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# Bastrop County Firefighters Association
# Bastrop, Texas

## Rural Water Supply Operations Seminar
## 2-hr Water Supply Drill
## December 15, 2013
## 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

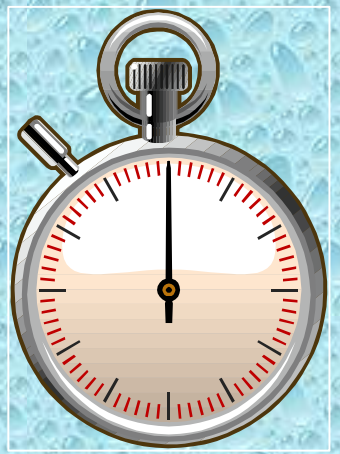
- The 2-day seminar started on Saturday with a 4-hour classroom session to review the basics of rural water supply operations.
- The review session was held at the Bastrop Fire Department Station 3.
- Once the classroom part was over, the seminar continued with several hours of practical work on fill-site and dump site operations.
- The program concluded on Sunday with the 2-hr ISO tanker shuttle exercise and program review.
- Seminar participants were from Bastrop County and Central Texas areas.

# The 2-hour Water Supply Drill

- The tanker shuttle drill was held on December 15th at Fire Station 3.
- 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 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 sixteen 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 Bastrop.*

# Drill Participants

- Bastrop Engine 231
  - 1,750 gpm pump w/1,000 gal tank
- Bastrop Engine 241
  - 1,750 gpm pump w/1,000 gal tank

# Drill Participants

- Bastrop Tender 213
  - 1,000 gpm pump w/2,000 gal tank
- Bastrop Tender 233
  - 1,000 gpm pump w/2,000 gal tank

# Drill Participants

- Bastrop Tender 243
  - 1,000 gpm pump w/2,000 gal tank
- Elgin Tender 1
  - 500 gpm pump w/2,000 gal tank


# Drill Participants

- Paige Tender 683
  - 500 gpm pump w/2,000 gal tank
- Five Points Tender 511
  - 1,250 gpm pump w/3,000 gal tank


# Drill Participants

- Heart of Pines Engine 871
  - 1,250 gpm pump w/1,000 gal tank
- Heart of Pines Tender 882
  - 500 gpm pump w/2,000 gal tank


# Drill Participants

- Smithville Engine 4
  - 1,250 gpm pump w/750 gal tank

# Preparation

Units were first staged in the fire station parking lot and crews were briefed on the operation. Units then were relocated about ½-mile away to a camp area where they awaited dispatch.

# The Drill Begins


Bastrop Engine 231 arrives on the scene and the timer is started.

# Dump Site Operations


The crew quickly went to work stretching a Blitzfire line to the rear of the fire station - as well as setting up a 3,000-gallon dump tank back at the pumper.

# Dump Site Operations


The plan was to not use a nurse tender operation, thus the crews had to be really good at getting the first dump tank set-up and the engine ready to draft. Each of Bastrop's four engines is equipped with an external control valve on both steamer suction inlets, which makes this type of drafting set-up operation much easier.

# Water Flow Started


At around the 5:00-minute mark, water flow was started at 250 gpm through a TFT Blitzfire using on-board tank water from Engine 231.

# Dump Site Operations



About 2-minutes later, the operation moved to a dump tank operation as the first load of water was dumped and a draft was obtained by Engine 231.

# Dump Site Operations

When the second tender arrived, crews grabbed the 3,000-gallon dump tank from it and went into action getting that tank set up as well.

# Dump Site Operations

Paige Tender 683 was the third tender to arrive and is shown here dumping its first load of 2,000 gallons.

# Dump Site Operations

At around the 11:30 minute mark, the site had two, 3000-gallon dump tanks in operation and two, Tender Task Forces enroute.

# Water Transfer Operations

A good looking jet siphon stream! At the 15:00 minute mark, flow was moved to 500 gpm and then again to 720 gpm at the 17:00 minute mark.

# Dump Site Operations

With the arrival of the 1st Tender Task Force, plans were put in place to put a third dump tank into operation. Space was becoming and issue, so folks took time to think about where to set up the tank.

# Dump Site Operations


Engine 231's 1,750 gpm pump had plenty of capacity to support the fire flow and to run two jet siphons. A gated wye was used on a 2-1/2-inch discharge to supply the two jet siphons.

# Dump Site Operations


With three dump tanks set-up, the operation was ready to increase flow as needed. The third tank was positioned a bit farther away in order to permit two tenders to offload at the same time.

# Dump Site Operations


At 46:12-minutes, the three dump tanks were full and tenders were in line waiting to dump. It was time to increase flow!

# A Problem with Flow

While trying to increase flow, crews found that the external control valve was limiting intake capabilities. So the valve was removed and the suction hose was connected directly to the steamer inlet. This made a huge increase in flow!

# Flow Restriction Corrected

The inside of the external control valve shows why flow was limited. The valve fits on the 6-inch threaded suction inlet but the ball opening is only about 4-inches – thus flow was limited.

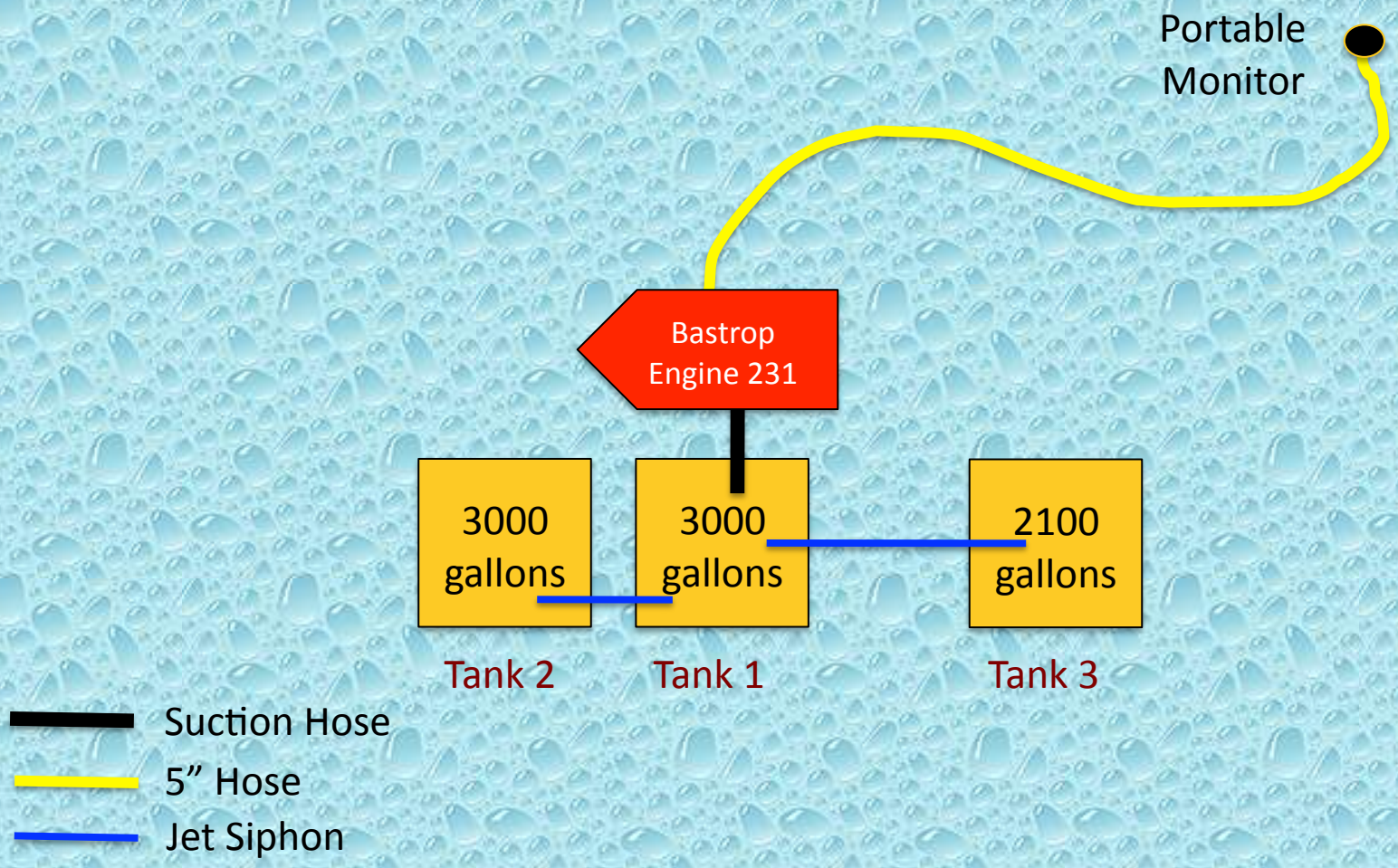
# Flow Increased to 1,000 gpm

At the 60:00 minute mark, flow was moved to 1,067 gpm using a portable ground monitor fed by 5-inch hose from the pumper's high-flow discharge. The flow to the Blitzfire was stopped.

# Dump Site Operations

The operation continued uninterrupted for the entire 2-hour time period and crews did a really great job supporting the dump site operation.

# Dump Site Layout



# The Fill Sites

- For this drill – three fill sites were used.
- The first fill-site placed into operation used Lake Bastrop as the water source and provided a 4.2-mile roundtrip for the units hauling water.
- This fill site utilized a boat launch area and the lake provided ample water volume to support the drill and access was not a problem.
- A single, 1,250 gpm pumper was used to support the tender fill station.

# The Fill Sites

- The second fill site was located on Tuck Lake at a culvert where the road passed over a narrow area of the lake.
- This fill site provided an 8.1-mile roundtrip for units hauling water.
- The site provided ample water volume to support the drill and access was not a problem.
- A single, 1,250 gpm pumper was used to support the tender fill station.

# The Fill Sites

- The third fill site was located at Hicks Lake and required the use of two portable pumps to supply water.
- This fill site provided a 2.1-mile roundtrip for units hauling water.
- The lake provided an ample water source, however, vehicle access was limited – thus, the use of the portable pumps.
- A single, 1,750 gpm pumper and two, 500 gpm portable pumps were used to support the tender fill station.

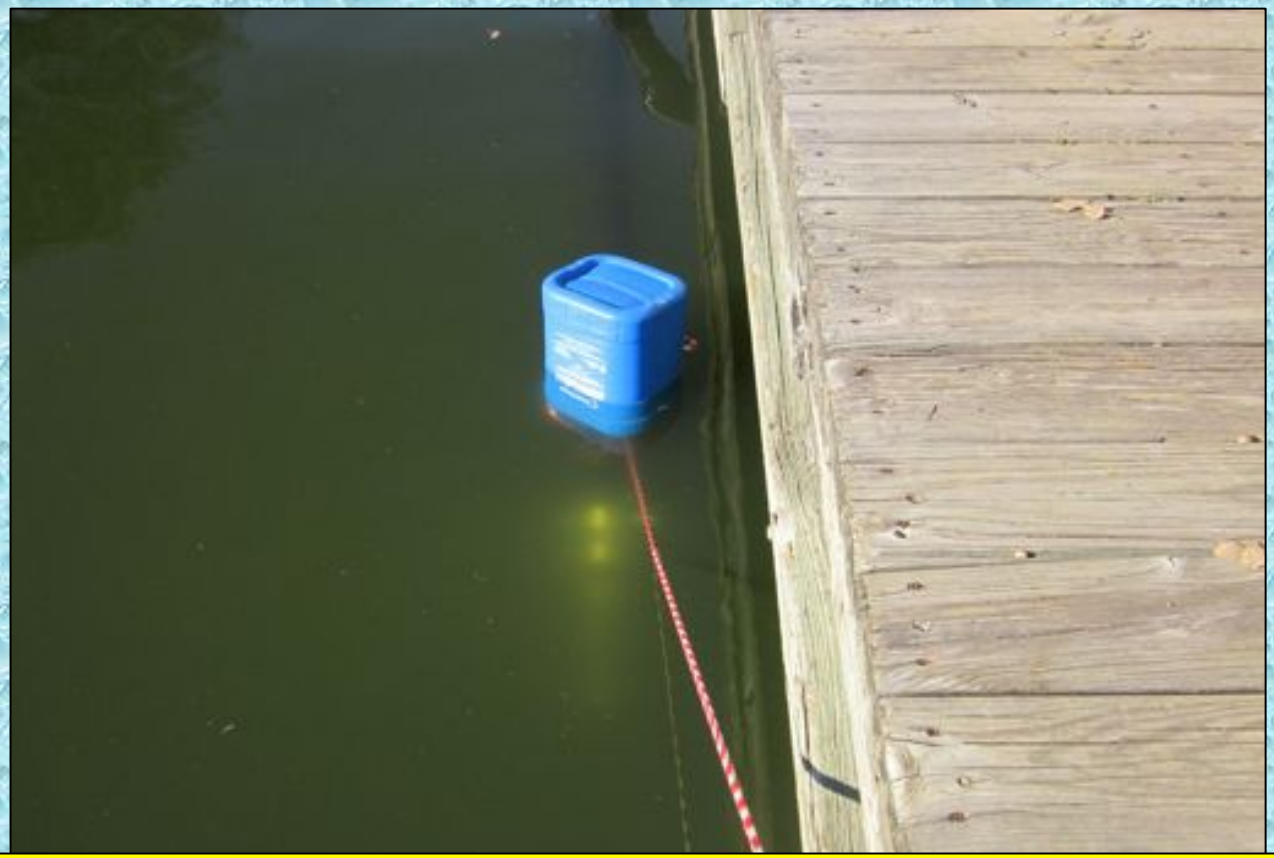
# Lake Bastrop Fill Site

Heart of Pines Engine 871 (1,250 gpm) backed into position along this boat launch area and took draft from the lake. The 5-inch line going into the water is a circulating line. The line had previously been set-up for a different use; however, its use was changed to circulation.

# Lake Bastrop Fill Site


The lake water was clean and deep and the lift was minimal. Had this been a real incident, the pumper would have positioned on the boat ramp.

# Lake Bastrop Fill Site



An improvised float was made using an empty 5-gallon foam container. The float helped keep the barrel strainer from resting on the lake bed.

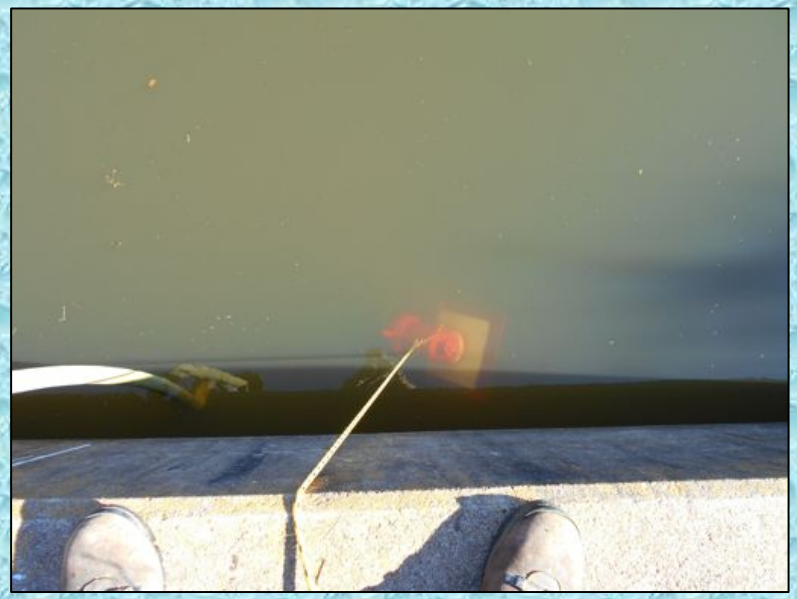
# Lake Bastrop Fill Site

A 5-inch LDH line outfitted with a manifold was used to fill tenders at this site. The tenders were filled at rates over 1,000 gpm.

# Tuck Lake Fill Site


Smithville Engine 4 (1,250 gpm) established a draft where water passed under the road through a culvert. The lift was less than 10-feet and the water was clean and plentiful.

# Tuck Lake Fill Site



No barrel strainer was available, so a low-level strainer was used. However, the strainer restricted flow to under 1,000 gpm.

# Tuck Lake Fill Site



Tenders were filled using 5-inch LDH supplied by a single, 2-1/2-inch discharge – which also restricted the available flow. The best fill rate for tenders at this site was about 850 gpm – which is still respectable.

# Hicks Lake Fill Site

This fill site was perhaps the most interesting because it required the use of two portable pumps in order to meet the 1,000 gpm fill rate goal. Crews used two, 500 gpm CET portable pumps to feed water to a 3,000-gallon dump tank from which a 1,750 gpm pumper drafted and loaded tenders.

# Hicks Lake Fill Site

The pumps were gasoline powered and equipped with 6-inch suction hose. The pumps discharged their water into 5-inch LDH which supplied a siamese.

# Hicks Lake Fill Site

The two pumps fed this 5”x5”x 5” double-clappered siamese which in turn supplied a single-5-inch line to the portable dump tank.

# Hicks Lake Fill Site

The 5-inch supply line from the double-clappered siamese fed a homemade fill pipe that dumped water into the 3,000-gallon dump tank.

# Hicks Lake Fill Site

Bastrop Engine 241 (1,750 gpm) drafted from the 3,000-gallon dump tanker and filled tenders at a rate over 1,000 gpm. This type of set-up is often called an “open” relay.

# Hicks Lake Fill Site


The fill sites used 5-inch LDH to load the tenders. One of Bastrop FD's 2,000-gallon tenders is shown here being filled at over 1,000 gpm.

# The Results

- The drill was stopped at the 2:00-hour mark.
- Water flow was never interrupted!
- An estimated 96,359 gallons of water were flowed through the attack engine during the drill producing an average flow rate of 838 gpm.

# The Lessons Learned

- At this drill, the dump site was set-up in less than 5 minutes which meant that there was no need for a nurse tanker operation.
- The use of the 1,750 gpm pumper at the dump site made a big difference in being able to support the 1,000 gpm flow while operating dual jet siphons.

# The Lessons Learned

- The use of intake control valves is important when using the same pumper to draft and pump attack lines. However, it is also important to know the limitations of the valves when attempting higher flow volumes.
- At this drill, the external intake control valve limited flow to under 1,000 gpm: but once removed, flow was not restricted.

# 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.
- Portable pumps can be quite useful when used with LDH. At this drill, two 500 gpm portable pumps were able to support a 1,000+ gpm tender loading site with little problem.

# 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 tender.
- The "bundling" of water hauling mutual aid resources has proven successful in many drills. The tender task force concept again proved to be an effective process for requesting and using additional rural water supply resources.

# The Lessons Learned

- Although most of pumpers and tankers could work with 5-inch LDH, there was a limited number of LDH valves and appliances available on the mutual aid apparatus.
- The standardized inventory on the Bastrop FD pumpers and tenders made it easy for personnel to locate and retrieve equipment.

# 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 Bastrop County Firefighters Association for sponsoring and hosting this seminar.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*This program was developed by*
*GBW Associates, LLC*


*For more information contact us at*
***thebigcamel@gotbigwater.com***