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NFSA

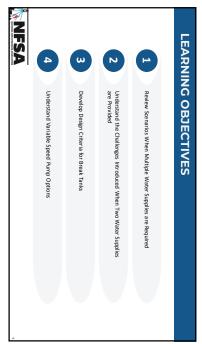
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### COURSE DESCRIPTION



Explore the challenges that could be posed when designing a fire pump system with two different water supplies. This course will review the options to overcome these challenges in compliance with NFPA standards.

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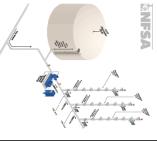


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### WHEN ARE TWO SUPPLIES NEEDED OR REQUIRED

- Redundancy
  Supplement One Inadequate Supply
  Seismic Zones
  BC (2021) Secondary water supply required for highrise buildings in areas with a seismic design category
  of C.D. E or F





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#### WHAT PUMPS DO

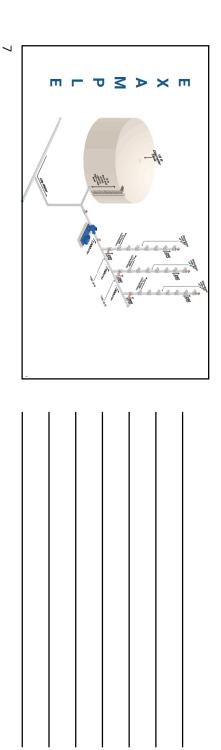
Fire pumps cannot create flow, and only increase pressure.

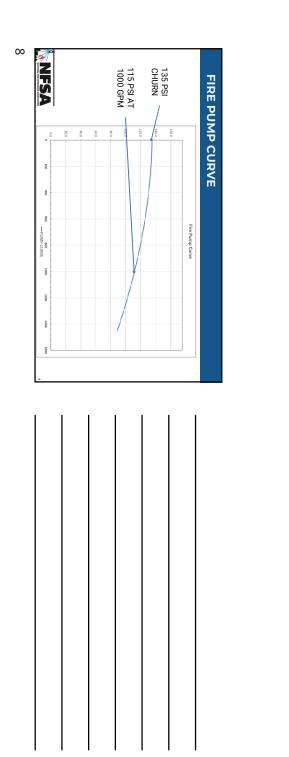
Psuction +Ppump Net = Pbischarge

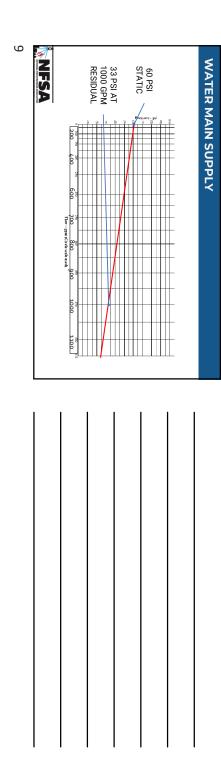
Psuction = Pressure sure at pump suction and flowing end of given flow

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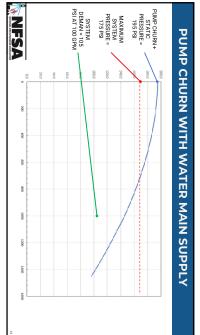
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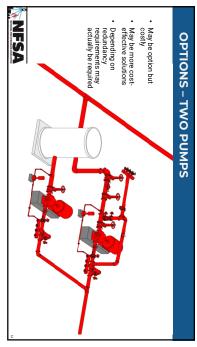






# COMBINATION OF MULTIPLE WATER SUPPLIES Maximum static Pressure from tank is 6.9 psi Maximum static Pressure from System demand is 1000 gpm at 105 psi Maximum static Pressure for 1000 gpm at 105 psi Maximum static Pressure for 1000 gpm at 115 psi Maximum static Pressure for 1000 gpm at 115 psi Maximum pressure = 60 psi 135 psi = 195 psi Maximum pressure = 60 psi 135 psi = 195 psi Maximum pressure = 60 psi 135 psi = 195 psi





### NFSA Section 4.7.7.2 of NFPA 20 (2022 edition) Pressure relief vlaves and pressure regulating devices in the fire pump indiablion shall not be used as means to meet the requirements of 4.7.7.1 (Maximum rated pressure). While Not allowed by NFPA 20 is allowed by NFPA 13 Not Allowed on suction pping per NFPA 20 section 4.16.9.1 If installed must be down stream of fire pump discharge isolation valve. May cause issues with redundancy Significant friction loss OPTIONS - PRESSURE REDUCING VALVE

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NESA	System demands can be met without too much pressure at any point in the system	<ul> <li>Water pressure getting to pump from either tank will be very similar</li> </ul>	<ul> <li>Design and installation requirements are in NFPA 22</li> </ul>	<ul> <li>Definition is in both NFPA 20 and NFPA 22</li> </ul>	<ul> <li>A tank providing suction to a fire pump whose capacity is less than the fire protection demand (flow rate times flow duration)</li> </ul>	OT HONS - BREAK - ANK
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NESA	<ul> <li>Would typically set the pump for 165 psi discharge pressure</li> </ul>	<ul> <li>When water is coming from the city water main, the pump will slow down and keep the discharge pressure between 150 and 174 psi</li> </ul>	<ul> <li>When water is coming from the tank, the pump will run at normal speed</li> </ul>	OPTIONS – VARIABLE SPEED FIRE PUMP
		1/11		

## Minimum of 15 minutes of water with the pump at 150% of rated flow if the tank is steed for less than 30 minutes 2 automatic fill lines are required. Must fill tank at 150% of rated flow of pump 150% of fire pump rating, then must meet 150% of fire pump rating, then must meet 150% of fire pump rating then must meet 150% of fire pump rating then see the automatic fill lines. Low water level audible and visible signal in the vicinity of the refill meet automatic fill lines. Low water level audible and visible signal in the vicinity of the refill meet hands for the pump rating from the pum

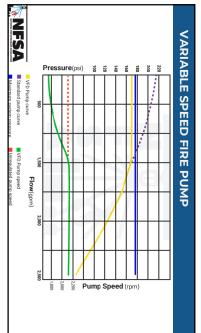
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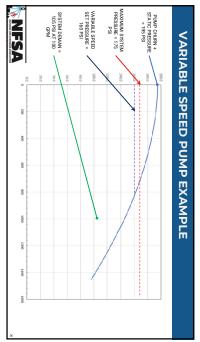
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## If the tank is sized for 30 minutes or more 1 automatic fill is required. Automatic fill is required. In it was fill rank at 110% of the rate neessary to meet the duration demand. In it (Curlotton Demand - Tank Capacity/Journation. Capacity/Journation. Low water level audible and visible signal in the vicinity of the refill mechanisms in the vicinity of the refill mechanisms on the primary automatic fill refill starts when water level drops 4 inches

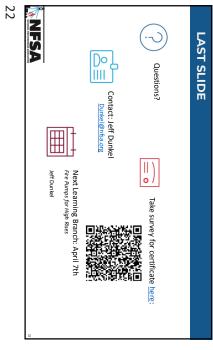
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			Variable Speed Electric Pumps use a Variable Frequency Dire (VFD) to regulate pump speed.  Adds considerable cost increases footprint  Variable Speed Diesel Pumps us Pressure Limiting device  Adds cost but not as much as VFD Does not increase footprint
		EED PUMP	VARIABLE SPEED PUMP



	Next Learning Branch: April 7th Fire Pumps for High Rises Jeff Dunkei	Dunkel@nfsa.org	Contact: Jeff Dunkel	Take survey for certificate here:	
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