Public Input No. 25-NFPA 20-2022 [Global Input]

Change all instances of "fire pump" to "pump"

Statement of Problem and Substantiation for Public Input

The title of NFPA 20 was changed several cycles ago to Standard for the Installation of Stationary Pumps for Fire Protection. The term "fire pump" is used abundantly throughout the standard, but it may be more appropriate to refer to "pumps" to accommodate the use of foam concentrate, water mist, and other stationary pumps that may not be considered "fire pumps"

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
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Submittal Date: Mon May 16 19:01:37 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: The current language intentionally discusses various types of pumps by name. They are classified as fire pump, water mist pump, foam pump, etc. In some instances, when the specific classification is not needed, the word pump is used in general.

Public Input No. 97-NFPA 20-2022 [Global Input]

Change all instances of "Pressure Maintenance (Jockey or Make-Up) Pump" to "Pressure Maintenance Pump"

Statement of Problem and Substantiation for Public Input

Linked to PI-96. Simplified definition needs to be modified throughout the standard for consistency

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 96-NFPA 20-2022 [Section No. 3.3.51.15]	Revised definition

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
State:
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Submittal Date: Wed Jun 01 10:38:30 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: The current language addresses the alternative meanings within the parentheses and are common within the industry.

Public Input No. 106-NFPA 20-2022 [New Section after 1.2]

1.2.1
Stationary pumps for fire protection systems and shall require design and installation by qualified personnel.

Statement of Problem and Substantiation for Public Input

Provides enforcement of qualified personnel for design and installation

Submitter Information Verification

Submitter Full Name:	Kenneth Schneider
Organization:	UA - ITF
Affiliation:	United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of the United States and Canada
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City:	
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Submittal Date:	Wed Jun 01 16:53:11 EDT 2022
Committee:	FIM-AAA

Committee Statement

Resolution: The current standard addresses the intent of this PI in section 4.3.2, 4.3.3, and 4.3.4.

Public Input No. 94-NFPA 20-2022 [Section No. 2.3.11]

2.3.11 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 142, *Steel Aboveground Tanks for Flammable and Combustible Liquids,* 2019, revised 2021 .

UL 508, *Industrial Control Equipment*, 2018, revised 2021 .

UL 1449, *Surge Protective Devices*, ~~2018~~ 2021 .

Statement of Problem and Substantiation for Public Input

Changes are updates to edition or revision dates and are submitted reference updates.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 95-NFPA 20-2022 [Section No. E.1.2.9]	

Submitter Information Verification

Submitter Full Name: Kelly Nicolello
Organization: UL LLC
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 01 10:31:36 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-1-NFPA 20-2022
Statement: Updates to dates of mandatory references to comply with the Manual of Style.

Public Input No. 96-NFPA 20-2022 [Section No. 3.3.51.15]

3.3.51.15* Pressure Maintenance ~~(Jockey or Make-Up)~~ Pump.

A pump designed to maintain the pressure on the fire protection system(s) between preset limits when the system is not flowing water.

A.3.3.51.15 Pressure maintenance pumps are also referred to as jockey pumps or make-up pumps.

Statement of Problem and Substantiation for Public Input

Simplifies the terminology utilized throughout the standard for pressure maintenance pumps.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 97-NFPA 20-2022 [Global Input]	

Submitter Information Verification

Submitter Full Name: Kevin Hall
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City:
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Submittal Date: Wed Jun 01 10:36:15 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: The current language addresses the alternative meanings within the parentheses and are common within the industry.

Public Input No. 17-NFPA 20-2022 [Section No. 3.3.77.4.1]

3.3.77.4.1 Circulation Relief Valve.

A valve used to cool a pump by discharging a small quantity of water. ~~This valve is separate from and independent of the main relief valve.~~

Statement of Problem and Substantiation for Public Input

The language referring to the main relief valve is extraneous and does not add value to this definition.

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
State:
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Submittal Date: Mon May 16 17:59:26 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-61-NFPA 20-2022
Statement: The revised language is reconfigured to give clarification to the definition.

Public Input No. 18-NFPA 20-2022 [Section No. 4.2.3.2]

4.2.3.2

Plans shall indicate, at a minimum, the items from the following list that pertain to the design of the system:

(1) Name(s) of owner ~~and occupant~~

(2) Location, including street address

(3) Point of compass

(4) Name and address of installing contractor

(5) Pump make and model number

(6) Pump rating ~~_____ gpm @ _____ psi _____ rpm~~ , including flow, pressure, and speed

(7) Suction main size, length, location, type and class/schedule of material, and point of connection to water supply, as well as depth to top of pipe below grade

(8) Water storage tank, if applicable

(9) Size and type of valves, regulators, meters, and valve pits, if applicable

(10) Water supply information including the following flow test information, if applicable:

(11) Location and elevation of static and residual test gauge with relation to the elevation reference point

(12) Flow location

(13) Static pressure, psi (bar)

(14) Residual pressure, psi (bar)

(15) Flow, gpm (L/min)

(16) Date

(17) Time

(18) Name of person who conducted the test or supplied the information

(19) Other sources of water supply, with pressure or elevation

(20) Pump driver details including manufacturer and horsepower

(21) Voltage for electric-motor-driven pumps

(22) Fuel system details for diesel-driven pumps

(23) Controller manufacturer, type, and rating

(24) Suction and discharge pipe, fitting, and valve types

(25) Test connection piping and valves

(26) Flow meter details, if applicable

(27) Pressure maintenance pump and controller arrangement including sensing line details, if applicable

Statement of Problem and Substantiation for Public Input

Clarifies the pump rating information. Current language is only in imperial units.

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
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Submittal Date: Mon May 16 18:01:04 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-62-NFPA 20-2022
Statement: The revision generalizes the pump rating information which can be given in imperial units or SI.

Public Input No. 19-NFPA 20-2022 [Sections 4.3.2, 4.3.3]

Sections 4.3.2, 4.3.3

4.3.2 System Designer.

4.3.2.1

The system designer shall be identified on the system design documents.

4.3.2.2

~~Acceptable minimum evidence of qualifications or certification~~ System design shall be ~~provided when requested by the authority having jurisdiction~~ performed by qualified personnel .

4.3.2.3

Qualified personnel shall ~~include, but not be limited to, one or more~~ meet at least one of the following qualifications :

(1) ~~Personnel who are factory~~ Factory trained and certified for fire pump system design of the specific type and brand of system being designed

(2) * ~~Personnel who are certified by a nationally recognized~~ Certified by an approved fire protection certification organization~~ acceptable to the authority having jurisdiction~~
~~Personnel who are registered~~

(3)

(4) Registered , licensed, or certified by a state or local authority

4.3.~~2.4~~ –

~~Additional evidence of qualification or certification shall be permitted to be required by the authority having jurisdiction.~~

~~4.~~ 3.3 System Installer.

4.3.3.1

~~Installation personnel~~ System installation shall be ~~qualified or shall be supervised by persons who are qualified in the installation, inspection, and testing of fire protection systems~~ performed by qualified personnel .

4.3.3.2

~~Minimum evidence of qualifications or certification shall be provided when requested by the authority having jurisdiction.~~

~~4.3.3.3~~ –

~~Qualified personnel shall include, but not be limited to, one or more~~ Qualified personnel shall meet at least one of the following qualifications :

(1) ~~Personnel who are factory~~ Factory trained and certified for fire pump system installation of the specific type and brand of system being ~~designed~~ installed

(2) * ~~Personnel who are certified by a nationally recognized~~ Certified by an approved fire protection certification organization~~ acceptable to the authority having jurisdiction~~
~~Personnel who are registered~~

(3)

(4) Registered , licensed, or certified by a state or local authority

~~**4.3.3.4** –~~

~~Additional evidence of qualification or certification shall be permitted to be required by the authority having jurisdiction.~~

Statement of Problem and Substantiation for Public Input

Current language included redundant requirements and references ITM activities which is not within the scope of NFPA 20. The revisions correlate with other water-based installation standards and simplifies text using NFPA official definitions.

Submitter Information Verification

Submitter Full Name: Kevin Hall
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Street Address:
City:
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Submittal Date: Mon May 16 18:05:27 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: The suggested revision is restrictive and means for verifying the qualifications are ambiguous.

Public Input No. 6-NFPA 20-2022 [Section No. 4.3.4.2]

4.3.4.2

Qualified personnel shall include, but not be limited to, one or more of the following:

(1) Personnel who are factory trained and certified for fire pump system servicing of the specific type and brand of system being designed

(2) * Personnel who are certified by ~~a nationally recognized~~ an approved fire protection certification organization~~- acceptable to the authority having jurisdiction~~

(3) Personnel who are registered, licensed, or certified by a state or local authority

(4) Personnel who are employed and qualified by an organization listed by a nationally recognized testing laboratory for the servicing of fire protection systems

Statement of Problem and Substantiation for Public Input

Given the international application of NFPA standards, "nationally recognized" is not appropriate. Each jurisdiction should be capable of determining which certifications are "approved" - which is defined by NFPA -based on their specific needs.

Submitter Information Verification

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City:
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Zip:
Submittal Date: Mon Jan 03 14:21:37 EST 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-63-NFPA 20-2022
Statement: Qualifications of ITM personnel are outside the scope of NFPA 20.

Public Input No. 20-NFPA 20-2022 [Section No. 4.5.1.5]

4.5.1.5*

For self-regulating variable speed fire pump units, two additional certified test curves showing the flow, net pressure, power, and speed shall be provided for each pump operating under the following conditions:

(1) In self-regulating variable speed mode with the pump unit operating at constant discharge pressure, as measured by the discharge pressure transducer, through the design duty, and all flow rates from churn to beyond 150 percent of rated flow until the maximum pump brake horsepower is reached

(2) In self-regulating variable speed mode with the pump unit operating at constant boost pressure through the design duty, and all flow rates from churn to beyond 150 percent of rated flow until the maximum pump brake horsepower is reached

Statement of Problem and Substantiation for Public Input

Editorial correction.

Submitter Information Verification

Submitter Full Name: Kevin Hall
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Affiliation: American Fire Sprinkler Association
Street Address:
City:
State:
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Submittal Date: Mon May 16 18:20:01 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-64-NFPA 20-2022
Statement: The word “to” is added in the two locations as editorial corrections. Additionally, the term “design duty” is not defined and has been eliminated to reduce confusion.

Public Input No. 21-NFPA 20-2022 [Section No. 4.5.2]

~~**4.5.2** –~~

~~The purchaser shall furnish the data required in 4.5.1 to the authority having jurisdiction.~~

Statement of Problem and Substantiation for Public Input

This is already a requirement of 14.2.4.1 and the certified pump curve will not be available at the time of plan review. Keeping this section in Chapter 4 will only confuse the the user of the standard as to the appropriate time when the certified pump curves will be available.

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
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Submittal Date: Mon May 16 18:23:19 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-65-NFPA 20-2022
Statement: This is already a requirement of 14.2.4.1 and the certified pump curve will not be available at the time of plan review. Keeping this section in Chapter 4 will only confuse the the user of the standard as to the appropriate time when the certified pump curves will be available.

Public Input No. 12-NFPA 20-2022 [Sections 4.6.2.1.1, 4.6.2.1.2]

Sections 4.6.2.1.1, 4.6.2.1.2

~~**4.6.2.1.1 ***~~ –

~~Where mechanical seals are used as fire pump shaft seals, water supplied to the pump shall be from one of the following:~~

(1) ~~Public service main~~

(2) ~~Clean water stored in a closed top tank~~

(3) ~~Other water supplies having a water quality that meets the pump manufacturer's specifications~~

~~**4.6.2.1.2**~~ –

~~Clean water flush for mechanical seals shall be of positive pressure.~~

Statement of Problem and Substantiation for Public Input

The Hydraulic Institute Fire Pump Committee reviewed and recommends that sections 4.6.2.1.1 and 4.6.2.1.2 and linked additions in 6.1.1.5 and 7.3.1.3 are made to disallow mechanical seals to be used in centrifugal and vertical turbine type fire pumps.

Mechanical seals are not recommended for use in fire pumps due to the potential of premature wear and damage caused by sediments and particles in water. Specifications of water quality at installation do not ensure continuous water cleanliness through the life of a Fire Pump system.

The quality of the water is a major concern, which the proposed edits to section 4.6.2.1.1 intended to manage. However, there are far too many probabilities for the fluid in a Fire Pump system to become contaminated. Sediment and particulates in contaminated system fluid can act to degrade mechanical seal faces during testing and fire emergency operation. Even seal flushing can be detrimental as high velocity flushing fluid can intensify abrasive wear. Additionally, fire systems are in standby mode for long periods of time, which can exacerbate settling of debris in the seal region. This sediment will then harmfully act upon the seal faces during pump operation. While NFPA has attempted to quantify that 'clean water' should be utilized, practical experience indicates that field conditions are not able to achieve this requirement. This is also true for closed loop systems where quality of the water is not continuously monitored by users.

Another concern is the life of mechanical seals due to engine vibration. Engine vibration has been shown to degrade sealing faces over time, and no suitable vibration tolerant mechanical seal is known to the HI committee.

Another concern is that the standard does not provide minimum requirements for the mechanical seal construction including seal face material, elastomeric material, flushing requirements (including rate of flow and pressure), and temperature considerations.

Allowing mechanical seals could lead to misapplication and an undermining of a Fire System's primary function of protecting life if proper seal construction requirements are not included in the standard. This equipment is treated as 'life saving equipment' and any failure of seals can impede a Fire Pump's intended function and potentially affect human life.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 13-NFPA 20-2022 [New Section after 6.1.1]	Water requirement for mechanical seal. Suggesting to disallow mechanical seals
Public Input No. 14-NFPA 20-2022 [New Section after 7.3]	Water requirement for mechanical seal. Suggesting to disallow mechanical seals
Public Input No. 13-NFPA 20-2022 [New Section after 6.1.1]	
Public Input No. 14-NFPA 20-2022 [New Section after 7.3]	

Submitter Information Verification

Submitter Full Name: Peter Gaydon
Organization: Hydraulic Institute
Affiliation: Hydraulic Institute Fire Pump Committee
Street Address:
City:
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Zip:
Submittal Date: Thu Apr 28 13:34:07 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: It is not appropriate to remove the language regarding the use of mechanical seals currently as several listing agencies allow the use of mechanical seals for fire pump service.

Public Input No. 22-NFPA 20-2022 [Section No. 4.7.6]

4.7.6*

The driver shall be selected in accordance with 9.5.2 (electric motors), 11.2.2 (diesel engines), or 13.1.2 (steam turbines) to provide the required power to operate the pump at rated speed and maximum pump load ~~under any flow condition~~ up to 175 percent rated flow .

Statement of Problem and Substantiation for Public Input

The current requirement grossly oversizes the power requirements for fire pumps. Pumps are only designed up to 150 percent capacity and past that point the liquid supply could be insufficient and the motor should not need to run past that point (plus a safety factor).

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 23-NFPA 20-2022 [Section No. A.4.7.6]	

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
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Submittal Date: Mon May 16 18:45:48 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-66-NFPA 20-2022
Statement: The current requirement grossly oversizes the power requirements for fire pumps. Pumps are only designed up to 150 percent capacity and past that point the liquid supply could be insufficient and the motor should not need to run past that point (plus a safety factor).

Public Input No. 7-NFPA 20-2022 [Section No. 4.13]

4.13 Circulation Relief Valve.

4.13.1 General Requirements.

4.13.1.1*

Where an electric variable speed pump is installed, the automatic circulation relief valve shall open at the minimum speed.

4.13.1.2

Unless the requirements of 4.13.1.8 are met, each pump(s) shall have an automatic relief valve listed for the fire pump service installed and set below the shutoff pressure at minimum expected suction pressure.

4.13.1.3

The valve shall be installed on the discharge side of the pump before the discharge check valve.

4.13.1.3.1

For multistage multiport pumps, the automatic circulation relief valve shall be installed before the discharge check valve for the last port and set below the churn pressure of the first port.

4.13.1.4

The valve shall provide sufficient water flow to prevent the pump from overheating when operating with no discharge.

4.13.1.5

Provisions shall be made for discharge to a drain.

4.13.1.6

Circulation relief valves shall not be tied in with the packing box or drip rim drains.

4.13.1.7

The automatic relief valve shall have a nominal size of 0.75 in. (19 mm) for pumps with a rated capacity not exceeding 2500 gpm (9462 L/min) and have a nominal size of 1 in. (25 mm) for pumps with a rated capacity of 3000 gpm to 5000 gpm (11,355 L/min to 18,925 L/min).

4.13.1.8

The requirements of 4.13.1 shall not apply to engine-driven pumps for which engine cooling water is taken from the pump discharge.

Additional Proposed Changes

File Name	Description	Approved
NFPA_20-2023_4_13.docx	Proposed rewritten section	

Statement of Problem and Substantiation for Public Input

The current section leads some designers to confuse a main relief valve with a circulation relief valve. The proposed text changes all instances where the valve is referenced to "circulation relief valve" for clarity and restructured the section to meet the manual of style.

Submitter Information Verification

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Submittal Date: Wed Jan 26 17:38:07 EST 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-67-NFPA 20-2022

Statement: The current section leads some designers to confuse a main relief valve with a circulation relief valve. The proposed text changes all instances where the valve is referenced to "circulation relief valve" for clarity and restructured the section to meet the manual of style.Line shaft turbine pumps that sit in a non-pressurized tank or can are surrounded by water so the additional cooling provided by the casing relief valve is not needed.

Public Input No. 44-NFPA 20-2022 [Section No. 4.13.1.1]

4.13.1.1* –

Where an electric variable speed pump is installed, ~~the~~ an additional automatic circulation relief valve shall be provided.

4.13.1.1.1*

The additional automatic circulation relief valve shall be set to open at the minimum operating speed.

4.13.1.1.2*

A restricting orifice shall be provided to restrict the flow to that needed to keep the pump coool at the minimum operating speed.

Statement of Problem and Substantiation for Public Input

Adds a second casing relief valve with a restrictive orifice to still allow enough water to cool the pump at minimum speed and prevent excessive flow in the bypass mode.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 45-NFPA 20-2022 [Section No. A.4.13.1.1]	

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 25 18:46:04 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-73-NFPA 20-2022

Statement: The revision allows the additional valve as optional instead of required. The specifics of an installation, including drain capabilities, are different from one to another. The necessity of the additional valve shall be determined by those responsible for the installation.

Public Input No. 46-NFPA 20-2022 [Section No. 4.13.1.2]

4.13.1.2

Unless the requirements of 4.13.1.8 or 4.13.1.9 are met, each pump(s) shall have an automatic relief valve listed for the fire pump service installed and set below the shutoff pressure at minimum expected suction pressure.

4.13.1.9

The requirements of 4.13.1.2 shall not apply to a vertical line shaft turbine installation taking water from a tank.

Statement of Problem and Substantiation for Public Input

Line shaft turbine pumps that sit in a tank are surrounded by water so the additional cooling provided by the casing relief valve is not needed.

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
Street Address:
City:
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Submittal Date: Wed May 25 19:12:37 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-67-NFPA 20-2022
Statement: The current section leads some designers to confuse a main relief valve with a circulation relief valve. The proposed text changes all instances where the valve is referenced to "circulation relief valve" for clarity and restructured the section to meet the manual of style.Line shaft turbine pumps that sit in a non-pressurized tank or can are surrounded by water so the additional cooling provided by the casing relief valve is not needed.

Public Input No. 24-NFPA 20-2022 [Section No. 4.14.1.1.2]

4.14.1.1.2*

Except as permitted in 4.14.1.1.3, indoor fire pump rooms in non-high-rise buildings or in separate fire pump buildings shall be physically separated or protected by fire-rated construction in accordance with Table 4.14.1.1.2.

Table 4.14.1.1.2 ~~Equipment~~ 2 Pump Room Protection

Pump Room/House	Building(s) Exposing Pump Room/House	Required Separation
Not sprinklered	Not sprinklered	2 hour fire-rated
Not sprinklered	Fully sprinklered in accordance with NFPA 13	or
Fully sprinklered in accordance with NFPA 13	Not sprinklered	50 ft (15.3 m)
Fully sprinklered in accordance with NFPA 13	Fully sprinklered in accordance with NFPA 13	1 hour fire-rated or 50 ft (15.3 m)

Statement of Problem and Substantiation for Public Input

Revises title to clarify that the protection is required for the fire pump room and only gives credit for fully sprinklered when installed in accordance with NFPA 13

Submitter Information Verification

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Submittal Date: Mon May 16 18:53:36 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-68-NFPA 20-2022
Statement: Revises title to clarify that the protection is required for the fire pump room and only gives credit for fully sprinklered when installed in accordance with NFPA 13 or NFPA 13R.

Public Input No. 26-NFPA 20-2022 [Sections 4.14.1.3, 4.14.1.4]

Sections 4.14.1.3, 4.14.1.4

4.14.1.3 ~~Fire Pump Buildings or Rooms with Diesel Engines.~~

~~Fire pump buildings or rooms~~

Sprinkler Systems

4.14.1.3.1

Sprinklers shall be installed in all pump rooms in accordance with NFPA 13.

4.14.1.3.2

Pump rooms enclosing diesel engine pump drivers and fuel tanks shall be ~~protected with an automatic sprinkler system installed in accordance with NFPA 13 as an~~ classified as an Extra Hazard (Group 2) occupancy.

4.14.1.4 ~~Fire Pump Buildings or Rooms with Electric Drivers.~~

~~For buildings that are required to be sprinklered, fire pump buildings or~~

3.3

Pump rooms enclosing electric fire pump drivers shall be ~~protected with an automatic sprinkler system installed in accordance with NFPA 13 as an~~ classified as an Ordinary Hazard (Group 1) occupancy.

Statement of Problem and Substantiation for Public Input

The previous language did not require electric pump rooms to be sprinklered. If a pump is present, sprinklers need to be installed. Section was also cleaned up to correlate with language used in NFPA 13 and other standards.

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
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Submittal Date: Mon May 16 19:07:34 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-69-NFPA 20-2022
Statement: The previous language did not require electric pump rooms to be sprinklered. If a pump is present, sprinklers need to be installed. Section was also cleaned up to correlate with language used in NFPA 13 and other standards.

Public Input No. 27-NFPA 20-2022 [Section No. 4.15.2.1]

4.15.2.1

Sections of steel piping shall be joined by means of screwed, flanged, welded, mechanical, or grooved joints, or other approved fittings.

Statement of Problem and Substantiation for Public Input

Missing commas and added welded pipe as an acceptable option.

Submitter Information Verification

Submitter Full Name: Kevin Hall
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Street Address:
City:
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Submittal Date: Mon May 16 19:15:19 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-70-NFPA 20-2022
Statement: This revision adds missing commas and adds welded pipe as an acceptable option.

Public Input No. 29-NFPA 20-2022 [Section No. 4.15.2.3]

4.~~15~~ 32 .~~2~~ 4 .3

The piping around check valves installed per 4.32.4.1, orifice unions, orifice plates, ~~flowmeters~~ flow meters , and other devices that have restricting orifices shall have a means to perform an internal inspection or a means to disassemble the piping to allow for the internal inspection of the restricting orifice(s).

Statement of Problem and Substantiation for Public Input

This section does have anything to do with joining methods and is more appropriate in 4.32 for sensing lines.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 30-NFPA 20-2022 [Section No. 4.15.3]	

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
State:
Zip:
Submittal Date: Mon May 16 19:21:58 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: The section shall remain as is in the current standard. The current language applies as items other than those found in sensing lines are considered. 'Flowmeter' is maintained as one word for consistency throughout the standard.

Public Input No. 30-NFPA 20-2022 [Section No. 4.15.3]

4.~~15~~ 32 .~~3~~ 8 Restricting Orifice Identification.

Check valves installed per 4.32.4.1, orifice unions, orifice plates, and other devices with a restricting orifice shall have a permanent tag or other means of identification indicating that a restricting orifice is present.

Statement of Problem and Substantiation for Public Input

This section does have anything to do with joining methods and is more appropriate in 4.32 for sensing lines.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 29-NFPA 20-2022 [Section No. 4.15.2.3]	Sensing Lines

Submitter Information Verification

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Committee: FIM-AAA

Committee Statement

Resolution: The current language applies as items other than those found in sensing lines are considered.

Public Input No. 32-NFPA 20-2022 [Section No. 4.16.2]

4.16.2 Installation.

~~Suction~~ Underground portions of suction pipe shall be ~~installed and tested in~~ installed in accordance with NFPA 24.

Statement of Problem and Substantiation for Public Input

Only underground portions of suction piping need to be installed in accordance with NFPA 24. Aboveground pipe can be installed in accordance with NFPA 20 and NFPA 13.

Submitter Information Verification

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Committee: FIM-AAA

Committee Statement

Resolution: The current language gives appropriate direction to the correct standard.

Public Input No. 9-NFPA 20-2022 [Section No. 4.17]

4.17 Discharge Pipe and Fittings.

4.17.1

The discharge components shall consist of pipe, valves, and fittings extending from the pump discharge flange to the system side of the discharge valve.

The Flexible connection shall not be used in discharge Piping.

4.17.2

For multistage multiport pumps, the discharge components for each port shall consist of pipe, valves, and fittings extending from the pump port discharge flange to the system side of the discharge valve for that port.

4.17.3

The pressure rating of the discharge components shall be adequate for the maximum total discharge head with the pump operating at shutoff and rated speed but shall not be less than the rating of the fire protection system.

4.17.4*

Steel pipe with flanges, screwed joints, or mechanical grooved joints shall be used above ground.

4.17.5

All pump discharge pipe shall be hydrostatically tested in accordance with NFPA 13.

4.17.6*

The size of pump discharge pipe and fittings shall not be less than that given in Section 4.28.

4.17.7*

A listed check valve or backflow preventer shall be installed in the pump discharge assembly.

4.17.8*

A listed indicating gate or butterfly valve shall be installed on the fire protection system side of the pump discharge check valve.

4.17.9

Where pumps are installed in series, a butterfly valve shall not be installed between pumps.

4.17.10 Low Suction Pressure Controls.

4.17.10.1

Suction pressure regulating valves that are listed for fire pump service and that are suction pressure sensitive shall be permitted where the authority having jurisdiction requires positive pressure to be maintained on the suction piping.

4.17.10.2

Where a suction pressure regulating valve is used, it shall be installed according to manufacturers' recommendations in the piping between the pump and the discharge check valve.

4.17.10.3

The size of the suction pressure regulating valve shall not be less than that given for discharge piping in Section 4.28.

4.17.10.4

The friction loss through a suction pressure regulating valve in the fully open position shall be taken into account in the design of the fire protection system.

4.17.10.5

System design shall be such that the suction pressure regulating valve is in the fully open position at the system design point and at 100 percent of rated flow.

4.17.11* Pressure-Regulating Devices.

No pressure-regulating devices shall be installed in the discharge pipe except as permitted in this standard.

Additional Proposed Changes

File Name	Description	Approved
NFPA_20_-_CLAUSE_IS_4.17_-_DISCHARGE_PIPE_FITTINGS.pdf		

Statement of Problem and Substantiation for Public Input

The reason is that any misalignment will be damage the flexible connection & to recommend to not install the flexible connection in discharge pipe to avoid damage of the Pump.

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Submittal Date: Sat Mar 12 04:47:51 EST 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-72-NFPA 20-2022
Statement: Due to the failure possibility of a nonmetallic flexible pump connection fitting, these fittings are required to be metallic. These flexible pump connections shall not be used to correct for misalignment.

Public Input No. 90-NFPA 20-2022 [Section No. 4.20]

4.20 – Main Relief Valves for Centrifugal Pumps.

4.20.1* General.

4.20.1.1*

~~Pressure~~ Main relief valves shall be used only where specifically permitted by this standard.

4.20.1.2

Where a diesel engine fire pump is installed and where a total of 121 percent of the net rated shutoff (churn) pressure plus the maximum static suction pressure, adjusted for elevation, exceeds the pressure for which the system components are rated, a ~~pressure~~ main relief valve shall be installed.

4.20.1.3

Where an electric variable speed pump or a diesel pressure limiting driver is installed, and the maximum total discharge head adjusted for elevation with the pump operating at shutoff and rated speed exceeds the pressure rating of the system components, a ~~pressure~~ main relief valve shall be installed.

4.20.1.3.1

Where an electric variable speed pump or diesel pressure limiting driver is used, the ~~pressure~~ main relief valve shall be set to a minimum of 10 psi (0.68 bar) above the set pressure of the variable speed pressure limiting control.

4.20.2 Size.

The main relief valve size shall be determined by one of the methods specified in 4.20.2.1 or 4.20.2.2.

4.20.2.1*

The main relief valve shall be permitted to be sized hydraulically to discharge sufficient water to prevent the pump discharge pressure, adjusted for elevation, from exceeding the pressure rating of the system components.

4.20.2.2

If the main relief valve is not sized hydraulically, the main relief valve size shall not be less than that given in Section 4.28. *(See also 4.20.7 and A.4.20.7 for conditions that affect size.)*

4.20.3 Location.

The main relief valve shall be located between the pump and the pump discharge check valve and shall be so attached that it can be readily removed for repairs without disturbing the piping.

4.20.4 Type.

4.20.4.1

~~Pressure~~ Main relief valves shall be either a listed spring-loaded or a pilot-operated diaphragm type.

4.20.4.2

Pilot-operated ~~pressure~~ main relief valves, where attached to vertical shaft turbine pumps, shall be arranged to prevent relieving of water at water pressures less than the ~~pressure~~ main relief setting of the valve.

4.20.5* Discharge.

4.20.5.1

The main relief valve shall discharge into an open pipe or into a cone or funnel secured to the outlet of the valve.

4.20.5.2

Water discharge from the main relief valve shall be readily visible or easily detectable by the pump operator.

4.20.5.3

Splashing of water into the pump room shall be avoided.

4.20.5.4

If a closed-type cone is used, it shall be provided with means for detecting motion of water through the cone.

4.20.5.5

If the main relief valve is provided with means for detecting motion (flow) of water through the valve, then cones or funnels at its outlet shall not be required.

4.20.6 Discharge Piping.

4.20.6.1

Except as permitted in 4.20.6.2, the main relief valve discharge pipe shall be of a size not less than that given in Section 4.28.

4.20.6.1.1

If the pipe employs more than one elbow, the next larger pipe size shall be used.

4.20.6.2

The discharge pipe shall be permitted to be sized hydraulically to discharge sufficient water to prevent the pump discharge pressure, adjusted for elevation, from exceeding the pressure rating of the system components.

4.20.6.3

~~Relief~~ Main relief valve discharge piping returning water back to the supply source, such as an aboveground storage tank, shall be run independently and not be combined with the discharge from other relief valves.

4.20.6.4

~~Relief~~ Main relief valve discharge piping from a single fire pump returning water back to the supply source shall be permitted to be combined with fire pump test piping downstream of any control valve in a manner that complies with 4.20.6, 4.22.2, and 4.22.3.

4.20.6.5

The discharge piping from multiple main relief valves shall not be combined with fire pump test piping.

4.20.6.6

Isolation of the test header piping from the ~~pressure relief~~ main relief valve discharge shall be possible.

4.20.7* Discharge to Source of Supply.

Where the main relief valve is piped back to the source of supply, the ~~relief~~ main relief valve and piping shall have sufficient capacity to prevent pressure from exceeding that for which system components are rated.

4.20.7.1

Where a ~~pressure~~ main relief valve has been piped back to suction, a circulation relief valve sized in accordance with 4.13.1.7 and 4.20.7 and discharged to atmosphere shall be provided downstream of the ~~pressure~~ main relief valve.

4.20.7.2

The circulating relief valve shall actuate below the opening set point of the ~~pressure~~ main relief valve to ensure cooling of the pump during churn operation.

4.20.7.~~2~~ 3

Where pump discharge water is piped back to pump suction and the pump is driven by a diesel engine with heat exchanger cooling, the controller shall provide a visual indicator and audible alarm and stop the engine when a high cooling water temperature signal as required by 11.2.4.4.8 is received, provided there are no active emergency requirements for the pump to run.

4.20.7.2.1

The requirements of 4.20.7.2 shall not apply when pump discharge water is being piped back to a water storage reservoir.

4.20.8* Discharge to Suction Reservoir.

Where the supply of water to the pump is taken from a suction reservoir of limited capacity, the drain pipe shall discharge into the reservoir at a point as far from the pump suction as is necessary to prevent the pump from drafting air introduced by the drain pipe discharge.

4.20.9 Shutoff Valve.

A shutoff valve shall not be installed in the main relief valve supply or discharge piping.

Statement of Problem and Substantiation for Public Input

The term "Relief valve" is ambiguous and this section only applies to the main relief valve that is installed on the fire pump assembly. Main relief valve is the appropriate term as described in the definitions of "relief valve" and "circulation relief valve"

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Submittal Date: Wed Jun 01 09:52:01 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-105-NFPA 20-2022
Statement: The term "Relief valve" is ambiguous and this section only applies to the main relief valve that is installed on the fire pump assembly. Main relief valve is the appropriate term as described in the definitions of "relief valve" and "circulation relief valve".

Public Input No. 105-NFPA 20-2022 [Section No. 4.28]

4.28 Summary of Centrifugal Fire Pump Data.

The sizes indicated in Table 4.28(a) and Table 4.28(b) shall be used as a minimum.

Table 4.28(a) Summary of Centrifugal Fire Pump Data (U.S. Customary)

Pump Rating (gpm)	Minimum Pipe Sizes (Nominal) (in.)							
	Suction[a,b,c]	Discharge[a]	Main Relief Valve	Main Relief Valve Discharge	Meter Device	Number and Size of Hose Valves	Number and Size of Nonthreaded Connections	Hose Header Supply
25	1	1	¾	1	1¼	1 — 1½	1 — 2½	1
50	1½	1¼	1¼	1½	2	1 — 1½	1 — 2½	1½
100	2	2	1½	2	2½	1 — 2½	1 — 2½	2½
150	2½	2½	2	2½	3	1 — 2½	1 — 2½	2½
200	3	3	2	2½	3	1 — 2½	1 — 2½	2½
250	3½	3	2	2½	3½	1 — 2½	1 — 2½	3
300	4	4	2½	3½	3½	1 — 2½	1 — 2½	3
400	4	4	3	5	4	2 — 2½	1 — 5	4
450	5	5	3	5	4	2 — 2½	1 — 5	4
500	5	5	3	5	5	2 — 2½	1 — 5	4
750	6	6	4	6	5	3 — 2½	1 — 5	6
1000	8	6	4	8	6	4 — 2½	1 — 5	6
1250	8	8	6	8	6	6 — 2½	1 — 5	8
1500	8	8	6	8	8	6 — 2½	1 — 5	8
2000	10	10	6	10	8	6 — 2½	2 — 5[d]	8
2500	10	10	6	10	8	8 — 2½	2 — 5[d]	10
3000	12	12	8	12	8	12 — 2½	2 — 5[d]	10
3500	12	12	8	12	10	12 — 2½	3 — 5[d]	12
4000	14	12	8	14	10	16 — 2½	3 — 5[d]	12
4500	16	14	8	14	10	16 — 2½	3 — 5[d]	12

Pump Rating (gpm)	Minimum Pipe Sizes (Nominal) (in.)							
	Suction[a,b,c]	Discharge[a]	Main Relief Valve	Main Relief Valve Discharge	Meter Device	Number and Size of Hose Valves	Number and Size of Nonthreaded Connections	Hose Header Supply
5000	16	14	8	14	10	20 — 2½	3 — 5[d]	12

Notes:

(1) The ~~pressure~~ main relief valve is permitted to be sized in accordance with 4.20.2.1.

(2) The ~~pressure~~ main relief valve discharge is permitted to be sized in accordance with 4.20.6.2.

(3) The flowmeter device is permitted to be sized in accordance with 4.22.2.3.

(4) The hose header supply is permitted to be sized in accordance with 4.22.3.4.

(5) Other types of test outlets, sizes, and quantities are permitted ~~when approved by the authority having jurisdiction~~ where approved .

[a]Actual diameter of pump flange is permitted to be different from pipe diameter.

[b]Applies only to that portion of suction pipe specified in 4.16.3.3.

[c]Suction pipe sizes in Table 4.28(a) are based on a maximum velocity at 150 percent rated capacity to 15 ft/~~sec (4.6 m/sec) in~~ sec in most cases.

[d]Provide a control valve on each outlet where more than one nonthreaded connection is required.

Table 4.28(b) Summary of Centrifugal Fire Pump Data (Metric)

Pump Rating (L/min)	Minimum Pipe Sizes (Nominal) (mm)							
	Suction[a,b,c]	Discharge[a]	Main Relief Valve	Main Relief Valve Discharge	Meter Device	Number and Size of Hose Valves	Number and Size of Nonthreaded Connections	Hose Header Supply
95	25	25	19	25	32	1 — 38	1 — 65	25
189	38	32	32	38	50	1 — 38	1 — 65	38
379	50	50	38	50	65	1 — 65	1 — 65	65
568	65	65	50	65	75	1 — 65	1 — 65	65
757	75	75	50	65	75	1 — 65	1 — 65	65
946	85	75	50	65	85	1 — 65	1 — 65	75
1,136	100	100	65	85	85	1 — 65	1 — 65	75
1,514	100	100	75	125	100	2 — 65	1 — 125	100

Pump Rating (L/min)	Minimum Pipe Sizes (Nominal) (mm)							
	Suction[a,b,c]	Discharge[a]	Main Relief Valve	Main Relief Valve Discharge	Meter Device	Number and Size of Hose Valves	Number and Size of Nonthreaded Connections	Hose Header Supply
1,703	125	125	75	125	100	2 — 65	1 — 125	100
1,892	125	125	75	125	125	2 — 65	1 — 125	100
2,839	150	150	100	150	125	3 — 65	1 — 125	150
3,785	200	150	100	200	150	4 — 65	1 — 125	150
4,731	200	200	150	200	150	6 — 65	1 — 125	200
5,677	200	200	150	200	200	6 — 65	1 — 125	200
7,570	250	250	150	250	200	6 — 65	2 — 125[d]	200
9,462	250	250	150	250	200	8 — 65	2 — 125[d]	250
11,355	300	300	200	300	200	12 — 65	2 — 125[d]	250
13,247	300	300	200	300	250	12 — 65	3 — 125[d]	300
15,140	350	300	200	350	250	16 — 65	3 — 125[d]	300
17,032	400	350	200	350	250	16 — 65	3 — 125[d]	300
18,925	400	350	200	350	250	20 — 65	3 — 125[d]	300

Notes:

(1) The ~~pressure~~ main relief valve is permitted to be sized in accordance with 4.20.2.1.

(2) The ~~pressure~~ main relief valve discharge is permitted to be sized in accordance with 4.20.6.2.

(3) The flowmeter device is permitted to be sized in accordance with 4.22.2.3.

(4) The hose header supply is permitted to be sized in accordance with 4.22.3.4.

(5) Other types of test outlets are permitted ~~when~~ where approved ~~by the authority having jurisdiction~~ .

[a]Actual diameter of pump flange is permitted to be different from pipe diameter.

[b]Applies only to that portion of suction pipe specified in 4.16.3.3.

[c]Suction pipe sizes in Table 4.28(b) are based on a maximum velocity at 150 percent rated capacity to ~~15 ft/sec (~~ 4.6 m/~~sec) in~~ sec in most cases.

[d]Provide a control valve on each outlet where more than one nonthreaded connection is required.

Statement of Problem and Substantiation for Public Input

Editorial corrections to table

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Committee: FIM-AAA

Committee Statement

Resolution: FR-75-NFPA 20-2022
Statement: Revisions to table titles and notes to clarify the relief valve is intended to be the Main Relief Valve.

Public Input No. 5-NFPA 20-2021 [Section No. 5.6.1]

5.6.1 Water Supply Tanks for Very Tall Buildings.

5.6.1.1*

Where the primary supply source for a vertical fire protection zone is stored water within the building, each zone shall be supplied by a minimum of two tanks.

5.6.1.1.1

A water tank shall be permitted to be divided into compartments such that the compartments function as individual tanks.

5.6.1.1.2*

The total volume of all tanks or compartments supplying a vertical fire protection zone shall be sufficient for the full fire protection demand in that zone.

5.6.1.1.3

Each individual tank or compartment directly supplying a vertical fire protection zone shall be sized so that at least 50 percent of the fire protection demand is stored with any one compartment or tank out of service.

5.6.1.

~~2~~

~~An automatic refill valve shall be provided for each tank or tank compartment.~~ **1.4** A manual refill valve shall be provided for each tank or tank compartment.

5.6.1.1.5 When any single tank or tank compartment is out of service and the total volume of water stored in the remaining tanks or tank compartments is less than the total fire protection demand, manual and automatic refill valves for each tank and compartment shall comply with 5.6.1.2.

5.6.1.1.5.1* When any single tank or tank compartment is out of service and the total volume of water stored in the remaining tanks or tank compartments meets or exceeds the total fire protection demand, compliance 5.6.1.2 is not required.

A.5.6.1.1.5.1 Where a zone or portions of a zone are beyond the pumping capacity of the fire department, the full system fire protection demand should be available at all times, including when a single tank or tank compartment may be out of service for maintenance or repair. Where only two tanks or tank compartments are provided, each with 50% of the system fire protection demand, the refill rate for each tank or compartment is sized to independently supply the system fire protection demand, effectively acting as a break tank so that the system fire protection demand is still provided with one tank or tank compartment out of service. Where three or more tanks or tank compartments are provided and sized so that with any single tank or tank compartment out of service, the remaining tanks or tank compartments can supply the full system fire protection demand, then the automatic refill at the system demand should not be required as the full system demand will always be available even with one tank or tank compartment out of service. Examples of this second arrangement would include providing 3 tanks or tank compartments each with 50% of the system fire protection demand or providing 4 tanks or tank compartments each with 33.33% of the system fire protection demand.

5.6.1.~~3~~ 2

~~A manual~~ An automatic refill valve shall be provided for each tank or tank compartment.

5.6.1.4 2.1 *

Each refill valve shall be sized and arranged to independently supply the system fire protection demand.

5.6.1.~~5~~ 2.2

The refill rate shall be sustainable for the required water supply duration.

5.6.1.~~6~~ 2.3 *

The automatic and manual fill valve combination for each tank or tank compartment shall have its own connection to one of the following:

(1) A standpipe riser for a zone that is not supplied from the tank served by the refill valve and is provided with a backup fire pump

(2) A gravity feed express or standpipe riser for a zone that is not supplied from the tank served by the refill valve

(3) A dedicated riser from a fire pump located below the refill valve

(4) A reliable domestic riser sized to meet the requirements of 5.6.1.4

5.6.1.~~6~~ 2 .~~1~~ 4 *

Each refill connection shall be made to a different riser.

5.6.1.~~6~~ 2 .~~2~~ – 5

The refill connections shall be interconnected.

5.6.1.~~6.~~ 2.5. 1

When the refill valves are connected to different zones, check valves shall be installed in each standpipe connection to prevent cross flow between the different zones.

5.6.1.~~6.~~ 2.5. 2

Isolation valves shall be provided on both sides of each check valve required by 5.6.1.6.2.1.

5.6.1.2. ~~6.3~~ –

Isolation valves shall be provided between each interconnection.

5.6.1.~~6~~ 2 .4 7

When at least one of the tank valves is fed from below, the primary fill shall be from below.

5.6.1.~~6~~ 2 .4 7 .1*

When the fill valves are connected to different zones, the isolation valve shall be permitted to be normally closed to assure that the primary refill is the first refill to operate.

5.6.1.~~6~~ 2 .~~5~~ 8 *

Each tank shall be provided with an overflow sized for the maximum refill rate with a single automatic refill valve operating fully open.

5.6.1.~~6~~ 2 .~~6~~ 9

The overflow shall be piped to a safe discharge location.

Statement of Problem and Substantiation for Public Input

The intended goal of the water tank arrangement described in NFPA 20 is to assure that there will always be 100% of the available water supply available even with a single tank or tank compartment out of service in very tall buildings. There is more than one way to accomplish this. The current requirement for water tank refill arrangement in very tall buildings appears to be predicated on the assumption that the minimum requirement of only 2 tanks or tank compartments, each with 50% of the system fire demand will be provided in all situations and therefore requires the refill rate at full system demand. Should a designer choose to provide an water supply arrangement with more than the minimum requirement of two tank or tank compartments each with 50% of the system fire protection demand (such as 3 tanks, each with 50% of the fire protection system demand or 4 tanks, each with 33.33% of the system demand), then with any single tank or tank compartment out of service, the full fire protection system demand is still available. There should be no requirement for automatic refill at

the system demand rate in such a situation. While this may take up more real estate, it may be more preferable than the complications that arise with dealing with overflow piping to safe location when the the tanks or tank compartments are located on an upper level of the building and the refill rate is 750 or 1000 gpm. As currently written, there is no other prescriptive choice but to provide automatic refill at the system demand rate regardless of the quantity of tanks and volume of stored water.

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Submittal Date: Fri Dec 03 09:54:18 EST 2021
Committee: FIM-AAA

Committee Statement

Resolution: The proposed language would eliminate the need for the tank automatic refill which has been a long standing requirement for very tall buildings. Additionally, it eliminates the design criteria for the manual only fill valve. The existing language requires both 100% stored water capacity and full automatic refill for buildings beyond the reach of the fire department. The required stored water duration for the occupancy can be as little as 30 minutes and therefore the automatic refill provides additional duration for firefighting needs.

Public Input No. 13-NFPA 20-2022 [New Section after 6.1.1]

Sealing

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6.1.1.5

The sealing type acceptable for centrifugal pumps shall be packing.

Statement of Problem and Substantiation for Public Input

The Hydraulic Institute Fire Pump Committee has reviewed and recommends the sealing type for centrifugal fire pumps be limited to packing.

Mechanical seals are not recommended for use in fire pumps due to the potential of premature wear and damage caused by sediments and particles in water. Specifications of water quality at installation do not ensure continuous water cleanliness through the life of a Fire Pump system.

The quality of the water is a major concern, which the proposed edits to section 4.6.2.1.1 intended to manage. However, there are far too many probabilities for the fluid in a Fire Pump system to become contaminated. Sediment and particulates in contaminated system fluid can act to degrade mechanical seal faces during testing and fire emergency operation. Even seal flushing can be detrimental as high velocity flushing fluid can intensify abrasive wear. Additionally, fire systems are in standby mode for long periods of time, which can exacerbate settling of debris in the seal region. This sediment will then harmfully act upon the seal faces during pump operation. While NFPA has attempted to quantify that 'clean water' should be utilized, practical experience indicates that field conditions are not able to achieve this requirement. This is also true for closed loop systems where quality of the water is not continuously monitored by users.

Another concern is the life of mechanical seals due to engine vibration. Engine vibration has been shown to degrade sealing faces over time, and no suitable vibration tolerant mechanical seal is known to the HI committee.

Another concern is that the standard does not provide minimum requirements for the mechanical seal construction including seal face material, elastomeric material, flushing requirements (including rate of flow and pressure), and temperature considerations.

Allowing mechanical seals could lead to misapplication and an undermining of a Fire System's primary function of protecting life if proper seal construction requirements are not included in the standard. This equipment is treated as 'life saving equipment' and any failure of seals can impede a Fire Pump's intended function and potentially affect human life.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 12-NFPA 20-2022 [Sections 4.6.2.1.1, 4.6.2.1.2]	If mechanical seals are disallowed, then 4.6.2.1.1 and 4.6.2.1.2 are not required
Public Input No. 12-NFPA 20-2022 [Sections 4.6.2.1.1, 4.6.2.1.2]	

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Submittal Date: Thu Apr 28 13:40:26 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: It is not appropriate to add language limiting the use of mechanical seals currently as several listing agencies allow the use of mechanical seals for fire pump service.

Public Input No. 91-NFPA 20-2022 [Section No. 6.4.1]

6.4.1*

Overhung impeller and impeller between bearings design pumps and driver shall be mounted on a common grouted base plate in accordance with the manufacturer's instructions .

Statement of Problem and Substantiation for Public Input

Base grouting is one of the most commonly missed features of the fire pump installation. The grouted base needs to be installed in accordance with the manufacturer's instructions (if necessary).

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Submittal Date: Wed Jun 01 10:16:28 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-78-NFPA 20-2022
Statement: Base grouting is one of the most commonly missed features of the fire pump installation. The grouted base needs to be installed in accordance with the manufacturer's instructions (if necessary).

Public Input No. 14-NFPA 20-2022 [New Section after 7.3]

Sealing

7.3.1.3

The sealing type acceptable for vertical shaft turbine-type pumps shall be packing.

Statement of Problem and Substantiation for Public Input

The Hydraulic Institute Fire Pump Committee has reviewed and recommends the sealing type for vertical shaft turbine fire pumps be limited to packing.

Mechanical seals are not recommended for use in fire pumps due to the potential of premature wear and damage caused by sediments and particles in water. Specifications of water quality at installation do not ensure continuous water cleanliness through the life of a Fire Pump system.

The quality of the water is a major concern, which the proposed edits to section 4.6.2.1.1 intended to manage. However, there are far too many probabilities for the fluid in a Fire Pump system to become contaminated. Sediment and particulates in contaminated system fluid can act to degrade mechanical seal faces during testing and fire emergency operation. Even seal flushing can be detrimental as high velocity flushing fluid can intensify abrasive wear. Additionally, fire systems are in standby mode for long periods of time, which can exacerbate settling of debris in the seal region. This sediment will then harmfully act upon the seal faces during pump operation. While NFPA has attempted to quantify that 'clean water' should be utilized, practical experience indicates that field conditions are not able to achieve this requirement. This is also true for closed loop systems where quality of the water is not continuously monitored by users.

Another concern is the life of mechanical seals due to engine vibration. Engine vibration has been shown to degrade sealing faces over time, and no suitable vibration tolerant mechanical seal is known to the HI committee.

Another concern is that the standard does not provide minimum requirements for the mechanical seal construction including seal face material, elastomeric material, flushing requirements (including rate of flow and pressure), and temperature considerations.

Allowing mechanical seals could lead to misapplication and an undermining of a Fire System's primary function of protecting life if proper seal construction requirements are not included in the standard. This equipment is treated as 'life saving equipment' and any failure of seals can impede a Fire Pump's intended function and potentially affect human life.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 12-NFPA 20-2022 [Sections 4.6.2.1.1, 4.6.2.1.2]	If mechanical seals are disallowed, then section 4.6.2.1 and 4.6.2.1.2 are not needed
Public Input No. 12-NFPA 20-2022 [Sections 4.6.2.1.1, 4.6.2.1.2]	

Submitter Information Verification

Submitter Full Name: Peter Gaydon

Organization:	Hydraulic Institute
Affiliation:	Hydraulic Institute Fire Pump Committee
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Submittal Date:	Thu Apr 28 13:48:05 EDT 2022
Committee:	FIM-AAA

Committee Statement

Resolution: It is not appropriate to add language limiting the use of mechanical seals currently as several listing agencies allow the use of mechanical seals for fire pump service.

Public Input No. 80-NFPA 20-2022 [Section No. 8.4.6]

8.4.6

Where provided with a variable speed control, one of the following shall apply:

(1) Failure of the variable speed control feature shall cause the controller to bypass and isolate the variable speed control system.

(2) There shall be a redundant motor and pump to compensate for the lost variable speed driven pump capacity.
When redundancy is used, requirement 10.10.4 for isolation contractors shall not apply and 10.10.5 for circuit breaker coordination shall not apply. VFD shall have independent circuit breaker according to requirement 10.4.3, separated from the circuit breaker that is used by the redundant motor and pump.

Additional Proposed Changes

File Name	Description	Approved
8.4.6_Redundant_motor.pdf	Descriptive schematic	

Statement of Problem and Substantiation for Public Input

It would be good to clearly clarify, how the redundant motor and pump (in 8.4.6 (2)) circuitry shall be different from the structure according to requirements in chapter 10.10.

Common argument/question committee, can and should the chapter 10.10 (Controllers with Variable Speed Pressure Limiting Control or Variable Speed Suction Limiting Control) be considered for WMPDPU's at all if it has VSD to control speed of one pump (other pumps will be controlled across the line with or without devices to smoothen the pump start). If yes, then the PI is valid with its change recommendation. If no, then a separate chapter(s) should be made to capture the requirements for the pumping units having a combination of pumps that are driven with VSD and across the line.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 81-NFPA 20-2022 [Section No. 10.10.3.1 [Excluding any Sub-Sections]]	
Public Input No. 82-NFPA 20-2022 [Section No. 10.10.3.1.1]	
Public Input No. 83-NFPA 20-2022 [New Section after 8.4.11]	

Submitter Information Verification

Submitter Full Name: Seppo Koskela
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Affiliation: Marioff Corp Oy Carrier Co
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Submittal Date: Mon May 30 10:12:39 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-10-NFPA 20-2022

Statement: The line isolation requirements of 10.10.4 are necessary to keep the VFD off-line when not in use. Since the equipment is generally connected to the Service on a continuous basis, damaging surges are always present. By keeping the VFD off-line until needed, the risk of damage due to surges is greatly reduced. Additionally, the circuit protection for the VFD needs to be coordinated with the instantaneous trip function of the isolating switch, if provided.

Public Input No. 75-NFPA 20-2022 [Section No. 8.4.8]

8.4.8

The requirement in 10.3.4.3 shall apply to each individual motor where currents from a one line is read per motor and ~~the entire unit~~ for the main power line to read all line voltages and currents .

Additional Proposed Changes

File Name	Description	Approved
8.4.8_UI_line_monitoring.png	Schematic to support the change	

Statement of Problem and Substantiation for Public Input

This update will reduce unnecessary voltage and/or current measurement points from the WMPDPU controller.

Due the physical behavior of the voltage and as WMPDPU has all electrical drives for the motors parallel, the voltage for each line can be measured from a single point. The following formula demonstrates that the voltage, measured in first line, is the same on all four measurement points UL1 = UM1.1 =UM2.1 = UM3.1 when circuit breakers are closed (see attached schematic). Thus there is no need to measure the voltage from several points as the voltage value would be the same and in case there is a need to indicate power to motor via voltage value, combined information of circuit breaker close and main line voltage is sufficient.

Regarding to the line currents measurement, single line measurement is sufficient to demonstrate the load of the motor and entire unit lines currents will notify in case there is a load difference between the lines.

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Submittal Date: Mon May 30 09:00:43 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-11-NFPA 20-2022
Statement: It is not necessary to monitor all line currents for the entire unit when all line currents for all motors are monitored.

Public Input No. 77-NFPA 20-2022 [New Section after 8.4.11]

8.4.11.1

The phase reversal test requirement in chapter 14.2.6.4.1 shall not be applicable for electric motors, driving the positive displacement pumps, as there is no device indicating the phase reversal condition as per 8.4.11.

Statement of Problem and Substantiation for Public Input

As defined in chapter 8.4.11, WMPDPUs do not need the phase reversal monitoring, thus the chapter, requiring the field test for the phase reversal should be aligned with the requirement.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 78-NFPA 20-2022 [New Section after 8.4.11]	
Public Input No. 79-NFPA 20-2022 [Section No. 8.4.11]	

Submitter Information Verification

Submitter Full Name: Seppo Koskela
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Submittal Date: Mon May 30 09:45:54 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-12-NFPA 20-2022

Statement: Where positive displacement pumps are able to deliver the required flow and pressure regardless of direction of rotation, monitoring for phase reversal and the test for phase reversal in Chapter 14 are not required. Therefore, the requirements in 10.8.3.6.4 and 14.2.6.12 do not apply.

Public Input No. 78-NFPA 20-2022 [New Section after 8.4.11]

8.4.11.2

In field testing, rotational direction of each electric motor, driving to positive displacement pump, shall be visually checked to comply with manufacturer recommendation if available.

Statement of Problem and Substantiation for Public Input

In case related PI#77 is accepted, there should be additional clarification, how to ensure recommended rotation of the pump and motor when phase monitoring is not available.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 77-NFPA 20-2022 [New Section after 8.4.11]	
Public Input No. 79-NFPA 20-2022 [Section No. 8.4.11]	

Submitter Information Verification

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Submittal Date: Mon May 30 09:50:45 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: Field testing for rotational direction is not necessary based on the proposed change to 8.4.11.

Public Input No. 83-NFPA 20-2022 [New Section after 8.4.11]

8.4.12

If positive displacement pump is used in variable speed pumping unit, the chapter 14.2.6.4.1 shall not be applicable and the required testing shall be performed according to chapter 14.2.6.6, positive displacement pumps.

Statement of Problem and Substantiation for Public Input

Positive displacement pump load (created pressure) is linear to speed of the pump and requirements in chapter 14.2.6.4.1 are not suitable for PD pumps that are speed controlled.

Common argument/question committee, can and should the chapter 10.10 (Controllers with Variable Speed Pressure Limiting Control or Variable Speed Suction Limiting Control) be considered for WMPDPU's at all if it has VSD to control speed of one pump (other pumps will be controlled across the line with or without devices to smoothen the pump start). If yes, then the PI is valid with its change recommendation. If no, then a separate chapter(s) should be made to capture the requirements for the pumping units having combination of pumps that are driven with VSD and across the line.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 80-NFPA 20-2022 [Section No. 8.4.6]	Same argument regarding the applicability of 10.10 for WMPDPUs with VSD control
Public Input No. 81-NFPA 20-2022 [Section No. 10.10.3.1 [Excluding any Sub-Sections]]	Same argument regarding the applicability of 10.10 for WMPDPUs with VSD control
Public Input No. 82-NFPA 20-2022 [Section No. 10.10.3.1.1]	Same argument regarding the applicability of 10.10 for WMPDPUs with VSD control

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Submittal Date: Mon May 30 11:07:23 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: Section 8.4 defines requirements for Water Mist positive Displacement Pumping Unit. Paragraph 14.2.6.6 applies to positive displacement pumps. By definition it is clear that 14.2.6.6 applies to positive displacement pumps.

Public Input No. 84-NFPA 20-2022 [New Section after 8.4.11]

8.4.13

Requirements in chapter 10.5.2.5 Sequence Starting of Pumps, shall not be applicable for the starting sequence of the pumps within a single WMPDPU.

Statement of Problem and Substantiation for Public Input

Chapter 10.5.2.5 seems to be applicable mainly for separate pump units which starts are sequenced. It is not suitable as is for WMPDPU internal sequencing. For example, the 20 second requirements as stated in 8.4.4 cannot be met in all cases if the starting sequence minimum interval is 5 seconds and total pump amount is more than 3 pumps within a single WMPDPU. Also starting of each motor doesn't need to be controlled by an individual control circuit loops as WMPDPU controller needs to have only one common control circuit look and the control logic within the controller as able to define the need to start individual motors.
A separate chapter could be made for the requirements for the internal pump start sequencing within the WMPDPU controller.

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Submittal Date: Mon May 30 11:10:44 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-107-NFPA 20-2022
Statement: Section 10.5.2.5 applies to starting sequence of pumps with multiple controllers. Since a water mist positive displacement pumping unit (WMPDPU) can only have one controller the requirements of 8.4.4 only need apply. Adding single controller requirement to 8.4.3 to clarify that the definition of a WMPDPU includes a single controller.

Public Input No. 86-NFPA 20-2022 [New Section after 8.4.11]

8.4.14

For WMPDPU's that are having redundancy to start a motor and pump manually in case of any single failure, the requirements in chapter 10.5.3.2.1 shall not apply and following requirements shall apply

8.4.14.1

The controller shall be equipped with an emergency-run switches that allows sufficient amount of motors and pumps to start.

8.4.14.2

The operating handles shall be marked or labeled as to function and operation.

Additional Proposed Changes

File Name	Description	Approved
8.4.14_redundant_motor.PNG	Example schematic	

Statement of Problem and Substantiation for Public Input

The intention of the requirements at chapter 10.5.3.2.1 are to allow operation of the motor in case of the coil/control circuits of the contactor are damaged.
To have an alternative option for the design for the WMPDPU's, the proposed update is made to meet the same level of the operational reliability. There the alternative design needs to have sufficient redundancy to start required capacity (amount of pumps) in case of a single failure in the contactor coil operational circuits.
Typical arrangement is visualized in the attached schematic, where a redundant motor and pump is used to compensate a lost of one pump capacity in case of a single failure of e.g. in a motor contactor coil. Further more the power feed for the contactor coils as well the wiring and control circuits shall be resistant to a single failure. For example, the power feed to the contactor coils are having a battery backup parallel to the main power supply for the coils. Short circuit at one contactor coil shall not prevent other coils from the operation.

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Submittal Date: Mon May 30 12:21:30 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: Emergency-Run Mechanical Control is the preferred method for motor starting in the event of control circuit failure. The use of the term sufficient is vague and unenforceable

as it relates to the number of switches required to start the pump(s).

Public Input No. 88-NFPA 20-2022 [New Section after 8.4.11]

8.4.15

Locked Rotor Overcurrent Protection requirements in 10.4.4. shall not be applicable to water mist positive displacement pumping unit that is equipped with a redundant motor and pump.

8.4.15.1 The overcurrent protective device to isolate the faulty motor shall be required and permitted between the isolating switch and the fire pump motor.

8.4.15.2 The overcurrent device shall be located within the fire pump controller.

8.4.15.3 For a squirrel-cage or wound-rotor induction motor, the device shall be of the time-delay type having tripping times between 8 seconds and 12 seconds at locked rotor current

8.4.15.4 It shall be possible to reset the device for operation immediately after tripping, with the tripping characteristics thereafter remaining unchanged.

8.4.15.5 Tripping shall comply with both of the following:

- (a) Tripping shall be accomplished by opening the circuit breaker.
- (b) The circuit breaker shall be of the external manual reset type.

8.4.15.6 In case the faulty motor is isolated, the redundant motor shall start shortly to compensate the lost capacity to meet the performance requirements as stated in 8.4.4

Statement of Problem and Substantiation for Public Input

NFPA20 has following rationalize for 10.4.4:
"The locked rotor protector can now be set between 8-12 seconds in accordance with FR25. The 3 minutes now required is at a minimum, not maximum, of 300%. This is to allow single phase running for at least 3 minutes. These requirements are part of the existing section 10.4.4."

Marioff proposes to have alternative solution where instead of trying to run the motor and pump with a single phase, the faulty motor would be isolated and healthy motor and pump would be started instead of it to compensate the lost capacity. The alternative requirements are mostly the same, only the time to require minimum 3 min at 300% is removed with the expectation that the single phase failure for the running motor will happen to only one motor at the time. Should the committee consider that the single phase failure has a significant chance to happen to all running motors at once, the current PI is not relevant. (the 3-phase motor is not expected to be able to start in case it is not running and a single phase condition appears before motor is started)

After some studies, the typical causes for single phasing are:
Dysconnectivity of one of the phases from the supply to the motor
A single cable damage out of three phases to the motor
Loose termination which breaks the terminal connections
Aging and continuous vibration in the cable termination
The motor circuit has contactors which supply the current. One of the contactors is open circuited.
Faulty contactor / starter or damage relay with rusty contacts which leaves an open phase
Blown fuse of one phase out of three phase lines
The improper configuration of protection scheme
Sources:
https://www.marineinsight.com/marine-electrical/single-phasing-in-electrical-motors-causes-effects-and-protection-methods/
https://www.electricaltechnology.org/2021/11/what-happens-to-the-3-phase-motor-when-1-out-of-3-phases-is-lost.html

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Submittal Date: Mon May 30 12:55:24 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: The proposal removes the requirement to hold a minimum of 300 percent of motor full-load current for three minutes, but provides no requirements addressing motors drawing currents in the range of 300 percent motor full-load to locked-rotor. The reference to ”faulty motor” is not understood as there is no criteria provided to determine when a motor is “faulty.”

Public Input No. 89-NFPA 20-2022 [New Section after 8.4.11]

8.4.16

When the water mist positive displacement pump unit is equipped with VSD, including the "fire mode" feature, the requirements in chapters 10.5.3.2, 10.10.3.3, 10.10.3.5, 10.10.4 and 10.10.5 shall not apply for the motor start circuit with the VSD.

8.4.16.1

Fire mode feature shall make the VSD to operate the motor at line speed, to ignore all internal VSD protection mechanisms and to operate at the same speed until it is not mechanically possible.

8.4.16.2

Fire mode feature shall be possible to start manually and externally in case of an emergency and the operation handle shall be marked or labeled as to function and operation.

Additional Proposed Changes

File Name	Description	Approved
10.10_VSD_control_and_fire_mode.PNG	Example schematic	

Statement of Problem and Substantiation for Public Input

Current, in built, technology of the VSD's allows to have a more simplified design for the VFD lines, reducing the need to have a separate by-pass line for the VFD. See an example schematic.

By-pass feature for the VSD/VFD is the fire mode, thus it will not require the VSD separation from the line.
Fire mode as a feature in VSD can be used to make similar approach as 10.5.3.2, emergency hand lever does.
It will force the VSD to run the motor and pump at line frequency, bypassing it's internal protection mechanisms, by forcing semi conductor relays to close, keeping the VSD running until it gets physically destroyed or until the request to run the pump and motor is cleared.
Fire mode feature also eliminates the need to have by-pass contactors (10.10.4) and a separate circuit breaker (10.10.5) as the only power source to the motor is through the VSD that can be forced to operate until it just is not able to do it.
Switch for the fire mode can be a normal latching motor start switch with NO or NC contact. VSD, with a fire mode input, typically feeds a low voltage to the contact of the switch by itself, thus independent on any auxiliary voltage sources.
See attached fire mode manual from one VSD manufacturer for more details of the fire mode. Key details in chapter 1.
The manual is publicly available e.g. from following link:
https://files.danfoss.com/download/Drives/Vacon-NXS-NXP-Fire-Mode-PID-ASFIFF11-Appl-Man-UD00752C-EN.PDF
Or by using following words in search engine like google: vacon fire mode pid

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Submittal Date: Tue May 31 08:19:34 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: The term “fire mode” is not defined other than in some supplier literature. Any time a variable speed drive is used, a bypass contactor is required to operate the pump separate from the variable speed drive, should the drive fail. The variable speed drive alone does not provide the required reliability for a fire pump.

Public Input No. 79-NFPA 20-2022 [Section No. 8.4.11]

8.4.11

The phase reversal requirements in 10.4.6.2.1, 10.4.6.2.2, ~~and 10~~ 1 0 .4.7.2.3, and 10.8.3.6.4 shall not be applicable to positive displacement pumps that are able to deliver the required flow and pressure regardless of direction of rotation.

Statement of Problem and Substantiation for Public Input

As per 8.4.11, where positive displacement pumps that are able to deliver the required flow and pressure regardless of direction of rotation, the phase monitoring is not required.
In this update, the power transfer switch for the WMPDPU units should not have either the requirement for phase monitoring.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 77-NFPA 20-2022 [New Section after 8.4.11]	
Public Input No. 78-NFPA 20-2022 [New Section after 8.4.11]	

Submitter Information Verification

Submitter Full Name: Seppo Koskela
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Submittal Date: Mon May 30 09:54:10 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-12-NFPA 20-2022
Statement: Where positive displacement pumps are able to deliver the required flow and pressure regardless of direction of rotation, monitoring for phase reversal and the test for phase reversal in Chapter 14 are not required. Therefore, the requirements in 10.8.3.6.4 and 14.2.6.12 do not apply.

Public Input No. 92-NFPA 20-2022 [Section No. 9.2.3 [Excluding any Sub-Sections]]

For fire pump installations using the arrangement in 9.2.2(1), 9.2.2(2), 9.2.2(3), or 9.2.2(5) for the normal source of power, ~~no more than one~~ a single disconnecting means and associated overcurrent protection device shall be permitted to be installed in the power supply to the fire pump controller.

Statement of Problem and Substantiation for Public Input

This clarifies that the disconnect switch is not required, but if provided only one can be installed.

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
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Submittal Date: Wed Jun 01 10:18:10 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-13-NFPA 20-2022
Statement: The revised language does not change the requirement, but clarifies the current text.

Public Input No. 35-NFPA 20-2022 [Section No. 9.2.3.4.2]

~~9~~

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~~2.3.4.2 Overcurrent Device Selection.~~

~~An instantaneous trip circuit breaker shall be permitted in lieu of the overcurrent devices specified in 10.8.2.2(2) provided it is part of a transfer switch assembly listed for fire pump service and complies with 9.2.3.4.1 .~~

Statement of Problem and Substantiation for Public Input

9.2.3.4.2 is not needed since item (7) has been added to 9.2.3.4.1 and 10.8.2.2(2) refers to section 9.2.3.4.1

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: Nema
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 25 14:56:26 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-15-NFPA 20-2022
Statement: Clause 9.2.3.4.2 is not needed since item (7) of 9.2.3.4.1, which has been moved to new 9.2.3.4.1.1, is coupled to 9.2.3.4 by reference and 10.8.2.2(2) refers to 9.2.3.4.

Public Input No. 51-NFPA 20-2022 [New Section after 9.2.3.4.3]

TITLE OF NEW CONTENT

Type your content here ...

9.2.3.4.4

For either 9.2.3.4 or 9.2.3.4.1, arc resistant rated equipment shall be provided.

Statement of Problem and Substantiation for Public Input

Arc flash mitigation for personnel protection should be provided for all electrical equipment that fire pump testing and maintenance personnel operate on the line side of the fire pump controller.

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 25 20:06:28 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution:
Statement: Arc flash mitigation for personnel protection should be provided for all electrical equipment that fire pump testing and maintenance personnel operate on the line side of the fire pump controller.

Public Input No. 36-NFPA 20-2022 [Section No. 9.2.3.4.3]

~~9.2.3.4.3~~ –

~~An instantaneous trip circuit breaker shall be permitted in lieu of the overcurrent device specified in 9.2.3.4 provided it is part of an assembly listed for fire pump service and complies with 9.2.3.4.1 .~~

Statement of Problem and Substantiation for Public Input

9.2.3.4.3 is not needed since item (7) has been added to 9.2.3.4.1

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: Nema
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City:
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Submittal Date: Wed May 25 14:59:01 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-16-NFPA 20-2022
Statement: Clause 9.2.3.4.3 is not needed since item (7) of 9.2.3.4.1, which has been moved to new 9.2.3.4.1.1, is coupled to 9.2.3.4 by reference and 10.8.2.2(2) refers to 9.2.3.4.

Public Input No. 37-NFPA 20-2022 [Sections 9.3.1, 9.3.2]

Sections 9.3.1, 9.3.2

9.3.1

Unless there is an installed power arrangement as described in 9.3.3, at least one alternative source of power shall be provided ~~for high-rise buildings~~ .

~~9.3.2~~ ~~*~~

~~Other Sources.~~

~~Except for an arrangement described in 9.3.3 , at least one alternate source of power shall be provided~~

~~(1) where the normal source is not reliable.~~

~~(2) for high-rise buildings~~

Statement of Problem and Substantiation for Public Input

Combines 9.3.1 and 9.3.2 together for clarity

Submitter Information Verification

Submitter Full Name: Megan Hayes
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Street Address:
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Submittal Date: Wed May 25 15:01:19 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-19-NFPA 20-2022
Statement: This revision combines 9.3.1 and 9.3.2 together for clarity. Current 9.3.3 becomes 9.3.2. Remaining sections after 9.3.2 shall be renumbered. Relocate existing annex from 9.3.2 to 9.3.1(1).

Public Input No. 52-NFPA 20-2022 [New Section after 9.3.6.2]

TITLE OF NEW CONTENT

Type your content here ...

9.3.6.3

The power transfer switch shall be installed in accordance with 10.8.2.2

Statement of Problem and Substantiation for Public Input

The additional transfer switch for the additional source is a critical device in the alternate source of power for a fire pump so it should be installed as an arrangement II transfer switch.

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
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Zip:
Submittal Date: Wed May 25 20:27:26 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-20-NFPA 20-2022

Statement: The additional transfer switch for the additional source is a critical device in the alternate source of power for a fire pump so it should be installed as an Arrangement II transfer switch.

Public Input No. 38-NFPA 20-2022 [Section No. 9.5.3.3]

9.5.3.3

Fire pump ~~motors that are~~ motors shall be marked with the maximum allowable service factor amps that can be used.

9.5.3.3.1

Where the motor is also listed as inverter duty

~~motors shall be marked with~~
, the maximum allowable service factor amps that can be used when connected to a variable frequency

~~drive~~
drive (VFD) shall be marked .

Additional Proposed Changes

File Name	Description	Approved
NFPA_20-2025_PI_9.5.3.3.docx	PI 9.5.3.3	

Statement of Problem and Substantiation for Public Input

14.2.6.7.1 and 14.2.6.7.2 require that the FLA times the service factor not be exceeded; however, this has led to motors being rejected by the AHJ when the motors are running at the maximum Service Factor. Since the Service Factor is the amount of additional horsepower that is allowed, not the additional current, the formula to use the FLA times the SF is an approximation. The precise rating to use is the Service Factor Amps.

Submitter Information Verification

Submitter Full Name: Megan Hayes
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City:
State:
Zip:
Submittal Date: Wed May 25 15:06:18 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-109-NFPA 20-2022
Statement: Clauses 14.2.6.7.1 and 14.2.6.7.2 require that the FLA times the service factor not be exceeded. However, this has led to motors being rejected by the AHJ when the motors are running at the maximum Service Factor. Since the Service Factor is the amount of additional horsepower that is allowed, not the additional current, the formula to use the FLA times the SF is an approximation. The precise rating to use is the Service Factor Amps for all motors, not just inverter duty motors.

Public Input No. 1-NFPA 20-2021 [Section No. 9.6.5.1]

9.6.5.1

Protective devices installed in the fire pump circuits of the on-site generator power source shall allow instantaneous pickup of the full pump room load and shall comply with *NFPA 70*, Section 700.~~28~~ 32 .

Additional Proposed Changes

File Name	Description	Approved
NFPA_20_PC_7.pdf	NFPA 20_PC 7	

Statement of Problem and Substantiation for Public Input

NOTE: This Public Input appeared as “Reject but Hold” in Public Comment No. 7 of the (A2021) Second Draft Report for NFPA 20 and per the Regs. at 4.4.8.3.1.

The requirements for selective coordination, previously in NEC 700.28, are now located in NEC 700.32.

Submitter Information Verification

Submitter Full Name: TC on FIM-AAA
Organization: NFPA
Street Address:
City:
State:
Zip:
Submittal Date: Tue Oct 05 08:45:04 EDT 2021
Committee: FIM-AAA

Committee Statement

Resolution: FR-22-NFPA 20-2022
Statement: The requirements for selective coordination, previously in NEC 700.28, are now located in NEC 700.32.

Public Input No. 93-NFPA 20-2022 [Section No. 10.3.4.6]

10.3.4.6

~~Electrical supply conductors for~~ Each pressure maintenance (jockey or make-up) pump(s) shall ~~not be connected to the fire pump controller~~ have its own dedicated electrical supply conductors .

Statement of Problem and Substantiation for Public Input

The electrical supply for the jockey pump should not be permitted to be connected to the fire pump electrical supply including any junction boxes or tee taps.

Submitter Information Verification

Submitter Full Name: Kevin Hall
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Affiliation: American Fire Sprinkler Association
Street Address:
City:
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Submittal Date: Wed Jun 01 10:30:49 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: Insufficient substantiation is provided justifying the need for a dedicated supply. No problems resulting from the current text have been identified. Also, it is not understood what is meant by dedicated supply. It could be a separate branch circuit or service.

Public Input No. 87-NFPA 20-2022 [Section No. 10.4.2.4.1]

10.4.2.4.1

Unless the requirements of 10.4.2.1.2 or 10. 4.2.4.2 _ are met, the following warning shall appear on or immediately adjacent to the isolating switch:

WARNING

DO NOT OPEN OR CLOSE THIS SWITCH WHILE THE CIRCUIT BREAKER (DISCONNECTING MEANS) IS IN CLOSED POSITION.

Statement of Problem and Substantiation for Public Input

The warning label is for the use with an isolating switch that is not capable of opening the motor locked rotor current. Since a molded case switch is suitable for interrupting the motor locked rotor current, the warning label is not required.

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Mon May 30 12:26:33 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-23-NFPA 20-2022
Statement: The warning label is for an isolating switch that is not capable of opening the motor locked rotor current. Since a molded case switch is suitable for interrupting the motor locked rotor current, the warning label is not required.

Public Input No. 53-NFPA 20-2022 [Section No. 10.5.2.1.3.1]

10.5.2.1.3.1*

Where the electronic pressure sensor reading exceeds the higher of 10 psi (0.68 bar) or 3.33 percent of the controller rated pressure during any automatic pump start that was initiated by the solenoid drain valve, as required by 10.5.2.7.3, the controller shall activate a visual and audible alarm that can be silenced.

Statement of Problem and Substantiation for Public Input

Allows for a higher drop on high pressure systems but maintains the same percent of rated pressure.

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
Street Address:
City:
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Zip:
Submittal Date: Wed May 25 20:41:20 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-24-NFPA 20-2022
Statement: This revision allows for a higher drop on high pressure systems but maintains the same percent of rated pressure. Reference to maximum controller rated pressure aligns with the listing standard as the maximum pressure that can be put into the controller. Alarm is changed to signal as these conditions do not require immediate action.

Public Input No. 76-NFPA 20-2022 [Section No. 10.5.2.1.3.1]

10.5.2.1.3.1*

The controller shall activate a visual and audible alarm that can be silenced in one of the following conditions:

(1) Where the electronic pressure sensor reading exceeds 10 psi (0.68 bar) during any automatic pump start that was initiated by the solenoid drain valve, as required

~~by 10~~
by 10 .5.2.7.3

~~, the controller shall activate a visual and audible alarm that can be silenced~~

.

(2) Where the difference between the values from the electronic pressure sensors is more than 10% of the pressure maintenance level for 60 minutes in the systems that are equipped with two electronic pressure sensors and from where the lower value of the two is used for automatic pump start .

Statement of Problem and Substantiation for Public Input

This is an additional/optional method to verify pressure sensor reading for any controller.
This alternative method utilizes the existing redundancy and related possibility to generate alarm with sensors that are commonly used with WMPDPU systems as those uses two pressure sensors for redundancy by default.

When the system is equipped with two pressure sensors, it provides improved reliability to the automatic start.
Should there be a case where the pressure sensor values are not identical, to ensure that the minimum pressure level in the system is maintained in any situation, the lower reading value of the two sensor values shall be used to determine the actual system pressure. This prevents the situation in case one of the sensor reading has drifted upwards.
When the two pressure sensors values are compared between each other, an alarm can be given at any point of time when the pressure value starts to drift. The detection of the case is monitored after any system actions, whether it is after pressure maintenance or after pump start.

Submitter Information Verification

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Submittal Date: Mon May 30 09:13:47 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: Insufficient substantiation is provided to justify the minimum pressure difference of 10

percent between the pressure sensors and the allowance for 60 minutes before the controller activates the visual and audible alarm.

Public Input No. 39-NFPA 20-2022 [Section No. 10.5.2.1.3.2]

10.5.2.1.3.2*

Where an electronic pressure sensor is used to control fire pump operation, the fire pump controller shall monitor and provide ~~a~~ an audible and visual signal for the following electronic pressure sensor conditions:

(1) Any time the electronic pressure sensor output is less than 10 percent of rated span or below its rated zero pressure output

(2) Any time the electronic pressure sensor reading is more than 10 percent above its rated full-scale output

Statement of Problem and Substantiation for Public Input

The standard lacks specificity as to the type of signal required, which may be audible, visual, or other types. This PI specifies the type of signals the controller is required to provide and represents present-day designs.

Submitter Information Verification

Submitter Full Name: Megan Hayes
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Submittal Date: Wed May 25 15:21:17 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-25-NFPA 20-2022
Statement: The standard lacks specificity as to the type of signal required, which may be audible, visual, or other types. This revision specifies the type of signals the controller is required to provide and represents present day designs. “Electronic pressure sensor” removed as it is considered redundant.

Public Input No. 54-NFPA 20-2022 [Section No. 10.5.2.1.4]

10.5.2.1.4

There shall be no valve or other restrictions ~~within~~ as part of the controller ahead of the pressure-sensing device.

Statement of Problem and Substantiation for Public Input

Revision is compatible with 10.5.2.1.1.2 since water piping is no longer allowed inside the controller.

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
Street Address:
City:
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Submittal Date: Wed May 25 20:46:54 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-26-NFPA 20-2022
Statement: This revision is compatible with 10.5.2.1.1.2 since water piping is no longer allowed inside the controller.

Public Input No. 41-NFPA 20-2022 [Section No. 10.5.2.1.8]

10.5.2.1.8

Water pressure control shall be in accordance with 10.5.2.1.8.1 through 10.5.2.1.8.~~6~~ 8 .

10.5.2.1.8.1

Pressure -sensing element of the pressure-sensing device at the low adjustment setting shall initiate the pump starting sequence ~~(~~ if pump is not already in operation~~)~~ .

10.5.2.1.8.2*

A pressure-recording device shall record the pressure in each fire pump controller pressure-sensing line at the input to the controller.

10.5.2.1.8.3

The pressure recorder shall be listed as part of the controller or shall be a separately listed unit installed to sense the pressure at the input of the controller.

10.5.2.1.8.4

The recorder shall be capable of storing events for at least 7 days.

10.5.2.1.8.5

The pressure-sensing element of the recorder shall be capable of withstanding a momentary surge pressure of at least 400 psi (27.6 bar) or 133 percent of fire pump controller rated operating pressure, whichever is greater, without losing its accuracy.

10.5.2.1.8.6

For variable speed pressure limiting control, a ½ in. (12.7 mm) nominal size inside diameter pressure line shall be connected to the discharge piping at a point recommended by the variable speed control manufacturer. The connection shall be between the discharge check valve and the discharge control valve.

10.5.2.1.8.7

Access to the recorder data shall not require opening the controller nor require taking the controller out of service.

Statement of Problem and Substantiation for Public Input

This proposal corrects the range of requirements referenced in 10.5.2.1.8 and in 10.5.2.1.8.1, the proposal aligns with the text 12.7.2.1.8(1)

Submitter Information Verification

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Submittal Date: Wed May 25 15:30:16 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-28-NFPA 20-2022

Statement: This revision corrects the range of requirements referenced in 10.5.2.1.8 and aligns 10.5.2.1.8.1 with the text in 12.7.2.1.8(2). The term “sensing element” is changed to “pressure-sensing device” to clarify that it is the “pressure-sensing device” that initiates the pump starting sequence, not just the “pressure sensing element.”

Public Input No. 40-NFPA 20-2022 [New Section after 10.5.2.1.8.7]

10.5.2.1.8.8
There shall be no shutoff valve in the pressure sensing line.

Statement of Problem and Substantiation for Public Input

The proposal adds this new requirement to align with 12.7.2.1.8(2).

Submitter Information Verification

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City:
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Submittal Date: Wed May 25 15:25:31 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-29-NFPA 20-2022
Statement: The proposal adds this new requirement to align with 12.7.2.1.8(1).

Public Input No. 42-NFPA 20-2022 [Section No. 10.5.2.2.2]

10.5.2.2.2

The ~~pressure switch~~ pressure sensing device shall not be required.

Statement of Problem and Substantiation for Public Input

Presently, the standard does not recognize the use of a pressure switch and electronic pressure sensor. The proposal replaces the term “pressure-actuated switch” with “pressure-sensing device” to allow for this type of device.

Submitter Information Verification

Submitter Full Name: Megan Hayes
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Submittal Date: Wed May 25 15:35:24 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-30-NFPA 20-2022
Statement: Presently, the standard does not recognize the use of a pressure switch and electronic pressure sensor. The revision replaces the term“pressure-actuated switch”with “pressure-sensing device” to allow for this type of device.

Public Input No. 43-NFPA 20-2022 [Section No. 10.5.2.3.1]

10.5.2.3.1

Where the pump supplies special water control equipment (deluge valves, dry pipe valves, etc.), it shall be permitted to start the motor before the pressure ~~-actuated switch(es) would~~ sensing device would do so.

Statement of Problem and Substantiation for Public Input

Presently, the standard does not recognize the use of a pressure switch and electronic pressure sensor. The proposal replaces the term “pressure-actuated switch” with “pressure-sensing device” to allow for this type of device.

Submitter Information Verification

Submitter Full Name: Megan Hayes
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Street Address:
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Submittal Date: Wed May 25 15:38:42 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-31-NFPA 20-2022
Statement: Presently, the standard does not recognize the use of a pressure switch and electronic pressure sensor. The revision replaces the term “pressure-actuated switch(es)” with “pressure-sensing device(s)” to allow for this type of device.

Public Input No. 85-NFPA 20-2022 [Section No. 10.5.2.7.1]

10.5.2.7.1

The controller equipment shall be arranged to automatically start, run, and shut down the motor at the minimum no-flow test frequency and duration required by NFPA 25.

10.5.2.7.1.1

Automatic remote testing shall be permitted through a secure connection from authorized users.

Statement of Problem and Substantiation for Public Input

For automated testing, the controller will need to have the capability to be started and stopped remotely.

Submitter Information Verification

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Submittal Date: Mon May 30 11:58:28 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-37-NFPA 20-2022
Statement: This revision provides details on controller functionality in regards to remote testing.

Public Input No. 70-NFPA 20-2022 [Section No. 10.5.3.1.1]

10.5.3.1.1

There shall be a manually operated switch on the control panel so arranged that, when the motor is started manually, its operation cannot be affected by the pressure-~~actuated switch~~ sensing device .

Statement of Problem and Substantiation for Public Input

Presently, the standard does not recognize the use of a pressure switch and electronic pressure sensor. The proposal replaces the term “pressure-actuated switch” with “pressure-sensing device” to allow for this type of device.

Submitter Information Verification

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Submittal Date: Thu May 26 15:19:16 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-32-NFPA 20-2022
Statement: Presently, the standard does not recognize the use of a pressure switch and electronic pressure sensor. The revision replaces the term “pressure-actuated switch” with “pressure-sensing device” to allow for this type of device.

Public Input No. 71-NFPA 20-2022 [Section No. 10.8.2.1.6]

~~10.8.2.1.6~~ –

~~For fire pump installations using one disconnecting means and associated overcurrent protection device installed in the normal power supply to the fire pump controller as permitted in 9.2.3 , an instantaneous-trip circuit breaker shall be permitted in lieu of the overcurrent device specified in 9.2.3.4 provided it is part of an assembly listed for fire pump service and complies with 9.2.3.4 .~~

Statement of Problem and Substantiation for Public Input

10.8.2.1.6 is not needed since item (7) has been added to 9.2.3.4.1.

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: Nema
Street Address:
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Submittal Date: Thu May 26 15:22:38 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-33-NFPA 20-2022
Statement: Clause 10.8.2.1.6 is not needed since item (7) of 9.2.3.4.1, which has been moved to new 9.2.3.4.1.1, is coupled to 9.2.3.4 by reference and 10.8.2.2(2) refers to 9.2.3.4.

Public Input No. 72-NFPA 20-2022 [Section No. 10.8.2.2]

10.8.2.2 Arrangement II (Individually Listed Power Transfer Switch and Fire Pump Controller or Individually Listed Power Transfer Switch and Listed Combination Fire Pump Controller and Power Transfer Switch).

The following shall be provided:

(1) A fire pump controller power transfer switch complying with Sections 9.6 and 10.8 and a fire pump controller or combination fire pump controller and power transfer switch shall be provided.

(2) The Individually-Listed-Power-Transfer-Switch overcurrent protection ~~required by 10~~

(3) for both the normal and alternate sources shall comply with Section 9.2.3.4.

(4) The overcurrent protection required by 1 0 .8.2.2(2) ~~and~~

(5) and the isolating switch ~~required by~~

(6) in accordance with 10.8.2.2(~~3~~

(7) 4) shall be permitted to be provided in a separate enclosure ~~upstream~~

(8) on the line side of the transfer switch. ~~The transfer switch overcurrent protection for both the~~

(9) An isolating switch ahead of both normal and alternate sources ~~shall comply with 9.2.3.4 or 9.2.3.4.1 .~~

(10) ~~An instantaneous trip circuit breaker shall be permitted in lieu of the overcurrent devices specified in 10.8.2.2(2) provided it is part of a transfer switch assembly listed for fire pump service and complies with 9.2.3.4.1 .~~

(11) ~~An isolating switch ahead of the alternate source input terminals of the transfer switch~~ input terminals of the Individually-Listed-Power-Transfer-Switch may be provided.

(12) The circuit breaker or fuses and disconnecting means and isolating switch, where provided, shall meet the following requirements:

~~The isolating switch~~

(13) They shall be externally operable and lockable in both the closed and the open position.

(14) A placard with letters at least 1 in.(25mm) in height shall be externally installed on ~~the~~

(a) :

i. The isolating switch stating “Fire Pump Isolating Switch, ~~” with letters at least 1 in. (25 mm) in height.~~

(a) ”

ii. The overcurrent protection device stating "Fire Pump Overcurrent Device"

(b) A placard shall be placed adjacent to the fire pump controller stating the location of the overcurrent device, the isolating switch , where provided, and the location of the key (~~if the isolating switch is locked~~

(a) if locked).

(b) The circuit breaker or fuses and disconnecting means and isolating switch , where provided, shall be supervised by one of the following methods to indicate when it is not closed:

(15) Central station, proprietary, or remote station signal service

(16) Local signaling service that will cause the sounding of an audible signal at a constantly attended point

(17) Locking the circuit breaker or fuses and disconnecting means and isolating switch , where provided, closed

(18) Sealing of

~~isolating switches and~~

(a)

i. circuit breaker or fuses and disconnecting means and isolating switch and approved weekly recorded inspections where

~~isolating switches are~~

(a)

i. circuit breaker or fuses and disconnecting means and isolating switch, where provided, are located within fenced enclosures or in buildings under the control of the owner

~~This~~

(a) Where the circuit breaker or fuses and disconnecting means and isolating switch, where provided, are part of an Individually-Listed-Power-Transfer-Switch, this supervision shall operate an audible and visible signal on the transfer switch and permit monitoring at a remote point

~~, where required~~

(a) .

(19) The ~~isolation~~ isolating switch shall not have short-circuit ~~or overcurrent~~ , overcurrent, or self-protecting instantaneous protection as part of the switching mechanism of the isolating switch.

(20) The transfer switch shall be the delayed transition type with a maximum delay time of 3 seconds.

Additional Proposed Changes

File Name	Description	Approved
NFPA_20-2025_PI_10.8.2.2.docx	PI 10.8.2.2	

Statement of Problem and Substantiation for Public Input

The standard needs to recognize that a power transfer switch with a combination fire pump controller and power transfer switch is also an arrangement II configuration. Also, since 10.8.2.2(2) requires that the normal and emergency sources have overcurrent protection in accordance with section 9.2.3.4, the normal and emergency isolating switches can be optional. Further, no type of tripping is allowed for the isolating switch, including a “self-protecting instantaneous trip”.

9.2.3.4.2 is not needed since item (7) has been added to 9.2.3.4.1 and 10.8.2.2(2) refers to section 9.2.3.4.1

As in 9.2.3.3, all circuit breakers or fuses and disconnecting means and isolating switches should be required to be supervised

Submitter Information Verification

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Submittal Date: Thu May 26 15:29:43 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-38-NFPA 20-2022

Statement: The standard needs to recognize that a power transfer switch with a combination fire pump controller and power transfer switch is also an arrangement II configuration. Also, since 10.8.2.2(2) requires that the normal and emergency sources have overcurrent protection in accordance with section 9.2.3.4, the normal and emergency isolating switches can be optional. Further, no type of tripping is allowed for the isolating switch, including a “self-protecting instantaneous trip.” The reference to 9.2.3.4.1 for an instantaneous trip circuit breaker is not needed since item (7) of 9.2.3.4.1, which has been moved to new 9.2.3.4.1.1, is coupled to 9.2.3.4 by reference and 10.8.2.2(2) refers to section 9.2.3.4. As in 9.2.3.3, all circuit breakers or fuses and disconnecting means and isolating switches should be required to be supervised.

Public Input No. 47-NFPA 20-2022 [Section No. 10.8.3.6.2]

10.8.3.6.2

Where the voltage on any phase of the normal source falls below 85 percent of motor-rated voltage, the power transfer switch shall automatically initiate starting of the standby generator, ~~if~~ where provided ~~and not running~~ , and initiate transfer to the alternate source.

Statement of Problem and Substantiation for Public Input

The transfer switch always initiates a start when the voltage on the normal source falls below 85 percent. It's not selective based on whether the standby generator is running or not.

Submitter Information Verification

Submitter Full Name: William Stelter
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Street Address:
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Submittal Date: Wed May 25 19:22:11 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-34-NFPA 20-2022
Statement: The transfer switch always initiates a start when the voltage on the normal source falls below 85 percent. It's not selective based on whether the standby generator is running or not. Even if the generator is running, the transfer switch should still initiate starting to make certain the generator continues to run if other causes of starting that originally started the generator are removed.

Public Input No. 55-NFPA 20-2022 [Section No. 10.8.3.11]

10.8.3.11* Overcurrent Protection.

The power transfer switch shall not have short circuit or overcurrent protection, or self-protecting instantaneous trips as part of the switching mechanism of the transfer switch.

Statement of Problem and Substantiation for Public Input

Some transfer switches use Molded Case Switches, but even though they are called switches they may or may not have "self-protecting instantaneous trips" in them. This makes it clear that the transfer switch shall not have any type of tripping device in them.

Submitter Information Verification

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Zip:
Submittal Date: Wed May 25 20:49:42 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-35-NFPA 20-2022
Statement: Some transfer switches use Molded Case Switches, but even though they are called switches they may or may not have "self-protecting instantaneous trips" in them. This makes it clear that the transfer switch shall not have any type of tripping device in them.

Public Input No. 81-NFPA 20-2022 [Section No. 10.10.3.1 [Excluding any Sub-Sections]]

When the variable frequency drive is not at line frequency, and upon failure of the variable speed pressure-limiting control to keep the system pressure within 10 percent of the set pressure of the variable speed pressure-limiting control system for more than ~~15 seconds~~ 20 seconds , the controller shall bypass and isolate the variable speed pressure-limiting control system and operate the pump at rated speed.

Statement of Problem and Substantiation for Public Input

As per 8.4.4. and 10.10.9.4 WMPDPU has 20 sec time to reach set pressure within 10 percent. And also 20 sec to recover from the intermediate pressure drop due increased flow demand.
15 second time is insufficient to satisfy 8.4.4 requirement when WMPDPU has variable speed operation.
In case 20 seconds is not acceptable for all pump units in requirement 10.10.3, then 20 sec should be made explicit for WMPDPU's only.
This aspect was most likely missed during updates to NFPA20 2022.

Common argument/question committee, can and should the chapter 10.10 (Controllers with Variable Speed Pressure Limiting Control or Variable Speed Suction Limiting Control) be considered for WMPDPU's at all if it has VSD to control speed of one pump (other pumps will be controlled across the line with or without devices to smoothen the pump start). If yes, then the PI is valid with its change recommendation. If no, then a separate chapter(s) should be made to capture the requirements for the pumping units having combination of pumps that are driven with VSD and across the line.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 80-NFPA 20-2022 [Section No. 8.4.6]	
Public Input No. 82-NFPA 20-2022 [Section No. 10.10.3.1.1]	
Public Input No. 83-NFPA 20-2022 [New Section after 8.4.11]	

Submitter Information Verification

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Affiliation: Marioff Corp Oy Carrier Co
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Submittal Date: Mon May 30 11:00:12 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-36-NFPA 20-2022

Statement: Field experience has shown that 15 seconds of variable frequency drive failure to perform its intended function is insufficient to determine if the bypass operation should occur for controllers equipped with variable speed pressure limiting control or variable speed suction limiting control. If the variable speed pressure-limiting control fails to keep the system pressure within 10 percent of the set pressure of the variable speed pressure-limiting control system for more than 20 seconds, it is reasonable that the bypass operation shall occur.

Public Input No. 74-NFPA 20-2022 [Section No. 10.10.3.1.1]

10.10.3.1.1* Low-Pressure Bypass.

If the system pressure remains below ~~this~~ the low- pressure bypass setting for more than 15 seconds, the bypass operation shall occur.

Statement of Problem and Substantiation for Public Input

The standard should be more specific in terms of which pressure applies. The proposal defines what “this pressure” is.

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: Nema
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 26 16:23:03 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-39-NFPA 20-2022

Statement: The standard should be more specific in terms of which pressure applies. This revision defines what “this pressure” is.

Field experience has shown that the system pressure being below the low-pressure bypass setting for 15 seconds is insufficient to determine if the bypass operation should occur for controllers equipped with variable speed pressure limiting control or variable speed suction limiting control. If the system pressure remains below the low-pressure bypass setting for more than 20 seconds, it is reasonable that the bypass operation shall occur.

Public Input No. 82-NFPA 20-2022 [Section No. 10.10.3.1.1]

10.10.3.1.1* Low-Pressure Bypass.

If the system pressure remains below this pressure for more than ~~15 seconds~~ 20 seconds , the bypass operation shall occur.

Statement of Problem and Substantiation for Public Input

Same substantiation as for PI-81:
As per 8.4.4. and 10.10.9.4 WMPDPU has 20 sec time to reach set pressure within 10 percent. And also 20 sec to recover from the intermediate pressure drop due increased flow demand.
15 second time is insufficient to satisfy 8.4.4 requirement when WMPDPU has variable speed operation.
In case 20 seconds is not acceptable for all pump units in requirement 10.10.3, then 20 sec should be made explicit for WMPDPU's only.
This aspect was most likely missed during updates to NFPA20 2022.

Common argument/question committee, can and should the chapter 10.10 (Controllers with Variable Speed Pressure Limiting Control or Variable Speed Suction Limiting Control) be considered for WMPDPU's at all if it has VSD to control speed of one pump (other pumps will be controlled across the line with or without devices to smoothen the pump start). If yes, then the PI is valid with its change recommendation. If no, then a separate chapter(s) should be made to capture the requirements for the pumping units having combination of pumps that are driven with VSD and across the line.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 81-NFPA 20-2022 [Section No. 10.10.3.1 [Excluding any Sub-Sections]]	Same arguments and related change
Public Input No. 80-NFPA 20-2022 [Section No. 8.4.6]	Same arguments for the applicability of the chapter 10.10
Public Input No. 83-NFPA 20-2022 [New Section after 8.4.11]	

Submitter Information Verification

Submitter Full Name: Seppo Koskela
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Submittal Date: Mon May 30 11:02:01 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-39-NFPA 20-2022

Statement: The standard should be more specific in terms of which pressure applies. This revision defines what “this pressure” is.

Field experience has shown that the system pressure being below the low-pressure bypass setting for 15 seconds is insufficient to determine if the bypass operation should occur for controllers equipped with variable speed pressure limiting control or variable speed suction limiting control. If the system pressure remains below the low-pressure bypass setting for more than 20 seconds, it is reasonable that the bypass operation shall occur.

Public Input No. 98-NFPA 20-2022 [Section No. 11.2.4.2.3.4(B)]

(B)

Where special environments exist, ~~suitably~~ suitable rated enclosures shall be used.

Statement of Problem and Substantiation for Public Input

Editorial

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
State:
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Submittal Date: Wed Jun 01 10:42:53 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-81-NFPA 20-2022
Statement: This revision editorially corrects the text within the standard.

Public Input No. 99-NFPA 20-2022 [Section No. 11.2.4.3]

11.2.4.3 Variable Speed Pressure Limiting Control or Variable Speed Suction Limiting Control ~~(Optional)~~ .

11.2.4.3.1

Variable speed pressure limiting control or variable speed suction limiting control systems used on diesel engines for fire pump drive shall be listed for fire pump service and be capable of limiting the pump output total rated head (pressure) or suction pressure by reducing pump speed.

11.2.4.3.2

Variable speed control systems shall not replace the engine governor as defined in 11.2.4.1.

11.2.4.3.3

In the event of a failure of the variable speed control system, the engine shall operate at pump-rated speed with the governor defined in 11.2.4.1.

11.2.4.3.4 Pressure-Sensing Line.

11.2.4.3.4.1

A pressure-sensing line shall be provided to the engine with a ½ in. (12.7 mm) nominal size inside diameter line.

11.2.4.3.4.2

For pressure-limiting control, a sensing line shall be installed from a connection between the pump discharge flange and the discharge check valve to the engine.

11.2.4.3.4.3*

If the pressure-sensing line is installed where sediment could enter, a drop-down trap and a cleanout shall be installed.

11.2.4.3.4.4

For suction-limiting control, a sensing line shall be installed from a connection at the pump inlet flange to the engine.

11.2.4.3.5

Within 20 seconds after a demand to start, pumps shall supply and maintain a stable discharge pressure (±10 percent) throughout the entire range of operation.

11.2.4.3.5.1

The discharge pressure shall restabilize within 20 seconds whenever the flow condition changes.

Statement of Problem and Substantiation for Public Input

Are the entire requirements of this section optional? If not, (Optional) needs to be removed from the title or an additional section needs to be added stating the requirements are optional.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 100-NFPA 20-2022 [Section No. 11.2.8.5.3.8]	

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
State:
Zip:
Submittal Date: Wed Jun 01 10:44:11 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-82-NFPA 20-2022

Statement: The charging statement was added to make the requirements of this section enforceable when pressure limiting variable speed control is used. This revision also ensures that materials used for pressure sensing lines are in compliance with section 4.32.3.

Public Input No. 101-NFPA 20-2022 [Section No. 11.2.4.3.4]

11.2.4.3.4 Pressure-Sensing Line.

11.2.4.3.4.1

Unless modified by 11.2.4.3.4, pressure-sensing lines shall be installed in accordance with 4.32.

11.2.4.3.4.3

A pressure-sensing line shall be provided to the engine with a ½ in. (12.7 mm) nominal size inside diameter line.

11.2.4.3.4.~~2~~ 3

For pressure-limiting control, a sensing line shall be installed from a connection between the pump discharge flange and the discharge check valve to the engine.

11.2.4.3.4.~~3~~ 4 *

If the pressure-sensing line is installed where sediment could enter, a drop-down trap and a cleanout shall be installed.

11.2.4.3.4.4 5

For suction-limiting control, a sensing line shall be installed from a connection at the pump inlet flange to the engine.

Statement of Problem and Substantiation for Public Input

The requirements of 4.32 need to be referenced in this section, otherwise the requirements for sensing-lines in 11.2.4.3.4 would seem to supersede 4.32.

Submitter Information Verification

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Street Address:
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Submittal Date: Wed Jun 01 10:49:11 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-82-NFPA 20-2022
Statement: The charging statement was added to make the requirements of this section enforceable when pressure limiting variable speed control is used. This revision also ensures that materials used for pressure sensing lines are in compliance with section 4.32.3.

Public Input No. 100-NFPA 20-2022 [Section No. 11.2.8.5.3.8]

11.2.8.5.3.8 Potable Water Separation~~- (Optional)~~ .

Where two levels of separation for possible contaminants to the ground or potable water source are required by the authority having jurisdiction, dual spring-loaded check valves or backflow preventers shall be installed.

(A)*

The spring-loaded check valve(s) shall replace the second indicating manual shutoff valve(s) in the cooling loop assembly as stated in 11.2.8.5.3.3.

(B)*

If backflow preventers are used, the devices shall be listed for fire protection service and installed in parallel in the water supply and water supply bypass assembly.

(C)

Where the authority having jurisdiction requires the installation of backflow prevention devices in connection with the engine, special consideration shall be given to the increased pressure loss, which will require that the cooling loop pipe size be evaluated and documented by engineering calculations to demonstrate compliance with the engine manufacturer's recommendation.

Statement of Problem and Substantiation for Public Input

Are the entire requirements of this section optional? If not, (Optional) needs to be removed from the title or an additional section needs to be added stating the requirements are optional.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 99-NFPA 20-2022 [Section No. 11.2.4.3]	Optional?

Submitter Information Verification

Submitter Full Name: Kevin Hall
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City:
State:
Zip:
Submittal Date: Wed Jun 01 10:45:09 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-83-NFPA 20-2022

Statement: The term Optional is not needed it is ambiguous, the option for potable water separation is already allowed in the existing text.

Public Input No. 16-NFPA 20-2022 [New Section after 11.3.1]

11.3.2*

Where the requirements of 11.3 rely on a normal source of power and the normal source power is unreliable, an alternate source of power shall be provided for those electrically operated components.

A.11.3.2

Examples of building functions that might require normal power are electrically operated ventilation or unit heaters within the pump room. Unreliable sources of power should be determined based on the recommendations in A.9.3.2.

Statement of Problem and Substantiation for Public Input

Alternate power needs to be required for proper operation building features (ventilation and heat) of a diesel engine fire pump any time the normal power to the building is considered unreliable. Without proper ventilation and room temperatures the pump assembly will not perform as designed.

Submitter Information Verification

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Submittal Date: Mon May 16 17:44:31 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-84-NFPA 20-2022
Statement: This revision assures that other equipment required by diesel driver to properly operate is functional during a loss of power.

Public Input No. 107-NFPA 20-2022 [Section No. 11.4.1.3.1 [Excluding any Sub-Sections]]

Fuel supply tank(s) shall be sized for a minimum of 12 hours of engine run time based on the fuel consumption rate requirements of the engine as indicated on the manufacturer's published data, plus 5 percent volume for expansion and 5 percent volume for sump.

Additional Proposed Changes

File Name	Description	Approved
NFPA_20_22-1_Log_No._1604.pdf	NFPA 20_22-1 Log No. 1604	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from Tentative Interim Amendment No. 22-1 (Log 1604) issued by the Standards Council on December, 8, 2021 and per the NFPA Regs., needs to be reconsidered by the Technical Committee for the next edition of the Document.

Substantiation: There are three different rates that are specified for diesel engines: Fuel Supply, Fuel Return, and Fuel consumption. The "fuel supply rate" is not the appropriate rate and should be changed to the "fuel consumption rate." As the section is currently written, this requirement would grossly over size the diesel fuel tank. This language needs to be changed for it to have the effect the committee wanted to achieve. This terminology was overlooked during the second draft meeting as the submitter used fuel consumption rate in his substantiation, but inadvertently used fuel supply rate in the submitted text.

Emergency Nature: The standard contains an error or an omission that was overlooked during the regular revision process. The requirements above were revised by SR-29. The submitter of the public comment that prompted this change referenced "fuel consumption rate" in his substantiation, however "fuel supply rate" was erroneously used in the revised text. As the section is currently written, this grossly oversize the diesel fuel tank. This language needs to be changed to meet the committee's and submitter's original intent.

Submitter Information Verification

Submitter Full Name: TC ON FIM-AAA
Organization: NFPA
Street Address:
City:
State:
Zip:
Submittal Date: Mon Jun 06 08:13:22 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: The committee accepts TIA 1604 and 1611 as written.

Public Input No. 108-NFPA 20-2022 [Section No. 11.4.1.3.1.1]

11.4.1.3.1.1*

When the fuel consumption rate requirements of the engine are not known, fuel supply tank(s) shall have a capacity at least equal to 1 gal per hp (5.07 L per kW), plus 5 percent volume for expansion and 5 percent volume for sump.

Additional Proposed Changes

File Name	Description	Approved
NFPA_20_22-2_Log_No._1611.pdf	NFPA 20_22-2 Log No. 1611	

Statement of Problem and Substantiation for Public Input

NOTE: This public input originates from Tentative Interim Amendment No. 22-2 (Log 1611) issued by the Standards Council on December, 8, 2021 and per the NFPA Regs., needs to be reconsidered by the Technical Committee for the next edition of the Document.

Substantiation: This subsection was missed by TIA No. 1604. There are three different rates that are specified for diesel engines: Fuel Supply, Fuel Return, and Fuel consumption. The "fuel supply rate" is not the appropriate rate and should be changed to the "fuel consumption rate." As the section is currently written, this requirement would grossly over size the diesel fuel tank. This language needs to be changed for it to have the effect the committee wanted to achieve. This terminology was overlooked during the second draft meeting as the submitter used fuel consumption rate in his substantiation, but inadvertently used fuel supply rate in the submitted text.

Emergency Nature: The standard contains an error or an omission that was overlooked during the regular revision process. The requirements above were revised by SR-29. The submitter of the public comment that prompted this change referenced “fuel consumption rate” in his substantiation, however “fuel supply rate” was erroneously used in the revised text. As the section is currently written, this grossly oversize the diesel fuel tank. This language needs to be changed to meet the committee’s and submitter’s original intent.

Submitter Information Verification

Submitter Full Name: TC ON FIM-AAA
Organization: NFPA
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City:
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Submittal Date: Mon Jun 06 08:28:18 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: The committee accepts TIA 1604 and 1611 as written.

Public Input No. 102-NFPA 20-2022 [Section No. 11.4.1.5.2]

11.4.1.5.2

Each tank shall have a drain connection.

11.4.1.5.2.1

A drain connection located in the lowest point of the tank shall be 1 in. (25 mm) NPT.

11.4.1.5.2.2

The tank shall be pitched to drain to the drain connection.

Statement of Problem and Substantiation for Public Input

In order to get all of the sediment out of the drain connection, the tank need to be nominally pitched towards the drain connection.

Submitter Information Verification

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Submittal Date: Wed Jun 01 10:56:28 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-85-NFPA 20-2022
Statement: The revised language will ensure that the tank is positioned in such a way such that water and debris will collect at the drain.

Public Input No. 103-NFPA 20-2022 [Section No. 12.3.5.3.3 [Excluding any Sub-Sections]]

~~Electrical supply conductors for~~ Each pressure maintenance (jockey or make-up) pump(s) shall ~~not be connected to the diesel engine fire pump controller~~ have its own dedicated electrical supply conductors .

Statement of Problem and Substantiation for Public Input

The electrical supply for the jockey pump should not be permitted to be connected to the fire pump electrical supply including any junction boxes or tee taps.

Submitter Information Verification

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Submittal Date: Wed Jun 01 11:11:30 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: Insufficient substantiation is provided justifying the need for a dedicated supply. No problems resulting from the current text have been identified. Also, it is not understood what is meant by dedicated supply. It could be a separate branch circuit or service.

Public Input No. 58-NFPA 20-2022 [Section No. 12.7.2.1.1]

12.7.2.1.1 Pressure-~~Actuated Switch~~ Sensing Device .

12.7.2.1.1.1

A pressure-sensing device, either a pressure- actuated switch or electronic pressure sensor, having adjustable high- and low-calibrated set points shall be provided as part of the controller ~~shall be provided~~ .

12.7.2.1.1.2*

Water piping shall not be extended into the controller.

12.7.2.1.1.3

For multistage multiport pumps, a dedicated pressure-actuated switch or electronic pressure sensor as described in 12.7.2.1.1.1 shall be provided for each discharge port of the pump as part of the controller.

12.7.2.1.1.4

For multistage multiport pumps, a dedicated pressure recorder as described in 12.4.4.1 shall be provided for each discharge port of the pump as part of the controller.

12.7.2.1.1.5

The requirements of 12.7.2.1.1.1 and 12.7.2.1.1.3 shall not apply to a non-pressure-actuated controller, where the pressure-actuated switch or pressure responsive means shall not be required.

Statement of Problem and Substantiation for Public Input

Aligns with 10.5.2.1.1 and 10.5.2.1.1.1

Submitter Information Verification

Submitter Full Name: William Stelter
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City:
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Submittal Date: Wed May 25 21:13:13 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-40-NFPA 20-2022
Statement: The revised text aligns with 10.5.2.1.1, 10.5.2.1.1.1, 10.5.2.1.1.3, 10.5.2.1.1.5 and clarifies which requirements do not apply to a non-pressure-actuated controller.

Public Input No. 56-NFPA 20-2022 [Section No. 12.7.2.1.1.3]

12.7.2.1.1.3

For multistage multiport pumps, a dedicated pressure-~~actuated switch or electronic pressure sensor~~ sensing device as described in 12.7.2.1.1.1 shall be provided for each discharge port of the pump as part of the controller.

Statement of Problem and Substantiation for Public Input

Aligns with 10.5.2.1.1.3.

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
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Submittal Date: Wed May 25 21:01:18 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-40-NFPA 20-2022
Statement: The revised text aligns with 10.5.2.1.1, 10.5.2.1.1.1, 10.5.2.1.1.3, 10.5.2.1.1.5 and clarifies which requirements do not apply to a non-pressure-actuated controller.

Public Input No. 57-NFPA 20-2022 [Section No. 12.7.2.1.1.5]

12.7.2.1.1.5

The requirements of 12.7.2.1.1.1 and 12.7.2.1.1.3 shall not apply to a non-pressure-actuated controller, where the pressure~~-actuated switch or pressure responsive means~~ sensing device shall not be required.

Statement of Problem and Substantiation for Public Input

Aligns with 10.5.2.1.1.5

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
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Submittal Date: Wed May 25 21:08:08 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-40-NFPA 20-2022
Statement: The revised text aligns with 10.5.2.1.1, 10.5.2.1.1.1, 10.5.2.1.1.3, 10.5.2.1.1.5 and clarifies which requirements do not apply to a non-pressure-actuated controller.

Public Input No. 59-NFPA 20-2022 [Section No. 12.7.2.1.2]

12.7.2.1.2

There shall be no pressure snubber or restrictive orifice employed within the pressure ~~switch or pressure responsive means~~ -sensing device .

Statement of Problem and Substantiation for Public Input

Aligns with 10.5.2.1.2.

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
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Submittal Date: Wed May 25 21:19:37 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-41-NFPA 20-2022
Statement: The revised text aligns with 10.5.2.1.2.

Public Input No. 62-NFPA 20-2022 [Section No. 12.7.2.1.3 [Excluding any Sub-Sections]]

Where an electronic pressure sensor is used to automatically control fire pump operation, the fire pump controller shall monitor ~~the transducer~~ this electronic pressure sensor during automatic testing.

Statement of Problem and Substantiation for Public Input

Aligns with 10.5.2.1.3.

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
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Submittal Date: Wed May 25 21:37:13 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-42-NFPA 20-2022
Statement: The revised text aligns with 10.5.2.1.3.

Public Input No. 60-NFPA 20-2022 [Section No. 12.7.2.1.3.1]

12.7.2.1.3.1*

~~When~~ Where the ~~transducer~~ electronic pressure sensor reading exceeds the higher of 10 psi (0.68 bar) or 3.33 percent of the controller rated pressure during any automatic pump start where initiated by the solenoid drain valve as required by 12.7.2.7.3, the controller shall activate a visual and audible alarm that can be silenced.

Statement of Problem and Substantiation for Public Input

Aligns with 10.5.2.1.3.1

Submitter Information Verification

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Street Address:
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Submittal Date: Wed May 25 21:22:54 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-93-NFPA 20-2022
Statement: This revision allows for a higher drop on high pressure systems but maintains the same percent of rated pressure. Reference to maximum controller rated pressure aligns with the listing standard as the maximum pressure that can be put into the controller. Alarm is changed to signal as these conditions do not require immediate action.

Public Input No. 61-NFPA 20-2022 [Section No. 12.7.2.1.3.2]

12.7.2.1.3.2*

Where an electronic pressure sensor is used to control fire pump operation, the fire pump controller shall monitor ~~for~~ and provide ~~a~~ an audible and visual signal for the following electronic pressure sensor conditions~~.~~ :

(1) Any time the ~~transducer~~ electronic pressure sensor output is less than 10 percent of rated span or below its rated zero pressure output

(2) Any time the electronic pressure ~~transducer~~ sensor reading is more than 10 percent above its rated full-scale output

Statement of Problem and Substantiation for Public Input

Aligns with 10.5.2.1.3.2 (as revised).

Submitter Information Verification

Submitter Full Name: William Stelter
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Submittal Date: Wed May 25 21:27:28 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-43-NFPA 20-2022
Statement: The revised text aligns with 10.5.2.1.3.2 (as revised). Second “Electronic pressure sensor” removed as it is considered redundant.

Public Input No. 63-NFPA 20-2022 [Section No. 12.7.2.1.4]

12.7.2.1.4

There shall be no valve or other restrictions ~~within~~ as part of the controller ahead of the pressure~~ switch or pressure responsive means~~ -sensing device .

Statement of Problem and Substantiation for Public Input

Aligns with 10.5.2.1.4 (as revised).

Submitter Information Verification

Submitter Full Name: William Stelter
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Submittal Date: Wed May 25 21:40:44 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-44-NFPA 20-2022
Statement: The revised text aligns with 10.5.2.1.4 (as revised).

Public Input No. 64-NFPA 20-2022 [Section No. 12.7.2.1.5]

12.7.2.1.5

This ~~switch~~ pressure-sensing device shall be responsive to water pressure in the fire protection system.

Statement of Problem and Substantiation for Public Input

Aligns with 10.5.2.1.5

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
Street Address:
City:
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Submittal Date: Wed May 25 21:44:42 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-45-NFPA 20-2022
Statement: The revised text aligns with 10.5.2.1.5.

Public Input No. 65-NFPA 20-2022 [Section No. 12.7.2.1.6]

12.7.2.1.6

The pressure- sensing ~~element of the switch~~ device shall be capable of withstanding a momentary surge pressure of 400 psi (27.6 bar) or 133 percent of fire pump controller rated operating pressure, whichever is higher, without losing its accuracy.

Statement of Problem and Substantiation for Public Input

Aligns with 10.5.2.1.6.

Submitter Information Verification

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Submittal Date: Wed May 25 21:46:50 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-46-NFPA 20-2022
Statement: The revised text aligns with 10.5.2.1.6. Reference to maximum rated pressure aligns with the listing standard as the maximum pressure that can be put into the controller.

Public Input No. 66-NFPA 20-2022 [Section No. 12.7.2.1.7]

12.7.2.1.7

Suitable provision shall be made for relieving pressure to the pressure-~~actuated switch~~ sensing device to allow testing of the operation of the controller and the pumping unit. *[See Figure A.4.32(a) and Figure A.4.32(b).]*

Statement of Problem and Substantiation for Public Input

Aligns with 10.5.2.1.7.

Submitter Information Verification

Submitter Full Name: William Stelter
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Street Address:
City:
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Submittal Date: Wed May 25 21:49:42 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-47-NFPA 20-2022
Statement: The revised text aligns with 10.5.2.1.7. 'Suitable' has been deleted as it is vague and unenforceable.

Public Input No. 67-NFPA 20-2022 [Section No. 12.7.2.1.8]

12.7.2.1.8

Water pressure control shall be as follows:

(1) There shall be no shutoff valve in the pressure sensing line.

(2) Pressure ~~switch actuation~~ sensing element of the pressure-sensing device at the low adjustment setting shall initiate the pump starting sequence if the pump is not already in operation.

Statement of Problem and Substantiation for Public Input

Aligns with 10.5.2.1.8.1.

Submitter Information Verification

Submitter Full Name: William Stelter
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Submittal Date: Wed May 25 21:51:51 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-48-NFPA 20-2022
Statement: The revised text aligns with 10.5.2.1.8.1.

Public Input No. 31-NFPA 20-2022 [Section No. 14.1.1.1]

14.1.1.1

~~Suction~~ Underground portions of suction piping shall be flushed at a flow rate not less than indicated in Table 14.1.1.1 or at the hydraulically calculated water demand rate of the system, whichever is greater.

Table 14.1.1.1 Minimum Flow Rates for Flushing Suction Piping

Nominal Pipe Size (in.)	Flow rate (gpm)	Nominal Pipe Size (mm)	Flow Rate (L/min)
1	37	25	140
1½	85	38	330
2	150	50	570
2½	229	65	870
3	330	75	1,250
3½	450	85	1,710
4	590	100	2,240
5	920	125	3,490
6	1,360	150	5,150
8	2,350	200	8,900
10	3,670	250	13,900
12	5,290	300	20,100
14	7,200	350	27,300
16	9,400	400	35,600

Statement of Problem and Substantiation for Public Input

Aboveground piping does not need to be flushed.

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
State:
Zip:
Submittal Date: Mon May 16 19:27:18 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-88-NFPA 20-2022

Statement: Flushing of suction piping only applies to the underground portion to remove any soil, stones, or other debris that may have entered the piping during installation. Flushing overhead piping isn't necessary and can be extremely difficult for suction piping in a high-rise building. Commas are removed from the flow rates in L/min to conform to standard SI numerals.

Public Input No. 10-NFPA 20-2022 [Section No. 14.1.2.2]

14.1.2.2

The pressure required in 14.1.2.1 shall be maintained without loss for 2 hours.

14.1.2.3

Loss shall be determined by a drop in gauge pressure or visual leakage.

Statement of Problem and Substantiation for Public Input

There is currently no acceptance criteria in NFPA 20 for a hydrostatic test. This pass/fail criteria correlates with the requirements for hydrostatic tests of aboveground piping.

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 22 13:42:11 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-108-NFPA 20-2022
Statement: Pass/fail criteria is added for the hydrostatic testing of above ground piping within the fire pump assembly. Additional criteria is added for packaged fire pump assemblies. The hydrostatic test for these assemblies is witnessed and certified by a third party.

Public Input No. 68-NFPA 20-2022 [Section No. 14.2.6.7.1]

14.2.6.7.1

For electric motors operating at rated voltage and frequency, the ampere demand on each phase shall not exceed the Service Factor Amps on the motor nameplate. If Service Factor Amps are not available, the product of the motor full-load ~~ampere rating~~ amps from NFPA 70, Table 430.248 or 430.250 times the allowable service factor ~~as stamped on the motor nameplate~~ shall not be exceeded .

Statement of Problem and Substantiation for Public Input

The motor Service Factor applies to the extra horsepower that can be drawn from the motor under normal conditions. The amps drawn at the service factor horsepower is the service factor amps. It's not precisely the FLA times the service factor, so if the FLA times the SF is to be used as the approximate service factor amps, the FLA should be taken from the NEC tables.

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 25 21:58:26 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-49-NFPA 20-2022
Statement: The Service Factor Amps (SFA) marked on the motor or in the manufacturer's documentation should be the primary source for obtaining the SFA. The motor Service Factor applies to the extra horsepower that can be drawn from the motor under normal conditions. The amps drawn at the service factor horsepower is the SFA. It's not precisely the FLA times the service factor, so if the FLA times the SF is to be used as the approximate SFA, the FLA should be taken from the NEC tables.

Public Input No. 69-NFPA 20-2022 [Section No. 14.2.6.7.2]

14.2.6.7.2*

For electric motors operating under varying voltage, the product of the actual voltage and current demand on each phase shall not exceed the product of the rated voltage and Service Factor Amps. If Service Factor Amps are not available, the product of the rated voltage and motor full-load ~~current~~ amps from NFPA 70, Table 430.248 or 430.250 times the allowable service factor shall not be exceeded .

Statement of Problem and Substantiation for Public Input

The motor Service Factor applies to the extra horsepower that can be drawn from the motor under normal conditions. The amps drawn at the service factor horsepower is the service factor amps. It's not precisely the FLA times the service factor, so if the FLA times the SF is to be used as the approximate service factor amps, the FLA should be taken from the NEC tables.

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 25 22:07:00 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-50-NFPA 20-2022
Statement: The Service Factor Amps (SFA) marked on the motor or in the manufacturer's documentation should be the primary source for obtaining the SFA. The motor Service Factor applies to the extra horsepower that can be drawn from the motor under normal conditions. The amps drawn at the service factor horsepower is the SFA. It's not precisely the FLA times the service factor, so if the FLA times the SF is to be used as the approximate SFA, the FLA should be taken from the NEC tables.

Public Input No. 48-NFPA 20-2022 [Section No. 14.2.8.1]

14.2.8.1

On installations with an alternate source of power and an automatic transfer switch, loss of primary source shall be simulated to automatically initiate the starting of the standby generator, where provided, and transfer shall occur while the pump is operating at peak load.

14.2.8.1.1

Where two or more alternate sources are provided, loss of primary source shall be simulated for each additional alternate source to automatically initiate the starting of the standby generator, where provided, and transfer shall occur while the pump is operating at peak load.

Statement of Problem and Substantiation for Public Input

Assures that the standby generator is started by the loss of primary power to the alternate source or additional alternate source.

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 25 19:28:08 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-52-NFPA 20-2022

Statement: The revised text assures that the standby generator is started by the loss of the normal source of power to the alternate source or additional alternate source. Where two or more alternate sources are provided transfer to the alternate source of power shall be to a standby generator or utility. The term “primary source” is changed to “normal source of power” for consistency with the use of the term in Chapter 9.

Public Input No. 23-NFPA 20-2022 [Section No. A.4.7.6]

A.4.7.6

For centrifugal and turbine pumps, the maximum brake horsepower required to drive the pump typically occurs at a flow beyond 150 percent of the rated capacity. For positive displacement pumps, the maximum brake horsepower required to drive the pump typically occurs when the relief valve is flowing 100 percent of the rated pump capacity. Pumps connected to variable speed drivers can operate at lower speeds, but the driver needs to be selected based upon the power required to drive the pump at rated speed and maximum pump load ~~under any flow condition~~ up to 175 percent rated flow .

Statement of Problem and Substantiation for Public Input

See PI 22

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 22-NFPA 20-2022 [Section No. 4.7.6]	Corresponding change to annex text

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
State:
Zip:
Submittal Date: Mon May 16 18:50:39 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-66-NFPA 20-2022

Statement: The current requirement grossly oversizes the power requirements for fire pumps. Pumps are only designed up to 150 percent capacity and past that point the liquid supply could be insufficient and the motor should not need to run past that point (plus a safety factor).

Public Input No. 45-NFPA 20-2022 [Section No. A.4.13.1.1]

A.4.13.1.1— .1

Under no-flow conditions, the jockey pump might maintain the pressure in the system above the set pressure, causing the variable speed control to slow down. However, there is still a need to discharge a small amount of water to cool the pump.

A.4.13.1.1.2

Since the setting required in 4.13.1.1.1 is much lower than it would be for the pump running in the bypass, the flow to the drain will be quite large in the bypass mode. It can overwhelm the drain, so to reduce the flow in the bypass mode a restricting orifice is required. The other automatic circulation relief valve is set as a non-variable speed pump would be set.

Statement of Problem and Substantiation for Public Input

Adds an explanation as to why the additional casing relief valve is needed.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 44-NFPA 20-2022 [Section No. 4.13.1.1]	

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 25 19:03:11 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-73-NFPA 20-2022
Statement: The revision allows the additional valve as optional instead of required. The specifics of an installation, including drain capabilities, are different from one to another. The necessity of the additional valve shall be determined by those responsible for the installation.

Public Input No. 28-NFPA 20-2022 [Section No. A.4.15.2]

~~**A.4.15.2** —~~

~~Flanges welded to pipe are preferred.~~

Statement of Problem and Substantiation for Public Input

Flanges welded to the pipe are no longer the preferred method of install.

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
State:
Zip:
Submittal Date: Mon May 16 19:16:29 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-76-NFPA 20-2022
Statement: Flanges welded to the pipe are no longer the preferred method of install.

Public Input No. 34-NFPA 20-2022 [Section No. A.4.16.4]

A.4.16.4

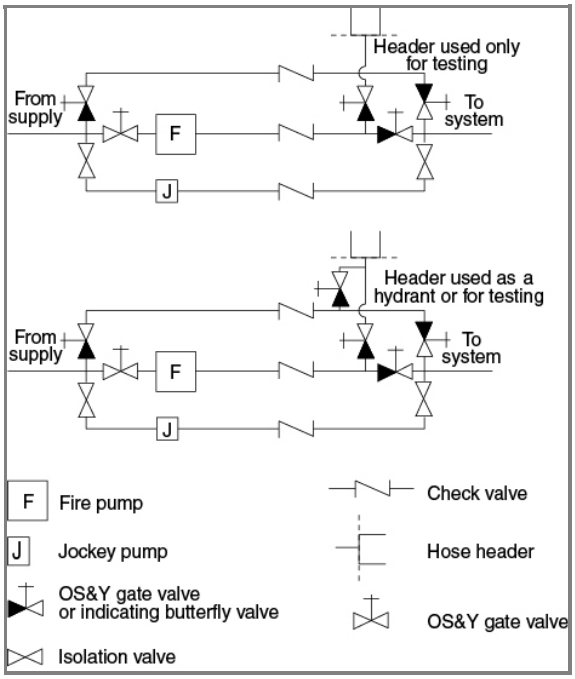
The following notes apply to Figure A.4.16.4:

(1) A jockey pump is usually required with automatically controlled pumps.

(2) If testing facilities are to be provided, also see Figure A.4.22.1.3(a) and Figure A.4.22.1.3(b).

(3) Pressure-sensing lines also need to be installed in accordance with 10.5.2.1 or 12.7.2.1. See Figure A.4.32(a) and Figure A.4.32(b).

Figure A.4.16.4 Schematic Diagram of Suggested Arrangements for a Fire Pump with a Bypass, Taking Suction from Public Mains.



Fire Pump Diagram should be more detailed to provide guidance for designers and field installation. We suggest referencing A8.5.2 (A) in NFPA 20 as a guide as well as A7.1 (A)-(C) in NFPA 14.

Statement of Problem and Substantiation for Public Input

NFPA 20 currently does not show a very detailed pump room layout. Improving this detail will help designers/field techs/etc. have more clarity on how to lay out the pump room and leave a smaller room for mistakes.

Submitter Information Verification

Submitter Full Name: Mildred Munoz
Organization: Frontier Fire Protection
Street Address:

City:
State:
Zip:
Submittal Date: Wed May 25 12:43:45 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: The submitter will need to propose specific language and diagrams. The information provided is incomplete.

Public Input No. 4-NFPA 20-2021 [Section No. A.4.22.3.4(3)]

A.4.22.3.4(3)

See Figure A.4.22.3.4(3).

Figure A.4.22.3.4(3) Sample Pump Test Header Calculation.

SAMPLE PUMP TEST HEADER SIZE CALCULATION

Pump size			1500		
Number of test hose streams			6		
Size of hose			2½		
Feet of hose per test hose			50		
Nozzle size			1.75		
Nozzle coefficient			0.97		
Pump test header pipe size			8.071		
C factor			120		
Pump Test Header Pipe Fittings	Type Fitting	Number	Equiv. Length	Total Equiv. Length	
	45∞	1	9	9	
	E	1	18	18	
	LRE	0	13	0	
	T	1	35	35	
	BV	0	12	0	
	GV	1	4	4	
	SW	1	45	45	
Pump test header pipe length				30	
Total equivalent length				141	
Maximum test flow				2250	
Friction loss per ft in pipe				0.0392	
Total loss in pump test header pipe					5.5
Flow in each hose				375	
Friction loss in 100 ft of hose				28.125	
Total friction loss in hose					14.1
Equivalent pipe length 2½ in. valve				7	
Friction loss in 2½ in. pipe				0.4561	
Friction loss through 2½ in. valve					3.2
Required pitot pressure					18
Elevation difference					0
Required pump discharge					40.8

Statement of Problem and Substantiation for Public Input

The current example utilizes an equivalent length of 7 ft for a 2-1/2 in. valve. That is the equivalent length of a butterfly valve and it would be more appropriate to utilize the standard equivalent length of an angle or hose valve -- 31 ft -- to emphasize the point that the friction loss through a hose valve must be accounted for.

This would increase the Friction Loss through the 2-1/2 in. valve to 14.1 psi and increase the required pump discharge pressure to 51.7 psi

Additionally, calculation needs to consider the wet pipe from the discharge flange to the test header control valve and the pipe from the test header control valve to the discharge of the water flow separately as one has a C-value of 120, and the other has a C-value of 100, respectively.

Submitter Information Verification

Submitter Full Name: Kevin Hall
Organization: American Fire Sprinkler Association
Affiliation: American Fire Sprinkler Association
Street Address:
City:
State:

Zip:

Submittal Date: Mon Nov 01 20:45:47 EDT 2021

Committee: FIM-AAA

Committee Statement

Resolution: FR-77-NFPA 20-2022

Statement: The current example utilizes an equivalent length of 7 ft for a 2-1/2 in. valve. That is the equivalent length of a butterfly valve and it would be more appropriate to utilize the standard equivalent length of an angle or hose valve -- 31 ft -- to emphasize the point that the friction loss through a hose valve must be accounted for. This would increase the Friction Loss through the 2-1/2 in. valve to 14.1 psi and increase the required pump discharge pressure to 51.7 psi. Additionally, calculation needs to consider the wet pipe from the discharge flange to the test header control valve and the pipe from the test header control valve to the discharge of the water flow separately as one has a C-value of 120, and the other has a C-value of 100, respectively.

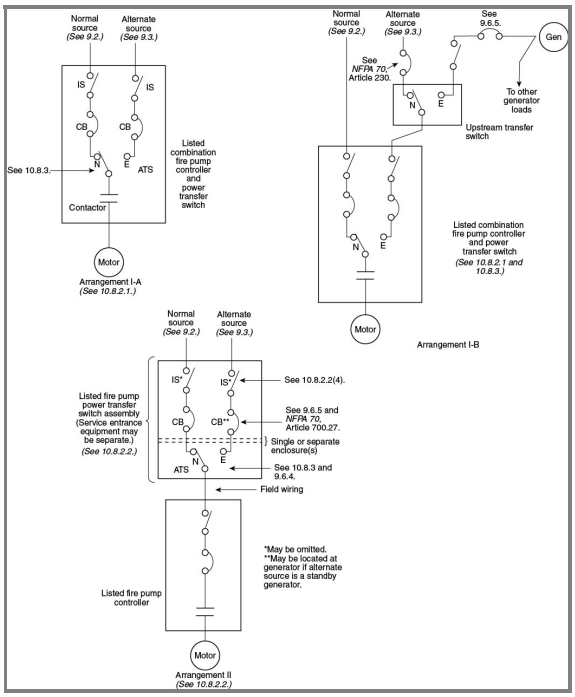
Public Input No. 73-NFPA 20-2022 [Section No. A.10.8]

A.10.8

Typical fire pump controller and transfer switch arrangements are shown in Figure A.10.8. Other configurations can also be acceptable.

Figure A.10.8 Typical Fire Pump Controller and Transfer Switch Arrangements.

Change under "Motor" Arrangement 1-A- in first diagram to 1. (remove the A)



Additional Proposed Changes

File Name	Description	Approved
NFPA_20-2025_PI_10.8.2.2.docx	Figure A.10.8 changes -	

Statement of Problem and Substantiation for Public Input

The standard needs to recognize that a power transfer switch with a combination fire pump controller and power transfer switch is also an arrangement II configuration. Also, since 10.8.2.2(2) requires that the normal and emergency sources have overcurrent protection in accordance with section 9.2.3.4, the normal and emergency isolating switches can be optional. Further, no type of tripping is allowed for the isolating switch, including a “self-protecting instantaneous trip”.

9.2.3.4.2 is not needed since item (7) has been added to 9.2.3.4.1 and 10.8.2.2(2) refers to section 9.2.3.4.1

As in 9.2.3.3, all circuit breakers or fuses and disconnecting means and isolating switches should be required to be supervised

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: Nema
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 26 16:14:28 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-51-NFPA 20-2022

Statement: The standard needs to recognize that a power transfer switch with a combination fire pump controller and power transfer switch is also an arrangement II configuration. Also, since 10.8.2.2(2) requires that the normal and emergency sources have overcurrent protection in accordance with section 9.2.3.4, the normal and emergency isolating switches can be optional. Further, no type of tripping is allowed for the isolating switch, including a “self-protecting instantaneous trip.” The reference to 9.2.3.4.1 for an instantaneous trip circuit breaker is not needed since item (7) of 9.2.3.4.1, which has been moved to new 9.2.3.4.1.1, is coupled to 9.2.3.4 by reference and 10.8.2.2(2) refers to section 9.2.3.4. As in 9.2.3.3, all circuit breakers or fuses and disconnecting means and isolating switches should be required to be supervised.

9.2.3.4.2 is not needed since item (7) has been added to 9.2.3.4.1 and 10.8.2.2(2) refers to section 9.2.3.4.1

As in 9.2.3.3, all circuit breakers or fuses and disconnecting means and isolating switches should be required to be supervised

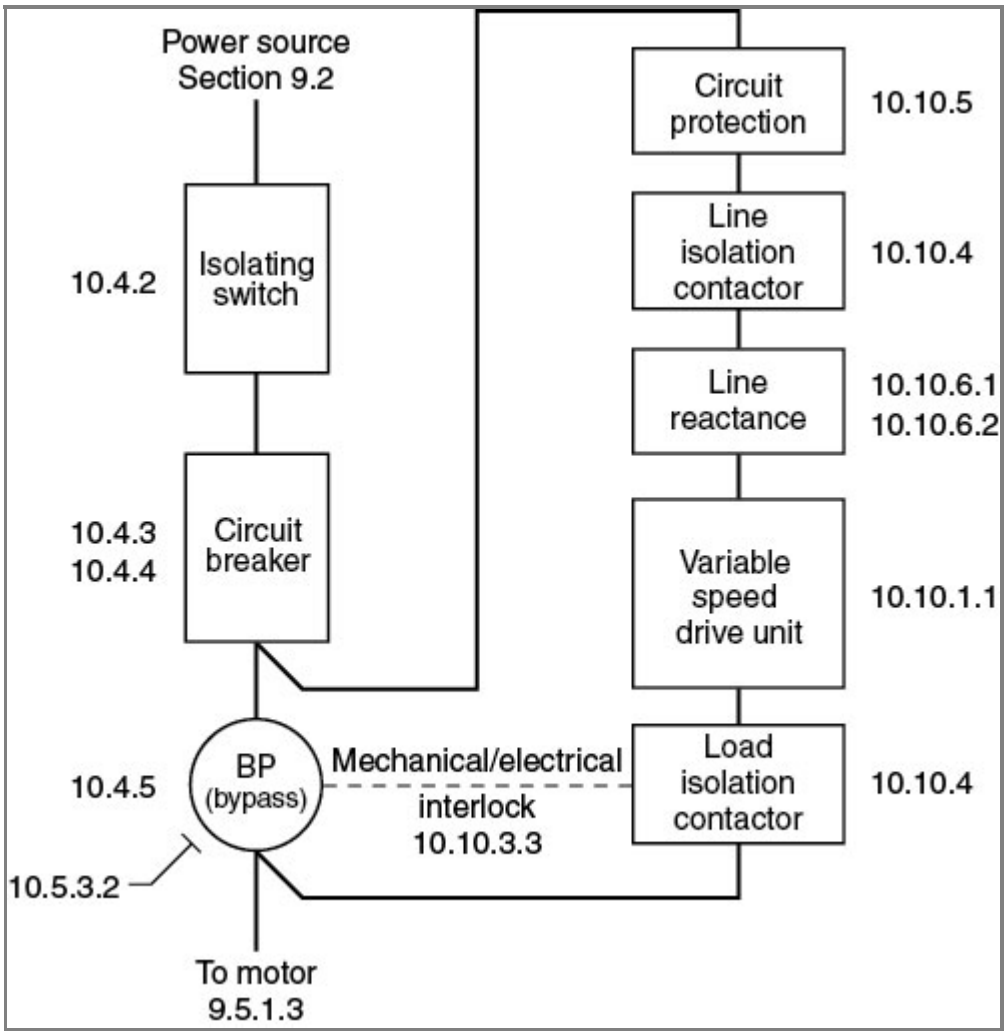
Public Input No. 49-NFPA 20-2022 [Section No. A.10.10]

A.10.10

See Figure A.10.10.

(Change reference 9.5.1.3 to 9.5.1.4)

Figure A.10.10 Variable Speed Pressure Limiting Control.



Statement of Problem and Substantiation for Public Input

Corrected reference to motors used with variable speed controllers.

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
Street Address:

City:
State:
Zip:
Submittal Date: Wed May 25 19:36:19 EDT 2022
Committee: FIM-AAA

Committee Statement

Resolution: FR-53-NFPA 20-2022
Statement: This revision corrects cross references in Figure A.10.10.

Public Input No. 104-NFPA 20-2022 [Section No. A.14.1.3]

A.14.1.3

See Figure A.14.1.3(a) for a sample of a contractor's material and test certificate for fire pumps and Figure A.14.1.3(b) for a sample certificate for private fire service mains.

Figure A.14.1.3(a) Sample of Contractor's Material Test Certificate for Fire Pump Systems.

Contractor's Material and Test Certificate for Fire Pump Systems

PROCEDURE Upon completion of work, inspection and tests shall be made by the contractor's representative and witnessed by an owner's representative. All defects shall be corrected and system left in service before contractor's personnel finally leave the job.

A certificate shall be filled out and signed by both representatives. Copies shall be prepared for approving authorities, owners, and contractor. It is understood the owner's representative's signature in no way prejudices any claim against contractor for faulty material, poor workmanship, or failure to comply with approving authority's requirements or local ordinances.

PROPERTY NAME | DATE

PROPERTY ADDRESS

PLANS	ACCEPTED BY APPROVING AUTHORITIES (NAMES)		
	ADDRESS		
	INSTALLATION CONFORMS TO ACCEPTED PLANS	☐ YES	☐ NO
	ALL EQUIPMENT USED IS APPROVED FOR FIRE SYSTEM SERVICE IF NO, STATE DEVIATIONS	☐ YES	☐ NO
INSTRUCTIONS	HAS PERSON IN CHARGE OF FIRE PUMP EQUIPMENT BEEN INSTRUCTED AS TO LOCATION OF SYSTEM CONTROL VALVES AND CARE AND MAINTENANCE OF THIS NEW EQUIPMENT? IF NO, EXPLAIN	☐ YES	☐ NO
	HAVE COPIES OF APPROPRIATE INSTRUCTIONS AND CARE AND MAINTENANCE CHARTS BEEN LEFT ON PREMISES? IF NO, EXPLAIN	☐ YES	☐ NO
LOCATION	SUPPLIES BUILDING(S) (CAMPUS, WAREHOUSE, HIGH RISE) EXPLAIN		
PUMP ROOM EQUIPMENT	IS THE PUMP ROOM EQUIPMENT PER THE PLANS AND SPECS?	☐ YES	☐ NO
	IS THE FIRE PUMP PROPERLY MOUNTED AND ANCHORED TO THE FOUNDATION? IF NO, EXPLAIN	☐ YES	☐ NO
	IS THE FIRE PUMP BASE PROPERLY GROUTED? IF NO, EXPLAIN	☐ YES	☐ NO
	DOES THE PUMP ROOM HAVE THE PROPER FLOOR DRAINS? IF NO, EXPLAIN	☐ YES	☐ NO
	IS THE SUCTION AND DISCHARGE PIPING PROPERLY SUPPORTED?	☐ YES	☐ NO
	IS THE PUMP ROOM HEATED AND VENTILATED PER NFPA 20?	☐ YES	☐ NO
PIPES AND FITTINGS	PIPE TYPES AND CLASS		
	PIPE CONFORMS TO _____ STANDARD FITTINGS CONFORM TO _____ STANDARD IF NO, EXPLAIN	☐ YES ☐ YES	☐ NO ☐ NO
	SUCTION AND DISCHARGE PIPING ANCHORED OR RESTRAINED?:	☐ YES	☐ NO
PRE-PACKAGED PUMP HOUSE	IS THIS A PACKAGE OR SKID MOUNTED PUMP?	☐ YES	☐ NO
	IS THE PACKAGE/SKID PROPERLY ANCHORED TO A CONCRETE FOUNDATION? IF NO, EXPLAIN	☐ YES	☐ NO
	IS THE STRUCTURAL FOUNDATION FRAME FILLED WITH CONCRETE TO FORM A FINISHED FLOOR?	☐ YES	☐ NO
	IS THERE A FLOOR DRAIN INSTALLED?	☐ YES	☐ NO
TEST DESCRIPTION	HYDROSTATIC: Hydrostatic tests shall be made at not less than 200 psi (13.8 bar) for 2 hours or 50 psi (3.4 bar) above static pressure in excess of 200 psi (13.8 bar) for 2 hours.		
	HYDROSTATIC TEST: ALL NEW PIPING HYDROSTATICALLY TESTED AT: _____ PSI/BAR FOR _____ HOURS	NO LEAKAGE ALLOWED	
FLUSHING TESTS	FLUSHING: Flow the required rate until water is clear as indicated by no collection of foreign material in burlap bags at outlets such as hydrants and blowoffs. Flush at flows not less than 390 gpm (1476 L/min) for 4 in. pipe, 610 gpm (2309 L/min) for 5 in. pipe, 880 gpm (3331 L/min) for 6 in. pipe, 1560 gpm (5905 L/min) for 8 in. pipe, 2440 gpm (9235 L/min) for 10 in. pipe, and 3520 gpm (13,323 L/min) for 12 in. pipe. When supply cannot produce stipulated flow rates, obtain maximum available.		

 (NFPA 20, 1 of 2)

FLUSHING TESTS *(continued)*	NEW PIPING FLUSHED ACCORDING TO _____ STANDARD BY (COMPANY) _____ IF NO, EXPLAIN	☐ YES	☐ NO
	HOW FLUSHING FLOW WAS OBTAINED ☐ PUBLIC WATER ☐ TANK OR RESERVOIR ☐ OTHER (EXPLAIN)	THROUGH WHAT TYPE OPENING ☐ TEST HEADER ☐ OPEN PIPE	
	LEAD-INS FLUSHED ACCORDING TO _____ STANDARD BY (COMPANY) IF NO, EXPLAIN	☐ YES	☐ NO
	HOW FLUSHING FLOW WAS OBTAINED ☐ PUBLIC WATER ☐ TANK OR RESERVOIR ☐ OTHER (EXPLAIN)	THROUGH WHAT TYPE OPENING ☐ Y CONNECTION TO FLANGE & SPIGOT ☐ OPEN PIPE	
FIELD ACCEPTANCE TEST	ALL EQUIPMENT APPROVED?	☐ YES	☐ NO
	ALL REQUIRED REPRESENTATIVES PRESENT FOR TEST	☐ YES	☐ NO
	AHJ AND OWNER'S REPRESENTATIVE PRESENT FOR TEST IF NO, EXPLAIN	☐ YES	☐ NO
	ALL ELECTRICAL WIRING COMPLETE AND PER *NFPA 70* AND NFPA 20 IF NO, EXPLAIN	☐ YES	☐ NO
	CALIBRATE TEST EQUIPMENT USED CALIBRATION DATE _____	☐ YES	☐ NO
	FLOW TESTS PUMP DESIGN _____ GPM _____ PSI DOES THE PUMP MEET OR EXCEED THE CERTIFIED CURVE?	☐ YES	☐ NO
	PUMP TYPE ☐ HORIZONTAL ☐ VERTICAL TURBINE ☐ OTHER PUMP MAKE _____ MODEL # _____ SERIAL # _____ COMMENTS _____		
	ELECTRIC DRIVER OPERATIONAL TEST SATISFACTORY	☐ YES	☐ NO
	ELEC. DRIVER _____ MODEL # _____ SERIAL # _____ VOLTAGE _____ VAC @ _____ HP _____ RPM _____ FLA		
	ENGINE DRIVEN	☐ YES	☐ NO
	ENGINE MAKE _____ MODEL # _____ SERIAL # _____ _____ HP _____ RPM SPEED		
	DIESEL DRIVER OPERATIONAL TEST SATISFACTORY? OTHER EXPLAIN	☐ YES	☐ NO
	CONTROLLER MAKE _____ MODEL # _____ SERIAL # _____		
	VARIABLE SPEED PRESSURE LIMITING CONTROL	☐ YES	☐ NO
	TESTED AT MINIMUM, RATED, AND PEAK FLOW	☐ YES	☐ NO
	CONTROLLER TEST:	☐ YES	☐ NO
	SIX AUTO STARTS	☐ YES	☐ NO
	SIX MANUAL STARTS	☐ YES	☐ NO
	PHASE REVERSAL TEST PERFORMED (ELECTRIC ONLY)	☐ YES	☐ NO
	ALTERNATE POWER SOURCE TESTED (ELECTRIC ONLY)	☐ YES	☐ NO
	ELECTRONIC FUEL MANAGEMENT (ECM) FUNCTION TEST PERFORMED (DIESEL ONLY)	☐ YES	☐ NO
CONTROL VALVES	SYSTEM CONTROL VALVES LEFT WIDE OPEN IF NO, STATE REASON	☐ YES	☐ NO
	HOSE THREADS OF FIRE DEPARTMENT CONNECTIONS AND HYDRANTS INTERCHANGEABLE WITH THOSE OF FIRE DEPARTMENT ANSWERING ALARM	☐ YES	☐ NO
REMARKS	DATE LEFT IN SERVICE _____ ADDITIONAL COMMENTS:		
SIGNATURES	NAME OF INSTALLING CONTRACTOR		
	TESTS WITNESSED BY FOR PROPERTY OWNER (SIGNED) TITLE DATE		
	FOR INSTALLING CONTRACTOR (SIGNED) TITLE DATE		

ADDITIONAL COMMENTS AND NOTES:

 (NFPA 20, 2 of 2)

Figure A.14.1.3(b) Sample of Contractor's Material and Test Certificate for Private Fire Service Mains Feeding Fire Pump(s).

Contractor's Material and Test Certificate for Private Fire Service Mains Feeding Fire Pump(s)

PROCEDURE Upon completion of work, inspection and tests shall be made by the contractor's representative and witnessed by an owner's representative. All defects shall be corrected and system left in service before contractor's personnel finally leave the job.

A certificate shall be filled out and signed by both representatives. Copies shall be prepared for approving authorities, owners, and contractor. It is understood the owner's representative's signature in no way prejudices any claim against contractor for faulty material, poor workmanship, or failure to comply with approving authority's requirements or local ordinances.

PROPERTY NAME		DATE
PROPERTY ADDRESS		
PLANS	ACCEPTED BY APPROVING AUTHORITIES (NAMES)	
	ADDRESS	
	INSTALLATION CONFORMS TO ACCEPTED PLANS	☐ YES ☐ NO
	EQUIPMENT USED IS APPROVED IF NO, STATE DEVIATIONS	☐ YES ☐ NO
INSTRUCTIONS	HAS PERSON IN CHARGE OF FIRE EQUIPMENT BEEN INSTRUCTED AS TO LOCATION OF CONTROL VALVES AND CARE AND MAINTENANCE OF THIS NEW EQUIPMENT? IF NO, EXPLAIN	☐ YES ☐ NO
	HAVE COPIES OF APPROPRIATE INSTRUCTIONS AND CARE AND MAINTENANCE CHARTS BEEN LEFT ON PREMISES? IF NO, EXPLAIN	☐ YES ☐ NO
LOCATION	SUPPLIES BUILDINGS	
PIPES AND JOINTS	PIPE TYPES AND CLASS	TYPE JOINT
	PIPE CONFORMS TO _____ STANDARD FITTINGS CONFORM TO _____ STANDARD IF NO, EXPLAIN	☐ YES ☐ NO ☐ YES ☐ NO
	BURIED JOINTS NEEDING ANCHORAGE CLAMPED, STRAPPED, OR BLOCKED IN ACCORDANCE WITH _____ STANDARD IF NO, EXPLAIN	☐ YES ☐ NO
TEST DESCRIPTION	FLUSHING: Flow the required rate until water is clear as indicated by no collection of foreign material in burlap bags at outlets such as hydrants and blowoffs. Flush at flow not less than 37 gpm for 1 in. pipe (140 L/min for 25 mm pipe), 85 gpm for 1½ in. pipe (330 L/min for 38 mm pipe), 150 gpm for 2 in. pipe (570 L/min for 50 mm pipe), 229 gpm for 2½ in. pipe (870 L/min for 65 mm pipe), 330 gpm for 3 in. pipe (1250 L/min for 75 mm pipe), 450 gpm for 3½ in. pipe (1710 L/min for 85 mm pipe), 590 gpm for 4 in. pipe (2240 L/min for 100 mm pipe), 920 gpm for 5 in. pipe (3490 L/min for 125 mm pipe), 1360 gpm for 6 in. pipe (5150 L/min for 150 mm pipe), 2350 gpm for 8 in. pipe (8900 L/min for 200 mm pipe), 3670 gpm for 10 in. pipe (13,900 L/min for 250 mm pipe), 5290 gpm for 12 in. pipe (20,100 L/min for 300 mm pipe), 7200 gpm for 14 in. pipe (27,300 L/min for 350 mm pipe), and 9400 gpm for 16 in. pipe (35,600 L/min for 400 mm pipe). When supply cannot produce stipulated flow rates, comply with 14.1.1.3. HYDROSTATIC: Hydrostatic tests shall be made at not less than 200 psi (13.8 bar) for 2 hours or 50 psi (3.4 bar) above static pressure in excess of 150 psi (10.3 bar) for 2 hours. LEAKAGE: New pipe laid with rubber gasketed joints shall, if the workmanship is satisfactory, have little or no leakage at the joints. The amount of leakage at the joints shall not exceed 2 qt/hr (1.89 L/hr) per 100 joints irrespective of pipe diameter. The amount of allowable leakage specified above can be increased by 1 fl oz per inch valve diameter per hour (30 mL/25 mm/hr) for each metal seated valve isolating the test section. If dry barrel hydrants are tested with the main valve open, so the hydrants are under pressure, an additional 5 oz per minute (150 mL/min) leakage is permitted for each hydrant.	

 (NFPA 20, 1 of 2)

FLUSHING TESTS	NEW PIPING FLUSHED ACCORDING TO BY (COMPANY) IF NO, EXPLAIN	_____ STANDARD ☐ YES ☐ NO
	HOW FLUSHING FLOW WAS OBTAINED PUBLIC WATER ☐ TANK OR RESERVOIR ☐ FIRE PUMP	THROUGH WHAT TYPE OPENING ☐ HYDRANT BUTT ☐ OPEN PIPE
	LEAD-INS FLUSHED ACCORDING TO BY (COMPANY) IF NO, EXPLAIN	_____ STANDARD ☐ YES ☐ NO
	HOW FLUSHING FLOW WAS OBTAINED PUBLIC WATER ☐ TANK OR RESERVOIR ☐ FIRE PUMP	THROUGH WHAT TYPE OPENING ☐ Y CONNECTION TO FLANGE & SPIGOT ☐ OPEN PIPE
HYDROSTATIC TEST	ALL NEW PIPING HYDROSTATICALLY TESTED AT _____ PSI FOR _____ HOURS	BURIED JOINTS COVERED ☐ YES ☐ NO
LEAKAGE TEST	TOTAL AMOUNT OF LEAKAGE MEASURED _____ GALLONS _____ HOURS	NO LEAKAGE ALLOWED FOR VISIBLE JOINTS
	ALLOWABLE LEAKAGE (BURIED) _____ GALLONS _____ HOURS	NO LEAKAGE ALLOWED FOR VISIBLE JOINTS
HYDRANTS	NUMBER INSTALLED / TYPE AND MAKE	ALL OPERATE SATISFACTORILY ☐ YES ☐ NO
CONTROL VALVES	WATER CONTROL VALVES LEFT WIDE OPEN IF NO, STATE REASON	☐ YES ☐ NO
	HOSE THREADS OF FIRE DEPARTMENT CONNECTIONS AND HYDRANTS INTERCHANGEABLE WITH THOSE OF FIRE DEPARTMENT ANSWERING ALARM	☐ YES ☐ NO
REMARKS	DATE LEFT IN SERVICE _____ ADDITIONAL COMMENTS: _____	
SIGNATURES	NAME OF INSTALLING CONTRACTOR	
	TESTS WITNESSED BY	
	FOR PROPERTY OWNER (SIGNED) / TITLE / DATE	
	FOR INSTALLING CONTRACTOR (SIGNED) / TITLE / DATE	
ADDITIONAL EXPLANATION AND NOTES		

 (NFPA 20, 2 of 2)

Statement of Problem and Substantiation for Public Input

Update the test certificate to reflect the current requirements for hydrostatic testing and flushing of underground piping per NFPA 24. The current form uses old leakage rate requirements and flush rates.

Submitter Information Verification

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Committee: FIM-AAA

Committee Statement

Resolution: FR-90-NFPA 20-2022

Statement: The test certificates have been updated to reflect several changes.

In Figure A.14.1.3(a), the sample of a contractor's material and test certificate for fire pumps the acceptance criteria for the hydrostatic test was updated and the flushing section for above ground suction piping was deleted.

In Figure A.14.1.3(b), the sample certificate for private fire service mains, the flush rates were deleted, and reference made instead to Table 14.1.1.1. Acceptance criteria for hydrostatic testing and flushing of underground piping were extracted from the 2022 edition of NFPA 24.

Public Input No. 50-NFPA 20-2022 [Section No. A.14.2.6]

A.14.2.6

The fire pump operation is as follows:

(1) *Motor-Driven Pump.* To start a motor-driven pump, the following steps should be taken in the following order:

(2) See that pump is completely primed.

(3) Close isolating switch and then close circuit breaker.

(4) Automatic controller will start pump if system demand is not satisfied (e.g., pressure low, deluge tripped).

(5) For manual operation, activate switch, pushbutton, or manual start handle. Circuit breaker tripping mechanism should be set so that it will not operate when current in circuit is excessively large.

(6) *Steam-Driven Pump.* A steam turbine driving a fire pump should always be kept warmed up to permit instant operation at full-rated speed. The automatic starting of the turbine should not be dependent on any manual valve operation or period of low-speed operation. If the pop safety valve on the casing blows, steam should be shut off and the exhaust piping examined for a possible closed valve or an obstructed portion of piping. Steam turbines are provided with governors to maintain speed at a predetermined point, with some adjustment for higher or lower speeds. Desired speeds below this range can be obtained by throttling the main throttle valve.

(7) *Diesel Engine–Driven Pump.* To start a diesel engine–driven pump, the operator should be familiar beforehand with the operation of this type of equipment. The instruction books issued by the engine and control manufacturer should be studied to this end. The storage batteries should always be maintained in good order to ensure prompt, satisfactory operation of this equipment (i.e., check electrolyte level and specific gravity, inspect cable conditions, corrosion, etc.).

(8) *Fire Pump Settings.* The fire pump system, when started by pressure drop, should be arranged as follows:

(9) The jockey pump stop point should equal the pump churn pressure plus the minimum static supply pressure.

(10) The jockey pump start point should be at least 10 psi (0.68 bar) less than the jockey pump stop point.

(11) The fire pump start point should be

~~5 psi~~

(a) 10 psi (0.

~~34~~

(a) 68 bar) less than the jockey pump start point. Use 10 psi (0.68 bar) increments for each additional pump.

(b) Where minimum run times are provided, the pump will continue to operate after attaining these pressures. The final pressures should not exceed the pressure rating of the system.

(c) Where the operating differential of pressure switches does not permit these settings, the settings should be as close as equipment will permit. The settings should be established by pressures observed on test gauges.

(d) Examples of fire pump settings follow (for SI units, 1 psi = 0.0689 bar):

(12) Pump: 1000 gpm, 100 psi pump with churn pressure of 115 psi

(13) Suction supply: 50 psi from city — minimum static; 60 psi from city — maximum static

(14) Jockey pump stop = 115 psi + 50 psi = 165 psi

(15) Jockey pump start = 165 psi - 10 psi = 155 psi

(16) Fire pump

~~stop~~

(a)

i. reset = 115 psi + 50 psi = 165 psi

ii. Fire pump start = 155 psi -

~~5 psi~~

(a)

i. 10 psi =

~~150 psi~~

(a)

i. 145 psi

ii. Fire pump maximum churn = 115 psi + 60 psi = 175 psi

(b) Where minimum-run timers are provided, the pumps will continue to operate at churn pressure beyond the stop setting. The final pressures should not exceed the pressure rating of the system components.

(17) *Automatic Recorder.* The performance of all fire pumps should be automatically indicated on a pressure recorder to provide a record of pump operation and assistance in fire loss investigation.

Statement of Problem and Substantiation for Public Input

The fire pump controller start point is typically set 10 psi below the jockey controller start point.

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Committee Statement

Resolution: FR-91-NFPA 20-2022
Statement: The fire pump controller start point is typically set 10 psi below the jockey controller start point to avoid unintended starts of the fire pump and to avoid nuisance alarms.

Public Input No. 33-NFPA 20-2022 [Section No. E.1.2.8]

E.1.2.8 SFPE Publications.

Society of Fire Protection Engineers, 9711 Washingtonian Blvd, Suite 380, Gaithersburg, MD 20878.

SFPE Engineering Guide: Fire Safety for Very Tall Buildings, ~~2013~~ 2022 .

Statement of Problem and Substantiation for Public Input

Edit needed for new edition of the SFPE Guide.

Submitter Information Verification

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Committee Statement

Resolution: FR-2-NFPA 20-2022
Statement: Update dates of informational references to comply with the Manual of Style.

Public Input No. 95-NFPA 20-2022 [Section No. E.1.2.9]

E.1.2.9 UL Publications.

Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 218, *Fire Pump Controllers,* 2015, revised 2020 .

UL 508, *Industrial Control Equipment*, 2018, revised 2021 .

UL 1008, *Transfer Switch Equipment*, ~~2018~~ 2021 .

Statement of Problem and Substantiation for Public Input

Changes are updates to edition or revision dates and are submitted reference updates.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 94-NFPA 20-2022 [Section No. 2.3.11]	

Submitter Information Verification

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Committee: FIM-AAA

Committee Statement

Resolution: FR-2-NFPA 20-2022
Statement: Update dates of informational references to comply with the Manual of Style.