Golden Valley Fire District

Daily Quick Drills

Volume 8, Numbers 1-10

The daily quick drill is designed to assist the company officer in delivery of a quick review of a department policy or procedure. Reviews of basic fire-fighting, ems and special response situations should be referenced to appropriate SOG's.

Golden Valley Fire District
Daily Quick Drills

Volume 16 , Number 1

Severe Weather

Review department policies and procedures for actions to be taken in the event of severe weather and storms.

What should both on-duty and off-duty personnel do?

Severe Weather Definitions

Here are some severe weather terms everyone should be aware of.

A Tornado or a Severe Thunderstorm **Watch**...means that tornadoes or severe thunderstorms are you are in or close to a watch area, dangerous severe weather may affect you.

A Tornado or a Severe Thunderstorm **Warning**...means a tornado or a severe thunderstorm i highly suspected. Warnings are issued for one county or multiple counties. If the county you ar warning, be ready to take action by going to the safest place available.

A **tornado** is a violently rotating column of air, a pendant from a thunderstorm cloud. The circulation, whether visibly connected or not, **is in contact with the ground** causing damag

A **funnel cloud** is a violently rotating column of air, pendant from a thunderstorm cloud.. The funnel's circulation **does not reach the ground.**

A **severe thunderstorm** is a thunderstorm producing sustained winds or gusts of 58 mph or greater, and/or hail three-fourths of an inch in diameter (penny size) or larger.

A **squall line** is a long line of thunderstorms often preceded by a dark horizontal band of clo associated with strong straight line winds and heavy downpours.

A **downburst** is a strong downdraft and out rush of straight line wind from a thunderstorm wh tree or structural damage.

A **flash flood** is a flood occurring within hours of a heavy rainfall. Floods are the number one in our country.

Golden Valley Fire District
Daily Quick Drills

Volume 8, Number 2

Safety—Wires at Fires

Be aware of downed or any wires at a fire scene.

-How can wire hazards be identified on the fireground?

-Who was in danger at this incident?

-What should be done to secure and mark the wires once it is removed from the firefighter?
(How should it be removed)

Golden Valley Fire District
Daily Quick Drills

Volume 8, Number 3

Brush Fires

Review equipment and procedures for Brush Fires.

-What is the standard response
-What brush fire equipment is available
-What resources are available outside of your department for brush fire operations

What tactic is used for brush fire operations that is different from typical structure fire operations?

Golden Valley Fire District
Daily Quick Drills

Volume 8, Number 4

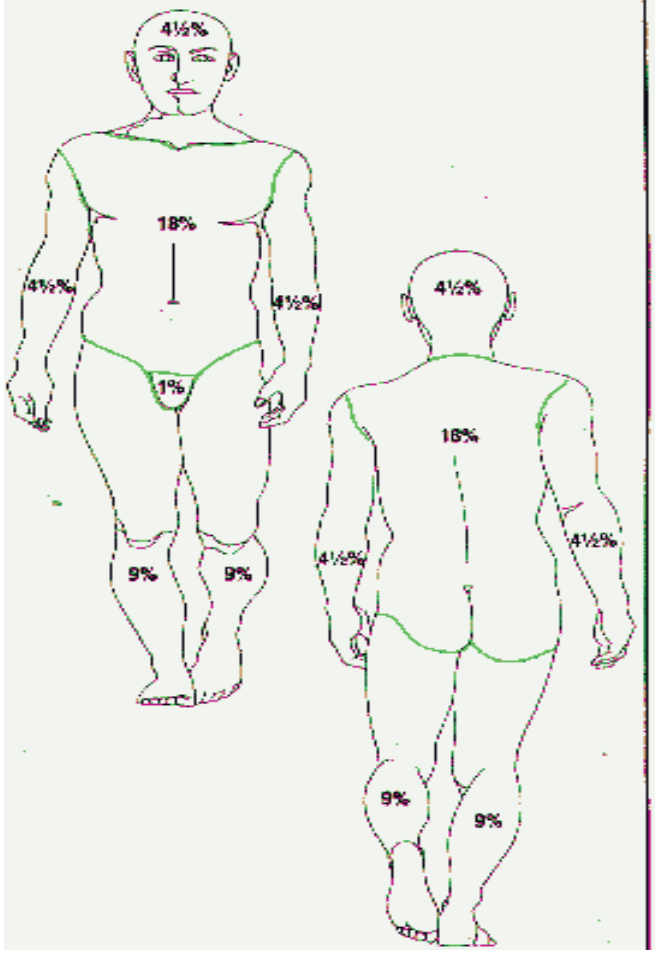
EMS—Rule of 9's

Using the "rule of nines" and the Lund and Browder Chart

You can quickly estimate the extent of an adult patient's burn by using the "rule of nines." This method divides an adult's body surface area into percentages. To use this method, mentally transfer your patient's burns to the body chart shown here, then add up the corresponding percentages for each burned body section. The total, a rough estimate of the extent of your patient's burn, enters into the formula to determine his initial fluid replacement needs.

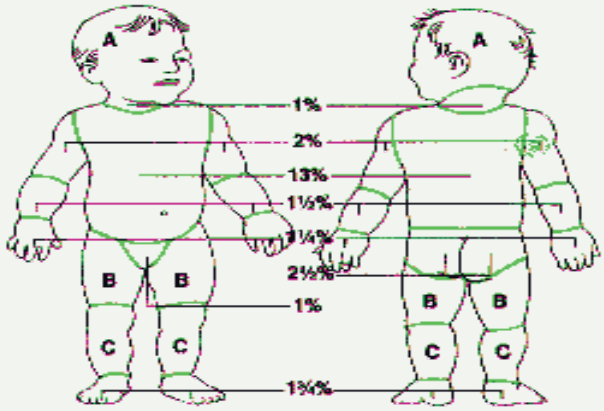
You can't use the rule of nines for infants and children, because their body section percentages differ from those of adults. (For example, an infant's head accounts for about 17% of the total body surface area, compared with 7% for an adult.) Instead, use the Lund and Browder Chart.

Rule of nines



Lund and Browder Chart

To determine the extent of an infant's or child's burns, use the Lund and Browder Chart shown here.



Relative percentages of areas affected by growth

AT BIRTH	0 TO 1 YR	1 TO 4 YR	5 TO 9 YR	10 TO 15 YR	ADULT
A: Half of head					
9½%	8½%	6½%	5½%	4½%	3½%
B: Half of thigh					
2¾%	3¼%	4%	4¼%	4½%	4¾%
C: Half of leg					
2½%	2½%	2¾%	3%	3¼%	3½%

Review EMS Protocols for Burn Injuries

Golden Valley Fire District
Daily Quick Drills

Volume 8, Number 5

Dumpster Fires

What levels of protective clothing are appropriate for dumpster fires?

What hazards could be present inside the dumpster?

Where should apparatus be positioned for fire attack at a dumpster fire?

What alternatives to traditional trash line attack on dumpster fires is available?

What discharge pressure should the trash line be operated at?

What should be done if a dumpster has an exposure to a building?

Golden Valley Fire District
Daily Quick Drills

Volume 8, Number 6

Methods of Forcing a Door

Review Essentials on Forcible Entry.

Inward and Outward Swinging Doors

Safety hazards

Equipment and tools

Door and jamb construction

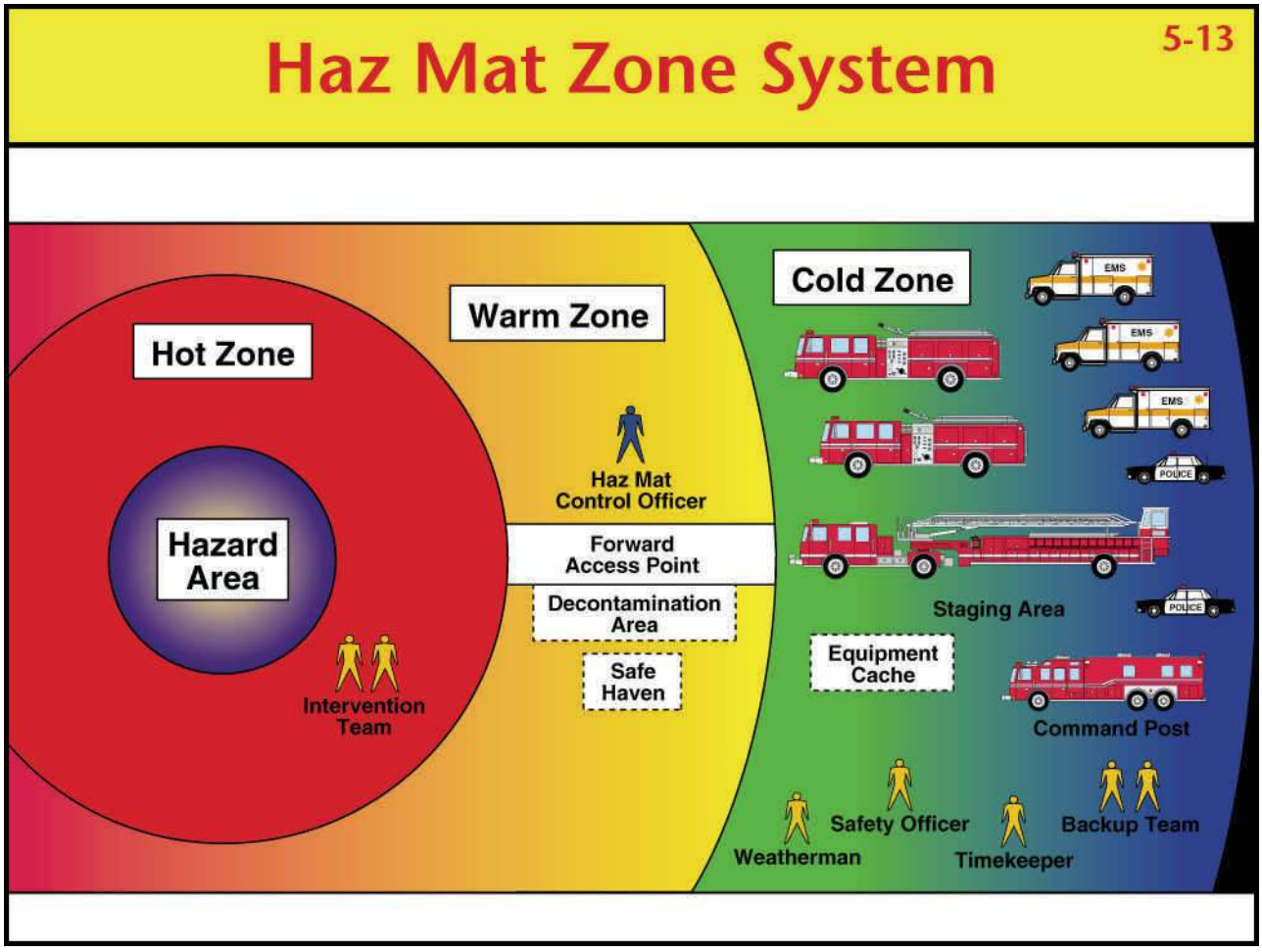
Golden Valley Fire District
Daily Quick Drills

Volume 8, Number 7

HazMat Zones

Review response procedures for potential hazmat incidents.

- What information do you need prior to and while enroute to the incident?
- What general terms are used when determining your response route and positioning on the incident?



Golden Valley Fire District
Daily Quick Drills

Volume 8, Number 8

Confined Space Rescue Response

Engine Company #1

1. You arrive to find the water dept. supervisor at the top of the access to the water treatment pumping station. He states that a co-worker is unconscious at the bottom of the pit. What are your **initial actions** as first responders at the awareness level?

2. What are your concerns regarding scene security and safety? How would you begin the rescue or recovery operation?

3. How would you notify a trained and equipped rescue team for this situation? Are there any other procedures at the department level that must be completed for this incident?

4. What actions can you take while the trained and equipped rescue team is responding and assembling on the scene?

5. What support activities can the first-in companies perform to assist the trained and equipped rescue team during the incident?

Golden Valley Fire District
Daily Quick Drill

Volume 8, Number 9

In an effort to reduce workplace injuries, and absence provided is a link to online training presentations. Please choose the proper applicable presentations to view and discuss to remind yourselves, to act, and be safe in the jobs we do.

Go to the site, hit the safety tab across the top, then pick the appropriate presentations that are online.

https://www.scfaz.com/safety/safety.php?load=online_training.html&bc=Online+Safety+Training

SCF-Arizona

Golden Valley Fire District
Daily Quick Drill

Volume 8, Number 10

Review two NIOSH report's of Line of Duty Deaths http://www2a.cdc.gov/NIOSH-fire-fighter-face/state.asp?

Discuss the events that lead to the result, and suggestions of what could have been done differently.

GOLDEN VALLEY FIRE PROTECTION DISTRICT

HYDRAULIC CALCUALATIONS WORKSHEET

Consider all flows up to 350 GPM to be considered a hand line. All flows over 350 GPM will be considered a master stream.

Nozzle Pressures

Smooth Bore
- Hand Held = _____ psi
- Master = _____ psi

Fogs (this includes fogs on master stream devices) = _____ psi

SOLID STREAM NOZZLES

Hand Lines	50 psi nozzle pressure (GPM)	Master Streams	80 psi nozzle pressure (GPM)
1"	gpm	1¼"	gpm
1-1/8"	gpm	1 3/8"	gpm
1¼"	gpm	1½"	gpm
		1 5/8"	gpm
		1¾"	gpm
		1 7/8"	gpm
		2"	gpm

ONE EIGHTH (1/8") RULE:

1/8" change in nozzle diameter at 50-psi nozzle pressure changes the flow by approximately 50 GPM.

1/8" change in nozzle diameter at 80-psi nozzle pressure changes the flow by approximately 100 GPM up to and including 2" tips.

FRICTION LOSS FORMULAS FOR 100 FEET OF HOSE

For 1½" Hose	FL = the FL in 2½" hose at 4 times the stated GPM
For 1¾" Hose	FL = $(10\ Q^2) + 10$
For 2" Hose	FL = $(2Q^2 + Q) \times 3$
For 2½ " Hose	FL = $(2Q^2 + Q)$
For 3" Hose	FL = $(2Q^2 + Q) \times .4$
For 3½" Hose	FL = $(2Q^2 + Q) \times .17$
For 4" Hose	FL = $(2Q^2 + Q) \times .1$
For 4½" Hose	FL = $(2Q^2 + Q) \times .05$
For 5" Hose	FL = $(2Q^2 + Q) \times .03$

Example: 1½ ” hose flowing 100 GPM

x 4

2½ ” hose = 36 psi = 400 GPM

All of the above formulas give you the amount of friction loss per 100 feet of hose.

Q = GPM divided by 100.

Friction Loss 1¾” Hose

To help simplify the computing of the **Friction Loss** in 1¾” hose, the OSFM FAE Committee has accepted a **standard flow** of 150 GPM and **Friction Loss** of 32 psi per 100 feet of 1¾ ” hose. This standard, 150 GPM 32 psi per 100 feet of 1¾” hose will be used when computing of friction loss in 1¾” hose.

FIELD HYDRAULICS

250 GPM fog nozzle on a 2½” line = _____ lbs. per 100’ friction loss
100 GPM fog nozzle on a 1½” line = _____ lbs. per 100’ friction loss
150 GPM fog nozzle on a 1¾” line = _____ lbs. per 100’ friction loss

ELEVATION

Add _____ psi for each floor of elevation (exclude one floor)
Subtract _____ lbs. for each floor below grade

APPLIANCES

Add _____ psi for standpipe system and siamese
Add _____ psi for gated wyes and siamese
Add _____ psi for all master stream devices
Add _____ psi for Relay Pumping

SPRINKLER SYSTEMS

Sprinkler systems shall be maintained at _____ psi pump discharge pressures

HYDRANT RESIDUAL PRESSURE

A recommended minimum of _____ psi should be maintained on the compound gauge when taking water from a hydrant.

TRANSFER VALVE SETTINGS

Pump in CAPACITY when you are going to discharge over _____% of your pumper's capacity. Pump in PRESSURE when you are going to have to develop a net pump pressure over _____ psi.

RED LINE FRICTION LOSS

If friction loss goes over 36 lbs., a second line or larger diameter hose should be used.

FRICTION LOSS

2½ Inch Rubber-lined Hose – Lbs. of Friction Loss per 100 feet			
200 GPM	200/100 = 2	2 x (2 x 2) + 2 =	10 lbs.
300 GPM	300/100 = 3	2 x (3 x 3) + 2 =	21 lbs.
400 GPM	400/100 = 4	2 x (4 x 4) + 2 =	36 lbs. **red line**
500 GPM	500/100 = 5	2 x (5 x 5) + 2 =	55 lbs.
600 GPM	600/100 = 6	2 x (6 x 6) + 2 =	78 lbs.
700 GPM	700/100 = 7	2 x (7 x 7) + 2 =	105 lbs.
800 GPM	800/100 = 8	2 x (8 x 8) + 2 =	136 lbs.
900 GPM	900/100 = 9	2 x (9 x 9) + 2 =	171 lbs.
1000 GPM	1000/100= 10	2 x (10 x 10) + 2 =	210 lbs.

3 Inch Hose - Lbs. of Friction Loss per 100 feet			
200 GPM	200/100 = 2	2 x 2 x 2 + 2 x .4 =	4.0 lbs.
300 GPM	300/100 = 3	3 x 3 x 2 + 3 x .4 =	8.4 lbs.
400 GPM	400/100 = 4	4 x 4 x 2 + 4 x .4 =	14.4 lbs.
500 GPM	500/100 = 5	5 x 5 x 2 + 5 x .4 =	22.0 lbs.
600 GPM	600/100 = 6	6 x 6 x 2 + 6 x .4 =	31.2 lbs. **red line**
700 GPM	700/100 = 7	7 x 7 x 2 + 7 x .4 =	42.0 lbs.
800 GPM	800/100 = 8	8 x 8 x 2 + 8 x .4 =	54.4 lbs.
900 GPM	900/100 = 9	9 x 9 x 2 + 9 x .4 =	68.4 lbs.
1000 GPM	1000/100= 10	10 x 10 x 2 + 10 x .4 =	84.0 lbs.

	4" Hose
	$2Q^2 + Q \times .1 = FL$
200 GPM	1.0
300 GPM	2.1
400 GPM	3.6
500 GPM	5.5
600 GPM	7.8
700 GPM	10.5
800 GPM	13.6
900 GPM	17.1
1000 GPM	21

STANDARDS FOR CALCULATING ENGINE DISCHARGE PRESSURES

Nozzles or Tips	Flows	Pressure Nozzle	Friction Loss/100" Hose			
			1½"	1¾"	2½"	3"
1½"	100 GPM	100 psi	30			
1¾"	150 GPM	100 psi		32		
2½"	250 GPM	100 psi			15	6
1"	200 GPM	50 psi			10	4.0
1-1/8"	250 GPM	50 psi			15	6.0
1¼"	300 GPM	50 psi			21	8.4
1¼"	400 GPM	80 psi			***36***	14.4
1-3/8"	500 GPM	80 psi			55	22.0
1½"	600 GPM	80 psi			78	***31.2***
1-5/8"	700 GPM	80 psi			105	42.0
1¾"	800 GPM	80 psi			136	54.4
1-7/8"	900 GPM	80 psi			171	68.4
2"	1000 GPM	80 psi			210	84.0

RED LINE: **

FORMULA FOR ENGINE PRESSURE CALCULATIONS

DP = NP + FL + AFL + E

Pump discharge pressure =
Nozzle Pressure + Friction Loss + Appliance Friction Loss + Elevation

Relays = maintain _____ psi for receiving pumper

Hydrant Residual = maintain _____ psi from hydrant

Wyes/Siamese = _____ psi loss

Standpipe Systems = _____ psi loss

Master Stream Devices = _____ psi loss

Elevation = _____ psi/floor (exclude fire floor)

Identify and place the rated GPM capacity next to each piece of apparatus. Each possible answer may be used more than once.

111 _____
121 _____
131 _____
114 _____
116 _____
121R _____

A. 1,000 GPM
B. 300 GPM
C. 1,250 GPM
D. 250 GPM
E. 1,500 GPM
F. 750 GPM
G. 200 GPM

Identify and place the correct size water tank next to each piece of apparatus. Each possible answer may be used more than once.

111 _____	A. 1,000 gallons
121 _____	B. 1250 gallons
131 _____	C. 1500 gallons
114 _____	D. 500 gallons
116 _____	E. 200 gallons
121R _____	F. 750 gallons
	G. 250 gallons

When packing the four inch hose on district apparatus, what is the last thing to be placed on the hose prior to putting it on the bed?

A. The rope hose tool so that the coupling can be reached
B. Nothing at all should be attached to the hose
C. A cap so that air cannot enter the hose
D. The rope hose tool and the 4 ½ hydrant adapter

121R is the only single stage pump we have T or F

131 is the only two stage pump currently in service T or F

What engines carry hard suction? _____

What is the standard attack line per SOG for the average single family structure fire?

A. 300ft Pre Connect
B. Leader Line
C. 200ft Pre Connect
D. Wait for the officer to tell you, after his walk around the building

118's porta tank holds how much water?

A. 500 gallons
B. 750 gallons
C. 1,500 gallons
D. 1,000 gallons
E. 1,250 gallons

How does the pressure relief valve work?

_____

_____

When do you use the pressure relief valve?

A. When one line is in operation, after the hydrant is secured and deployment of additional lines that may be needed
B. As soon as you put the first line in service
C. When one line is in operation and you are charging a second line, with or with out hydrant water
D. Only when using fog nozzles, due to the higher pressures needed to attain the proper streams

You arrive on the scene of a structure fire and you are the pump operator with a two stage pump. What would assist you in deciding if you need to place the pump in pressure or volume.

You are supplying a sprinkler system. After several minutes you find that you are unable to maintain 150 psi on your discharge gauge. What does this mean?

A. Someone is operating a line off the standpipe
B. A sprinkler head has gone off and water is being used
C. Something is wrong with the engine or pump
D. The fire pump is in operation and is using water from the same grid that you are

You are at a fire, supplying water to the standpipe system in a multi story building with numerous reports of people trapped. You receive requests for water from the interior crews prior to achieving a positive water supply. You should ?

A. Wait to attain a positive water supply
B. Immediately send them tank water after you let them know that they are receiving only tank water and do not have a positive water supply yet
C. Send tank water if you know you will have a positive water supply prior to the interior crews running out
D. Send them water only if they are below the third floor

You are attempting to supply water to a standpipe with a fire on the third floor. You have stretched hose to the Siamese and find out that the female coupling on the standpipe will not turn. Several attempts are made to free the coupling with no avail. What are your two options?

_____
_____
_____
_____

What should your engine pressure be at the eductor when utilizing a foam operation? _____

The eductor can be at the pump panel OR how far from the panel?

_____

As a rule, one pal of 3% foam solution should be able to cover an area of approximately?

A. 50 sq ft
B. 25 sq ft
C. 100 sq ft
D. 150 sq ft
E. None of the above

When the vehicles reach ____ tank of fuel they must be refueled.

Upon receiving an alarm, the engineer should?

A. Call dispatch and ask for clarification of the address
B. Go from memory of previous calls
C. Ask fellow crew members how to get to the address
D. Go to the map and find the quickest route to the address

When approaching intersections the driver should always slow down prior to entering the intersection T or F

You arrive on the scene of an accident on the inside shoulder of I-40. How should you position the apparatus?

_____
_____
_____

What is the rated GPM for the Valley Pioneers water system? _____

You are testing hose. What is the maximum length of hose that can be tested off one port? _____

Foam eductors for application of foam operate on a/an _____ principle

A. Bernoulli's
B. Venturi
C. Chemical
D. Interaction

What is the maximum GPM you can flow through 2 ½ inch hose before redline?

_____

Siamese Operations

When it becomes necessary for a pumper to deliver large quantities of water, a siamese operation will be needed. Siamesing lines are one way of reducing the excessive friction loss created by large volume flows. Though it may look difficult to compute, it is actually no harder than a single line.

When it becomes necessary to siamese, divide the GPM by the number of lines that pump is supplying. Next, compute the friction loss for 1 line at the reduced GPM flow and disregard the other lines. All that remains is to add either the Nozzle Pressure if supplying a deluge gun or 20 psi for residual pressure if supplying another engine.

EXAMPLE: It is necessary to supply a deluge set with a 1¾" tip with three-inch hose from 400' away. This lay would require 800 GPM, which would create 55 lbs. F.L. per 100' in 3" hose; therefore, siamesing is necessary.

1. Divide the total GPM by two lines. This will give 400 GPM through each line.

2. Compute the friction loss for one line of 3" hose delivering 400 GPM:
   4 x 4 x 2 + 4 = 36 x .4 = 14.4 or 15 lbs. F.L. per 100 ' of hose

3. Multiply the F.L. for 100' by length of the lay in hundreds of feet:
   15 x 4 = 60 psi F.L. for the total lay

4. To the 60 lbs. F.L., add 80 lbs. N.P. = 20 lbs. approximate loss for deluge set and this will be the engine discharge pressure:
   60 + 80 + 20 = 160 lbs. engine pressure

Wye Operations

Wye operations are very common and are used, in one way or another, on just about any fire of consequence. Sometimes they are used to get 1½" hand lines to the fire where the reach is too long for pre-connect. On most large fires, they are used for overhaul from 2½" lines rather than laying longer and additional lines of 1½". Another use would be to get two 2½" lines on a fire from one 3" supply line.

Wye operations like siamese operations are used to reduce friction loss. By the use of a wye, one may have one large supply line feeding two or more smaller hand lines.

Example: 400' of 2½" hose wyed to two 200' lines of 1 ½" hose.

1. Total the GPM from both 1½" lines. This is the amount of water for which the supply line must be computed.
   100 GPM + 100 GPM = 200 GPM for both 1½" lines.
Therefore, the 2½" supply line is flowing 200 GPM.

2. Compute the friction loss for the supply line.
   2 x 2 x 2 + 2 = 10 lbs. F.L. for 100'

3. Compute the friction loss for one 1½" line 200' long.
   30 lbs. F.L. per 100' = 60 total (disregard the second line)

4. 40 lbs. F.L. for 2½" supply line
   + 60 lbs. F.L. for 1½" hand line
   + 100 lbs. N.P.
   + 10 lbs. for Wye
   210 lbs. engine discharge pressure

The lay would give 200 GPM through two 1½" lines 600' from the engine. The engine would be running at a discharge pressure of 210 psi.

If there were two 1½" lines each 600' in length, the discharge pressure would be 280 psi and the engine would be running at excessive RPM for the job.

CALCULATIONS FOR ELEVATED STREAMS FROM PRE-PIPED WATERWAYS

When it is necessary to supply a pre-piped waterway, there are some basic facts that you will have to know:

1. It is necessary to supply the water to the pump inlets, or aerial intake when bypassing the pump and supplying the total operation.
2. It is necessary to know the size tip that is intended for use in order to calculate pressure, determine the number of lines required and their diameter.

Since the waterways on pre-piped aerial are made of pipe, the following constants are used to determine the friction loss in the piping, master stream at different gallon flows.

The friction loss factor for pre-piped waterways will include the friction loss in the

1. piping
2. turret gun
3. intake at the GPM flow provided

Example 1: It is necessary to supply a pre piped aerial ladder. The aerial is elevated 50' above grade on a 100' aerial with a 2" tip (1000 gpm). The engineer decides to use two 100' lengths of 3" hose as feeder lines to supply the aerials siamese in the rear of the aerial. Each of the lines will carry 500 gpm and the friction loss in the feeder lines will be about 22 lbs. For the 100' lay. The constant is 60-psi friction loss on a 100' pre piped aerial ladder intake connection and master stream device. Obtain the engine pressure and add as follows:

22-psi loss for two – 100' lengths of 3" feeder line
60-psi loss for 100' pre piped aerial, intake and master stream
25-psi loss for elevation
80-psi loss for nozzle pressure

187 psi will be the engine discharge pressure

Example 2: Using the same pre piped aerial ladder as in Example 1, except this time the engineer will use the piping from the pump to the aerial.

60-psi loss for 100' pre piped aerial, intake and master stream
20-psi loss for piping from the pump to the base of the aerial ladder (residual)
25-psi loss for elevation
80 psi for nozzle pressure
185 psi will be the engine discharge pressure

The examples given above have been figured with 60 psi. friction loss in the piping of a 100' aerial ladder flowing 1000 gpm as a standard.

ELEVATED STREAM MISCELLANEOUS NOTES

The following are some recommended procedures for obtaining good elevated streams:

1. Try to keep supply lines under 300 feet.
2. Nozzle pressure should be 80 psi for solid streams and 100 psi for fog nozzles.

For each foot of elevation, the weight of water produces a pressure of .434 pounds per square inch. This may be rounded off to 1/2 pound per foot of elevation for fire ground calculations.

Considering the simple basics, good elevated streams are possible if:

1. The proper size tip or fog nozzle is used for the available water supply and pumping capacity.
2. Sufficient lines of sufficient diameter are run from the pumper to the base of the elevated apparatus.
3. Sufficient pressure is maintained.

IF PUMP WILL NOT DELIVER CAPACITY

The following may prevent the pump from delivering its rated capacity.

1. Relief Valve Improperly Set
   If a relief valve is set at a pressure below the desire operating pressure, it will by pass water and lower the capacity (see manufacturer's relief valve operating instructions).
2. Badly Worn Wear Rings
   Failure of the pump to deliver its rated capacity at a given pressure may be an indication that the impeller wear rings are badly worn, allowing excessive quantities of water to leak around them.
3. Suction Screen and Impeller Vanes Fouled with Debris
   Backwash of water from the pump through the impellers when the pump is stopped usually cleans the impeller vanes. Debris on the pump suction screen, however, usually remains in the suction hose and is immediately caught by the

screen when pumping is resumed. Therefore, suction hose should be removed and cleaned.

4. Chassis Transmission in Wrong Gear
   See operating instructions.
5. Suction Hose Collapsed
   On defective or old suction hoses, the inner liner often collapses when drafting water, thus restricting the flow of water to the pump. Collapse of the inner liner is often hard to detect even when the inside of the hose is examined with a light. This is due to the fact that the inner liner often goes back in place when the suction vacuum is removed. If the pump will deliver capacity with a different suction hose, it is reasonable to assume that the liner on the former hose has become loosened.
6. Suction Hose Not Submerged Deeply Enough
   The lower end of the suction hose should be submerged at least two feet below the surface of the water to avoid taking air.
7. Suction Hose Too Small
   When higher than normal lifts are involved or at high altitudes, larger suction hose is needed.
8. Insufficient Engine Power
   Although the engine had sufficient power originally, there are several reasons why the power can decrease to the point at which it will not handle the pump at the rated capacity and pressure. Things to suspect are: incorrect timing, fouled spark plugs, burned distributor points, weak condenser or coil, sticking valves, worn piston rings, worn fuel pump, and poor carbonation. Also, if the engine is operated at higher than normal altitudes, the power may be too low. The power of an engine decreases about 3% to 4% for every 1000 feet of increase in altitude. Excessive engine temperatures, which frequently occur in hot weather, and during long periods of operation, reduce the power. This can be caused by clogged radiator or heat exchanger, insufficient coolant, worn water pump, loose fan belt, and deteriorated crank case oil.
9. Transfer Valve Improperly Set (does not apply to single stage pumps)
   The valve should be in “parallel” (volume) position when pumping more than one-half rated capacity. When changing the position of the valve, make sure it is moved completely into the new position; if not, pump performance may be seriously affected.

IF PUMP WILL NOT DEVELOP SUFFICIENT PRESSURE

In general, there should be conditions, which prevent the pump from delivering rated capacity will also, affect the pressure adversely. The following may prevent the pump from developing sufficient pressure:

1. Relief Valve Improperly Set
   A relief valve properly set will prevent the pump pressure from rising much above that at which it is set; consequently, too low a setting causes too low a pressure. (See manufacturer’s relief valve operating instructions).
2. Insufficient Pump Speed
   Insufficient pump speed may be due to one or more of the following causes:
   a. impeller wear rings or other pump parts binding
   b. clutch slipping
   c. chassis transmission in wrong gear

d. governor limiting engine speed
e. insufficient engine power

3. Transfer Valve Improperly Set (does not apply to single stage pumps)
   The transfer valve should be in "series" (pressure) position when pumping at high pressures.
4. Capacity Limiting Pressure
   Care should be taken not to attempt to take more water from the pump than it can handle at the desired pressure (see instructions on operation of pump). If the pump is operating at draft under normal suction conditions and the maximum rated capacity is exceeded, the pressure will be low due to the characteristic of a centrifugal pump even if the engine has plenty of power and speed. Also, excess capacity may raise the suction vacuum to a point above that which the pump was designed and lowered pressures will result. On pumping units having engines with low surplus power, the pressure will be limited by engine power if surplus capacity is being pumped.

SUPPLYING A STANDPIPE SYSTEM WHEN THE FIRE DEPARTMENT CONNECTION IS NOT USABLE

When the fire department connection (siamese) supporting a standpipe system is not useable; and, where the check valve below the fire department connection (siamese) is inoperative, the following procedure should be followed:

1. Stretch a line from the pumper to a gated outlet on the first floor.

2. Remove any house lines, reducer connections, and/or pressure reducers.

3. Connect the pumper supply line to the discharge outlet using a double female adapter.

4. When water is started in the supply line, the outlet valve is opened fully to allow water to flow into the riser.

5. Where the hose outlet extends at a right angle from the riser, the weight of the hose and fittings should be supported by a short length of rope.

6. If necessary, additional lines can be similarly stretched to hose outlets on other floors.

When the fire department connection (siamese) has a frozen swivel, placing a double male and double female on the connection can overcome this difficulty.

Golden Valley Fire District **JPR PERFORMANCE REQUIREMENT** **Company Training Program**	DESCRIPTION: This JPR Training Guideline follows the format identified in NFPA 1001, Standard for Firefighter Professional Qualifications 1997 Edition. Knowledge, skill, performance and topic description are referenced from the Certified Firefighter II & III Instructor Reference Manual. Other materials are referenced as needed.

JPR Duty Area : Apparatus Operator; Operations Subject: Calculating Discharge Pressure

Job Performance Requirement: Produce effective hand or master streams, given the sources specified in the following list, so that the pump is safely engaged, all pressure controls and vehicle safety devices are set, the rated flow of the nozzle is achieved and maintained, and the apparatus is continuously monitored for potential problems. ***1. Internal tank, 2. Pressurized source, 3. Static source, 4. Transfer from internal tank to external source***

	Skill / Knowledge / Performance / Topic Description	NFPA #	Standard	Validated
	The Fire Apparatus Engineer shall identify and demonstrate the use of proportions in mathematical calculations as required to solve fire department pumper hydraulic problems.	1002 3-2.1	Pass/Fail	√
	The Fire Apparatus Engineer shall mentally calculate the engine pressure required to supply elevated streams.	"	Pass/Fail	√
	The Fire Apparatus Engineer shall identify GPM flows at standard tip pressures.	"	Pass/Fail	√
	The Fire Apparatus Engineer shall identify the elements of friction loss.	"	Pass/Fail	√
	The Fire Apparatus Engineer, given a series of fire ground situations, shall mentally calculate pump pressure, GPM, friction loss and nozzle pressure.	"	Pass/Fail	√

GENERAL TASK STATEMENT:

- Calculate pump discharge pressure for a variety of scenarios
  - Calculate within =/- 10 psi

Prerequisite Knowledge	Prerequisite Skills
• Hydaulic calculation methods • Friction loss standards • Standard pressure & g.p.m. factors • Functions of valves and controls	• Apply calculation methods to practical skill evolutions 1. Practical optional for this training module

Validation Synopsis

1. Given a series of simulated fire problems, calculate the proper discharge pressure for each scenario.

Golden Valley Fire District **JPR PERFORMANCE REQUIREMENT** **Company Training Program**	DESCRIPTION: This JPR Training Guideline follows the format identified in NFPA 1001/1002, Standard for Firefighter Professional Qualifications 1997 Edition. Knowledge, skill, performance and topic description are referenced from the Certified Firefighter II & III Instructor Reference Manual. Other materials are referenced as needed.

JPR Duty Area: Apparatus Driver/Operator Subject: Operations; Multiple Line Operations

Job Performance Requirement: Produce effective hand or master streams, given the sources specified in the following list, so that the pump is safely engaged, all pressure control and vehicle safety devices are set, the rated flow of the nozzle is achieved and maintained, and the apparatus is continuously monitored for potential sources: 1)Internal tank water 2)Pressurized source 3)Static source 4)Transfer from internal tank to external source (*Static source is not included in this JPR evolution)

	Skill / Knowledge / Performance / Topic Description	NFPA # 1002	Standard	Validated
	Position a fire dept. pumper to operate at a fire hydrant utilizing pumper connection, given a pumper, a length of intake hose, an appropriate fittings or tools, so that the intake hose can be connected, without kinks, to the pump connection without repositioning the vehicle.	3-2.1	Pass/Fail *Recommend less 120 sec.	√
	The FAE shall change water supply from the apparatus water tank to an external source, given a pumper with an operating fire attack line of 1 ½" or larger so that the flow of water to the attack line is not interrupted and the proper pressure is maintained.	3-2.1	Pass/Fail	√
	The Fire Apparatus Engineer, given a selection of nozzles and tips, shall identify the type, design, operation, nozzle pressure, and flow in GPM for proper operation of each as described in course content.	*3-2.2(b)*)	Pass/Fail	√
	The Fire Apparatus Engineer, given a fire department pumper, shall demonstrate the method(s) of power transfer from vehicle engine to pump.	*3-2.1 (b)*	Pass/Fail	√
	The Fire Apparatus Engineer, given a fire department pumper and a series of fire ground situations, shall produce effective hand streams specified by the course content.	*3-2.2)*	Pass/Fail	√

GENERAL TASK STATEMENT:

- Supply multiple hand-lines to correct tip pressure and utilize pressure relief valve to maintain pressure.

Prerequisite Knowledge	Prerequisite Skills
• Hydraulic calculations • Safe operation of fire pump • Problems relating to water main types and sizes • Private water supply systems • Supply hose use • Applications of various appliances and hose tools •	• Apparatus operation & driving • Spotting hydrants for various intakes • Soft suction hose deployment • Hydrant opening procedures • Hose appliance uses • Operation of various intake valves and pump operations •

Validation Synopsis

1. Demonstrate the ability to properly charge multiple hand lines to correct pressure as directed by officer in charge.
   - ❑ 1- "trash line" with combination nozzle
   - ❑ 1- "preconnect line" with Smooth Bore and Fog nozzle
   - ❑ 1- "back-up line" with Fog and Smooth Bore tips

Golden Valley Fire District **JPR PERFORMANCE REQUIREMENT** **Company Training Program**	DESCRIPTION: This JPR Training Guideline follows the format identified in NFPA 1001, Standard for Firefighter Professional Qualifications 1997 Edition. Knowledge, skill, performance and topic description are referenced from the Certified Firefighter II & III Instructor Reference Manual. Other materials are referenced as needed.

JPR Duty Area: Apparatus Driver/Operator **Subject: Operations; Relay Pumping**

Job Performance Requirement:

	Skill / Knowledge / Performance / Topic Description	NFPA #	Standard	Validated
	Demonstrate the loading of large diameter hose as illustrated in IFSTA	3-12.4a	Pass / Fail	
	Demonstrate the proper procedure for making hydrant connections with intake hose 4 1/2 or larger	3-19.1	Pass / Fail	
	Demonstrate a hand lay of 300 feet or more of 5" supply line	3-12.7	Pass / Fail	
	Given a series of fireground situations, mentally calculate correct pump discharge pressure, gpm, friction loss and nozzle pressure using formulas specified by the a/h/j		Pass/Fail	√
	Perform relay pumping evolution so that intake residual pressure on engine being supplied does not do below 20psi		Pass/Fail	

GENERAL TASK STATEMENT:

- Perform relay pumping operation between two engines. Residual pressure at either engine not to go below 20psi.

Prerequisite Knowledge	Prerequisite Skills
• Operation of fire pumps • Friction loss calculations • Maximum hose lead out lengths • Hydrant operations	• Operating valves and controls • Hose intake and discharge connections • Radio communications

Validation Synopsis

1. Perform relay pumping operation in tandem pumping scenario so that proper gpm's and pressures are maintained without >20psi residual pressures.
   - Evolution will require several changes +/- in flow requirements
   - Evolution to be performed to satisfaction of officer/instructor in charge

Golden Valley Fire District **JPR PERFORMANCE REQUIREMENT** **Company Training Program**	DESCRIPTION: This JPR Training Guideline follows the format identified in NFPA 1001, Standard for Firefighter Professional Qualifications. Knowledge, skill, performance and topic description are referenced from the Certified Firefighter Basic & Advanced Instructor Reference Manual. Other materials are referenced as needed.

JPR Duty Area: Apparatus Driver/Operator **Subject: Rural Water Supply**

Job Performance Requirement: Establish a water shuttle dump site, given two or more portable water tanks, low-level strainers, water transfer equipment, fire hose and a fire apparatus equipped with a fire pump, so that the tank being drafted from is kept full at all times, the tank being dumped into is emptied first, and the water is transferred from one tank to the next; supplying the required fire flow as indicated by nozzles and appliances being used. (NFPA 1002; 8-2.2)

	Skill / Knowledge / Performance / Topic Description	NFPA #	Standard	Validated
	Identify apparatus, equipment, and appliances required to provide water at rural locations via mobile water supply apparatus (tender) shuttle	5.3.15B	Pass/Fail	
	Demonstrate the procedure for assembling and connecting equipment necessary for drafting from a static water supply source.	5.3.15B	Pass / Fail	√
	Identify guidelines to follow when deploying portable water tank	5.3.15B	Pass / Fail	√
	Demonstrate assembling and connecting the equipment necessary for the transfer of water between portable tanks	5.3.15B	Pass / Fail	√
	Demonstrate as part of a team, the deployment of a portable water tank	5.3.15B	Pass / Fail	√
	Perform drafting operation using a static source (portable tank) and required equipment to satisfy flow requirements for scenario presented. *Evolution must utilize at least 1 engine for drafting and a tanker.*	3-2.1 (NFPA 1002)	Pass / Fail	√
	Demonstrate nurse operations from a tender to an attack engine			
	Utilize the jet siphon to transfer water from one porta tank to another			

GENERAL TASK STATEMENT:

- Perform rural water supply drafting operation from portable tank using tanker apparatus and engine company to flow water for fire suppression.

Prerequisite Knowledge	Prerequisite Skills
• Hydraulic calculations • Drafting operations • Equipment requirements • Problems with static source use • Safety in operations with tanker operations	• Pump operation • Set up of portable tank and drafting equipment • Use of suction hose & strainers • Recirculation of water techniques • Transfer operations from tank to static source

Validation Synopsis

1. Perform drafting operation using 1 engine, 1 tanker, 1 portable tank to flow minimum of 300 g.p.m.'s.
    a. May use nozzles to flow required g.p.m. or supply another engine with same g.p.m. requirement.
    b. Recommended time of 5 minutes. Is timed from departure from staging area until all lines are properly supplied