Maryland State Fireman's Association

Rural Water Supply Committee
2011 Spring Drill

New Market District VFD
Frederick County, Maryland
May 22, 2011

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Purpose of the Drill

1) To simulate a fire where the municipal water supply fails.
2) Supply with a tanker shuttle
3) Expand water supply with a relay of LDH

The 2 Hour ISO Test

- Designed to test the water supply capabilities of a fire department.
- It starts when the brake is set on the first rig.
- Flow of 250 GPM must be established at the 5 minute mark, can be increased at the 15 minute mark, and must continue for the remainder of the time.
- Flow can be increased, as water is available, but can not drop below the flow at the 15-min mark.

Initial layout

Crews lay a 4” line from the closest hydrant

A 3” line is placed in service with an initial flow of 250 GPM. (5 mins)

Relay pumper was placed between the fire ground and dump site

Due to the length of layout (nearly 2000') and the topography of the street, an additional pumper was needed to assist with boosting pressure in the 4" hose from the dump site

Dump site was set at a traffic circle

The traffic circle provided the only place to maneuver tankers, but the need for space still challenged the crews

Although tankers could make the turn around the circle, lining up with dump tanks, was problematic

Tight quarters at the dump site made for a lot of wasted water

Tankers lined up waiting to dump

Normally a welcomed sight, but the dump site configuration and long distance to the fire ground, kept flow between 500 and 700 gpm until a supplemental relay was established

Fill site #1

This fill site looks like an easy set up. In reality water was delayed, due to a number of boat trailers blocking access.

They all had to be moved to allow apparatus to get close enough to the water.

Fill site #1 worked well. It had a good turnaround area for large tankers and plenty of water

Fill site # 2

This fill site was on a roadway that ran past a lake. A fill for standard tankers was made on one end and a second fill for a vacuum tanker consisting of a folding tank and sleeve with strainer, on the other end.

Manpower equals efficiency at a fill site

How many people does it take?

1 pump operator, 1 valve operator, 2 hook up people per line and 1 traffic cop.

How much manpower do you dedicate?

Fill site #2

A folding tank was placed for use by a vacuum tanker and fed by a separate pump

Fill site #2 Folding tank for vacuum tanker.

As the tanker draws the folding tank down, the pumper can refill it.
Giving an uninterrupted fill through the shortest sleeve possible

The nice things about vacuum tankers

- Versatility
- Fills and dumps use the same piping
- Evacuates air from the tank to fill faster
- Needed manpower is greatly reduced (1-2 instead of 7-8)
- Does not require a separate pump to feed it

More about vacuum tankers

- Their hi-volume air pump is used to fill and to dump, this equals consistency
- They won't lose head pressure while dumping
- Speed of operation – vacuum tankers generally make 2-3 more trips during the 2 hour period, than the elliptical tankers

Fill site #3

This site used portable pumps to feed a pumper.

This pond was fed by a stream, helping to avoid depletion of available water.

Also, some laws require the FD to refill a water source within a certain timeframe.

Fill site #3

Shown is the pumper that was relaying the water from the portable pumps

An easy way to increase flow , if resources are available, is to place a folding tank at the larger pump. This will give more water for the larger pump when its time to fill a tanker.

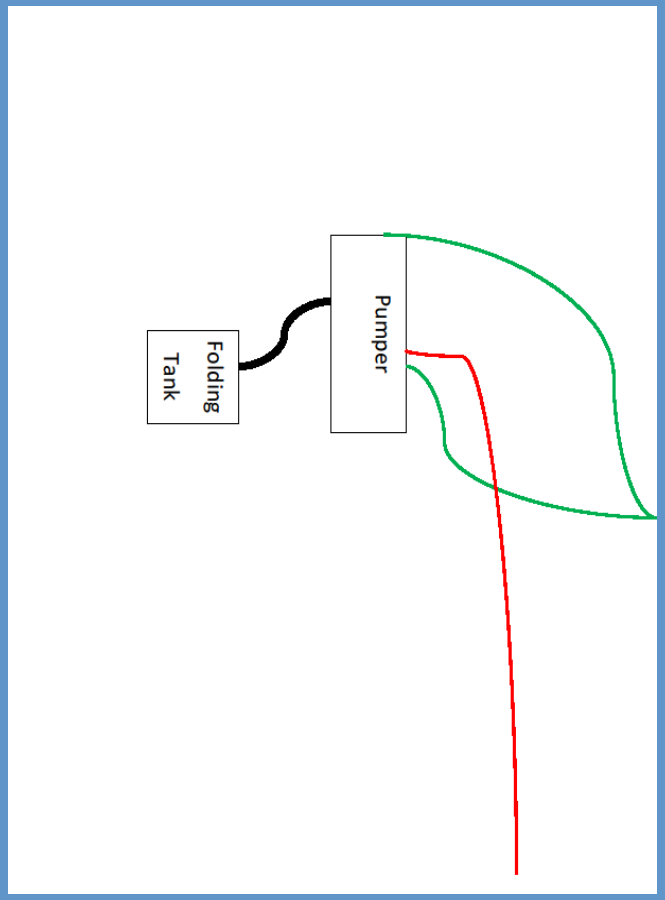
Check out the GBW archives: Larry Davis did an article about this operation in Alaska. He referred to a low-flow hydrant, but the principle is the same

In this scenario, the two lines (green) from the portable pumps enter from the front and side intakes of the pumper. Since water takes the path of least resistance, the folding tank will fill when the discharge is closed, allowing a usable volume of water to accumulate.

When a tanker pulls in to be filled, open the discharge (red) and you'll start drawing from both sources.

The pumper will draw mostly from the folding tank and be supplemented by the portable pumps.

When finished filling, throttle down and closed the discharge to refill the folding tank



Fill site #3

When you have limited flow at a fill site; send the smaller capacity tankers there, this will reduce fill times.

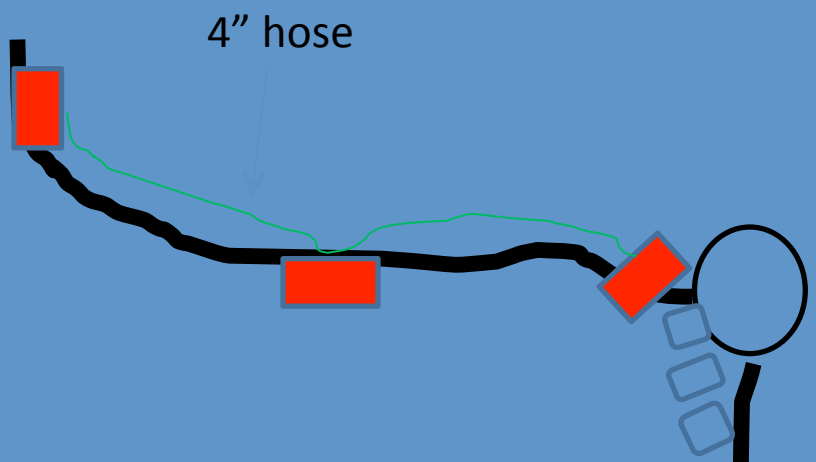
A 3500 gallon tanker could take over double the normal time to fill and deplete the water source quickly

More water was needed than the tanker shuttle could provide

Near the 30 minute mark , we started to build a 5” hose relay from the fire ground to the lake at the bottom of the development

Sounds simple enough , until you factor in:

- Almost a mile of 5” hose had to be laid, while keeping the shuttle going
- The hill that we had to pump up had more than 200 feet of elevation to overcome
- No larger capacity pumpers could get close enough to draft from the lake

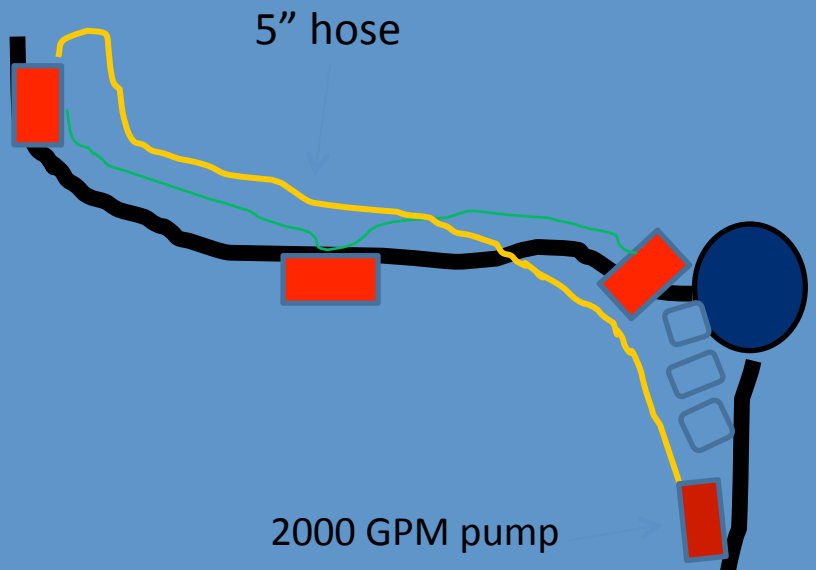


The layout of the fire ground did not make laying additional lines easy. Specialized equipment and a lot of hands were used

The first utilized special unit

This support unit carries 2000 feet of 5” hose, plus valves and adapters .

It laid the first leg of the relay from the attack pumper to just past the dump site, where a 2000 gpm pumper was waiting.

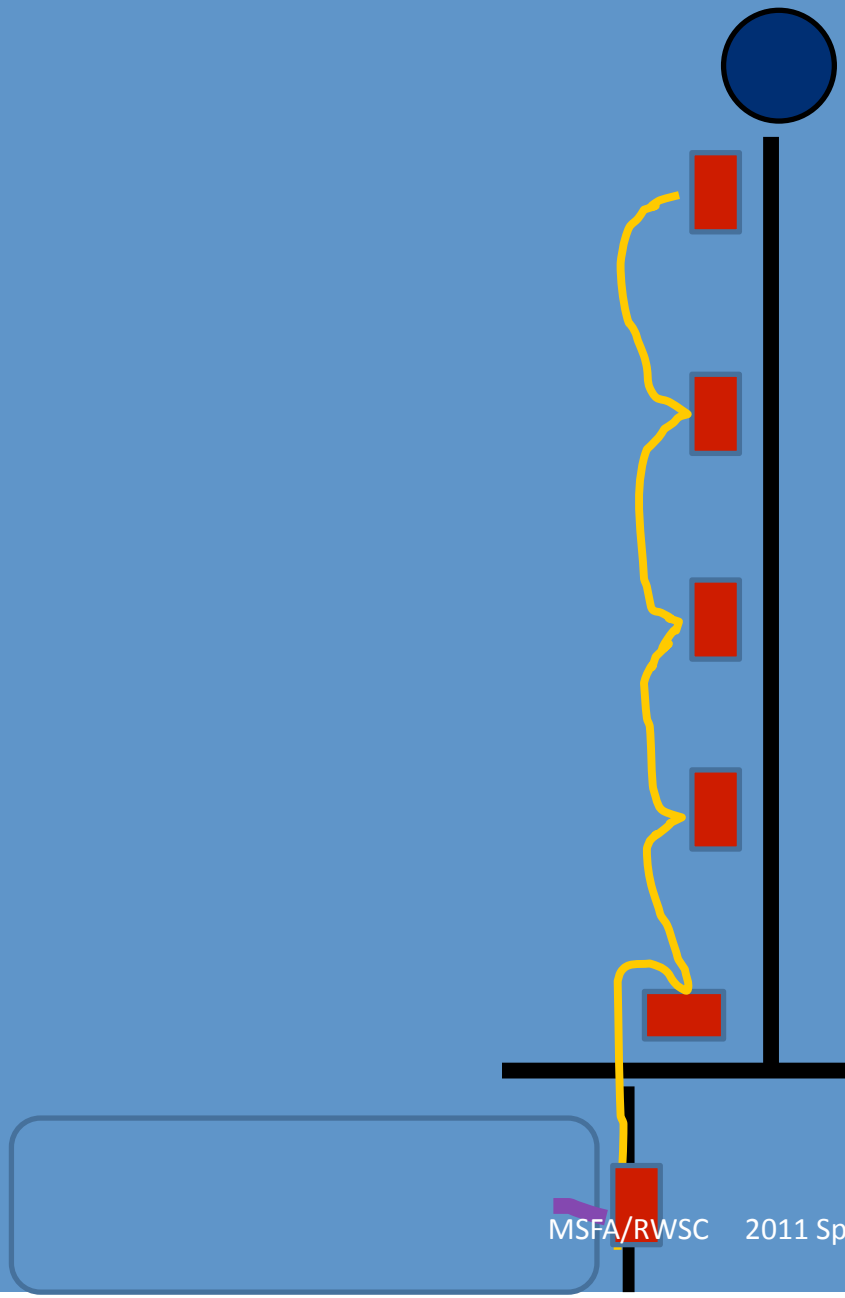


Larger capacity pumps are required to push water at long distances and higher elevations.

The higher your pump pressure rises over 150 psi, the less efficiency your pump will have

This water supply unit made quick work of laying and picking up the 5” hose.

Units with reels have been around for years, and work well when manpower is limited



The rest of the relay consisted of large capacity pumper and 5” hose.

The pumps were spaced about 700-800 feet apart.

Elevation was the problem, the hill we pumped up was very steep

The relay took almost an hour

From start to finish the relay took about an hour to build and send water to the fire ground.

The relay added a little over 750 GPM to the total GPM

The reason for this was resource based. By the time the relay was built, the biggest pump that could make it to the water had a 750GPM pump.

The big pumps in the relay had to overcome the elevation, they were working hard to send the water up the hill

Concluding Time Line

0-15 mins:	Water was sporadic and was lost momentarily throughout the first period
15 - 90 mins:	Flow was maintained between 500-600 GPM
At 90 mins:	Flow was increased from the shuttle to about 800 GPM
90 – 120mins:	Water from shuttle and relay combined to make a flow of 1576 GPM

SUMMARY

This drill was designed to show how quickly resources could be placed in service when the municipal water fails.

Based on the fire flow needs for the area and the limited roadway, we proved that an large amount of resources and manpower were needed to move enough water to fight the fire.

What we found was that given this scenario, we could move enough water to try to cut off the fire and save some of the exposures.

Thanks to the multiple jurisdictions for coming to drill, we had nearly 100 personnel in attendance with 27 pieces of apparatus. Several companies drove long distances to attend.

Many Thanks to the New Market District Volunteer Fire Department for hosting the drill, the countless hours of preparation and community relations, that allowed the drill to take place and for feeding everyone breakfast and lunch.