Public Comment No. 11-NFPA 110-2017 [Section No. 4.4]

4.4* Level.

This standard recognizes two levels for equipment installation, performance, and maintenance requirements.

4.4.1*

Level 1 systems shall be installed where failure of the equipment to perform could result in loss of human life or serious injuries.

4.4.2*

Level 2 systems shall be installed where failure of the EPSS to perform is less critical to human life and safety.

4.4.3*

All equipment shall be permanently installed.

4.4.4*

Level 1 and Level 2 systems shall ensure that all loads served by the EPSS are supplied with alternate power that meets all the following criteria:

(1) Of a quality within the operating limits of the load

(2) For a duration specified for the class as defined in Table 4.1(a)

(3) Within the time specified for the type as defined in Table 4.1(b)

Additional Proposed Changes

File Name	Description	Approved
Correlating_Committee_Note_No_1.pdf	110_CCN1	

Statement of Problem and Substantiation for Public Comment

NOTE: This Public Comment appeared as CC Note No. 1 in the First Draft Report on First Revision No. 2 and is also related to Public Input No. 51.

Substantiation: This section recognizes the two levels of systems that are used throughout the document. The correlating committee directs the technical committee to review 7.2.1 and 7.11.1, as well as the remainder of the document, for correlation and consistency in the application of these two levels. This will be considered as a public comment.

Related Item
FR 2
PI 51

Submitter Information Verification

Submitter Full Name:	CC on NEC-AAC
Organization:	NFPA NATIONAL ELECTRICAL CODE CORRELATING COMMITTEE
Street Address:	
City:	

State:

Zip:

Submittal Date: Tue May 09 16:43:46 EDT 2017

Committee Statement

Committee Action: Rejected

Resolution: The technical committee reviewed the document and determined that the requirements for Level 1 and Level 2 systems is consistent throughout the document.

Correlating Committee Note No. 1-NFPA 110-2017 [Section No. 4.4 [Excluding any Sub-Sections]]

Submitter Information Verification

Submitter Full Name: Mark Earley

Organization: National Fire Protection Assoc

Street Address:

City:

State:

Zip:

Submittal Date: Fri Jan 20 13:18:14 EST 2017

Committee Statement and Meeting Notes

Committee Statement: This section recognizes the two levels of systems that are used throughout the document. The correlating committee directs the technical committee to review 7.2.1 and 7.11.1, as well as the remainder of the document, for correlation and consistency in the application of these two levels. This will be considered as a public comment.

Ballot Results

This item has passed ballot

12 Eligible Voters

0 Not Returned

12 Affirmative All

0 Affirmative with Comments

0 Negative with Comments

0 Abstention

Affirmative All

Brunssen, James E.
Deike, Jr., Roland E.
Dressman, Kevin L.
Hickman, Palmer L.
Hittinger, David L.
Holub, Richard A.
Johnston, Michael J.
Kovacik, John R.
Manche, Alan
McCullough, Robert A.
Pierce, James F.
Saporita, Vincent J.

Public Comment No. 3-NFPA 110-2017 [Section No. 5.2.1 [Excluding any Sub-Sections]]

Energy converters shall consist only of rotating equipment as indicated in 5.2.4, or fuel cells as described in NFPA 852, Standard for Installation of Stationary Fuel Cell Power Systems .

Statement of Problem and Substantiation for Public Comment

Summary:
To address the coordination of NFPA-70, NFPA-99 and NFPA-110, NFPA-110 should be changed to permit fuel cells as source of emergency power provided specific conditions are met.

Originally Proposed Changes to the Code:
The following proposed changes were submitted by Walt Vernon during the public comment period on NFPA-110 as one way to permit fuel cells as a source of emergency power in NFPA-110 (Public Input #62 and Public Input #61 respectively):
1. Change 5.2.1 to read: “Energy converters shall consist only of rotating equipment as indicated in 5.2.4, or fuel cells as described in NFPA 852, Standard for Installation of Stationary Fuel Cell Power Systems.

2. Additions to section 5.4 as follows:
5.4.1 Because Fuel Cells cannot come up to rated load within a reasonable time,

5.4.1.1. Fuel cell installations must consist of N+1 units operating in parallel, and continuously supplying power to the Emergency System.

5.4.1.2 Fuel cell installations shall have a normal utility supply available in case of total system failure. And

5.4.1.3 Fuel cell installations shall include a connection for portable diesel generator to supply the legally required life safety loads.

These changes were submitted to ensure coordination with NFPA-99 and NFPA-70 both of which permit the use of fuel cells for emergency power.

Committees initial Response:

The NFPA110 committee rejected these changes indicating that “currently fuel cells do not meet all of the performance requirements of NFPA 110.”

New Comment:
The committee response in resolving PI 61 was that “fuel cells do not meet the requirements of Section 5.4.” The response to PI 62 was that “currently fuel cells do not meet all of the performance requirements of NFPA 110.” That is exactly what these proposals are trying to address and that resolution statement given by the committee on PI 61 and PI 62 do not address why the committee decided to reject this submittal.

We therefore suggest that the following be added to the text as section 5.4.1:
5.4.1 Fuel cells shall be considered to meet the requirement of 5.4 where all of the following conditions are met:
(1) Fuel cell installations consist of N+1 units operating in parallel, and continuously supplying power to the Emergency System.
(2) Fuel cell installations have a normal utility supply available in case of total system failure.
(3) Fuel cell installations include a connection for portable diesel generator to supply the legally required life safety loads.
Additionally, section 5.2.1 should be modified as originally suggested, namely:
Energy converters shall consist only of rotating equipment as indicated in 5.2.4 or fuel cells as described in NFPA 853, Standard for Installation of Stationary Fuel Cell Power Systems.

Additional Background Information

It does not appear the committee addressed the fact that fuel cells are already permitted as emergency power sources in other NFPA documents. The committee should further consider the change to ensure proper coordination between all NFPA codes.

Walt Vernon chaired the electrical systems committee for NFPA-99 at the time fuel cells were introduced for inclusion as a source of emergency power for health care facilities. He has indicated he would be happy to work with the NFPA-110 committee to ensure the NFPA-110 is appropriately changed to include fuel cells.

NFPA-99 has jurisdiction over healthcare:
NFPA-99 was intended to have jurisdiction over healthcare facilities. Section 1.3.1 indicates that “This code shall apply to all health care facilities other than home care and veterinary care.” Section 1.2 states that “the purpose of this code is to provide minimum requirements for the installation, inspection, testing, maintenance, performance, and safe practices for facilities, material, equipment, and appliances, including other hazards associated with the primary hazards.”
Furthermore, section 2.1 (2) notes “where the requirements of a referenced code or standard differ from the requirements of this code, the requirements of this code shall govern.” NFPA-110 is a referenced standard.

NFPA 99 explicitly recognizes use of fuel cells for emergency power
Section 6.4.1.1.7 permits fuel cell systems to serve as the alternate source for all or part of an essential electrical system under certain conditions.

The National Electrical Code (NFPA-70) explicitly recognizes the use of fuel cells for emergency power
NFPA70 Already recognizes Fuel Cells as a source of power for emergency systems. Sections 700.12E speaks to this specifically:
700.12E
“(E) Fuel Cell System. Fuel cell systems used as a source of power for emergency systems shall be of suitable rating and capacity to supply and maintain the total load for not less than 2 hours of full-demand operation.
Installation of a fuel cell system shall meet the requirements of Parts II through VIII of Article 692.
Where a single fuel cell system serves as the normal supply for the building or group of buildings concerned, it shall not serve as the sole source of power for the emergency standby system.”

As well, NFPA-70 section 701.12F speak specifically to fuel cell use for legally required standby systems:
701.12F:
“(F) Fuel Cell System. Fuel cell systems used as a source of power for legally required standby systems shall be of suitable rating and capacity to supply and maintain the total load for not less than 2 hours of full-demand operation.
Installation of a fuel cell system shall meet the requirements of Parts II through VIII of Article 692.
Where a single fuel cell system serves as the normal supply for the building or group of buildings concerned, it shall not serve as the sole source of power for the legally required standby system.”

Therefore, for coordination, changes should be made to NFPA-110:
To ensure coordination of the NFPA documents, NFPA-110 should be changed to permit fuel cells as source of emergency power.
The technical details of such a change can be deliberated to address concerns. However, NFPA-110 should recognize fuel cells as a source of emergency power, given that they are already explicitly permitted as a source of emergency power for healthcare facilities under the jurisdiction of NFPA-99 and are explicitly permitted more generally under NFPA-70.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 4-NFPA 110-2017 [Section No. 5.4]	

Related Item
Public Input#62
Public Input#61

Submitter Information Verification

Submitter Full Name: Walter Vernon

Organization: Mazzetti
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 20 09:47:10 EDT 2017

Committee Statement

Committee Action: Rejected

Resolution: Fuel cells cannot provide the required start time (10 seconds) required for energy converters in Level 1 and Level 2 systems. Additionally, fuel cells need to be proven to be capable of starting all types of loads such as large motors.

Public Comment No. 4-NFPA 110-2017 [Section No. 5.4]

5.4* Energy Converters — Capacity.

The energy converters shall have the required capacity and response to pick up and carry the load within the time specified in Table 4.1(b) after loss of primary power.

5.4.1 Fuel cells shall be considered to meet the requirement of 5.4 where all of the following conditions are met:

(1) Fuel cell installations consist of N+1 units operating in parallel, and continuously supplying power to the Emergency System.

(2) Fuel cell installations have a normal utility supply available in case of total system failure.

(3) Fuel cell installations include a connection for portable diesel generator to supply the legally required life safety loads.

Statement of Problem and Substantiation for Public Comment

Summary:
To address the coordination of NFPA-70, NFPA-99 and NFPA-110, NFPA-110 should be changed to permit fuel cells as source of emergency power provided specific conditions are met.

Originally Proposed Changes to the Code:
The following proposed changes were submitted by Walt Vernon during the public comment period on NFPA-110 as one way to permit fuel cells as a source of emergency power in NFPA-110 (Public Input #62 and Public Input #61 respectively):
1. Change 5.2.1 to read: “Energy converters shall consist only of rotating equipment as indicated in 5.2.4, or fuel cells as described in NFPA 852, Standard for Installation of Stationary Fuel Cell Power Systems.

2. Additions to section 5.4 as follows:
5.4.1 Because Fuel Cells cannot come up to rated load within a reasonable time,

5.4.1.1. Fuel cell installations must consist of N+1 units operating in parallel, and continuously supplying power to the Emergency System.

5.4.1.2 Fuel cell installations shall have a normal utility supply available in case of total system failure. And

5.4.1.3 Fuel cell installations shall include a connection for portable diesel generator to supply the legally required life safety loads.

These changes were submitted to ensure coordination with NFPA-99 and NFPA-70 both of which permit the use of fuel cells for emergency power.

Committees initial Response:
The NFPA110 committee rejected these changes indicating that “currently fuel cells do not meet all of the performance requirements of NFPA 110.”

New Comment
The committee response in resolving PI 61 was that “fuel cells do not meet the requirements of Section 5.4.” The response to PI 62 was that “currently fuel cells do not meet all of the performance requirements of NFPA 110.” That is exactly what these proposals are trying to address and that resolution statement given by the committee on PI 61 and PI 62 do not address why the committee decided to reject this submittal.

We therefore suggest that the following be added to the text as section 5.4.1:
5.4.1 Fuel cells shall be considered to meet the requirement of 5.4 where all of the following conditions are met:
(1) Fuel cell installations consist of N+1 units operating in parallel, and continuously supplying power to the

Emergency System.
(2) Fuel cell installations have a normal utility supply available in case of total system failure.
(3) Fuel cell installations include a connection for portable diesel generator to supply the legally required life safety loads.
Additionally, section 5.2.1 should be modified as originally suggested, namely:
Energy converters shall consist only of rotating equipment as indicated in 5.2.4 or fuel cells as described in NFPA 853, Standard for Installation of Stationary Fuel Cell Power Systems.

Additional Background Information:
It does not appear the committee addressed the fact that fuel cells are already permitted as emergency power sources in other NFPA documents. The committee should further consider the change to ensure proper coordination between all NFPA codes.

Walt Vernon chaired the electrical systems committee for NFPA-99 at the time fuel cells were introduced for inclusion as a source of emergency power for health care facilities. He has indicated he would be happy to work with the NFPA-110 committee to ensure the NFPA-110 is appropriately changed to include fuel cells.

NFPA-99 has jurisdiction over healthcare:
NFPA-99 was intended to have jurisdiction over healthcare facilities. Section 1.3.1 indicates that “This code shall apply to all health care facilities other than home care and veterinary care.” Section 1.2 states that “the purpose of this code is to provide minimum requirements for the installation, inspection, testing, maintenance, performance, and safe practices for facilities, material, equipment, and appliances, including other hazards associated with the primary hazards.”
Furthermore, section 2.1 (2) notes “where the requirements of a referenced code or standard differ from the requirements of this code, the requirements of this code shall govern.” NFPA-110 is a referenced standard.

NFPA 99 explicitly recognizes use of fuel cells for emergency power:
Section 6.4.1.1.7 permits fuel cell systems to serve as the alternate source for all or part of an essential electrical system under certain conditions.

The National Electrical Code (NFPA-70) explicitly recognizes the use of fuel cells for emergency power
NFPA70 Already recognizes Fuel Cells as a source of power for emergency systems. Sections 700.12E speaks to this specifically:

700.12E:
“(E) Fuel Cell System. Fuel cell systems used as a source of power for emergency systems shall be of suitable rating and capacity to supply and maintain the total load for not less than 2 hours of full-demand operation.
Installation of a fuel cell system shall meet the requirements of Parts II through VIII of Article 692.
Where a single fuel cell system serves as the normal supply for the building or group of buildings concerned, it shall not serve as the sole source of power for the emergency standby system.”

As well, NFPA-70 section 701.12F speak specifically to fuel cell use for legally required standby systems:
701.12F:
“(F) Fuel Cell System. Fuel cell systems used as a source of power for legally required standby systems shall be of suitable rating and capacity to supply and maintain the total load for not less than 2 hours of full-demand operation.
Installation of a fuel cell system shall meet the requirements of Parts II through VIII of Article 692.
Where a single fuel cell system serves as the normal supply for the building or group of buildings concerned, it shall not serve as the sole source of power for the legally required standby system.”

Therefore, for coordination, changes should be made to NFPA-110
To ensure coordination of the NFPA documents, NFPA-110 should be changed to permit fuel cells as source of emergency power.
The technical details of such a change can be deliberated to address concerns. However, NFPA-110 should recognize fuel cells as a source of emergency power, given that they are already explicitly permitted as a source of emergency power for healthcare facilities under the jurisdiction of NFPA-99 and are explicitly permitted more generally under NFPA-70.

Related Public Comments for This Document

Related Comment	Relationship
Public Comment No. 3-NFPA 110-2017 [Section No. 5.2.1 [Excluding any Sub-Sections]]	Both related to use of fuel cells for emergency power

Related Item

PI-61

Submitter Information Verification

Submitter Full Name: Walter Vernon
Organization: Mazzetti
Street Address:
City:
State:
Zip:
Submittal Date: Thu Apr 20 10:10:01 EDT 2017

Committee Statement

Committee Action: Rejected

Resolution: Fuel cells cannot provide the required start time (10 seconds) required for energy converters in Level 1 and Level 2 systems. Additionally, fuel cells need to be proven to be capable of starting all types of loads such as large motors.

Public Comment No. 8-NFPA 110-2017 [Section No. 5.6.4.7]

5.6.4.7

All chargers shall include the following characteristics, which are to be accomplished without manual intervention (i.e., manual switch or manual tap changing):

(1) At its rated voltage, the charger shall be capable of delivering energy into a fully discharged battery unit without damaging the battery.

(2) The charger shall be capable of returning the fully discharged battery to 100 percent of its ampere-hour rating within the time specified in Table 5.6.4.2, item (f).

(3) As specified in Table 5.6.4.2, item (e), meters with an accuracy within 5 percent of range shall be furnished.

(4) ~~The generator set or charger~~ The charger shall be permanently marked with the following:

(5) Allowable range of battery unit capacity that can be recharged within the time requirements of Table 5.6.4.2

(6) Nominal output current and voltage

(7) Sufficient battery-type data to allow replacement batteries to be obtained

(8) The battery charger output and performance shall be compatible with the batteries furnished.

(9) Battery chargers used in Level 1 systems shall include temperature compensation for charge rate.

Statement of Problem and Substantiation for Public Comment

Article 5.6.4.7 is speaking to static automatic battery chargers (not prime mover driven chargers), as prefaced in 5.6.4.6. So, we should strike "generator set or" from (4), as it doesn't make sense.

Related Item

27-NFPA 110-2016

Submitter Information Verification

Submitter Full Name: Timothy Windey
Organization: Cummins Power Systems
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 05 14:55:16 EDT 2017

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-6-NFPA 110-2017

Statement: Section 5.6.4.7 references static automatic battery chargers (not prime mover driven chargers), as prefaced in 5.6.4.6. The phrase "generator set or" from (4), has been deleted.

Public Comment No. 6-NFPA 110-2017 [Section No. 5.6.5.1]

5.6.5.1

A control panel shall be provided and shall contain the following:

(1) Automatic remote start capability

(2) "Run-off-~~automatic" mechanical switch~~ automatic" switch function

(3) Shutdowns as required by 5.6.5.2(3)

(4) Alarms as required by 5.6.5.2(4)

(5) Controls as required by 5.6.5.2(5)

Statement of Problem and Substantiation for Public Comment

The intent of the submitters PI was to make this more flexible, as many modern digital generator controls have HMI membrane panels that include the switch function. The intent was not to insert the word "mechanical" ahead of the word "switch". Don't think we should require a step backwards with technology.

Related Item

28-NFPA 110-2016

Submitter Information Verification

Submitter Full Name: Timothy Windey
Organization: Cummins Power Systems
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 05 14:28:02 EDT 2017

Committee Statement

Committee Action: Accepted
Resolution: SR-4-NFPA 110-2017
Statement: The word mechanical was removed from the first draft to allow the inclusion of modern digital controls. The word "functions" was added following "switch" in item (2).

Public Comment No. 5-NFPA 110-2017 [Section No. 5.6.5.5]

5.6.5.5

The cranking cycle shall be capable of being initiated by any of the following:

(1) Manual start initiation as specified in 5.6.5.2(2)(a).

(2) Loss of normal power at any automatic transfer switch (ATS) considered a part of the EPSS. Prime mover shall start (or stop) after appropriate time delays, upon operation of a remote switch or set of contacts.

(3) Clock exerciser located in an ATS or in the control panel.

(4) Manually operated (test) switch located in each ATS that simulates a loss of power and causes automatic starting and operation until this switch is reset, to cause the engine circuit to duplicate its functions in the same manner commercial power is restored after a true commercial power failure.

Statement of Problem and Substantiation for Public Comment

I am the submitter of the original PI (49-NFPA 110-2016). The PI was passed in the first draft meeting, using my exact wording and substantiation. Unfortunately there was an error made with the wording of this article in the first draft report (and subsequent reports). Please restore wording per this PC (and my original PI 49).

Related Item

PI 49-NFPA-2016

Submitter Information Verification

Submitter Full Name: Timothy Windey
Organization: Cummins Power Systems
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 05 13:46:16 EDT 2017

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-3-NFPA 110-2017
Statement: Item (5) was added to cover installations that do not use a transfer switch and have a signal indicating a loss of acceptable power. Item (2) was revised to remove "(or stop)".

Public Comment No. 2-NFPA 110-2017 [Section No. 5.6.5.6]

5.6.5.6 ***

All installations shall be provided with at least one remote tamperproof emergency stop switch located outside the room housing the prime mover, where so installed, or elsewhere on the premises where the prime mover is located outside the building.

5.6.5.6.1

The remote manual stop station shall be labeled.

The remote stop should be an option not a mandatory component. I suggest the language in 5.6.5.6 be changed from "All installations ***shall*** be provided with at least one remote tamperproof emergency stop switch" to "All installation ***should*** be proided with at least one remote tamperproof emergenc stop switch"

I don't think it is imperitive in Level 1 applications to have this device installed. The specific operating procedure for each facility should dictate the need to incorporate the use of the remote switch. I have 30+ years of oerational experience working for hospitals in the Engineering Department, I have yet to see a procedure in place and staff training on the use of the remote stop switch. I have reached out to numerous members of the NFPA 110 committee for feedback on policies or procedures in place at other facilities, I have yet to receive any correspondance back with an active procedure that has been implemented. We take the generation of emergency power very seriously here in NYC area, which is why we commit continuous manpower for the observation and data collection of the emergency generator while in operation.

I would have difficult time putting together an operational procedure for staff to follow for the implementation of the remote stop switch. We all strive to provide our staff the proper training, tools, education and operatonal strategy for all of our equipment and systems, yet all my peers I've spoken to have yet to address the operational strategy for the remote stop switch for Level 1 applcations.

I would be happy to expound further on the topic and entertain any thought processess to safely implement the use of the switch that would never jeopardize LIFE SAFETY in our hospital.

Please feel free to contact me if you would like to have further dialogue on the topic.

Best Regards,

Kenny Brengel

516-592-3692

kjbrengel@gmail.com

Statement of Problem and Substantiation for Public Comment

The undue burden on the hospital to implement a strategic policy and procedure for the operation and training of staff on how, when and why they would use the remote manual stop station for the emergency generator for Level 1 facility.

The remote stop should be an option not a mandatory component. I suggest the language in 5.6.5.6to be changed from "All installations SHALL be provided with at least one remote tamperproof emergency stop switch" to"All installations SHOULD be provided with at least one remote tamperproof emergency stop switch"

I don't think it is imperative in Level 1 applications to have this device installed. The specific operating procedure for each facility should dictate the need to incorporate the use of the remote switch. I have 30+ years of hospital operational experience in the Engineering Department. I have yet to see a policy, procedure and staff training in place on the use of the remote stop switch. I have reached out to numerous members of the NFPA 110 committee for feedback on current policies and procedures in place at other facilities. I have yet to receive any correspondence back with an active program that has been implemented. We take the generation of emergency power very seriously here in the NYC area, which is why we commit resources and continuos manpower for the observation and data collection of the emergency generator while in operation.

I would have a difficult time putting together an operational procedure for staff to follow for the implementation of

the remote stop switch. We all strive to provide staff the proper training, tools, education and systems, yet all my peers I've spoken to have yet to address the operational strategy for the remote stop switch for Level 1 applications.

I would be happy to expound further on my concerns on this topic and entertain any thought process to safely implement the use of the switch that would NEVER jeopardize LIFE SAFETY in any hospital.

Please feel free to contact me if you would like to have further dialogue on this topic.

Best regards,
Kenny Brengel
516-592-3691
kjbrengel@gmail.com

Related Item

5.6.5.6

Submitter Information Verification

Submitter Full Name: Ken Brengel
Organization: KJB Facility Consulting Inc.
Street Address:
City:
State:
Zip:
Submittal Date: Thu Mar 30 09:34:38 EDT 2017

Committee Statement

Committee Action: Rejected but see related SR

Resolution: SR-9-NFPA 110-2017

Statement: The requirements for the remote emergency stop switch are needed to provide for the safety of qualified personnel and protection of property.

The language from the annex has been incorporated into the body of the text in accordance with the Manual of Style.

Public Comment No. 7-NFPA 110-2017 [Section No. 5.6.9.9]

5.6.9.9

The generator instrument panel for Level 1 applications shall contain the following:

(1) An ac voltmeter(s) for each phase or a phase selector switch

(2) An ac ammeter(s) for each phase or a phase selector switch

(3) A frequency meter

(4) A voltage-adjusting feature to allow ± 5 percent voltage adjustment

(5) An ac kW ~~meter indicating total load on~~ or kVA meter to show total power for the generator set

Statement of Problem and Substantiation for Public Comment

Need some flexibility for this new requirement, as some more basic generator control HMI's have kVA meters.

Related Item

29-NFPA 110-2016

Submitter Information Verification

Submitter Full Name: Timothy Windey
Organization: Cummins Power Systems
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 05 14:34:29 EDT 2017

Committee Statement

Committee Action: Rejected but see related SR
Resolution: SR-5-NFPA 110-2017
Statement: This revision provides flexibility because some basic generator control HMI's have kVA meters rather than kW meters.

Public Comment No. 10-NFPA 110-2017 [Section No. 7.9.13]

7.9.13

Automatically actuated valves shall not be permitted in the fuel oil supply or fuel oil return lines for Level 1 emergency power supply systems when the fuel supply is directly connected to the prime mover .

7.9.13.1*

Automatically actuated valves shall be permitted in the fuel oil supply or fuel oil return lines between a day fuel tank and the main fuel tank for Level 1 emergency power supply systems.

A.7.9.13.1

The fuel supply is also a fire risk to the building and the occupants of that building. The main fuel tank provides fuel for extended use of the emergency power system or to multiple emergency generators. If there is an issue with the fuel delivery system to the day fuel tank, a large quantity of fuel can be fed into the generator room. This fuel will feed a growing fire in the generator room and can escape the room creating a liquid fire hazard in an occupancy not designed for that type of fire hazard.

Statement of Problem and Substantiation for Public Comment

The reliability and availability of the direct fuel supply to a Level 1 emergency power supply system is critical. A properly sized day fuel tank will ensure the emergency power is available when needed.

A properly designed fuel/fire detection system interlocked to an automatically actuated valve between the main fuel tank and day fuel tank will help keep any potential spill and/or fire in the emergency generator room and limit the exposure to the main occupancy of the building. With an alarm system, personnel at the facility could respond to any potential false alarm and restore the main fuel supply to the day fuel tank long before the day fuel tank is exhausted. The provision of an automatic shut-off valve in the fuel supply lines between the main fuel tank and day fuel tank will not negatively impact the availability or reliability of the fuel supply to the generator.

The concern of a fuel exposure to the main occupancy of a building is real. There are upsets in the generator room that can lead to fuel from the main tank being pumped into the generator room and also escape the room. To date FM Global has had a couple of incident reported that involved fuel escaping the generator room. In one case the fuel entered a hospital. These events have not resulted in a fire but a liquid fuel fire in any occupancy that is not specifically designed for that exposure can be devastating to the occupancy.

Related Item

PI 57

Submitter Information Verification

Submitter Full Name: John LeBlanc
Organization: FM Global
Street Address:
City:
State:
Zip:
Submittal Date: Tue May 09 15:05:17 EDT 2017

Committee Statement

Committee Action: Rejected

Resolution:	Ambiguity was detected with regard to automatic actuated valves. NFPA 37 covers the fuel train.

Public Comment No. 9-NFPA 110-2017 [Section No. 7.11.6]

7.11.6 *

For systems in seismic risk areas, the EPS, transfer switches, distribution panels, circuit breakers, and associated controls shall be capable of performing their intended function during and after being subjected to the anticipated seismic shock.

Statement of Problem and Substantiation for Public Comment

Rolling this back to the original wording after discussing with OSHPD. The California Electrical Code, 2016 (NFPA National Electrical Code, 2014) Section 517.31 requires that Life Safety and Critical Branch of Essential Electrical System (Alternative Power Source) be restored within 10 seconds after interruption of normal source, irrespective of the cause.

Related Item

46-NFPA 110 2016

Submitter Information Verification

Submitter Full Name: Timothy Windey
Organization: Cummins Power Systems
Street Address:
City:
State:
Zip:
Submittal Date: Fri May 05 15:18:28 EDT 2017

Committee Statement

Committee Action: Rejected

Resolution: The submitters substantiation supports the committee action during the first revision as restoration of power is permitted within 10 seconds and not operation during the seismic event. This aligns with the IBC requirements. The electrical distribution equipment seismic testing does not evaluate the electrical equipment operation during the event.

Public Comment No. 13-NFPA 110-2017 [Section No. 8.3.7]

8.3.7*

A fuel quality test shall be performed at least annually using appropriate ASTM standards.

Please see my additions and changes to the current 8.3.7* below as there is much confusion in the industry due to the broadness of the testing recommendations and information. It would be my privilege to assist in the upcoming editions pertaining to this Chapter and Section.

8.3.7* _

A fuel quality test shall be performed no less than annually using appropriate test methods approved under ASTM D 975, *Standard Specifications for Diesel Fuel Oils,* to indicate fuel can be stored for a minimum of 1 year without degradation. Not all approved testing under D 975 specifications shall be required, but **a minimum testing of Bacteria/Fungi ASTM D6469, Water & Sediment ASTM D2709 and other foreign materials shall be performed** as where there is a separation of water from the diesel fuel, microbial contamination can occur. For fuels being stored for periods longer than 12 months, the **diesel fuel shall also be tested for ignition quality and performance by testing for a minimum of Cetane Index ASTM D4737** approved under ASTM D 975 standards.

Additional tests chosen should be recommended on several factors including but not limited to the following:

1) Geographical location and climate in which diesel fuel is being stored. Climates where the temperature does not get below freezing should not require the testing of the diesel fuels cold weather properties such as cloud point, pour point, and cold filter plug point.

2) The environment in which the fuel stored. See points referenced in Annex A 7.9.1.2 which suggest that fuel degradation accelerates in tanks subjected to temperature variations as it can lead to the presence of water and where there is a separation of diesel fuel and water microorganisms and fungi can grow and contaminate the fuel supply which can lead to general or pitting corrosion of steel tanks and components, possibly resulting in filter plugging, operational issues or a hydrocarbon release to the environment.

3) The material of the tank in which the fuel stored. See points referenced in Annex A 7.9.3.1 that states "Copper can promote fuel degradation and can produce mercaptide gels. Zinc coatings can react with water or organic acids in the fuel to form gels that rapidly plug filters." Tanks with copper and zinc material could recommend having Copper Corrosion testing performed by methods approved under ASTM D 975 specifications.

4) ASTM D 975 specification allows biodiesel concentrations up to 5% (B5) in diesel fuel with no separate labeling required at the pump. It is recommended to test for **% Biodiesel Concentration ASTM D7371** in a fuel supply being stored for a minimum of 6 months as biodiesel blends are comprised of organic substances which accelerate the degradation of fuel if not properly treated. Acceleration is greater with any presence of microbiological growth and could possibly lead to sludge like substances within the fuel supply leading to clogged filters and operational issues.

5) All diesel fuel tanks filled after 2014, when the ULSD diesel fuel was made required for all NRLM engines and equipment, it is recommended to test for the **Sulfur Content ASTM D2622** to ensure all stored fuels meet the current USLD requirement which reduced Sulfur Content to 15ppm.

Additional documentation suggested to be added from the NFPA 25 - Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems—2017 Edition is as follows:

1) If diesel fuel is found to be deficient in the testing required in 8.3.7, the fuel shall be reconditioned or replaced, the supply tank shall be cleaned internally, and the engine fuel filter(s) shall be changed.

2) After the restoration of the fuel and tank, the fuel shall be retested every 6 months until experience indicates the fuel can be stored for a minimum of 1 year without degradation beyond that allowed in above chapters.

Statement of Problem and Substantiation for Public Comment

As a provider of diesel fuel testing predominately within the power generation industry, I believe the clarification and guidelines within the fuel quality testing requirements would eliminate much confusion and inconsistency nationwide, particularly when it comes to critical and emergency power operations. As a member of several associations and hundreds of customers, I have experienced that lack of guidance and education is largest and most consistent challenge in the field not only at the service level but especially at the end user level. In addition, it would certainly assist other regulatory firms that reference the NFPA110 regulations in understanding what to look for when enforcing the requirements within their jurisdiction.

Related Item

Professional within Diesel Fuel Testing Laboratory

Member of the EGSA (Electrical Generator Systems Association

Member of the EGSA Dealer / Distributor Committee

Provider of Diesel Fuel Testing for Service Companies / Dealers / Distributors / End Users who are required to follow NFPA110 Guidelines

Submitter Information Verification

Submitter Full Name:	Michelle Hilger
Organization:	Titan Laboratories, Member of E.G.S.A (Electrical Generator Systems Association), Member of the Dealer / Distributor Committee within the E.G.S.A
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Submittal Date:	Wed May 10 08:31:27 EDT 2017

Committee Statement

Committee Action:	Rejected but see related SR
Resolution:	SR-7-NFPA 110-2017 The remainder of the proposed language was deleted because the submitter did not provide the revised proposed text in accordance with the NFPA Regulations Governing the Development of NFPA Standards and the Manual of Style (MOS).
Statement:	Language was added to allow testing to the manufacturer's recommendations as well as to the ASTM standards. The annex material has been removed as being unnecessary.