

NFPA 20 Update – 2013 Edition

Kenneth E. Isman, P.E. F.S.F.P.E.
Vice President of Engineering



NFSA

NFPA 20 Update - 2013 Edition
Goals and Objectives

- By the end of this presentation, the participant will be able to:
 1. Repeat the revision cycle for NFPA 20
 2. Discuss how to use the provisions of the 2013 edition even if a previous edition is being enforced
 3. Design a fire pump system for a very tall building
 4. Discuss the differences between limited service controllers and regular fire pump controllers

NFSA

NFPA 20 Update - 2013

- Revision cycle
- Why does this matter?
- Water mist pumps
- Fire pump installation issues
 - Pumps in series
 - High rise buildings
 - Reliability of power supplies
 - Fuel supply
 - Other miscellaneous items

NFSA

Revision Cycle

- Proposals due October 2010
- Committee ROP Meeting, Jan. 2011
- ROP open for comment until August 2011
- Committee ROC Meeting, Oct. 2011
- Voted by NFPA membership in June 2012
- NFPA Standards Council in August 2012
- Issued in Sept. 2012 with 2013 date
- Electronic version available now from website
- Printed version by late October

NFSA

Why does this matter?

- We all need to keep up-to-date
- Limit our liability
- Most changes are clarification of old text
- Manufacturers will change their product lines to meet the new rules
- New technology or alternate arrangements (Equivalency)

NFSA

Why does this matter?

- New technology or alternate arrangements
 - For Example: NFPA 20 – 2007
 - 1.5 Equivalency. Nothing in this standard is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard.
- Systems meeting the 2013 edition of NFPA 20 are equivalent or superior to those meeting the 2007 edition

NFSA

NFPA 20 -2013

- Fire Pump Installation Issues

Water Mist Pumps

- A number of changes throughout the document
- Clarified the rules for multiple small volume positive displacement pumps used as a single pumping unit for a water mist system
- Single controller
- Helps NFPA 20 work with NFPA 750 and listed water mist systems

Within Sight of

- There are a number of locations in NFPA 20 where it specifies that two different parts of the pump installation need to be “within sight” of each other
- This term was defined as each of the items being visible and not more than 50 ft distant from the other item

Plans (4.2.3.1)

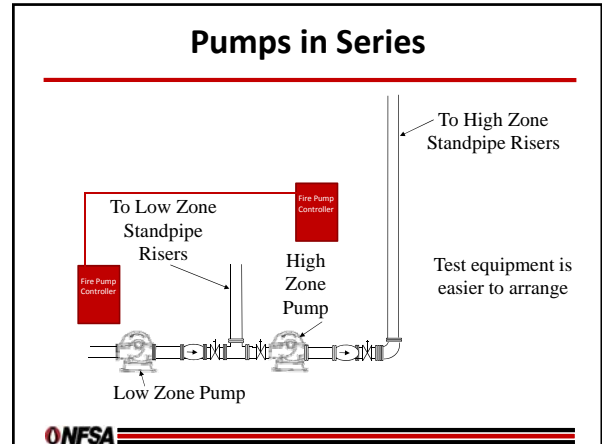
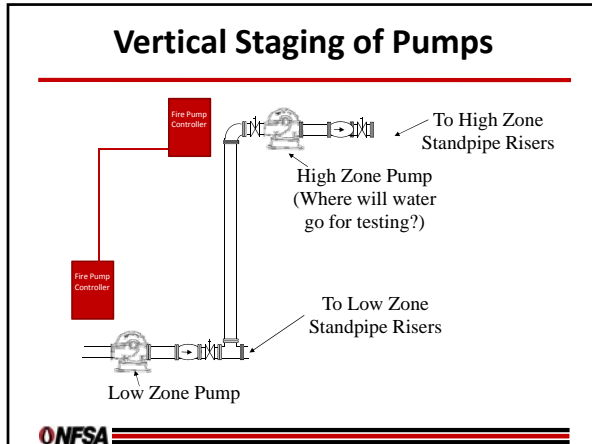
- Plans need to be drawn to scale
- List of 14 items that need to be included on plans

Pumps in Series

- Proposals to put all pumps in series in the same pump room
- Ultimately, these proposals failed, but be on the lookout for this in future editions

Committees Concerns about Pumps in Series

- Vertical staging of pumps is hard to do correctly
 - If the high pump starts before the low pump, the high pump could be damaged
 - Inter-control wiring between controllers could be damaged
 - Communication between people in separate pump rooms is difficult
 - Testing of pumps is difficult



- ### Pumps in Series – NFPA Membership
- Pumps can be vertically staged, if:
 - Inter-control wiring is at least rated for 2-hrs
 - Consideration is given to providing a safe testing arrangement (can't just use closed loop metering)
 - Method is created for people in pump rooms to communicate with each other
 - Owner needs to be aware of importance of low zone pump and need to maintain
- ONFSA

- ### Space in the Pump Room (4.12.1.1.6)
- The pump room needs to be designed with space for:
 - Clearance between components for ITM
 - Clearance between components and walls for ITM
 - Clearance between components and energized electrical equipment
 - Orientation of the suction pipe
- ONFSA

- ### Suction Pipe Water Velocity
- Standard has said for years that the maximum velocity is 15 ft/sec in suction pipe
 - Standard has also provided minimum pipe sizes (in Tables) and defined maximum flows
 - When you put together the defined maximum flows and minimum pipe sizes, you end up with velocities of 15.1 ft/sec and 15.3 ft/sec in some cases
 - Committee clarified that is okay by deleting 15 ft/sec rule and adding a note to the Table on why these pipe sizes were selected
- ONFSA

- ### Age of Water Supply Tests
- A new section 4.6.1.2 was added to require that water supply tests used to determine the adequacy of water supplies be done within 12 months of the submission of the working plans.
- ONFSA

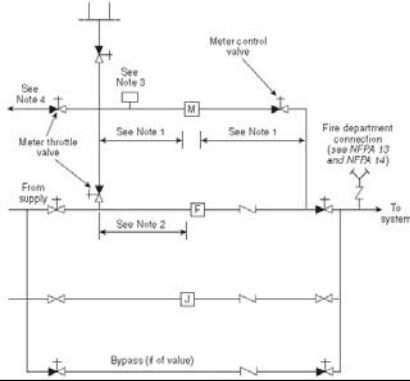
Test Headers

- The valve on the pipe to the test header needs to be installed even if the test header is not in an area subject to freezing (4.20.3.3.1)
- The valve needs to be supervised closed (4.16.2)
- Test header can be indoors as long as it is not in the pump room and water can be discharged during testing (4.20.1.4)

Accuracy of Meters

- For flow meter lines that are looped back to pump suction or water tanks
- A means will need to be included downstream of the meter to test the flow so that the accuracy of the meter can be checked
- Could be a different test header from the one used to test the pump
- Or there could be a pipe connecting the discharge from the meter to the test header

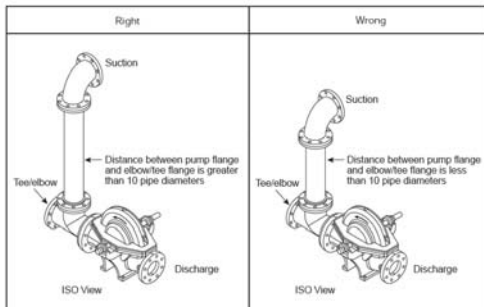
Meter Arrangement



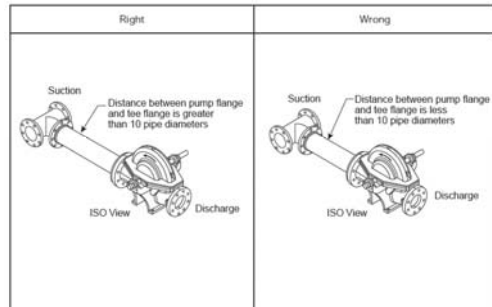
Elbows and Tees in Suction for Horizontal Split Case Pumps

- New three dimensional (isometric) figures were added to the annex to show correct and incorrect combinations of tees and elbows

Elbows and Tees



Elbows and Tees



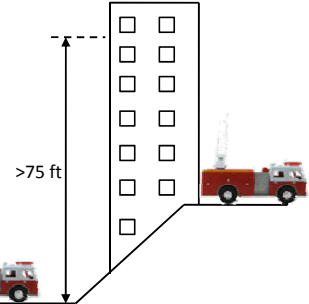
Questions from Part 1

1. When were the issues dealing with the 2013 edition of NFPA 20 voted on by the membership of the NFPA?
2. Why should you care what is in the 2013 edition since the jurisdiction you work in has probably not yet legally adopted it?



High-Rise Buildings

Definition: more than 75 ft (23m) from the lowest level of fire department vehicle access to highest floor for human occupancy



Chapter 5 – High Rise

- Rewrite of Chapter
- Sections 5.1 through 5.5 apply to all high rise buildings
- Section 5.6 applies to “Very Tall Buildings”
- No indication what “Very Tall Buildings” are, but there is an implication that these are the buildings that are too tall for the Fire Department to get reasonable pressure to the top from the street



Section 5.6 Very Tall Buildings

- Water Supply Tanks (paraphrased)
 - Where the primary source is a tank, you need two or more tanks (compartments in a single tank are okay if they are valved separately)
 - The tanks have to be sized so that when any one tank is out of service, you still have at least 50% of the duration demand
 - Each tank needs an automatic refill valve
 - Each tank needs a manual refill valve
 - The refill valves have to be sized and arranged to provide the fire protection system flow demand

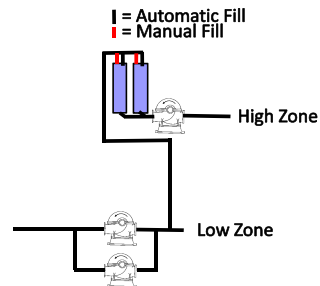


Section 5.7 Very Tall Buildings

- Water Supply Tanks (Section 5.7.1.5)
 - The automatic and manual fill valve combination for each tank or tank compartment shall have its own connection to one of the following
 - A standpipe riser that is supplied with a back-up fire pump
 - A reliable domestic riser sized to meet the requirements of 5.7.1.4 (full flow demand of system)



Very Tall Building

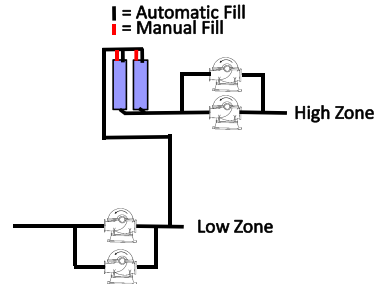


Section 5.8 Fire Pump Back-Up

- For pumps serving zones that are partially or wholly beyond the pumping capability of the Fire Department, do either of the following:
 - Provide a back-up pump (fully meeting all system demands)
 - Provide an auxiliary means of meeting all of the system demands (acceptable to the AHJ)

ONFSA

Very Tall Building



ONFSA

Reliable Power to Electric Motors

- The annex note that discusses the attributes of a “reliable” power supply was modified
- Removed the discussion of power outages during storms
- It is not the intent of NFPA 20 to require stand-by power for all fire pumps
- The impairment procedures of NFPA 25 could be used when power outages occur rather than forcing everyone with an electric motor driven fire pump to install a generator

ONFSA

Limited Service Controller

- Rather than eliminate them, upgraded the circuit breaker
- Only difference between “full service” controllers will be the isolation switch

ONFSA

Dikes and Fuel Tanks

- The committee clarified a change that they tried to make last cycle to state that dikes are not required when double-wall tanks are used

ONFSA

Cleaning up Fuel

- A comment was accepted by the committee to require a listed active fuel maintenance system to be installed on all fuel storage tanks
- This was overturned by the NFPA membership
- The issue is still valid, there needs to be a plan for how all owners will maintain their fuel

ONFSA

Acceptance Test Form

- The form in the standard was updated with all of the new requirements since it was last updated

Questions After Part 2

3. A tank holding 15,000 gallons is being used as a part of a fire protection system for the top floors in a building 600 ft tall. How many automatic fill valves does the tank need?
4. After manufacturers start implementing the rules in the 2013 edition of NFPA 13, what is the main difference going to be between a limited service controller and a regular (full service) controller?

Thank You!