

# Relay Drill After Action Report



MCFRS Battalion 5  
“C”

May 24, 2011

# Purpose of Drill

- Practice setting up and operating a relay
- Assess our ability to pump 1000 gpm to the Dayspring Church Farm.
- Assess ability of 2000' of 4" hose to move 500 gpm or better
- Assess placement of layout points.



# Dayspring Church Farm

- Multiple buildings with small group lodging.
- The Inn and the Lodge both accommodate about 18 people.
- Closest hydrant on main road – could be over 3000' away.





# Drill Setup

- Units staged on Church Bend Court.
- E708 took first due and laid out 1000' from a pre-designated lay out point. They wound up being 300' short of the Lodge. This provided good information to adjust the layout point.
- E728 took 2<sup>nd</sup> due and laid out 1000' from a second designated layout point and picked up E708's line.
- E734 took 3<sup>rd</sup> due, laid out 900' from the road and picked up E728's line.
- E717 completed the split with 100' and took the hydrant at Church Bend Court & Neelsville Church Road.





E708 E728 E734 E717

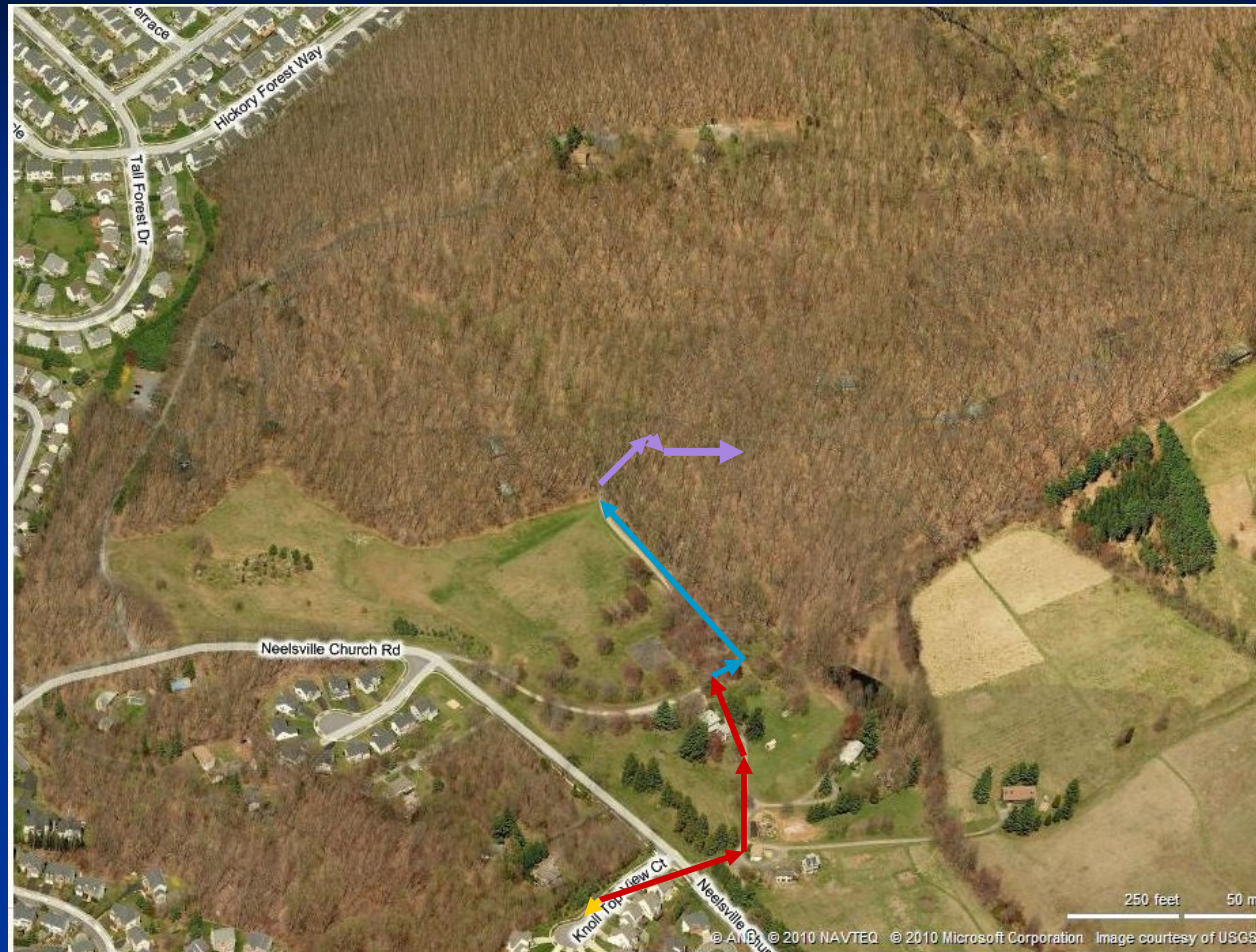


# Results

- Initial attempts to flow 500 to 1000 gpm were unsuccessful due to the hydrant at Church Bend Court not being able to support the flow.
- Despite the hydrant having a static of 75 psi, and sitting on a 12" main, E717 cavitated when flowing 500 gpm.
- A high static pressure but low flow is usually indicative of a blockage in the main or a partially closed valve.

# Results

- E717 repositioned to the next closest hydrant at Knoll Top View Court.
- This hydrant was able to support 1000 gpm.
- Units were able to supply each other with sufficient flow and pressure.
- The relay units averaged an intake of 20 psi and a discharge of 150 to 180 psi. This is in line with what our pump capacities and LDH relief valves are able to accommodate.



E708 E728 E734 E717



# Humat valve used as a relay valve

- E734 took themselves out of the supply chain and replaced themselves with a Humat valve.
- E717 was able to flow 500 gpm through 2000' to E728. The Humat may have added 10 psi of friction loss in the pictured configuration.
- E734 then took suction from the Humat & boosted pressure. Units then flowed 1000 gpm through the reconfigured hose lay without issues. The Humat valve did not seem to add to the friction loss at all – probably due to the lack of right angle turns.

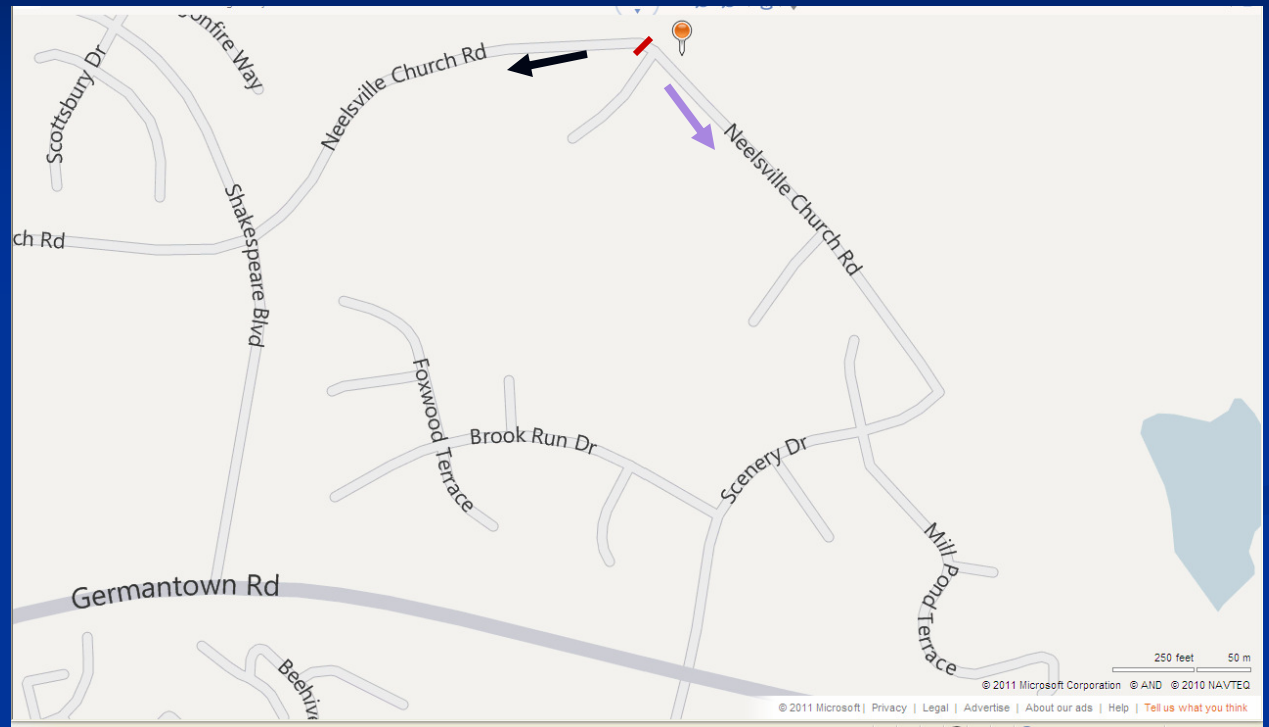


# Traffic control

Neelsville Church Road was blocked between Church Bend Court and Knoll Top View Court.

Traffic was very light and no complaints were received.

MCPD did not show up but was not needed.



# Radio

- Incident Channel 71C was used without any problems reported.



# Relay Theory in MC

- Maximum Total Distance?
- Optimal distance between engines?
- Where does biggest pump go if possible?
- If we plan to use more than 1000' which hose bed should we lead off with?
- Do you fill hose with tank water????
- Do we have other options besides 4 inch hose?



# Distance....

## Maximum Relay Lengths (Feet) <sup>13-4</sup>

Flow in gpm	Hose size in inches						
	One 2½	One 3	One 4	One 5	Two 2½	One 2½ & One 3	Two 3s
250	1,440	3,600	13,200	33,000	5,760	9,600	14,400
500	360	900	3,300	8,250	1,440	2,400	36,000
750	160	400	1,450	3,670	640	1,050	1,600
1000	90	225	825	2,050	360	600	900
1250	50	140	525	1,320	200	375	500

# Lessons learned

- Plan B is important. In this case, we were able to have E717 proceed up the lane and use a 2<sup>nd</sup> lane to lay from E734 back to another hydrant. On a real incident, we could have had the fifth engine lay from E717 to another hydrant.
- The Humat valve can be used as a relay valve. This affords engines the flexibility to lay 2000' of 4" with a Humat in the middle with the assurance that they can receive 500 gpm of initial flow – and that this flow can be boosted with the addition of another engine at the Humat.