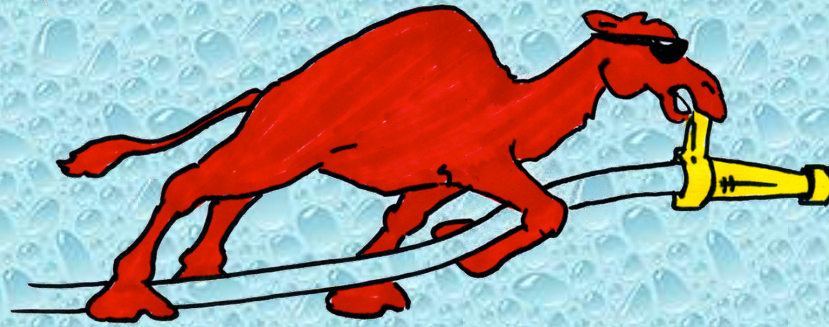


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# Adams County, Pennsylvania

Rural Water Supply Operations Seminar  
2-hr Water Supply Drill – August 21, 2011  
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 3-hour session to review the basics of dump site and fill site operations.
- The review session was conducted at the Adams County Volunteer Emergency Services Association's Training Center located near Gettysburg, Pennsylvania.
- Seminar participants were from Pennsylvania and Maryland.

# The 2-hour Water Supply Drill

- The tanker shuttle drill was also held at the Adams County VESA Training Center.
- 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 in two states and the water hauling apparatus was representative of the type of water supply support that would respond to a structure fire in Adams County.*

# Drill Participants

- Gettysburg Engine 1-2
  - 1,500 gpm pump w/750 gal tank
  
- Bonneauville Engine/Tanker 19
  - 1,750 gpm pump, w/1,800 gal tank



# Drill Participants

- Biglerville Engine 6-2
  - 1,500 gpm pump  
w/800 gal tank



- Lake Meade Tanker 26
  - 1,000 gpm pump,  
w/3,000 gal tank



# Drill Participants

- Jarrettsville Special Unit 781
  - 1,500 gpm pump w/300 gal tank
- York Springs Tanker 9
  - 1,500 gpm pump, w/2,600 gal tank



# Drill Participants

- United Tanker 33
  - 1,250 gpm pump  
w/1,500 gal tank
- Pleasant Valley Tanker 6
  - 1,500 gpm pump,  
w/3,200 gal tank



# Drill Participants

- Pleasant Valley Engine 63
  - 1,500 gpm pump w/1,000 gal tank
- Pleasant Valley Special Unit 6
  - 1,500 gpm pump, w/500 gal tank



# Drill Participants

- Littlestown  
Engine/Tanker 20
  - 1,500 gpm pump  
w/2,500 gal tank
  
- Fairfield  
Engine/Rescue 2
  - 1,500 gpm pump,  
w/750 gal tank



# Drill Participants

- Cashtown Engine 4-1
  - 1,000 gpm pump  
w/2,000 gal tank





# Preparation



Units staged at the Adams County Training Center 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. Biglerville Engine 6-2 stops to layout a 5-inch supply line. Cashtown Engine 4-1 arrives shortly thereafter. Once Engine 6-2 completes its supply hose layout – the clock will start.

# The Drill Begins



Engine 6-2 stretches a hose line in preparation for water flow while Engine 4-1's crew begins to set-up for dump site operations.

# Attack Engine Set-up



In hopes of delivering 1,000 gpm, a 5-inch line is stretched to the flow measuring device.

# Dump Site Set-Up



Meanwhile, an LDH manifold is placed in-line in order to facilitate nurse tanker operations if needed.

# Dump Site Set-Up



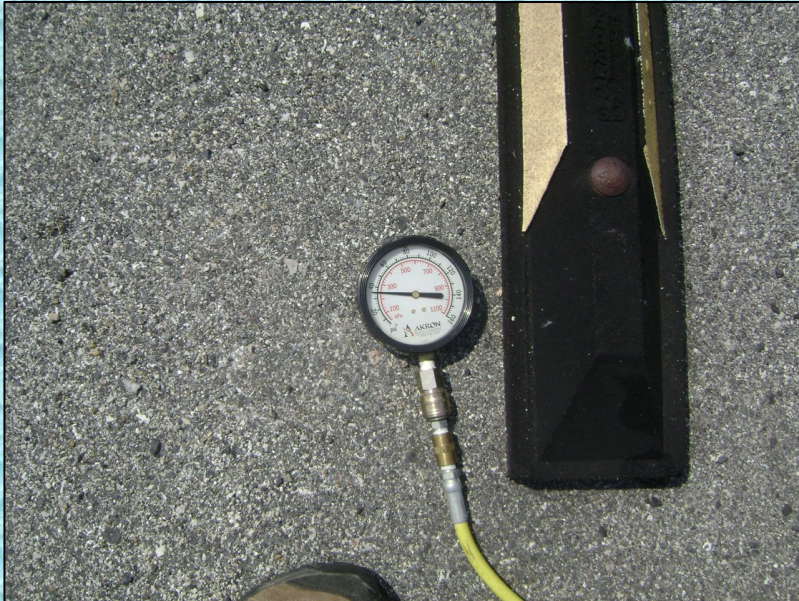
Bonneville Engine/Tanker 19 arrives on the scene and begins nurse tanker operations while other crews assist with dump site set-up.

# Water Flow is Started



At the 5:00 minute mark, water flow is started at 250 gpm from Engine 6-2 while ET19 supports the flow through nurse tanker operations.

# Flow Measurement



A Hose Monster equipped with a fixed pitot tube was used to measure the flow during the drill.



# Dump Site Set-Up



Gettysburg Engine 1-2 arrives and also supports the fire attack using the LDH manifold while the dump site awaits the arrival of a tanker.

# Dump Site Set-Up



With the dump site ready for water, all that is needed is a tanker. Fortunately, the nurse tanker operation supports the attack engine.

# Dump Site Set-Up



At the 13:30-minute mark, York Springs Tanker 9 arrives as the first tanker on the Tanker Task Force and prepares to offload its water. The dump site crews also grab extra equipment and begin setting up a second dump tank.

# Dump Site Set-Up



Tanker 9 dumps its water and the transition to a dump site operation begins at 16:58 minutes.

# Dump Site Set-Up



One problem that arose at the dump site was that Cashtown Engine 4-1 was not equipped with a control valve on its suction inlet which meant that it could not pump its 1,000 gallons of water to the attack engine.

# More Tankers Arrive



Lake Meade Tanker 26 arrives and dumps its 3,000 gallons of water .

# Dump Site Set-Up



While not ideal for a tanker shuttle operation – water is water. Pleasant Valley Engine 6-3 pumps off its water while awaiting the arrival of more tankers.

# Flow Increases



At the 19:00-minute mark, flow was increased to 504 gpm as more equipment is brought in to expand the dump site.



# Nurse Tanker Operation



Pleasant Valley Tanker 6 finishes up as a nurse tanker and will soon move to hauling water in a shuttle operation.

# Dump Site Set-Up



At the 43:00-minute mark, the dump site operation has moved to four tanks. At the 1:21-minute mark – flow was moved to 1,000 gpm.

# Water Transfer Operation



This type of jet siphon is effective in transferring water but it also can easily develop a vortex. This is why a ball is often used with these type of siphons.

# Water Transfer Operation



Not enough pressure

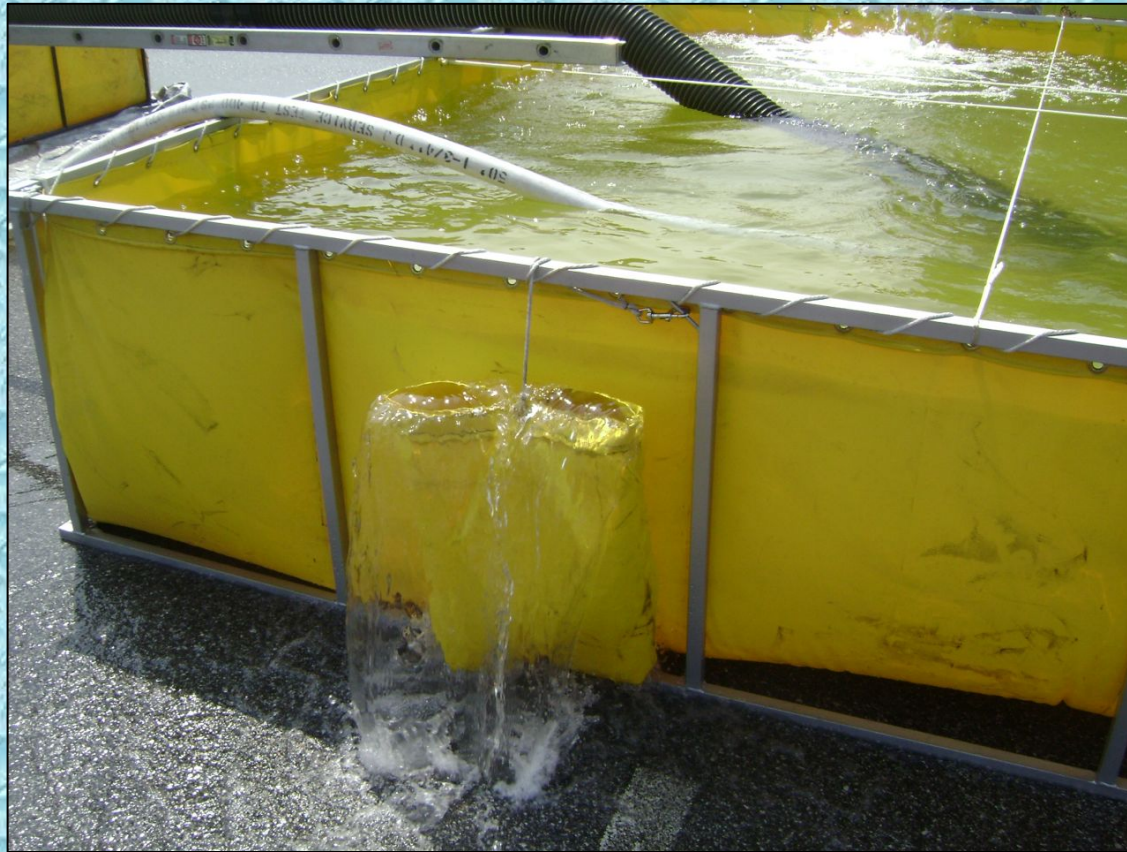
When pumping a jet siphon, pump enough pressure so that a solid stream of water is discharged from the end of the suction hose.

# High-Flow Discharge



Choosing the right discharge is critical when moving to larger flow volumes. The high-flow discharge shown in use above is able to easily support the 1,000-gpm flow at this drill.

# Tie Up Those Drains



It is important to secure the drains on dump tanks. While it is unlikely that the entire contents will be lost, this does make a huge mess in bad weather. When possible, tie the drains up on the inside of the tank.

# Dump Site Operations



With the flow now at 1,000 gpm, the four-tank, dump site operation provides adequate support.

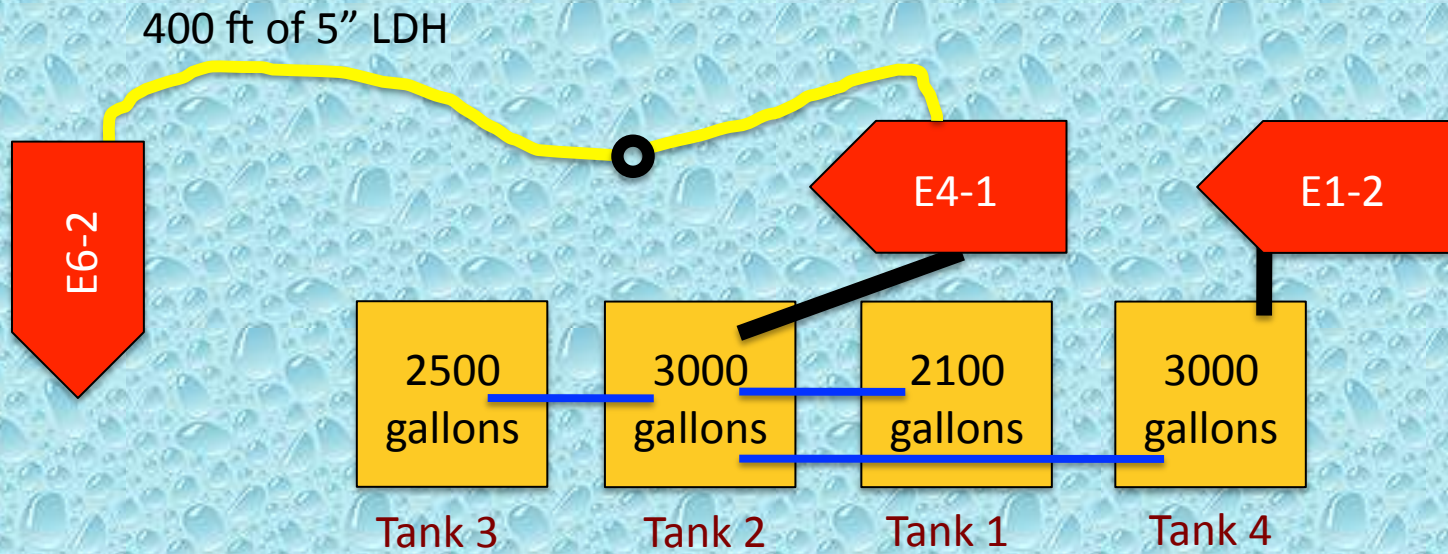
# Dump Site Operations



With a 1,000 gpm flow, water transfer operations were critical to the success.



# Dump Site Layout



- Suction Hose
- 5-inch LDH
- Jet Siphon

Note: Gettysburg E1-2 was used to help support jet siphon operations

# The Fill Sites

- For this drill – two fill sites were used – one at a pond on the training center grounds and one at a fire hydrant in a nearby industrial development.
- The training center's pond was quite large and crews were able to establish two fill stations at the site. Because the pond was close to the dump site, tankers were required to travel a longer route in order to generate the 2.2-mile roundtrip.
- The second fill site was a traditional fire hydrant that provided a 4.5-mile roundtrip for the tankers hauling water.

# Training Center Fill Site



Jarrettsville Special Unit 781 (1500 gpm) arrives at the pond and begins work on setting up a tanker fill site. The pond was located on the grounds of the training center – so the travel route for tankers was adjusted to add some distance.

# Training Center Fill Site



Jarrettsville's crew hustles to get the site ready for when the first tanker arrives ready to be filled.

# Training Center Fill Site



The Jarrettsville crew sets up three suction lines so that they can maximize their pumper's flow capacity.

# Training Center Fill Site



Fairfield Engine/Rescue 2 sets up a second fill site at the same pond thus allowing two tankers to be filled independently.

# Training Center Fill Site



The training center fill site became quite a busy place as tankers started to arrive.

# Training Center Fill Site



As always, fill site staffing is important as is the use of LDH and quick-connect fittings and couplings.



# Hydrant Fill Site



Pleasant Valley Special Unit 6 (1500 gpm) was used to establish the second fill station at a fire hydrant. The crew did a nice job of accessing the available water from the hydrant.

# Hydrant Fill Site



The crew from Special Unit 6 used 5-inch LDH to fill tankers and they operated the fill station like a NASCAR pit stop!

# The Results

- The drill was stopped after two hours.
- Water flow was interrupted twice, once at the 8:03-minute mark when the attack engine ran out of water and nurse tanker and dump site operations were not ready.
- Water flow also was interrupted at the 22:03-minute mark when the primary dump tank became empty and E4-1 could not use its booster tank water because it is not equipped with a suction inlet control valve.
- An estimated 74,438 gallons of water were flowed through the attack engine during the drill producing an average flow rate of 678 gpm.

# The Lessons Learned

- If nurse tanker operations are part of the plan, the first-arriving units need to focus on getting those operations up and running BEFORE committing resources to other activities.
- As seen at many of the drills across the country, the ability to control one's suction inlet can make a huge difference in rural water supply operations. Engine 4-1 could not use its 1,000-gallons of booster tank water because they were already set-up to draft and would have lost that water had they tried to pump it to the attack engine.

# The Lessons Learned

- When a water source is abundant enough to support two fill stations, get a second pumper there to create one. This will almost always be more successful than trying to have one pumper fill two tankers simultaneously.
- LDH fill lines certainly make a huge difference – that practice was once again reinforced at this drill.
- The “bundling” of water hauling mutual aid resources has proven successful in many drills – it did at this one as well. The tanker task force concept is an effective process for requesting and using additional rural water supply resources.

# Summary

- The drill was a success even though the 1,000 gpm goal was not reached until late into the operation.
- Like the 2010 drill, this year's drill reinforced the critical nature of the first actions taken during the dump site set-up process.
- The success of the drill also reinforced the importance of mutual aid response practices and procedures – and the importance of mutual aid interoperability.
- Much thanks to the Adams County Volunteer Emergency Services Association for sponsoring and hosting this seminar.



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