Public Comment No. 12-NFPA 20-2023 [Global Input]

6.3 Water Mist Centrifugal Pumps.

6.3.1 Water mist centrifugal pumping units shall be dedicated to and listed as a unit for fire protection service.

6.3.2 Where provided with a variable speed control, failure of the variable speed control feature shall cause the controller to bypass and isolate the variable speed control system.

6.3.3 Pumps for water mist systems shall have adequate capacities to meet the maximum system demand for their intended service.

6.3.4 NPSH shall exceed the pump manufacturer's required NPSH plus 5 ft (1.52 m) of liquid.

6.3.5 The inlet pressure to the pump shall not exceed the pump manufacturer's recommended maximum inlet pressure.

Statement of Problem and Substantiation for Public Comment

NFPA 20 does not include information for water mist centrifugal pumps.

Related Item

• 13, 106

Submitter Information Verification

Submitter Full Name: Brad Stilwell
Organization: Fike Corporation
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 17 14:57:34 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected but held
Resolution: This is new material and should be submitted as a Public Input during the next revision cycle.

Public Comment No. 28-NFPA 20-2023 [Global Input]

"Jockey Pump" is the accepted industry term for a pump used to maintain pressure on a system utilizing a fire pump. The attached document replaces all references to pressure maintenance pumps and make-up pumps to "jockey pumps"

Additional Proposed Changes

File Name	Description	Approved
Jockey_Pumps.docx	Proposed changes to create a consistant document using "jockey pump" as the preferred term	

Statement of Problem and Substantiation for Public Comment

The term jockey pump is a recognized term in the industry and should be utilized consistently throughout NFPA 20. Figures in the annex already use "jockey pump." The proposed changes clean up the document to comply with the manual of style.

Related Item

• PI-96 • PI-97

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 May 31 15:14:00 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-15-NFPA 20-2023
Statement: This revision changes the terms ‘pressure maintenance pump’ and ‘make up pump’ to ‘jockey pump’. The standard currently uses multiple terms for this type of pump throughout, and standardizing on one term will bring consistency.

Public Comment No. 22-NFPA 20-2023 [New Section after 4.3.3.4]

4.3.4* Startup or Service Personnel Qualifications.

4.3.4.1

Startup or Service personnel shall be factory trained and certified by the manufacture of the equipment to be started or serviced or be directly supervised by the manufacture during the startup or service event.

4.3.4.2

The factory training and certification shall be for the specific type and brand of equipment.

Statement of Problem and Substantiation for Public Comment

The text in 4.3.4. should not be deleted in its entirety. Startup or Service personnel that work on equipment before the acceptance test required in NFPA 20 are not NFPA 25 ITM personnel. They still need qualifications.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 23-NFPA 20-2023 [New Section after A.4.3.3.3(2)]	

Related Item

- FR 63

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: NEMA
Street Address:
City:
State:
Zip:
Submittal Date: Tue May 30 20:04:53 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected

Resolution: Section 14.2.1 clearly states who the onsite personnel shall be for the startup. NFPA 25 addresses the qualifications of service personnel.

Public Comment No. 6-NFPA 20-2023 [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 Comment

The Hydraulic Institute (HI) Fire Pump Committee reviewed the NFPA20 Committee's response to our past public comment on this topic and appreciate the consideration. The HI Fire Pump committee is following up with this public comment providing additional substantiation addressing the NFPA20 Committee's concern about harmonization with other standards.

Of the two-3rd party approval/listing agencies only one allows new fire pump listings with mechanical seals. The ULc standard had not been updated since 1979 and when updated in 2021 UL eliminated the use of mechanical seals for new listings. While the FM standard allows listings with mechanical seals as an option; however, in practice there are many manufacturer requirements that are out of the manufacturer's control that limits the practical use of mechanical seals. Thus, as of 2021, FM indicated there were only (5) five FM listings with Mechanical seals out of a total of 13,586 FM listed fire pumps.

As evident by the update to the UL standard and limited pumps with FM approval that have mechanical seals, it is clear that the use of mechanical seals for centrifugal and vertical turbine fire pumps compromises operational reliability and should not be allowed for life safety equipment. The HI Fire Pump Committee asks the NFPA-20 committee to reconsider their resolution to the prior public input submitted.

The HI Fire Pump Committee original public inputs (as noted below) cover our concerns and recommendation.

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 Item

• 6.1.1.5 • 7.3.1.3

Submitter Information Verification

Submitter Full Name: Peter Gaydon
Organization: Hydraulic Institute
Street Address:
City:
State:
Zip:
Submittal Date: Fri Apr 28 15:37:18 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected

Resolution: There are listed fire pumps that use mechanical seals. As such, NFPA 20 needs to include provisions for their installation and use. Chapter 4 applies to all pumps and positive displacement pumps commonly use a mechanical seal.

Public Comment No. 29-NFPA 20-2023 [Section No. 4.7.6]

4.7.6*

The driver shall be selected in accordance with 9.5.2~~.~~ ~~(~~ for electric motors~~)~~ , 11.2.2~~.~~ ~~(~~ for diesel engines~~)~~ , or 13.1.2~~.~~ ~~(~~ for steam ~~turbines) to~~ turbines to provide the required power to operate the pump at rated speed and maximum pump load ~~under any flow condition~~ up to 200 percent rated flow .

Statement of Problem and Substantiation for Public Comment

This was originally submitted as a public input and was moved as a First Revision during the First Draft meeting. For the ballot, the FR failed by one vote and is in the First Draft report as CI-66.

The current requirement grossly oversizes the power requirements for fire pumps. Pumps are only permitted to utilize up to 150 percent capacity for fire protection design 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).

In response to the negative comments, the proposed capacity has been increased, and the requirement to provide a horsepower rating based on the 200% capacity of the rated flow is reasonable. Flows beyond 200 percent are indicative of a catastrophic event that are not within the purview of NFPA 20 to mitigate. The purpose of NFPA 20 is to provide a reasonable degree of protection, and mandating that a fire pump must be indestructible is not reasonable. NFPA 20 is a minimum standard.

To respond to some of the negative comments received on the ballot:
1. It is not reasonable to expect a fire pump to maintain performance if an underground main ruptures. In fact, it could be argued that it would not be beneficial for the fire pump to continue to run during this catastrophic event due to the risk of additional water damage and damage to the foundation and structure of a building depending on the proximity of the break. In any event, the pump running during this event is not providing fire protection.
2. Issues were raised with correlating with other sections. Corresponding PCs have been submitted to address the correlation issue.
3. This revision would have no affect on the pump performance during a "normal fire event." Sprinkler systems are calculated with at least a 50% safety margin for storage applications and demands that surpass what has been hydraulically calculated would exceed the design criteria from multiple full scale fire tests that are used to determine the discharge criteria
4. One negative comment indicated that the "maximum pump load" was the 150% capacity duty point. This would clarify that interpretation and provide a prescriptive data point to derive the horsepower rating.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 30-NFPA 20-2023 [Section No. 4.11.3]	

Related Item

• CI-66

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 May 31 15:22:59 EDT 2023
Committee:	FIM-AAA

Committee Statement

Committee Action:	Rejected but held
Resolution:	The committee was not presented with sufficient data to act on this. This is being held until the next revision cycle and a task group is being established to study the issue of fire pump peak driver sizing and put forth recommendations for the next revision cycle.

Public Comment No. 30-NFPA 20-2023 [Section No. 4.11.3]

4.11.3

The nameplate shall indicate the maximum pump horsepower demand required to power the pump at any flow, including flows ~~beyond 150 percent~~ up to 175 percent of the rated capacity.

Statement of Problem and Substantiation for Public Comment

Correlates with the proposed changes to determine maximum hp rating.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 29-NFPA 20-2023 [Section No. 4.7.6]	

Related Item

- CI-66

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 May 31 15:55:02 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected

Resolution: There have been no revisions to the maximum horsepower rating in the standard. A task group is being established to study the issue of fire pump peak driver sizing and put forth recommendations for the next revision cycle.

Public Comment No. 26-NFPA 20-2023 [New Section after 4.14.3.2]

TITLE OF NEW CONTENT

4.14.3.3* Where the requirements of Section 14.3 rely on a source of power and the normal source of power is unreliable, an alternate source of power shall be provided for those electrically operated components.

Statement of Problem and Substantiation for Public Comment

A new requirement was added for section 11.3.2 for back-up power to be provided to ensure proper operation of the diesel engine. The requirement for back-up power should apply to all pumps when the source of protection from pipes freezing in the pump room is from an unreliable electric power source.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 27-NFPA 20-2023 [New Section after A.4.14.1.1.6]	

Related Item

- FR-84

Submitter Information Verification

Submitter Full Name: Terry Victor
Organization: Johnson Controls
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 31 11:05:06 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected

Resolution: There are other sources of heat besides electrical power that can be considered. Section 4.14.3.1 states that an approved heat source must be provided to maintain the pump room or pump house above 40 degrees F where required. The current language addresses the need for heat in the fire pump room regardless of the means provided. Each site needs to address temperature in the fire pump room based on available heating sources.

Public Comment No. 7-NFPA 20-2023 [New Section after 6.1]

6.1.1.5 Sealing

The sealing type acceptable for centrifugal pumps shall be packing

Statement of Problem and Substantiation for Public Comment

The Hydraulic Institute (HI) Fire Pump Committee reviewed the NFPA20 Committee's response to our past public comment on this topic and appreciate the consideration. The HI Fire Pump committee is following up with this public comment providing additional substantiation addressing the NFPA20 Committee's concern about harmonization with other standards.

Of the two-3rd party approval/listing agencies only one allows new fire pump listings with mechanical seals. The ULc standard had not been updated since 1979 and when updated in 2021 UL eliminated the use of mechanical seals for new listings. While the FM standard allows listings with mechanical seals as an option; however, in practice there are many manufacturer requirements that are out of the manufacturer’s control that limits the practical use of mechanical seals. Thus, as of 2021, FM indicated there were only (5) five FM listings with Mechanical seals out of a total of 13,586 FM listed fire pumps.

As evident by the update to the UL standard and limited pumps with FM approval that have mechanical seals, it is clear that the use of mechanical seals for centrifugal and vertical turbine fire pumps compromises operational reliability and should not be allowed for life safety equipment. The HI Fire Pump Committee asks the NFPA-20 committee to reconsider their resolution to the prior public input submitted.

The HI Fire Pump Committee original public inputs (as noted below) cover our concerns and recommendation.

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 Item

• 4.6.2.1.1 and 4.6.2.1.2

Submitter Information Verification

Submitter Full Name: Peter Gaydon
Organization: Hydraulic Institute
Street Address:
City:
State:
Zip:
Submittal Date: Fri Apr 28 16:04:22 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-8-NFPA 20-2023
Statement: This revision requires the sealing of centrifugal pump to be packing. There are concerns with the reliability of other sealing methods for centrifugal fire pumps. With a fire pump in standby mode for a long period of time, there is concern with debris settling in a mechanical seal and causing premature failure.

Public Comment No. 8-NFPA 20-2023 [New Section after 7.3.1]

7.3.1.3 Sealing

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

Statement of Problem and Substantiation for Public Comment

The Hydraulic Institute (HI) Fire Pump Committee reviewed the NFPA20 Committee's response to our past public comment on this topic and appreciate the consideration. The HI Fire Pump committee is following up with this public comment providing additional substantiation addressing the NFPA20 Committee's concern about harmonization with other standards.

Of the two-3rd party approval/listing agencies only one allows new fire pump listings with mechanical seals. The ULc standard had not been updated since 1979 and when updated in 2021 UL eliminated the use of mechanical seals for new listings. While the FM standard allows listings with mechanical seals as an option; however, in practice there are many manufacturer requirements that are out of the manufacturer’s control that limits the practical use of mechanical seals. Thus, as of 2021, FM indicated there were only (5) five FM listings with Mechanical seals out of a total of 13,586 FM listed fire pumps.

As evident by the update to the UL standard and limited pumps with FM approval that have mechanical seals, it is clear that the use of mechanical seals for centrifugal and vertical turbine fire pumps compromises operational reliability and should not be allowed for life safety equipment. The HI Fire Pump Committee asks the NFPA-20 committee to reconsider their resolution to the prior public input submitted.

The HI Fire Pump Committee original public inputs (as noted below) cover our concerns and recommendation.

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 Item

• 4.6.2.1.1 and 4.6.2.1.2

Submitter Information Verification

Submitter Full Name: Peter Gaydon
Organization: Hydraulic Institute
Street Address:
City:
State:
Zip:
Submittal Date: Fri Apr 28 16:09:34 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-9-NFPA 20-2023
Statement: This revision requires the sealing of vertical shaft fire pumps to be packing. The water supply is typically drawn from raw water sources which contain debris that can collect and cause premature failure of a mechanical seal.

Public Comment No. 33-NFPA 20-2023 [Section No. 8.4.6.1]

~~8.4.6.1~~ –

~~Where a redundant motor and pump are provided to satisfy the requirement in~~ 8.4.6(2) ~~, the following shall apply:~~

(1) ~~Load isolation in accordance with~~ 10.10.4 ~~shall not be required for the variable speed pump.~~

(2) ~~Circuit protection in accordance with~~ 10.10.5.1 ~~shall be provided between the line side of the variable speed drive and the load side of the isolating switch.~~

(3) ~~If the isolating switch required by~~ 10.4.2 ~~has self-protecting instantaneous short-circuit overcurrent protection, the circuit protection required by~~ 10.10.5.2 ~~shall be coordinated such that the isolating switch does not trip due to a fault condition in the variable speed drive.~~

Statement of Problem and Substantiation for Public Comment

These are electrical requirements and are not appropriate in Chapter 8. Corresponding PCs have been submitted in Chapter 10 to address (1) and (3). (2) is redundant and already covered in Chapter 10.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 32-NFPA 20-2023 [New Section after 10.4.2.1.3]	
Public Comment No. 31-NFPA 20-2023 [Section No. 10.10.4]	
Public Comment No. 32-NFPA 20-2023 [New Section after 10.4.2.1.3]	

Related Item

• FR-10

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 May 31 16:31:08 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The requirements specific to water mist positive displacement pumping units (WMPDPU) should be contained in Chapter 8 even if they are electrical related to clarify that the requirements only apply to WMPDPU.

Public Comment No. 4-NFPA 20-2023 [Section No. 8.4.6.1]

8.4.6.1

Where a redundant motor and pump are provided to satisfy the requirement in 8.4.6(2), the following shall apply:

(1) Load isolation in accordance with 10.10.4 shall not be required for the variable speed pump.

(2) The line isolation requirements of 10.10.4 shall not be required on the variable speed pump when the VFD meets the surge protection requirements as per EN/IEC 61000-4-5 and the pump controller, including the VFD, has surge protection according to 10.4.1.

(3) Circuit protection in accordance with 10.10.5.1 shall be provided between the line side of the variable speed drive and the load side of the isolating switch.

(4) If the isolating switch required by 10.4.2 has self-protecting instantaneous short-circuit overcurrent protection, the circuit protection required by 10.10.5.2 shall be coordinated such that the isolating switch does not trip due to a fault condition in the variable speed drive.

Statement of Problem and Substantiation for Public Comment

The VFD has immunity for surges per EN/IEC 61000-4-5 standard (<1kV) and the pump controller has also a separate surge protection (1-10kV) as per 10.4.1
Additionally, since there is a redundant/by-pass motor/pump available, the unit is capable to operate if the VFD somehow is damaged. Therefore the line side isolation is not critical to the fire pump function.

Related Item

• Public Input No. 80

Submitter Information Verification

Submitter Full Name: Seppo Koskela
Organization: Marioff Corp Oy Carrier Co
Street Address:
City:
State:
Zip:
Submittal Date: Fri Mar 31 01:38:03 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected

Resolution: A drive may be compliant with the IEC 61000-4-5 standard but not compliant with it in all power configurations. A corner grounded Delta power supply or a high resistance grounded power supply may invalidate the surge protection feature in the Adjustable Speed Drive (ASD) even though the drive was "compliant" with this EMC surge protection standard. Twenty years of NFPA 20 history with variable speed drive (VFD)

isolation has been extremely successful at preventing VFD damage due to spikes and surges.

Public Comment No. 2-NFPA 20-2023 [New Section after 8.4.12]

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 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 a motor is isolated by the tripped overcurrent protective device, the redundant motor be started to compensate the lost capacity, according to the performance requirements as stated in 8.4.4

Statement of Problem and Substantiation for Public Comment

Related to Public Input No. 88, the resolution from the committee was to clarify fault conditions. This PC has an updated language to support the comments from the committee.
For the related task group, please involve us to the group work for to provide any additional clarification or information if needed.

Rationalize from PI#88.
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-effectsand-protection-methods/
https://www.electricaltechnology.org/2021/11/what-happens-to-the-3-phase-motor-when-1-out-of-3-phases-is-lost.html

Related Item

• Public Input No. 88

Submitter Information Verification

Submitter Full Name: Seppo Koskela
Organization: Marioff Corp Oy Carrier Co
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 30 09:03:19 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected

Resolution: There is no substantial operational difference between the water mist positive displacement pumping unit (WMPDPU) and a centrifugal fire pump with regards to single phase running to have an exception for the 300% requirement. These pumps will still provide some fire protection value if already running and running at light loads. The 300% requirement accounts for single phase running. A single phase condition is likely to affect all of the motors and controls at one time.

Public Comment No. 3-NFPA 20-2023 [New Section after 8.4.12]

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, one per motor, that allows maximum amount of motors and pumps to start.

8.4.14.1.1

Maximum allowed motor amount to start, shall be marker or labeled next to emergency run switches.

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 Comment

In the first draft committee resolution, it was considered that the previous presented language was vague and unenforceable, the PC language is improved to address the concerns, from the committee / task group.

For the upcoming task group work, please involve us to the group work for to provide any additional clarification or information if needed.

Rationalize in Public Input No. 86:
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.

Related Item

• Public Input No. 86

Submitter Information Verification

Submitter Full Name: Seppo Koskela
Organization: Marioff Corp Oy Carrier Co
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 30 09:49:17 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected

Resolution: Manual mechanical operation provides additional reliable opportunities during fire fighting to run the water mist positive displacement pumping unit (WMPDPU) when all electrical means fail.

Public Comment No. 17-NFPA 20-2023 [Section No. 10.3.3.3]

10.3.3.3

Where the equipment is located outside, or where other special environments exist, rated enclosures suitable for the environments shall be used.

Statement of Problem and Substantiation for Public Comment

It is important that this requirement maintain emphasis on equipment located outside since that is the most misused application of a special environment. A standard Type 2 enclosure is not adequate for outdoor environments.

Related Item

• FR 98

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: NEMA
Street Address:
City:
State:
Zip:
Submittal Date: Sat May 27 21:21:26 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-16-NFPA 20-2023
Statement: Committee recognizes that NEMA 2 indoor enclosure are being used outdoors, so the revision adds text and Annex language to explain the typical NEMA enclosure for outdoor locations. It also references the NEMA and IEC comparison document to explain the IP equivalents.

Public Comment No. 32-NFPA 20-2023 [New Section after 10.4.2.1.3]

10.4.2.1.3.1

Where a redundant variable speed pump is provided with self-protecting instantaneous short-circuit overcurent protection, the isolating switch shall not trip due to a fault condition in the variable speed drive.

Statement of Problem and Substantiation for Public Comment

The isolating switch requirement added to Chapter 8 in FR-10 need to be located in Chapter 10 as they relate to electric drive controller requirements.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 33-NFPA 20-2023 [Section No. 8.4.6.1]	
Public Comment No. 33-NFPA 20-2023 [Section No. 8.4.6.1]	

Related Item

- FR-10

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 May 31 16:28:24 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The requirements specific to water mist positive displacement pumping units (WMPDPU) should be contained in Chapter 8 even if they are electrically related to clarify that the requirements only apply to WMPDPU.

Public Comment No. 21-NFPA 20-2023 [Sections 10.4.2.4, 10.4.2.5]

Sections 10.4.2.4, 10.4.2.5

10.4.2.4 – Instruction and Warning Labels .

10.4.2.4.1

Unless the requirements of An instruction label shall be provided that directs the order of operation of the isolating switch and circuit breaker.

10.4.2.

4

4 .2

or 10.

–

The instruction label shall be permitted to be part of the label required by 10.3.7.3.

10. 4.2.4.

2 are met, the

3 _

Unless the isolating switch and the circuit breaker are interlocked in accordance with 10.4.2.5.1, or the isolating switch complies with 10.4.2.1.2, the following warning shall appear on or immediately adjacent to the isolating switch:

WARNING

WARNING

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

10.4.2.4.2 Instruction Label 5 _ Operating Handle .

The requirements of

10.4.2.

4.1 shall not apply where the requirements of 10.4.2.4.2.1 and 10.4.2.4.2.2 are met.

10.4.2.4.2.1 –

Where the

5.1 _

The isolating switch and the circuit breaker are so interlocked shall be permitted to be interlocked so that the isolating switch can neither be neither opened nor closed while the circuit breaker is closed, the warning label shall be permitted to be replaced with an instruction label that directs the order of operation .

10.4.2.4 5 .2 2

~~This label shall be permitted to be part of the label required by 10.3.7.3 .~~

~~10.~~

Where the isolating switch is not interlocked in accordance with 10. 4.2.5

~~Operating Handle~~

.

~~10.4.2.5.~~

1

Unless the requirements of ~~10.4.2.5.2 are met~~ , the ~~isolating switch~~ operating handle shall be provided with a spring latch that shall be so arranged that it requires the use of the other hand to hold the latch released in order to permit opening or closing of the switch.

~~10.4.2.5.2~~

~~The requirements of 10.4.2.5.1 shall not apply where the isolating switch and the circuit breaker are so interlocked that the isolating switch can be neither opened nor closed while the circuit breaker is closed.~~

Statement of Problem and Substantiation for Public Comment

The current wording of 10.4.2.4 is confusing. It is proposed to be rewritten for clarity, and to make the correct reference to 10.4.2.1.2 for not requiring the warning label in 10.4.2.4.1.2.

Related Item

• FR 23

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: NEMA
Street Address:
City:
State:
Zip:
Submittal Date: Sat May 27 22:15:35 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-17-NFPA 20-2023

Statement: This revision clarifies the language of 10.4.2.4 for instruction and warning labels. This section is also revised for readability and to make the correct reference to 10.4.2.1.2 for not requiring the warning label. Additionally, the order of 10.4.2.4.3 was change for better readability.

Public Comment No. 5-NFPA 20-2023 [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 the higher of 10 psi (0.68 bar) or 3.33 percent of the maximum 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 signal that can be silenced~~ .

(2) Where the difference between the values from the electronic pressure sensors is more than 5% of the pressure maintenance level for 10 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. Additionally the system shall be equipped with a pressure switch to initiate automatic activation in case the both pressure sensors has been drifted up simultaneously.

(3) Where the pump unit has a pressure gauge and a pressure sensor, a settable alarm limit shall be used to activate the alarm when the electronic pressure sensor reading do not decrease below the set alarm pressure limit during any automatic pump start that was initiated by the solenoid drain valve, as required by 10.5.2.7.3. The alarm limit shall be set and verified during commissioning and annual services .

Statement of Problem and Substantiation for Public Comment

As discussed as part of Public Input No. 76, the resolution was that even there are two pressure sensors, it is possible that those drift upwards simultaneously and thus the alarm of the pressure difference between sensors is not suitable for the monitoring.
Therefore, Marioff has prepared two alternative solutions that should meet the same operational reliability as original text.
Intention for the change is to enable more reasonable solution for the high pressure water mist systems, where the current requirements to reduce pressure physically to less than 10 psi is not practical.
First option (2) is to have a separate pressure switch, set to initiate the pump unit automatic start in case both pressure sensors has drifted upwards simultaneously.
Second option (3) is to utilize the same method as in the original text but with a separately settable alarm limit that is set according to the physical fact, how low the pressure with that specific installation will actually decrease to when the solenoid valve is operated. E.g. in large systems pressure is likely to decrease from 360 psi to 250 psi before the pump unit automatically starts. In that example, if the pressure will not drop below 260 psi, the alarm will be triggered.

For the related task group, please involve us to the group work for to provide any additional clarification or information if needed.

Related Item

• Public Input No. 76

Submitter Information Verification

Submitter Full Name: Seppo Koskela
Organization: Marioff Corp Oy Carrier Co
Street Address:
City:

State:
Zip:
Submittal Date: Fri Mar 31 01:40:59 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected

Resolution: Water mist positive displacement pumping units (WMPDPUs) can operate up to 3000 psi, but with the first draft language that was revised to add "…or 3.33 percent of maximum controller rated pressure", the alarm pressure would be greater than 100 psi for this pressure rating. This is achievable with today's technology. Comparing the transducer pressure to atmospheric pressure through an open solenoid valve is still the most reliable way to check for a drifting transducer.

Public Comment No. 34-NFPA 20-2023 [Section No. 10.5.2.1.8.8]

~~10.5.2.1.8.8~~ –

~~A shutoff valve in the pressure-sensing line shall not be permitted.~~

Statement of Problem and Substantiation for Public Comment

This requirement is redundant to 4.32.6. It is not necessary to repeat requirements that do not have specific differences related to the other chapter that they are located.

Related Item

• FR-29

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 May 31 16:38:29 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-19-NFPA 20-2023
Statement: This requirement is redundant to the general requirement, 4.32.6, which applies to all installations.

Public Comment No. 13-NFPA 20-2023 [Section No. 10.5.2.7.4]

10.5.2.7.4

The motor shall shut down from motor overload when the motor current exceeds 120 percent of full load amperes for ~~10~~ 12 seconds.

10.5.2.7.4.1

Audible and visual alarms with trouble remote contacts shall be provided to indicate motor overload shutdown during testing.

Additional Proposed Changes

File Name	Description	Approved
NFPA_20_PC_13_Stelter.pdf	NFPA_20_PC_13_Stelter	

Statement of Problem and Substantiation for Public Comment

For 10.5.2.7, the test sequence for automatic testing lacks a signaling means indicating motor overload shutdown during testing. Audible and visual alarms with trouble remote contacts meet this need.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 14-NFPA 20-2023 [Section No. 10.5.2.8]	

Related Item

- FR-37

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 18 13:12:13 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-20-NFPA 20-2023

Statement: This revision adds requirements for alarms to indicate motor overload shutdown during automatic testing, and addition safety shutdowns have been added to prevent equipment damage during automatic testing. Additional language was added to ensure no remote interference before or after the automatic testing.

Public Comment No. 14-NFPA 20-2023 [Section No. 10.5.2.8]

10.5.2.8 Remote Automatic Testing.

10.5.2.8.1–

~~Automatic remote~~

*–

Remote automatic testing shall be permitted through a secure connection from authorized users.

A. 10.5.2.8. 1 For cybersecurity requirements for life safety equipment, see NFPA 70, 110.3(A)(8).

10.5. 2.8.2

Additional safety shutdowns in 10.5.2.8.2.1 shall be allowed if the controller overrides the shutdown and restarts in the event of a starting cause.

10.5.2.8. 2.1 Additional safety shutdowns.

(1) Overload of 120 percent of full load amperes exceeded for 12 seconds;

(2) Reversed phase rotation;

(3) Overpressure

(4) Single phasing

10.5.2.8. 3

Remote stop shall be allowed only if the controller overrides the remote stop signal and restarts in the event of a starting cause.

10.5.2.8.4

Upon starting a remote test, a ~~watchdog~~ timer shall be set to stop all remote testing operations and return the system to standby if it is not reset remotely and locally once every minute.

10.5.2.8.5

After 30 minutes, the controller shall automatically stop all remote testing activities, even if still occurring, and return to standby mode.

10.5.2.8.6
Personnel trained to immediately disable the remote automatic test sequence, if necessary, shall be present within sight of both the controller and the fire pump.

10.5.2.8.7

Local means shall be provided to cancel all testing and to return to standby mode.

Additional Proposed Changes

File Name	Description	Approved
NFPA_20_PC_14_Stelter.pdf	NFPA 20_PC_14_Stelter	

Statement of Problem and Substantiation for Public Comment

For 10.5.2.8, the test sequence for remote automatic testing needs specific additional safeguards for this testing scenario. In 10.5.2.8.4, the term “watchdog alarm” is replaced with simply “alarm” since

watchdog alarm is not defined. 10.5.2.8.6 was added since it is important for someone to be near the controller and fire pump in case something goes wrong, e.g., blown gasket, during remote testing. 10.5.2.8.7 is added since trained personnel need a means to cancel remote testing.

A.10.5.2.8.1 is added to clarify cybersecurity requirements for life safety equipment in accordance with NFPA 70, the National Electrical Code.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 13-NFPA 20-2023 [Section No. 10.5.2.7.4]	

Related Item

• FR-37

Submitter Information Verification

Submitter Full Name: William Stelter
Organization: Master Control Systems, Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Thu May 18 13:15:14 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-21-NFPA 20-2023

Statement: This revision incorporates additional safety shutdowns included in 10.5.2.7 since they apply to both automatic and automatic remote testing. The cybersecurity language is in accordance with NEC 110.3(A)(8) and was enhanced with additional language taken from NEC 240.6(D). Personnel required within sight of the equipment was not included because 4.3.1 presently states that “Means shall be provided for qualified personnel to determine that the fire pump is operating in a satisfactory manner during pump operation.” This does not require personnel within sight of the equipment and since additional shutdowns have been added, including leak detection, the pump room and equipment have been protected in a satisfactory manor during the automatic test.

Public Comment No. 31-NFPA 20-2023 [Section No. 10.10.4]

10.10.4 Isolation.

10.10.4.1

The variable speed drive shall be line and load isolated when not in operation.

10.10.4.2

The variable speed drive load isolation contactor and the bypass contactor shall be mechanically and electrically interlocked to prevent simultaneous closure.

10.10.4.3

Where a redundant motor and pump are provides to satisify the requirements fo 8.4.6(2), load isolation shall not be required for variable speed pumps

Statement of Problem and Substantiation for Public Comment

The load isolation requirement added to Chapter 8 in FR-10 need to be located in Chapter 10 as they relate to electric drive controller requirements.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 33-NFPA 20-2023 [Section No. 8.4.6.1]	

Related Item

- FR-10

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 May 31 16:18:08 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The requirements specific to water mist positive displacement pumping units (WMPDPU) should be contained in Chapter 8 even if they are electrically related to clarify that the requirements only apply to WMPDPU.

Public Comment No. 18-NFPA 20-2023 [Section No. 11.2.4.2.3.4(B)]

(B)

Where the equipment is located outside, or where other special environments exist, rated enclosures suitable for the environments shall be used.

Statement of Problem and Substantiation for Public Comment

It is important that this requirement maintain emphasis on equipment located outside since that is the most misused application of a special environment. A standard Type 2 enclosure is not adequate for outdoor environments.

Related Item

• FR 81

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: NEMA
Street Address:
City:
State:
Zip:
Submittal Date: Sat May 27 21:25:26 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-36-NFPA 20-2023
Statement: The existing language left room for interpretation. This revision adds a reference to NEMA 250 (Enclosures for Electrical Equipment – 1000V Maximum) that provides specific examples and their corresponding required enclosure rating.

Public Comment No. 19-NFPA 20-2023 [Section No. 12.3.3.1.2]

12.3.3.1.2

Where the equipment is located outside, or where other special environments exist, rated enclosures suitable for the environments shall be used.

Statement of Problem and Substantiation for Public Comment

It is important that this requirement maintain emphasis on equipment located outside since that is the most misused application of a special environment. A standard Type 2 enclosure is not adequate for outdoor environments.

Related Item

• FR 99

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: NEMA
Street Address:
City:
State:
Zip:
Submittal Date: Sat May 27 21:34:56 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-22-NFPA 20-2023
Statement: Committee recognizes that NEMA 2 indoor enclosure are being used outdoors. This revision adds text and Annex language to explain the typical NEMA enclosure for outdoor locations. It also references the NEMA and IEC comparison document to explain the IP equivalents.

Public Comment No. 25-NFPA 20-2023 [Section No. 14.2.6.6.11.1]

14.2.6.6.11.1

For water mist positive displacement pumping units, the automatic activation test shall be carried out by using a test connection that simulates the smallest system nozzle, in the hydraulically most remote area, discharged from maintenance pressure/standby pressure or ~~equal-sized~~ a test orifice in the pump ~~unit test line~~ test header that is designed to simulate the system pressure decay associated with the smallest nozzle at the most hydraulically remote area .

Statement of Problem and Substantiation for Public Comment

This is a proposal from the NFPA 750 and NFPA 25 task group.

Related Item

• NFPA 750/25 TG

Submitter Information Verification

Submitter Full Name: Terry Victor
Organization: Johnson Controls
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 31 10:15:15 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-34-NFPA 20-2023
Statement: The revision provides a more exact and clearer definition of the test orifice size to be used for automatic activation. This revision mirrors the language in NFPA 25 2026 first draft.

Public Comment No. 15-NFPA 20-2023 [Section No. 14.2.6.7.1.1]

14.2.6.7.1.1

~~Where service factor amperes are not provided, the product of the motor full-load amperes from Table 430.248 or 430.250 of *NFPA 70* times the allowable service factor shall not be exceeded.~~

Additional Proposed Changes

File Name	Description	Approved
NFPA_20_14.2.6.7.1.1_FR_49_and_14.2.6.7.2.1_Example.docx	Motor Performance - Service Factor amp	

Statement of Problem and Substantiation for Public Comment

The motor full-load ampere tables from the NEC are for branch circuit protection and not representative of actual Service Factor amps. Documentation of Service Factor amps is available online from motor manufacturers. An image is provided as an example of this available information from a NEMA fire pump motor member, Nidec Motors (St. Louis, MO).

Related Item

• FR 49

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: NEMA
Street Address:
City:
State:
Zip:
Submittal Date: Sat May 27 20:58:55 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-23-NFPA 20-2023

Statement: The product of the service factor and the motor full-load ampere table values from the NEC are not representative of actual Service Factor amps. The NEC tables are approximately 5% higher than the motor's full-load ampere rating so when you add 5% to the additional 15% for the service factor calculation, the motor could be 20% over its full-load ampere rating. This is beyond motor manufacture's ratings so these tables

should not be used. The revision returns the original wording for older motors that don’t have the SFA on the nameplate and where documentation is not provided.

Public Comment No. 20-NFPA 20-2023 [Section No. 14.2.6.7.2.1]

~~14.2.6.7.2.1~~ –

~~Where service factor amperes are not provided, the product of the rated voltage and motor full-load amperes from Table 430.248 or 430.250 of *NFPA 70* times the allowable service factor shall not be exceeded.~~

Additional Proposed Changes

File Name	Description	Approved
NFPA_20_14.2.6.7.1.1_FR_49_and_14.2.6.7.2.1_Example.docx	Motor Performance - Service Factor amps	

Statement of Problem and Substantiation for Public Comment

The motor full-load ampere tables from the NEC are for branch circuit protection and not representative of actual Service Factor amps. Documentation of Service Factor amps is available online from motor manufacturers. An image is provided as an example of this available information from a NEMA fire pump motor member, Nidec Motors (St. Louis, MO).

Related Item

• FR 50

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: NEMA
Street Address:
City:
State:
Zip:
Submittal Date: Sat May 27 21:40:33 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-24-NFPA 20-2023

Statement: The product of the service factor and the motor full-load ampere table values from the NEC are not representative of actual Service Factor amps. The NEC tables are approximately 5% higher than the motor's full-load ampere rating so when you add 5% to the additional 15% for the service factor calculation, the motor could be 20% over its full-load ampere rating. This is beyond motor manufacture's ratings so these tables should not be used. The revision returns the original wording for older motors that don't have the SFA on the nameplate and where documentation is not provided.

Public Comment No. 23-NFPA 20-2023 [New Section after A.4.3.3.3(2)]

A.4.3.4

Service personnel should be able to:

(1) Understand equipment-specific requirements, such as programming, application, and compatibility of the equipment being serviced.

(2) Understand the use of meters and test equipment required for the service to be performed.

(3) Understand basic job site safety rules and requirements of NFPA 70E.

Statement of Problem and Substantiation for Public Comment

See substantiation for NFPA 20 4.3.4; PC No. 22-NFPA 20-2023

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 22-NFPA 20-2023 [New Section after 4.3.3.4]	

Related Item

• FR 63

Submitter Information Verification

Submitter Full Name: Megan Hayes
Organization: NEMA
Street Address:
City:
State:
Zip:
Submittal Date: Tue May 30 20:14:11 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected

Resolution: Section 14.2.1 clearly states who the onsite personnel shall be for the startup. NFPA 25 addresses the qualifications of service personnel.

Public Comment No. 27-NFPA 20-2023 [New Section after A.4.14.1.1.6]

TITLE OF NEW CONTENT

A.4.14.3.3 A method of freeze protection that requires normal power is electrically operated unit heater(s) 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 Comment

The requirement for back-up power should apply to all pumps when the source of protection from pipes freezing in the pump room is from an unreliable electric power source.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 26-NFPA 20-2023 [New Section after 4.14.3.2]	Charging statement

Related Item

- FR-84

Submitter Information Verification

Submitter Full Name: Terry Victor
Organization: Johnson Controls
Street Address:
City:
State:
Zip:
Submittal Date: Wed May 31 11:19:38 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected

Resolution: There are other sources of heat besides electrical power that can be considered. Section 4.14.3.1 states that an approved heat source must be provided to maintain the pump room or pump house above 40 degrees F where required. The current language addresses the need for heat in the fire pump room regardless of the means provided. Each site needs to address temperature in the fire pump room based on available heating sources.

Public Comment No. 24-NFPA 20-2023 [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:

(a) See that pump is completely primed.

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

(c) Automatic controller will start pump if system demand is not satisfied (e.g., pressure low, deluge tripped).

(d) 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.

(2) *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.

(3) *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 that end. The storage batteries should always be maintained in good order to ensure prompt, satisfactory operation of this equipment (e.g., check electrolyte level and specific gravity, inspect cable conditions, check for corrosion).

(4) *Fire Pump Settings.* The fire pump system, when started by pressure drop, should be arranged as follows:

(a) The jockey pump stop point should equal the pump churn pressure plus the minimum static supply pressure.

(b) The jockey pump start point should be at least 10 psi (0.68 bar) less than the jockey pump stop point.

(c) The fire pump start point should be 10 psi (0.68 bar) less than the jockey pump start point. Use 10 psi (0.68 bar) increments for each additional pump.

(d) 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.

(e) 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.

(f) The following are examples of fire pump settings (for SI units, 1 psi = 0.0689 bar):

i. Pump: 1000 gpm, 100 psi pump with churn pressure of 115 psi

ii. Suction supply: 50 psi from city — minimum static; 60 psi from city — maximum static

iii. Jockey pump stop = 115 psi + 50 psi = 165 psi

iv. Jockey pump start = 165 psi −10 psi = 155 psi

v. Fire pump stop = 115 psi + 50 psi = 165 psi

vi. Fire pump start = 155 psi −10 psi = 145 psi

vii. Fire pump maximum churn = 115 psi + 60 psi = 175 psi

(g) 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.

(5) *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.

Additional Proposed Changes

File Name	Description	Approved
NFPA_20_A.14.2.6_f_FR_91.docx		

Statement of Problem and Substantiation for Public Comment

Fire pumps are now manual stop per 10.5.4.2.1 and do not stop when the pressure exceeds reset pressure.

Related Item

• FR 91

Submitter Information Verification

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City:
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Submittal Date: Tue May 30 20:29:21 EDT 2023
Committee: FIM-AAA

Committee Statement

Committee Action: Rejected

Resolution: The reference to “fire pump stop” is appropriate given the context of the annex note for fire pump settings for cut in and cut out pressures.