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Shiro Vol. Fire Department
Grimes County, Texas

Rural Water Supply Operations Seminar
2-hr Water Supply Drill
September 24, 2017
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

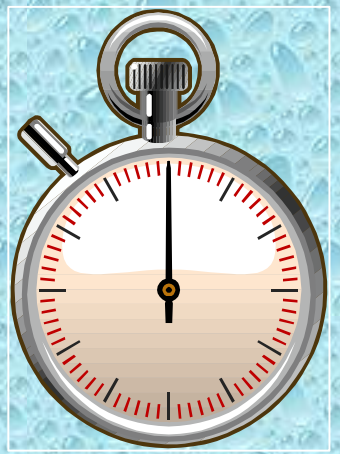
- The 2-day seminar started with a 4-hour classroom session to review the basics of rural water supply operations.
- The review session was held at the Roan's Prairie Community Center.
- Once the classroom part was done, the seminar continued with 8 hours of practical work on fill-site and dump site operations.
- The program concluded with the 2-hr ISO tanker shuttle exercise and program review.
- Seminar participants were from Grimes County and the surrounding area.

The 2-hour Water Supply Drill

- The tanker shuttle drill was held on September 24th at the Tenaska Power Plant in Shiro.
- 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 ISO no longer uses the physical demonstration of water supply delivery*, the 2-hour test is still a reasonable standard by which fire departments can compare their water supply operations.
- *ISO now uses computer modeling to predict tanker shuttle flow capabilities.*

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 several different fire departments in Grimes County and the water hauling apparatus was representative of the type of water supply support that would respond to a structure fire in the Shiro area.*

Drill Participants

- Iola Tanker 231
  - 750 gpm pump w/3,000 gal tank
- Richards Tanker 264
  - 750 gpm pump w/2,000 gal tank

Drill Participants

- Shiro Tanker 314
  - 750 gpm pump w/2,000 gal tank

- Richards Engine 260
  - 1,250 gpm pump w/1,000 gal tank

Drill Participants

- Iola Engine 235
  - 1250 gpm pump w/750 gal tank

Preparation

Units staged at the Roan's Prairie Community Center where they received drill assignments and a safety briefing.

The Drill Begins

Iola Engine 235 was the first-arriving unit and assumed the role as the attack pumper. The stopwatch was started when the Iola engine driver applied the air brakes. At the 4:59 mark, the engine began flowing 250 gpm out of their deck gun – this was verified using a pitot gauge.

Dump Site Operations

The Richards Engine arrived on scene and began setting up dump tanks while also stretching 3" supply lines to the Iola engine. For purposes of ISO record keeping, a dump site recorder kept track of set up times, and dump times for each unit.

Water Flow is quickly escalated

At the 10 minute mark, the Iola Engine upped their flow to 500 gpm. The Iola and Shiro Tankers were both able to dump their loads and the two-tank dump site was built out

Water Transfer Operations

Water transfer operations are a critical component at any multi-dump tank water supply operation. Folks at this drill knew the importance of water transfer and worked quickly to get those devices set up and running. Two jet siphons were set up so as to more quickly transfer water from the red tank (Tank 2) to the primary (yellow) tank.

Dump Site Operations

Knowing when to "cut and run" is important in tanker shuttle work. A typical 2,000-gal gravity dump tanker dumps most of its water in the first 60 to 90 seconds. Waiting 3 minutes to dump all water actually reduces the efficiency of the tanker. The folks on this drill did an outstanding job of keeping track of this. This was especially important since there was only three tankers available for this drill. Time was critical for loading, dumping, and travel!

Dump Site Operations

The dump site was set up with (2) 2100 gallon dump tanks – but one of the tankers hauled 3000 gallons of water. The crews figured out that the best way to deal with this was to have the tanker dump into Tank 2, and also simultaneously pump off the water into the booster tank of the Richardson pumper. Since the Richardson pumper had a direct tank fill located on the back of the pumper, this worked well and the 3000 gallon tanker was able to get rid of over 90% of its water in the allotted 90-second time frame.

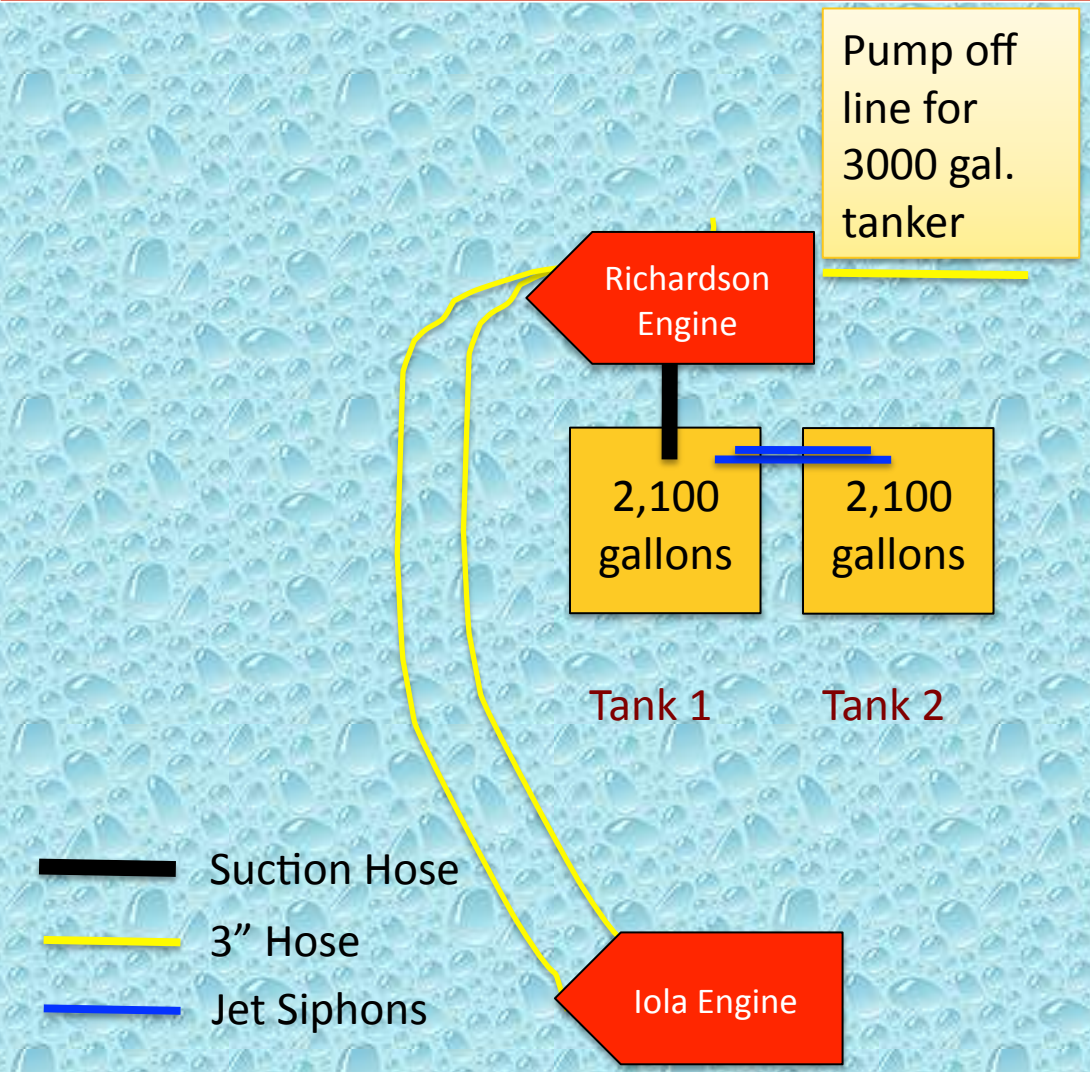
Dump Site Operations

The dump site at work. The dump site engine and attack engine both had to use their booster tanks to keep flows going, and then refilled when the tankers came back around. Ground was slowly gained during the course of the drill and by the end, the use of the booster tanks was less and less.

You know things are tight….

In the early going, the dump site crew made sure that every ounce of water got to the primary tank. Fortunately, there were plenty of hands to help. Note the tank numbers to help guide the tanker drivers where to park appropriately.

Dump Site Layout



The Fill Sites

- For this drill – one fill site was used. It was located at the power plant water storage tank. An onsite pump was used to fill tankers using twin, 3-inch hoses.
- The fill site provided about a 2-mile round trip for the units hauling water.
- There was ample water volume to support the drill and access was not a problem.
- Personnel from the plant operated the control valves.

Plant Fill Site

Not a typical fill site for a rural water supply operation; however this power plant has a 500,000 gallon water tank with a pump supplying over 1000 gpm – so the folks at Shiro have identified this a good fill site – and think about the manpower and apparatus that is freed up as a result. Sometimes you need to think out of the box. Also at the dump site, there was a person recording all fill times for ISO documentation.

Turn on the bubble machine…

It doesn't take a lot of foam concentrate to make a lot of suds. This occurred late into the operation and did not mess anything up – but sure looks funny.

The Results

- The drill was stopped at the 2:00-hour mark.
- Water flow was never interrupted during the entire drill.
- An estimated 56,250 gallons of water were flowed through the attack engine during the drill producing an average flow rate of 489 gpm.
- A peak flow of 500 gpm was sustained for the last 110 minutes of the drill.

The Lessons Learned

- At this drill, an attack pumper and a supply pumper were used at the dump site. This arrangement allowed for each pump operator to focus on just one area of operation – attack ops or supply ops.
- The supply pumper had a control valve on the driver side suction inlet which allowed him to either draft from the dump tank, or use his booster tank. This was critical for keeping continuous flow.

The Lessons Learned

- The use of smaller dump tanks combined with one large tanker presented a novel problem. Pumping off some water from that tanker into the dump site pumper's booster tank via his direct tank fill was a great idea. Having a pump on your tanker adds a lot of flexibility.
- It is critical to get the arrangement of dump tanks right the first time. In this drill, only one tank could be accessed easily by tankers. In the early goings, when tankers were making multi-point turns, this slowed the operation. After the dump site folks figured out the optimal traffic pattern, things got better.

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, there were different tanker fill connections which required adaptors and thus slowed down some of the fill operations.
- Having a standardized fill connection for all tankers increases fill efficiency and decreases fill time.

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

The Lessons Learned

- Three tankers carrying 7,000 gallons total were able to furnish 500 gpm over a 2-mile course. A longer course would have led to a lower flow; conversely more tankers would have led to more volume. The old rule of each tanker contributing 150 to 250 gpm of flow over a 3 mile course is still a valid quick estimate.
- Folks worked very hard with minimal resources to make this drill work and were successful.

Drill Videos

Be sure to watch videos from the drill on the GotBigWater YouTube Channel.

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 Grimes County Firefighters Association for sponsoring, the Shiro VFD for hosting, and TEEX for supporting this seminar.

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This program was developed by
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