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Hartford FD
White River Junction, Vermont

Rural Water Supply Operations Seminar
Water Supply Drill – September 18, 2011
Summary Report

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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.

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The Seminar

- The seminar started on September 17th with a 6-hour session to review the basics of rural water supply operations.
- The review session was held at the William Yasinski Education Center located on the campus of the VA Hospital in White River Junction, VT.
- 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 the central Vermont and western New Hampshire areas.

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The Seminar

- The tanker shuttle drill was held on September 18th at the Wilder Dam area.
- The drill reviewed the basics of setting up a dump site with special attention being paid to dump tank positioning and arrangement as well as water transfer operations.
- The drill also reviewed the use of portable pumps to support a fill site operation. Two, 500 gpm portable pumps were used to supply a tanker fill site operation.

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Water Supply Drill Participants

- *The participants for the drill were from seven 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 White River Junction.*

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Participants

Hartford FD – Engine 1 – 1,500 gpm w/ 1,000 gal tank

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Participants

Hartford FD – Engine 3 – 1,500 gpm w/1,500 gal tank

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Participants

Hartford FD – Tanker 2 – 1,000 gpm w/1,800 gal tank

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Participants

Hartford FD – Ladder 1 – 2,000 gpm w/500 gal tank

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Participants

Hartland VFD – Tanker 1 – 500 gpm w/1,500 gal tank

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Participants

Lyme FD – Tanker 1 – 1,000 gpm w/ 2,000 gal tank

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Participants

Grantham FD (New Hampshire) – Tanker 1 – 2,500 gal vacuum tanker

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Participants

Hartland VFD – Engine 2 – 1,500 gpm w/1,000 gal tank

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Participants

Springfield FD (NH)– Engine 3 – 1,500 gpm w/1,000 gal tank

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Dump Site Operations

Seminar instructor, Mark Davis, reviewed the basics of setting up a dump site. Discussion centered around positioning the tanks, water transfer operations, and tanker off-loading.

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Dump Site Operations

Crews work to set-up a second dump tank along with a jet siphon transfer device.

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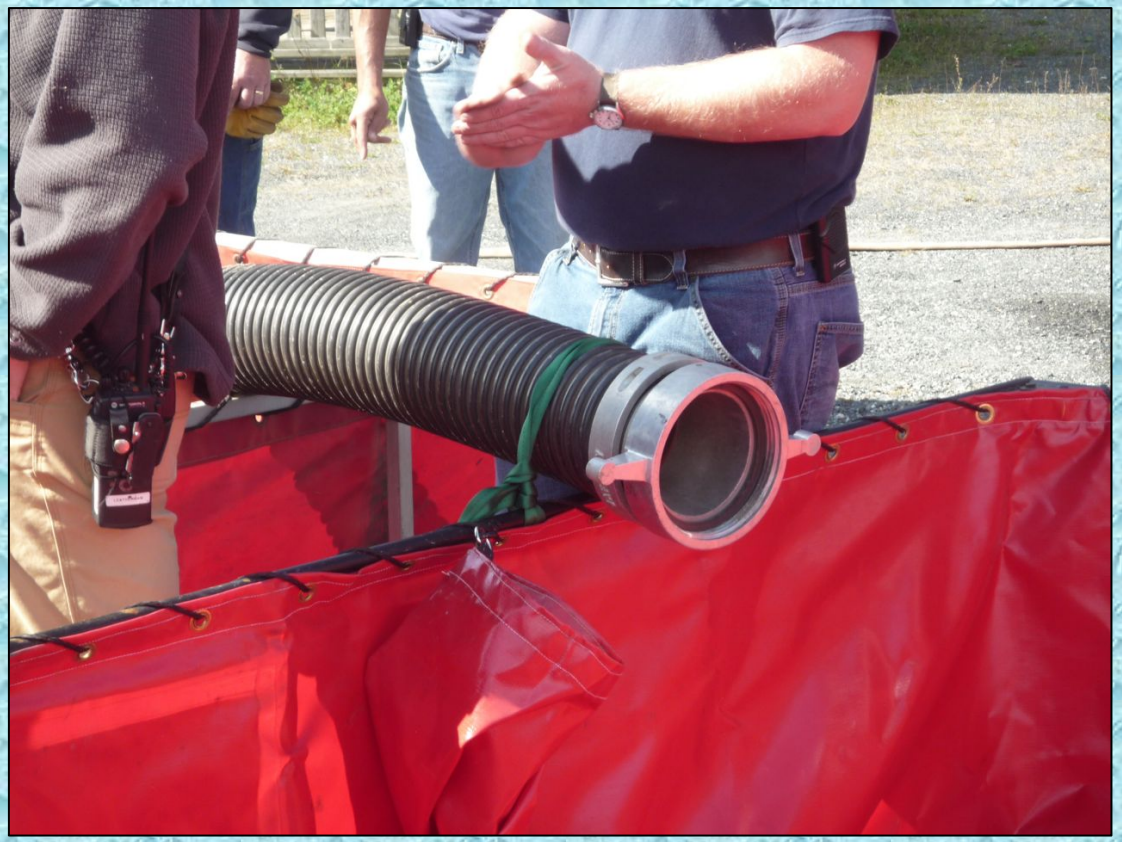
Dump Site Operations



An important note about jet siphon transfer devices – keep the flowing end of the device out of the water so that the device doesn't siphon water back into the supply tank when the jet is shut off.

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Dump Site Operations

Another important tip is to tie up the dump tank drains on the inside of the tank. By doing this, the water pressure keeps the drain closed until it is time to drain the tank. Don't worry – the drain can be easily untied.

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Dump Site Operations

When placing the second tank, think about where the third will be placed if needed.

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Dump Site Operations

The use of multiple dump tanks requires some planning in terms of space and arrangement. Tanks can be arranged in “diamond” shape or “parallel” shape – something that really depends on the type of off-loading that occurs – side or rear.

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Fill Site Operations

Instructor Paul Quigley reviews the basics of setting up a tanker fill site. Topics discussed included drafting, LDH use, tanker fill lines, and the use of portable pumps.

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Fill Site Operations

Two, 500 gpm portable pumps were used to draft from a lake and feed a dump tank from which a pumper then drafted and filled tankers.

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Fill Site Operations

The portable pumps each drafted and then pumped through 4-inch LDH. The use of the LDH allowed each pump to maximize its flow ability.

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Fill Site Operations

The portable pumps supplied a dump tank about 300-ft away from the lake.

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Tanker Shuttle Operations

With the fill site review completed, a tanker shuttle operation began. Ladder 1 was used to discharge the water at the dump site because the ladder truck is equipped with a flow meter. The flow meter was used to evaluate the success of the tanker shuttle operation.

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Tanker Shuttle Operations

The goal for the drill was to sustain a 500 gpm flow. If "things looked good," then the flow could be increased.

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Tanker Shuttle Operations

Grantham's vacuum tanker is shown here offloading its water. Positioning became a bit of an issue with two dump tanks in a parallel arrangement and one in a diamond arrangement.

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Tanker Shuttle Operations

A number of units ended up backing into the dump site to offload their water.

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Tanker Shuttle Operations

Flow was increased to 750 gpm as it became apparent that the shuttle was able to support that flow. All three dump tanks are full in the photo above and a tanker waits to dump – both a good sign.

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Tanker Shuttle Operations

In any multiple dump tank operation, the ability to transfer water is very important. Hartland Engine 2 drafted and supplied two jet siphons for this drill.

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Tanker Shuttle Operations

The two jet siphons were run using a short length of 2-1/2-inch hose wyed into 1-1/2-inch hose to the jet siphons. By putting the gated wye near the dump tanks, the operator could see and monitor tank levels and open and close the jet siphons as needed.

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Tanker Shuttle Operations

As flow was again increased, a portable pump was brought in to run an additional jet siphon since Engine 2's pump capacity was being maximized.

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Tanker Shuttle Operations

The portable pump made a difference and allowed water to be transferred and Engine 2 to support a higher flow.

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Tanker Shuttle Operations

With three dump tanks in operation, crews were able to support an 800 gpm flow.

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Tanker Shuttle Operations

Water flow was sustained for the entire drill and the crews really hustled to keep the flow moving.

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Fill Site Operations

Hartford Engine 1 drafted from the lake and operated a tanker fill station using 4-inch LDH.

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Fill Site Operations

A 4”x 2-1/2”x 2-1/2”x 2-1/2” valve was used to fill tankers. The valve was outfitted with 4” Storz adaptors so that 4” hose could be used for the filling operation. An in-line gauge was also provided so that folks could see the pressure at the appliance – which was around 125 psi during filling operations.

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Fill Site Operations

The goal for filling tankers at the drill was 1,000 gpm and this fill station met that goal quite easily using a single, 4-inch line.

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Fill Site Operations

Springfield Engine 3 operated the other fill station that was supplied by the two, 500 gpm portable pumps.

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Fill Site Operations

The two portable pump supplied water to Engine 3. When no tanker was being filled, the portable pump water passed through Engine 3's pump via hard suction hose into the 2,100-gallon dump tank. When a tanker arrived and fill operations started, Engine 3 drafted from the dump tank and was supplemented by the portable pumps - thus being able to fill at a rate exceeding 1,000 gpm.

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Fill Site Operations

Engine 3's fill station supplies 4" hose for tanker fill operations. A 2-1/2" x 2-1/2" x 4" gated wye was used as a control valve for loading the tankers. Note how the valve was "reversed" to create a large drain for use when breaking down from a tanker.

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Fill Site Operations

The fill site was very efficient. Tankers were loaded quickly and were back on the road hauling water to support the 800 gpm operation.

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Fill Site Operations

Tankers are meant to be filled fast. The use of large, direct fill lines and LDH support the goal of 1,000 gpm

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Fill Site Operations

Grantham FD (New Hampshire) brought their 2,500-gallon vacuum tanker to the drill. The key advantage to a vacuum tanker is that no fill site pumper is needed. The tanker driver can load water almost anywhere and with very little staffing needed. Above, the vacuum tanker loads up at a boat ramp – at a rate exceeding 1,000 gpm!

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Fill Site Operations

Crews experimented with different types of strainers on the vacuum fill line – the floating strainer worked a little better in terms of flow – about a 100 gpm gain.

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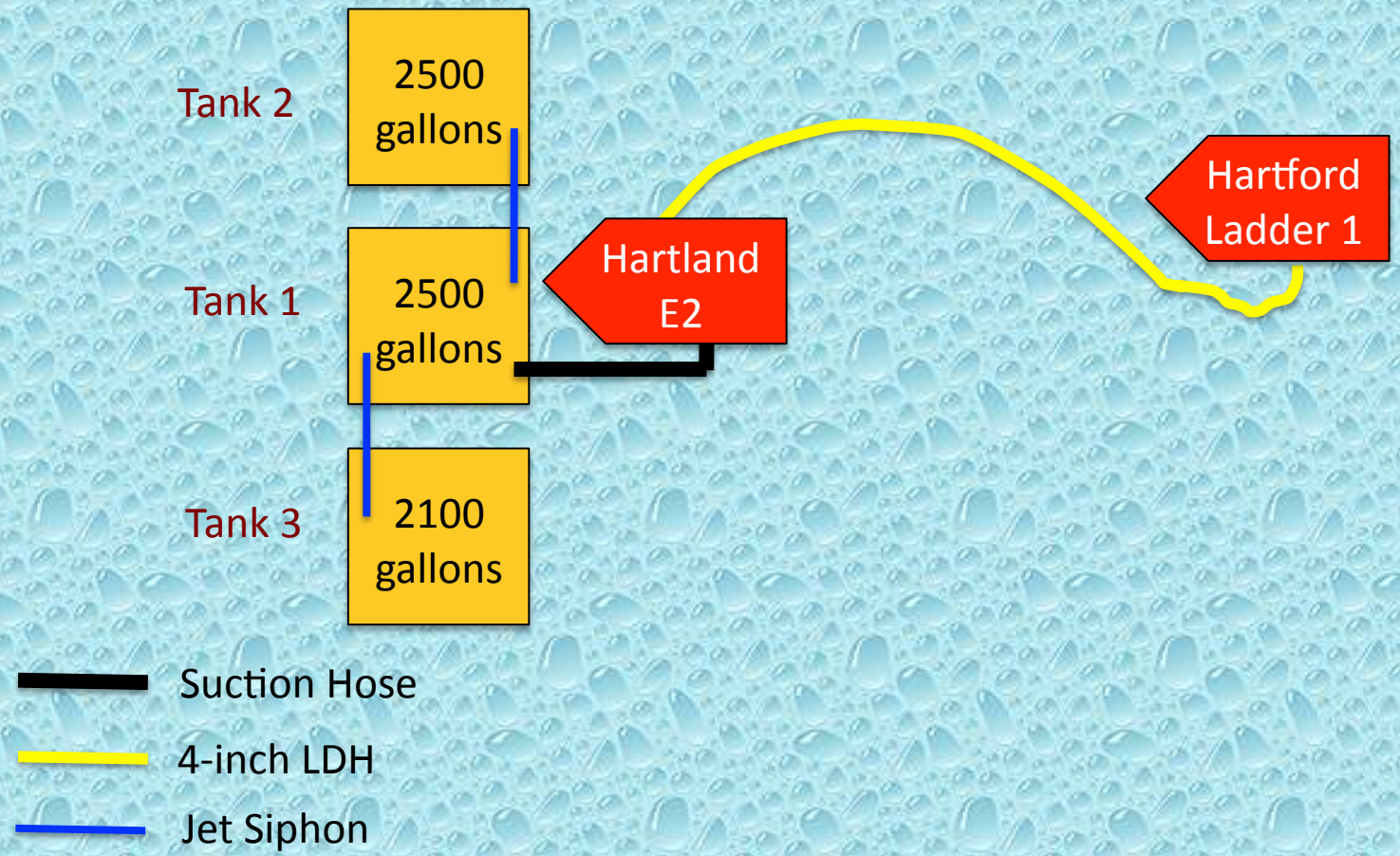
Dump Site Layout



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The Results

- The tanker shuttle was stopped after about one-hour.
- Water flow was not interrupted during the shuttle operation – although there were a couple of instances where water levels were pretty low in the dump tanks.
- Near the end of the shuttle, the flow was maximized at about 800 gpm and the limiting factor became the dump site pumper's ability to pump more water.

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The Lessons Learned

- Dump tank arrangement impacts operations. At this drill, the original plan was to arrange tanks in the parallel configuration. However, the parking lot proved a bit tighter than expected and most tankers ended up backing in to off-load their water.
- Jet siphons consume pump capacity. This normally is not a big deal until multiple dump tanks are in use. As the flow increased at this drill, Engine 2 reached its maximum capacity and could not go any higher because of the jet siphons.

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The Lessons Learned

- One way to increase pump capacity is add an additional suction line. This was one option available to Engine 2 (dump site) – but it was not used.
- The difficult part to adding suction lines is that unless the suction inlet has a control valve, then pumping operations have to be stopped in order to connect the additional suction hose. This is another reason for outfitting all suction inlets with control valves.

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The Lessons Learned

- Portable pumps are very useful devices in the rural setting. At this drill, portable pumps were used to support both the fill site and dump site operation and they proved quite capable of making a big difference.

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Summary

- The seminar and drill were a success and reinforced the need for mutual aid training and interoperability.
- Much thanks to the Hartford Fire Department for sponsoring and hosting this seminar.

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