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Northern Westchester County, New York

Rural Water Supply Operations Seminar
2-hr Water Supply Drill – April 25, 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 Seminar



- The seminar started with a 6-hour session to review the basics of rural water supply operations.
- The review session was conducted at the John Jay Middle School located in Cross River, New York.
- 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 New York and Connecticut.

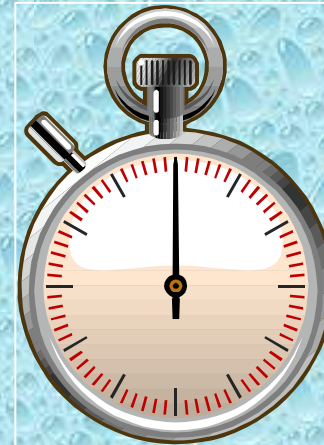
The 2-hour Water Supply Drill

- The tanker shuttle drill was held on April 25, 2010, at the South Salem FD 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 in recent times, ISO has come under some scrutiny for its rating schedule, the ISO 2-hour test is still a reasonable standard by which fire departments can compare their water supply operations.



The ISO Test

- There are three critical time segments of the ISO 2-hour Water Supply Delivery Test:
 - 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 from two states and the apparatus was representative of the type of water supply support that would respond to a fire in Northern Westchester County.*

Drill Participants

- Golden Bridge Tanker 1
 - 1,000 gpm pump w/
3,300 gal tank
- South Salem Tanker 2
 - 1,500 gpm pump, w/
3,250 gal tank



Drill Participants

- Pound Ridge Tanker 3
 - 1,000 gpm pump w/
3,550 gal tank
- Vista Tanker 4
 - 1,500 gpm pump, w/
3,500 gal tank



Drill Participants

- Bedford Hills Tanker 5
 - 2,000 gpm pump w/
2,750 gal tank
- Katonah Tanker 6
 - 2,000 gpm pump, w/
3,200 gal tank



Drill Participants

- Banksville Tanker 7
 - 1,250 gpm pump w/
3,300 gal tank
- Croton Falls Tanker 8
 - 1,500 gpm pump, w/
2,500 gal tank



Drill Participants

- Beaver Brook Tanker 11
 - 500 gpm pump w/2,500 gal tank
- Mill Plain Tanker 12
 - 1,250 gpm pump, w/ 2,500 gal tank



Drill Participants

- Yorktown Tanker 14
 - 1,250 gpm pump w/
2,600 gal tank
- Somers Tanker 16
 - 1,500 gpm pump, w/
3,000 gal tank



Drill Participants

- Vista E142
 - 1,500 gpm pump w/
1,000 gal tank
- Chappaqua Tower 27
 - 1,250 gpm pump, w/300
gal tank



Drill Participants

- South Salem Engine 168
 - 1,500 gpm pump w/
750 gal tank
- Bedford Engine 110
 - 1,250 gpm pump, w/750
gal tank



Preparation



Units staged at the South Salem Fire Department where an operational briefing was conducted outlining the objectives for the drill. Safety issues were also reviewed.

The Drill Begins



With everyone ready, the drill started. Chappaqua Tower Ladder 27 backed into position and Vista Engine 142 laid out a 5-inch supply line. The clock started when the driver of Engine 142 set the rig's parking brake.

The Drill Begins



South Salem's tanker arrives and crews begin setting up for dump tank (portable pond) operations.

Dump Site Set-Up



The first tank down is a 3,500 gallon tank and crews work quickly to get the tank into position so that water can be off-loaded into it.

Dump Site Set-Up



With the dump tank in position, South Salem's tanker prepares to dump its 3,250 gallons of water.

Dump Site Set-Up



With the South Salem tanker dumping, Engine 142 works to get the pumper ready to draft. A word of caution here – filling the dump tank without having a pumper ready to draft can result in water that cannot be moved. Why? What happens if the pumper can't obtain a draft? That 3,000 gallons cannot be pumped anywhere until a draft is obtained. Thus – caution must be used.

Dump Site Set-Up



Lots of people doing lots of “stuff.” The first few minutes of a dump tank operation can be hectic – the chaos has to be controlled.

Dump Site Set-Up



With time running out and the draft pumper not yet ready, Vista's Tanker 4 is used as a nurse tanker in order to support the 250 gpm flow to Tower Ladder 27. The tanker's 1500 gpm pump and 3500 gallons of water will allow the draft pumper more time to set-up.

Incident Command



Chief Andrew Llewellyn of the South Salem FD assumed the role of Incident Commander and a Command Post was established.

Dump Site Set-Up



With nurse tanker operations underway, additional work is done to build out the dump site. More tankers arrive and crews work to create an effective operation.

Nurse Tanker Operations



While there are many different types of tankers out there in America – tankers that also have a full-size (1,000 gpm plus) pump on them have the added capability of supporting the fire attack while dump site operations are developed.

Water Flow Begins



At the 5:49 minute mark, Tower Ladder 27 begins flowing the required 250 gpm. The tower's flow meter was used to measure the flow throughout the drill.

Dump Site Expands



Two more dump tanks - 3,500 and a 3,000 gallon - are placed while nurse tanker operations are continued. First-alarm resources arrived in a timely manner and brought with them plenty of tools and equipment to build a working dump site.

Three Dump Tanks



Additional tankers arrive simulating the mutual aid response to a working structure fire in the South Salem response district.

Switching Over



With the dump site pumper (E142) now in position and a draft established, the crews work to switch over from a nurse tanker operation to a dump and run operation.

Dump Site Operations



Tankers continue to arrive and offload their water as crews prepare to increase the flow to the tower ladder.

Dump Site Operations



Because E142 (1500 gpm) did not have a high-flow discharge, three, 2-1/2inch lines were used to feed the 5-inch supply line going to the tower ladder.

Dump Site Operations



With the dump site pumper now operational, Vista Tanker 4 stops its nurse tanker operation and offloads the remainder of its water into the dump tanks.

Dump Site Operations



The extra-large dump on this tanker allows for an extremely fast offload rate.

Water Flow is Increased



At the 15:00 minute mark, the flow is moved to 500 gpm. The tower's flow meter was used to monitor the flow rate.

Dump Site Operations



With the dump site now up and running, the focus is on improving the flow and expanding the operation.

Water Transfer Operations



Jet siphons were put into operation in order to transfer water from the outer dump tanks to the primary dump tank. E142 is shown here drafting and running two jet siphons.

More Tankers Arrive



Additional tankers arrive as more resources are requested and the incident commander prepares to increase the flow once again.

More Tankers Arrive



Tankers waiting to dump – a good sign or a bad sign? In this case, a good sign because the dump tanks are full and the tower ladder has its flow requirement being met.

Dump Site Operations



With the large, 3,000-gallon plus dump tanks arranged in a parallel fashion, two tankers can offload at the same time. Such arrangement will really make a difference once the flow moves above 1,000 gpm.

Dump Site Pumper



Vista E142 uses all of its available discharges to support the tower ladder and the jet siphons.

Water Flow Increased



At the 32:00 minute mark, operations are moving along quite smoothly and the flow is moved to 1,000 gpm.

Improving Operations



With a goal of 1,500 gpm, the crew works to change out the three, 2-1/2-inch lines feeding the 5-inch line. They are replacing the hose with three, 3-inch lines. This change out should allow the 1,500 gpm pumper to reach the 1500 gpm goal and still run the jet siphons.

Flow Increased Again



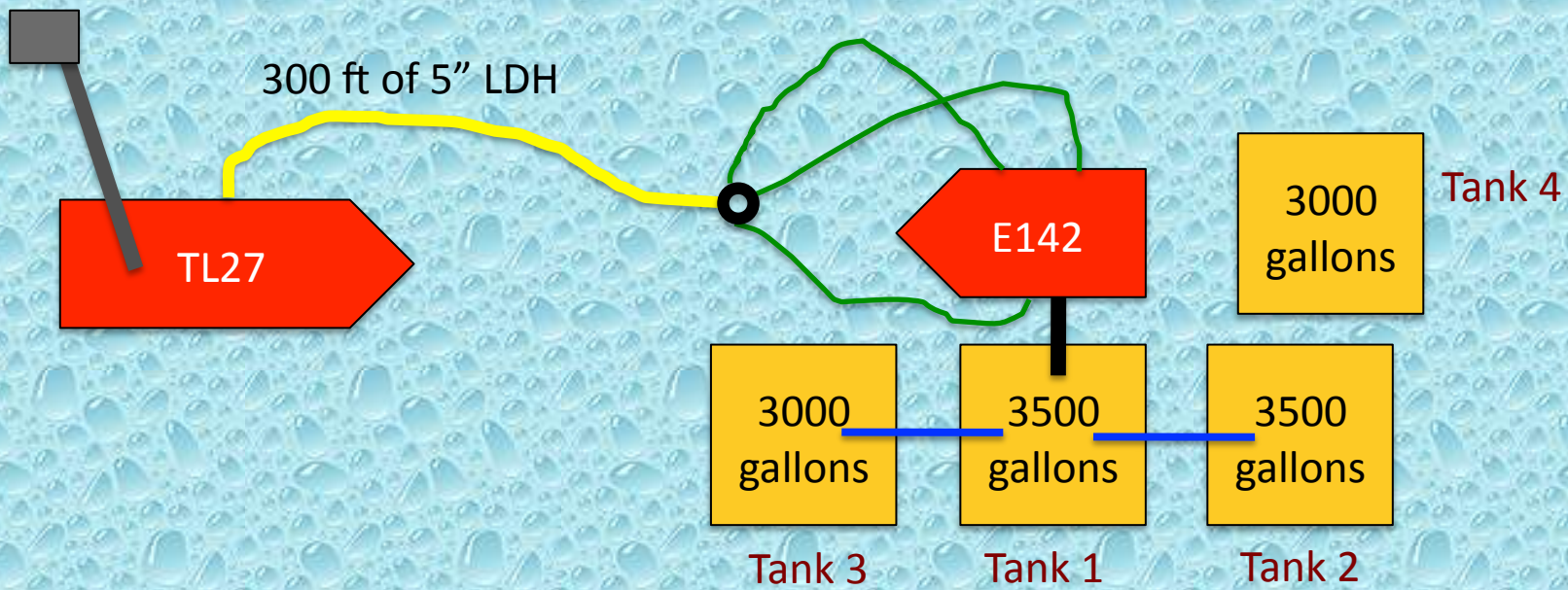
With the 3-inch hose now changed out, the flow is once again increased at the 75:00 minute mark – this time to 1,500 gpm.


Keeping It Moving!



Crews did an excellent job of keeping the water moving. The photo above shows what a jet siphon should look like when it is operating properly.

Dump Site Layout



-  Suction Hose
-  5-inch LDH
-  3-inch Hose
-  Jet Siphon

Note: Tank 4 was set-up but not used.

The Fill Sites

- For this drill – two fill sites were used – one at a nearby park and one at a pond in a nearby residential development.
- The park's lake was the larger of the two water supply sites and was the first site operational in the drill. It also provided about a 2.0-mile roundtrip.
- The second fill site was a smaller pond that provided a 3.8-mile roundtrip for the tankers hauling water.

Town Park Fill Site



This recreational lake provided plenty of water and plenty of access for drafting. While only one pumper was used at this fill site, access was certainly present for more pumpers if needed.

Town Park Fill Site



South Salem Engine 168 (1,500 gpm) was used to operate this fill site. The fill site was set-up in short order.

Town Park Fill Site



The crew laid 500-ft of 5-inch LDH from a parking lot area to the draft site so that tankers would have an easier time maneuvering in the fill area.

Town Park Fill Site



E168 is shown above supplying the 5-inch LDH. The operator also used one of the rig's 2-1/2-inch discharges as a recirculation line for maintaining the pumper's draft when not pumping to a tanker.

Town Park Fill Site



E168 used a 6-inch dry hydrant as the primary suction point and the crew added a 2-1/2-inch suction line to increase the pumper's capability. The photo on the right shows a section of 6-inch suction hose that had to be used to replace a bad section of 2-1/2-inch suction. That is why redundant adaptors are so important!

Town Park Fill Site



The fill crew at the Town Park fill site worked like a “pit crew” to fill tankers as they arrived. The 5-inch hose from E168 fed an LDH manifold which served as the control point for the fill station.

Town Park Fill Site



The crew is shown above using a 5-inch and a 3-inch line to fill a tanker. This arrangement made filling operations go rather fast.

Adams Hill Fill Site



The Adams Hill fill site was the second site put into operation. It was located at a pond on a residential road. Can you spot the problem in the photo above?

Adams Hill Fill Site



Because Adams Hill Road was a looped road, it was unclear which end to come in – and there was at least one instance of arriving “nose-to-nose” at the fill pumper. Fortunately, crews sorted out the problem and tankers were filled without issue.

Adams Hill Fill Site



Bedford Engine 110 (1,250 gpm) operated as the pumper at this fill site. Access to the pond was good and crews did a good job of setting up the pumper for drafting operations.

Adams Hill Fill Site



Some problems occurred at this fill site with the use of an LDH manifold, however, the fill site crew was able to work through the problem and keep filling tankers. This was good reinforcement for being prepared to handle malfunctioning equipment.

Adams Hill Fill Site



Being an older pumper, E110 did not have a high-flow discharge, so flow through the 5-inch hose shown above was limited - but adequate enough to sustain the filling of tankers at this site. A better approach might have been to feed the 5-inch with dual- 3" lines from two discharges. This would have been needed if flow was to be increased again.

Adams Hill Fill Site



Pound Ridge Tanker 3 is shown above being filled with a 5-inch line through its large capacity direct fill.

Adams Hill Fill Site



South Salem's tanker is shown being filled by a 3-inch line. However, an improved approach would have been to connect a 5-inch line directly to the large capacity direct fill.

The Results

- The drill was stopped after two hours.
- Water flow was only interrupted once at the 89-minute mark after water had been flowing at a rate of 1,500 gpm for 14-minutes using three dump tanks.
- The flow was resumed in 3 minutes and was sustained for the remainder of the drill at 1,000 gpm.
- An estimated 102,783 gallons of water were flowed through the tower ladder during the drill producing an **average flow rate of 925 gpm – which is the best average flow rate thus far attained in a GBW Rural Water Supply Operations Seminar!**

The Lessons Learned

- Water flow was not started until the 5:49-minute mark due to some delay in getting the dump site pumper into position.
- Fortunately, quick thinking crews chose to move to a nurse tanker operation and used Vista's tanker to pump off its water to the Chappaqua's tower ladder.
- Again – that action supports the advantage of having a full-size fire pump on a tanker - if one can afford it.

The Lessons Learned

- As the number of tanker resources increase, the number of fill sites needs to increase also. At this drill, tankers were waiting to fill – sometimes 3-deep at the two fill sites. With 12 tankers hauling water, a third fill site would have helped sustain the 1,500 gpm flow.
- LDH fill lines certainly make a huge difference – that practice was reinforced at this drill.
- Mutual aid resources must “work on the same page.” They clearly did at this drill.

Summary

- The drill was a success. For the new folks, they got to see how “it is supposed to be done.”
- 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 – without those practices, this drill would not have been as successful.
- Much thanks to the Northern Westchester County VFA and the South Salem FD for hosting this seminar.



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