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Kuhl Hose Company
Erie, Pennsylvania

Rural Water Supply Operations Seminar
2-hr Water Supply Drill
September 19, 2021
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 Kuhl Hose Company.
- Once the classroom part was over, 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 Erie County and the surrounding area.

The 2-hour Water Supply Drill

- The tanker shuttle drill was held on September 19th on a rural road a few miles from the Kuhl fire station.
- 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

Participants				
Department	Unit	Pump Size	Tank Size	Dump Tank
Kuhl	Engine 683	1250 gpm	1000 gal	NA
Kuhl	Tanker 685	1000 gpm	2000 gal	2100 gal
Kuhl	Tanker 686	1000 gpm	2000 gal	2100 gal
Elgin-Beaverdam	Engine/Tanker 756	1750 gpm	2700 gal	3000 gal
Harborcreek	Engine 222	1500 gpm	1000 gal	NA
Wattsburg	Tanker 176	1000 gpm	2000 gal	2100 gal
East Mead	Tanker 985	NA	2450 gal	2500 gal
Waterford	Tanker 145	1000 gpm	1800 gal	2100 gal
Franklin Twp	Tanker 725	750 gpm	2000 gal	2100 gal
McKean	Engine/Tanker 405	2000 gpm	1980 gal	2100 gal
Union City	Engine/Tanker 1135	2000 gpm	3000 gal	2500 gal
Clymer	Tanker 331	1250 gpm	2500 gal	2500 gal
Greenfield	Tanker 715	500 gpm	3000 gal	2500 gal
Fuller	Tanker 206	1250 gpm	3000 gal	3000 gal

- *The participants for the drill were from several different fire departments in the Erie County region and the water hauling apparatus was representative of the type of water supply support that would respond to a structure fire in the Kuhl Hose Company response area.*

The Drill Begins



The drill began with Kuhl Engine 683 (left) arriving on scene and going to work setting up as the attack pumper. A few minutes later, McKean Engine/Tanker 405 arrived and started nurse tanker operations with plans to transition to dump tank operations.

Dump Site Operations



As nurse tanker operations are about to get underway the first-arriving tanker shows up at the dump site and crews work to gather and deploy a dump tank.

Dump Site Operations



Water flow was started at 250 gpm at the 5-minute mark using tank water.

Dump Site Operations



Crews worked to get two dump tanks down quickly once an additional tanker arrived in anticipation of a large-scale flow operation.

Dump Site Operations



Engine/Tanker 405 set up to draft from the first dump tank using an ETT Water Shark strainer.

Dump Site Operations



The Water Shark strainer allowed the engine/tanker to access almost all of the water in the dump tank while supporting a large flow.

Dump Site Operations



Around the 15-minute mark one dump tank was in operation and flow was moved to 500 gpm.

Dump Site Operations



By the 19-minute mark, three dump tanks were down and one was in operation supporting the 500 gpm flow.

Dump Site Operations



As additional tankers arrived the second and third dump tanks were brought on line. East Mead VFC's vacuum tanker is shown off-loading in this photo.

Dump Site Operations



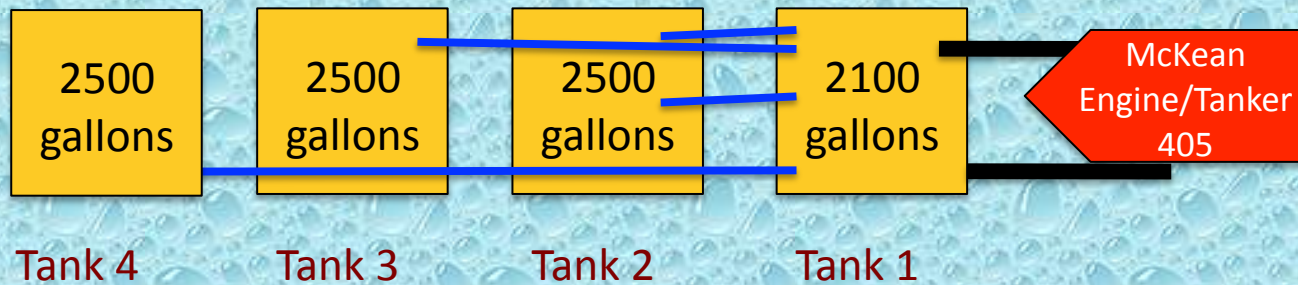
Flow eventually made it to 1000 gpm using four dump tanks and twin suction lines.

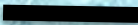
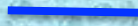
Dump Site Operations



The narrow roadway forced the crews to use a single-lane arrangement of dump tanks....which was very realistic for the Kuhl response area.

Dump Site Layout



 Suction Hose
 Jet Siphon

The Fill Sites

- For this drill – two fill sites were used; one a stream and one a pond equipped with a dry fire hydrant.
- The fill sites both provided about a 3-1/2-mile round trip for the units hauling water.
- Both sites had ample water volume to support the drill and access was not a problem.
- A 1500 gpm and a 2000 gpm pumper were used at the fill sites.

Stream Fill Site



Harbor Creek Engine 222 (1500 gpm) drafted off a bridge and loaded tankers using LDH. A Hydra-Assist valve was used as the control valve on one of the loading lines.

Pond Fill Site



Union City Engine/Tanker 1135 (2000 gpm) supplied water for the second fill site which also included keeping a dump tank full for the vacuum tanker that was hauling water.

Pond Fill Site



By keeping this dump tank full, every time East Meade's vacuum tanker arrived at the pond fill site the rig simply self-loaded and got back on the road to the dump site.

Pond Fill Site



5-inch LDH was used to load the traditional tankers at the pond fill site.

The Results

- The drill was stopped at the 2:00-hour mark.
- Water flow was interrupted once around the 75-minute mark due to a water transfer issue.
- An estimated 73,800 gallons of water were flowed through Engine 683 during the drill producing an average flow rate of 671 gpm.
- A peak flow of 1,000 gpm was achieved for about 15 minutes during the second half of the drill.

The Lessons Learned

- At this drill, crews chose to use a nurse tanker operation from the very beginning.
- The nurse tanker operation provided time to get the first dump tank set up without having to worry about running out of water in a minute or two.
- A single, rear-dumping only tanker was assigned to pull past the dump site and pump its water off back to the dump site engine. This kept traffic moving in the open lane.

The Lessons Learned

- The dump site engine used twin suction lines maximize flow capacity out of the primary dump tank.
- The use of a suction elbow and the Water Shark set-up allowed the dump tanks to be arranged in a single-lane configuration.

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, most all of the tankers had the same fill connection which allowed the rigs to get filled and be back on the road in little 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.

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 Erie County Firefighters Association for sponsoring and to the Kuhl Hose Company for hosting this seminar.



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