

FIRERESCUE

January 2005 • U.S. \$4/CAN \$5

Rural Fire Command

by

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Installment 26 — January 2005

Fluid Motion, Part 4

Improving Your Drafting Operations



RFI

RURAL FIREFIGHTING INSTITUTE

Training America's Rural Fire & Emergency Responders

A Message the Author, Larry Davis

In October 2002, I started writing the monthly “Rural Fire Command” column for *FireRescue Magazine*. Since that time, the RFC column has been carried in just about every subsequent issue of the magazine.

As time has passed, several readers have contacted me about obtaining back issues of the column. Some expressed an interest in acquiring the articles in Powerpoint format for use in training programs.

This led to, my adaptation of the RFC columns to the PowerPoint format. These PowerPoint programs are being made available through the combined efforts of *FireRescue Magazine* and the Rural Firefighting Institute.

Fluid Motion — Part 4

Improving Your Drafting Operations

In the first 3 parts of this series, we pointed out the need to understand the hydraulics associated with drafting so that when Command is relying on us to supply him/her water from draft we can deliver the highest delivery rate possible.



**City of Pittsburgh (PA)
Circa 1975**

Figure 1. When I first started in the fire service (after steamers but before diesels), hard suction hose (hard sleeve to some) was not only used for drafting operations but was also used to make hydrant hook-ups. Fortunately we now have light weight plastic suction for drafting and lightweight LDH for hydrant hook-ups. Today's suction hose is meant for just one purpose — drafting. It is not designed nor intended for use in hydrant operations

Tips to Improve Drafting Operations

- Minimize Static Lift
- Use Multiple Suctions
- Use Kocheck's Jumbo Siamese
- Use 2-1/2" or 3" (Pony) Suctions
- Use anything that boosts pump output

Minimize Static Lift

Of all of the factors that impact drafting operations, static lift has a greater impact than any other — about .5 psi of atmospheric pressure is required to lift water each foot of lift. Anything that can be done to minimize lift will improve pump output capability.

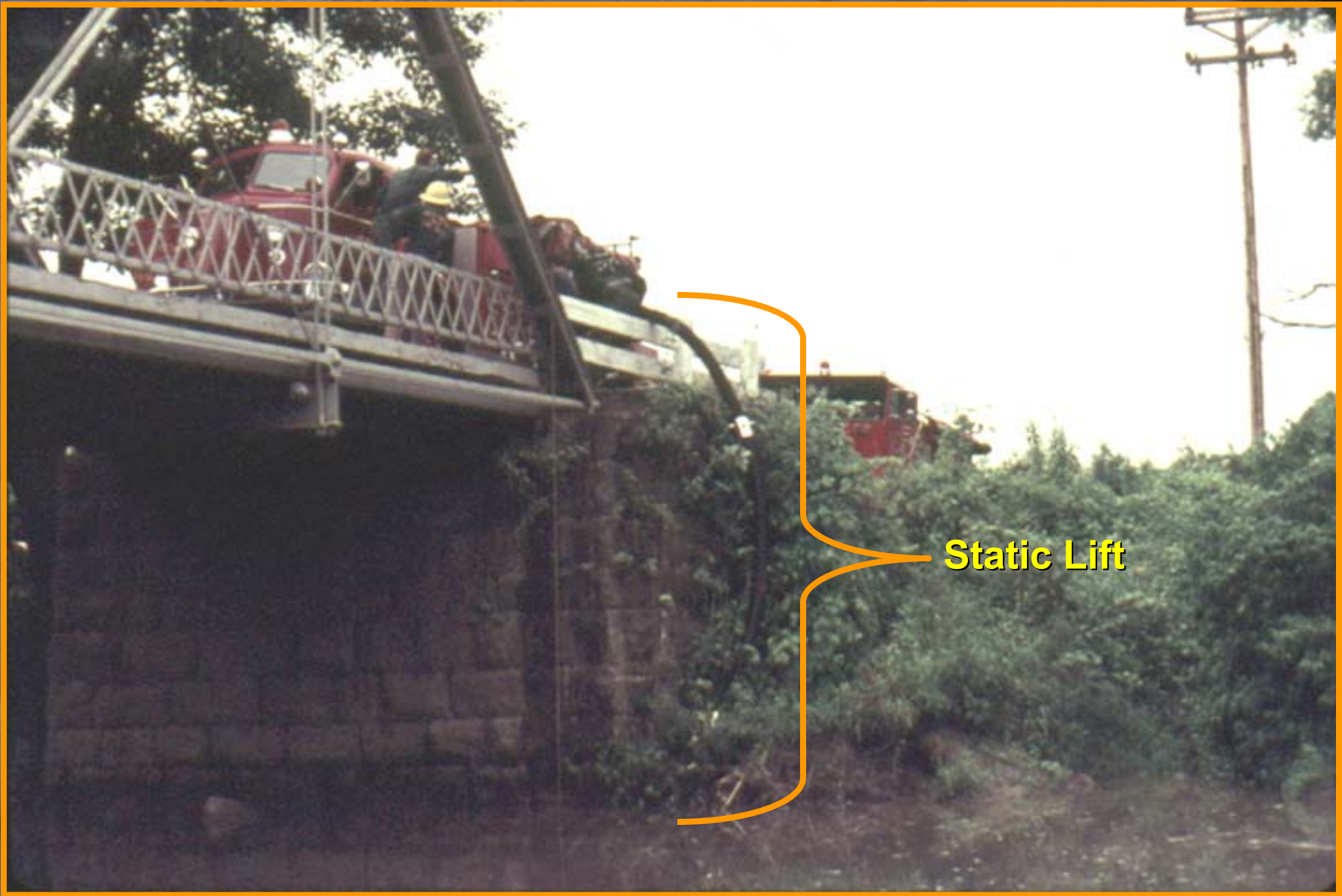


Figure 2. A static lift of 20' requires 10 psi to overcome the static lift.



Figure 3. The Big Run (PA) VFD found a great way to reduce static lift in setting up this tanker fill site — simply back the engine into the stream. A decent roadway and a solid stream bed certainly helped maximize tanker fill rates.

Use Multiple Suctions

In any drafting situation, the delivery rate of a pump can be improved if the area of the suction hose is increased. One way of doing this is by using two or more suction lines.



Figure 4



Figure 5

The Middlefield (CT) VFD knows that the standard 20 ft of suction hose isn't enough if a department plans to be serious about drafting. This 1250-gpm pumper carries 68 feet of 6" Kocheck folding long-handle Storz-coupled suction hose. One length is 28 ft long.



Figure 6. Middlefield uses dual 6" suctions from two porta-tanks at a water shuttle dump site.

Long-handle
Storz
connecton



Figure 7. With the flexible Kochek suction hose, a second suction from the right side can be run through the walkway for the top-mount pump panel. With dual suctions, the 1250-gpm pumper can easily deliver 2000 gpm.



Figure 8



Figure 9

The Eastford (CT) VFD found another way of getting a second suction line from the right (officer) side to the left (driver) side — run it under the pumper.



Figure 10. The Amenia (NY) VFD utilized dual 30-ft suctions to supply this pumper being used as a source pumper for a tanker fill site. Dual suctions maximized fill capability.



Figure 11. The Nikiski (AK) FD designed two 2000-gpm pumpers with front suctions so that dual suctions could be used to maximize flow of the dump site pumper in shuttle operations. Here Engine 411 drafts from two porta-tanks on one side to deliver over 1000 gpm.



Figure 12. When needed, porta-tanks can be set up on each side of the dump site pumper. Here Engine 411 drafts from porta-tanks on both sides.



Figure 13. A test of Winfield Community (MD) VFD's 1500-gpm pumper, used 3 suction lines — both side suctions and the front suction — to deliver over 2300 gpm.

Use the Kocheck Jumbo Siamese

**The Kocheck Company designed a 6" x 6" x 6"
“jumbo” siamese that allows dual 6" suctions to
be connected to a single pump intake.**



Figure 14. The Kochek 6" x 6" x 6" Jumbo Siamese



Figure 15. Rockville (MD) VFD's 2000-gpm pumper drafting with dual 6" suctions connected to a Kochek jumbo siamese.



Figure 16. The Kochek jumbo siamese can significantly improve a pump's drafting capability through a single 6" suction intake.

Use 2-1/2" or 3" (Pony) Suctions

In cases where the only extra suction hose available is 2-1/2" or 3", these can be connected to auxiliary 2-1/2" intakes to help improve pump delivery.



Figure 17. This Rhode Island pumper uses both 5" and 2-1/2" suctions to improve flow into the pump at a tanker fill site.



Figure 18. The Muse (PA) VFD's 1000-gpm pumper utilizes both 5" and 2-1/2" suctions to draft from a dammed-up stream to fill tankers.



Figure 19. The Gamber Community (MD) VFD's 750-gpm rear-mount pumper delivered over 1100 gpm when a 2-1/2" suction was used to supplement the 4-1/2" suction. The pumper supplies a 5" line to a manifold for use in filling tankers.

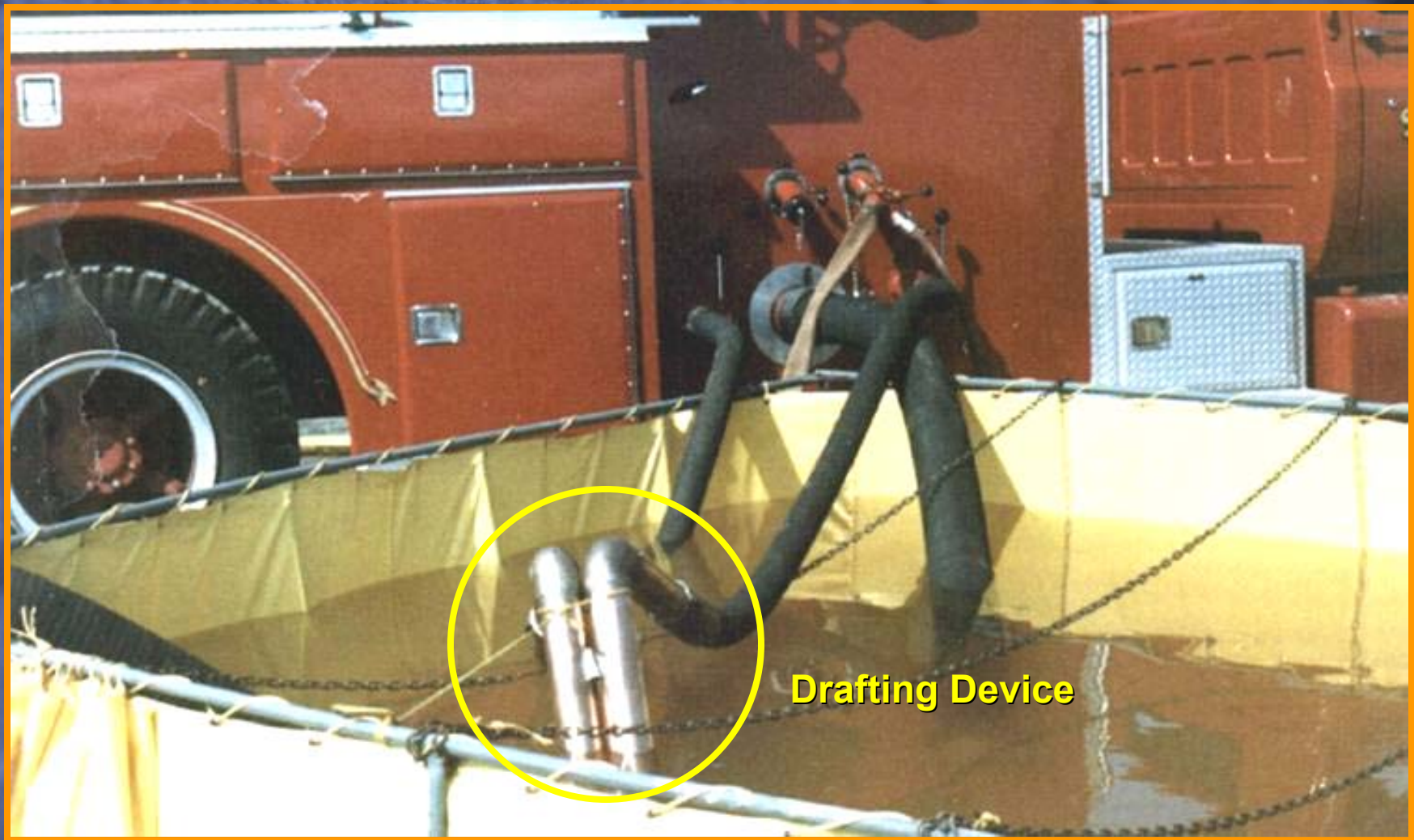


Figure 20. This 750-gpm operated at a dump site in Stewiacke, Nova Scotia. Department members built a drafting device to allow dual 2-1/2" suctions to supplement the 4-1/2" suction.

More to Follow

In Part 5 of this series, we'll take a look at other things that can be done to improve drafting operations.

For Questions or comments on this or any of the Rural Fire Command articles, contact the author at ldavis@RFI411.org

About the Author



Larry Davis is a full member of the Society of Fire Protection Engineers, a Certified Fire Protection Specialist, and a Certified Fire Service Instructor II with more than 30 years experience as a fire service instructor. He is Vice President of GBW Associates, and Chairman of the Rural Firefighting Institute.

Davis has conducted more than 400 Rural Firefighting Tactics and Rural Water Supply Operations seminars throughout the United States and Canada. In addition, he has written numerous fire service texts, including *Rural Firefighting Operations*, books I, II, and III. Most recently, Davis co-wrote the *Rural Firefighting Handbook* and *Foam Firefighting Operations*, book I with Dominic Colletti.



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To obtain any or all of the other PowerPoint versions of the Rural Fire Command column, contact Larry Davis at:

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Visit the RFI website at www.rfi411.org to learn of the other training resources available by Larry Davis.

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