**TROUBLE SHOOTING DRILLS WHEN OPERATING FROM STANDPIPE SYSTEMS**

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Standpipe and sprinkler systems are often overlooked. The female connections on a FDC may be missing or packed with crud for sometime before anybody notices there is a problem. Hopefully any problems are noticed and corrected before the system needs to be used.

I'd like to offer some scenarios that your crew can discuss or set up at the training tower, if one is available, to help recognize and train in correcting any flow or pressure fluctuations that may arise while operating attacklines from a standpipe system.


Although the problem with this FDC is obvious; not all problems are. You may be operating on one floor but a SPO (standpipe outlet) on another may be open or there may be a faulty pipe connection somewhere in the system. Maybe due to a pipe freezing months ago.

Overview: Driver pumps to the training tower's FDC. SPO FF attaches inline pressure gauge to first floor SPO and supplies attackline that's stretched to the second floor. One inline gate valve will be placed mid-point on the attackline, a gated wye on the 3rd floor SPO, a gate valve on the FDC, and one of the engines gated intake valves will be used. These valves will be opened and closed as needed, depending on the scenario, to replicate problems such as a blockage, broken or busted piping or hose, an inoperable hydrant or clogged pump intake. The driver, SPO FF and nozzle team, should be out of view of all gate valves.

Communication between all team members and positions will be imperative in resolving any water supply problems to the attackline.

This drill is just as much for the benefit and training of the nozzle team and SPO FF as it is for the driver at the pump panel.

Set-up for all scenarios:

1. Position engine with pump panel away from building. Use single 3" to supply gated 2.5" intake on auxiliary pump panel that's facing building.
2. Attach 2.5" gate valve to FDC. Supply the FDC with a single 3" line. A normal operation calls for adding friction loss for this line.
3. Attach 100' of 2.5" attackline with a 1 1/8" SB nozzle to first floor SPO using inline pressure gauge. Take nozzle to fire floor (2nd floor). Place gate valve at mid-point and out of view of nozzle team. Tie the nozzle off to building if you like.
4. Attach gated wye to 3rd floor SPO. Use 1.75" line to dump water out of building. Attach coupling to building so it is hands free.

## SCENARIO 1

MAINTAIN PRESSURE ON THE INTIAL ATTACKLINE
WHEN A SECOND LINE IS PLACED INTO OPERATION

Action:

1. Driver supplies 150 PSI to FDC: second floor fire.
2. Nozzle team calls for water then operates nozzle at full flow.
3. SPO FF sets pressure to 70 PSI: 100' high-rise attackline to one floor above.
4. SPO FF recognizes pressure or flow reducer and disables it.
5. Nozzle team opens and closes the nozzle intermittently to allow SPO FF to recognize normal nozzle operation.
6. Partially open 3rd floor wye enough to simulate another attackline being opened and allowing SPO FF and driver to recognize pressure drop.
7. SPO FF and driver recognize a pressure decrease on their respective gauges and open their respective valves, or increase engine speed, to overcome the additional demand and maintain the proper pressure on the initial attackline.
8. No other action necessary as long as the SPO FF and driver can makes adjustments to overcome additional demands. Radio communications should take place only as necessary.

## SCENARIO 2

LOW NOZZLE FLOW – OBSTRUCTION OR KINKS BETWEEN SPO AND NOZZLE

Action:

1. Driver supplies 150 PSI to FDC: second floor fire.
2. Nozzle team calls for water then operates nozzle at full flow.
3. SPO FF sets pressure to 70 PSI: 100' high-rise attackline to one floor above.
4. SPO FF recognizes pressure or flow reducer and disables it.
5. Partially close attacklines' inline gate valve to simulate kinks or debris in attackline or nozzle.
6. When nozzle team recognizes lack of pressure at the nozzle they call for more pressure.
7. SPO FF hears call for more pressure, reads gauge and takes appropriate action:
    a. Recognizes higher pressure on gauge than initially set. Radio that information.
    b. All team members should recognize the possibility of kinks or obstruction in attackline or nozzle, and take corrective action.

c. SPO FF must be ready to readjust SPO to proper pressure if kinks are found and corrected, or if at anytime obstruction is passed.

8. Driver reads discharge gauge and maintains 150 PSI to FDC.
9. After scenario is finished, discuss what options nozzle team has if obstruction can't be resolved.

## SCENARIO 3

LOW NOZZLE FLOW – CATASTROPHIC PRESSURE DROP FROM NOZZLE TO ENGINE

Action:

1. Driver supplies 150 PSI to FDC: second floor fire.
2. Nozzle team calls for water then operates nozzle at full flow.
3. SPO FF sets pressure to 70 PSI: 100' high-rise attackline to one floor above.
4. SPO FF recognizes pressure or flow reducer and disables it.
5. Fully open 3rd floor wye to simulate open SPOs or pipe break.
6. When nozzle team recognizes lack of pressure at the nozzle they call for more pressure.
7. SPO FF and driver recognize a pressure decrease on their respective gauges and open their valves to overcome additional demand and attempt to maintain proper attackline pressure.
8. If the SPO FF and driver take appropriate action and adequate pressure still can't be achieved at the SPO, or at the pump panel, radio IC and nozzle team as there may be catastrophic problems such as a burst hose, pipe break or open SPOs in the system that need to be closed. Use "emergency traffic" as necessary.
9. Team takes corrective action to close any opened SPOs or find alternative means to supply attackline.
10. Discuss what actions the nozzle team may have to take. Note: 40 PSI at the SPO will still give 200 GPM from the nozzle.

## SCENARIO 4

LOW NOZZLE FLOW – FDC OBSTRUCTION

Action:

1. Driver supplies 150 PSI to FDC: second floor fire.
2. Nozzle team calls for water then operates nozzle at full flow.
3. SPO FF sets pressure to 70 PSI: 100' high-rise attackline to one floor above.
4. SPO FF recognizes pressure or flow reducer and disables it.
5. FDC gate valve is closed to allow only a partial flow and to simulate obstruction between engine and SPO.
6. When nozzle team recognizes lack of pressure at the nozzle they call for more pressure.
7. SPO FF recognizes drop in gauge pressure and radios that information.
8. Driver recognizes increase in discharge pressure and radios that information.
9. The urgency of any radio transmission may depend on the severity of the pressure fluctuations. "Emergency radio traffic" should be considered. Keep in mind any radio communication may be iffy at best in standpiped buildings. Discuss options.
10. Driver confirms no kinks in supply line to FDC.
11. Driver calls for help in order supply another FDC if available or add additional lines to FDC.

12. Consideration should be given to laying 3" line up attack stairwell to supply attackline or pump to a lower floor SPO, thus bypassing the FDC.

## SCENARIO 5

LOW NOZZLE FLOW – HYDRANT MALFUNCTION OR OBSTRUCTION IN PUMP INTAKE

Action:

1. Driver supplies 150 PSI to FDC: second floor fire.
2. Nozzle team calls for water then operates nozzle at full flow
3. SPO FF sets pressure to 70 PSI: 100' high-rise attackline to one floor above.
4. SPO FF recognizes pressure or flow reducer and disables it.
5. Partially close pump intake valve to simulate obstruction or faulty water supply between hydrant and engine intake.
6. When nozzle team recognizes lack of pressure at the nozzle they call for more pressure.
7. SPO FF recognizes drop in gauge pressure and radios that information.
8. Driver recognizes decreased intake and discharge pressures and radios that information.
9. Driver confirms no kinks in supply line and hydrant is full open.
10. Driver radios catastrophic water supply problem using "emergency traffic" if problem isn't immediately resolved.
11. Discuss the numerous causes of this situation and their numerous remedies: clearing debris caught in pump strainer, burst supply line, faulty pump, to name a few.

Walk the crew through these scenarios as necessary before performing the drills where the closed valves are not known. Mix them up. This is by no means a comprehensive list of all the problems that we may encounter. Discuss others and set them up as time permits.

## TROUBLE SHOOTING CHART

Look for the problem between the first low and the next high reading
when working from nozzle to engine.

| NOZ PSI | SPO PSI | EP | *HYDRANT SUPPLY LINE | PROBLEM |
|---|---|---|---|---|
| NORMAL | AS SET | AS SET | SEEMS NORMAL TO DEMAND | NORMAL OPERATION |
| NORMAL SHUT OFF OF NOZ | MUCH HIGHER | SLIGHTLY HIGHER | SEEMS NORMAL TO DEMAND | SHOULD BE ANTICPATED BY SPO FF |
| LOW | HIGH | HIGH | SEEMS NORMAL TO DEMAND | BETWEEN NOZ AND SPO – KINKS OR BLOCKAGE |
| LOW | LOW | HIGH | SEEMS NORMAL TO DEMAND | BETWEEN SPO AND ENGINE – KINKS, CLOGGED FDC |
| LOW | LOW | LOW | STIFF | CLOGGED INTAKE STRAINER |
| LOW | LOW | LOW | LOW–DEPENDS–SIZE OF BURST? | BURST HOSE OR PIPE ANYWHERE |
| LOW | LOW | LOW | LOW | HYDRANT OR WATER SYSTEM FAILURE |

* Residual pressure will vary according to initial static pressure, size of main and GPM output.