operations

Dual, 4-inch jet siphons were needed to provide adequate water transfer from the third dump tank.

# Dump Site Layout



# The Fill Sites

- For this drill – two fill sites were used – each one a pond.
- The closest fill site (1.9-mile roundtrip) was at a pond off of County Road 21 - north of the dump site.
- The second fill site was at a pond near Ruckertown Furniture also on County Road 21 – but south of the dump site. This fill site provided a 5.0-mile round trip for the tankers hauling water.

# South Fill Site

The south fill site was the first fill site to get set up. Billingsley Pumper 601 (1,250 gpm) arrived at the pond which was about 200 feet from the road.

# South Fill Site


The Billingsley crew made quick work of getting the equipment needed to draft. The effective teamwork reinforced the need for adequate staffing when sending an engine to set up a tanker fill site at a static water source.

# South Fill Site

A temporary dry hydrant was used at this fill site and the crew needed one section of 6-inch suction hose to make the connection.

# South Fill Site

The temporary dry hydrant was provided for the drill by Stan Merrett of ETT, LLC. The 6-inch PVC hydrant was a great training tool.

# South Fill Site

Because the dry hydrant was finished out with a female swivel, a double female adaptor was needed back at the suction intake to complete the hook-up.

# South Fill Site

Another issue that arose was a leak at one of the suction hose couplings requiring the hose to be changed out in order to obtain a draft.

# South Fill Site

Two, 3-inch lines were stretched back out to the road to serve as tanker fill lines. The lines were trimmed out with camlock fittings in order to speed up the connecting and disconnecting operations.

# South Fill Site

Once a draft was obtained – the South Fill Site was quite functional. Two additional 3-inch lines were stretched so that a tanker could be connected while another one was being filled.

# South Fill Site

Booth and Independence's tankers are shown above in line at the South Fill Site.

# South Fill Site

Another adaptor issue arose – this time a tanker had a 5-inch direct fill but no way of connecting to it. Instead, a 3-inch line has to be connected to an auxiliary suction intake. Another good reminder to equip engines and tankers with plenty of adaptors – especially when they serve duty in the rural arena.

# South Fill Site

The Booth tanker was unique in that it did not have a control valve on its fill lines – but it worked just fine. The use of camlock connections made filling this tanker a quick operation.

# North Fill Site

At the North Fill Site, Pine Level's new pumper drafts and fills tankers. The pumper, an old Fairfax County, Virginia unit, was purchased a few days before the drill and the crew was able to give it a good workout filling tankers.

# North Fill Site

Crews used the pumper's front intake for the drafting operation. However, this probably was not the best choice since front suctions do not provide access to full pump capacity. The better choice would have been to use a side suction intake on this 1,250 gpm pumper.

# North Fill Site

Crew members used dual, 3-inch lines for tanker fill operations. However, the lines were not equipped with any type of quick connect couplings – so the couplings had to be threaded and unthreaded each time.

# The Results

- The drill was stopped after two hours.
- Water flow was interrupted once at the 14:02-minute mark while the dump site pumper switched over to a drafting operation. Flow was restarted about 50 seconds later.
- An estimated 53,461 gallons of water were flowed through the attack engine during the drill - producing an average flow rate of 468 gpm.

# The Lessons Learned

- Nurse tanker operations can be successful as long as everyone knows the limitations prior to use. At this drill, 4,000 gallons of water were available before additional resources were needed – definitely a big plus.
- A control valve on a suction intake can really improve drafting operations. At this drill, the lack of a suction control valve resulted in an interruption of flow when the blind cap had to be removed in order to connect suction hose to the pumper.

# The Lessons Learned

- When moving to a multiple-dump tank operation, additional appliances are going to be needed. At this drill, the dump site was short a jet siphon for awhile which slowed their ability to place the third dump tank in service.
- When the second jet siphon was located, it was only a 4-inch siphon and required the use of 4-inch suction hose – which did not match the flow of the 6-inch jet siphon transferring water from the other tank. Eventually, dual 4-inch jet siphons were needed from the third tank.

# 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.
- While LDH is the preferred method for filling tankers, 3-inch hose can be effective if the length is kept under 200 ft and multiple lines are used.

# The Lessons Learned

- 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 “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.

# 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 Autauga County Volunteer Firefighters Association and the Old Kingston VFD for sponsoring and hosting this seminar.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