

EMERGENCY COMMUNICATIONS SYSTEMS SUPPLEMENTARY RECORD OF COMPLETION *(continued)*

2. DESCRIPTION OF SYSTEM OR SERVICE *(continued)*

2.2.2 System Features:

- ☒ Combination fire alarm/MNS ☐ MNS autonomous control unit ☐ Wide-area MNS to regional national alerting interface
☐ Local operating console (LOC) ☐ Distributed-recipient MNS (DRMNS) ☐ Wide-area MNS to DRMNS interface
☐ Wide-area MNS to high power loudspeaker array (HPLA) interface ☐ In-building MNS to wide-area MNS interface
☐ Other (specify): _____

2.2.3 MNS Local Operating Consoles

Location 1: Fire Control Room

Location 2: Security Office

Location 3: _____

2.2.4 High-Power Loudspeaker Arrays

Number of HPLA loudspeaker initiation zones: 0

Location 1: _____

Location 2: _____

Location 3: _____

2.2.5 Mass Notification Devices

Combination fire alarm/MNS visual devices: 48 MNS-only visual devices: _____

Textual signs: _____ Other (describe): _____

Supervision class: _____

2.2.6 Special Hazard Notification

- ☒ This system does not have special suppression predischage notification.
☐ MNS systems DO NOT override notification appliances required to provide special suppression predischage notification.

3. TWO-WAY EMERGENCY COMMUNICATIONS SYSTEMS

3.1 Telephone System

Number of telephone jacks installed: 15 Number of warden stations installed: 3

Number of telephone handsets stored on site: 6

Type of telephone system installed: ☐ Electrically powered ☒ Sound powered

3.2 Area of Refuge (Area of Rescue Assistance) Emergency Communications Systems

Number of stations: 0 Location of central control point: _____

Days and hours when central control point is attended: _____

Location of alternate control point: _____

Days and hours when alternate control point is attended: _____

FIGURE A.7.8.2(1)(b) *Continued*

EMERGENCY COMMUNICATIONS SYSTEMS SUPPLEMENTARY RECORD OF COMPLETION *(continued)*

3. TWO-WAY EMERGENCY COMMUNICATIONS SYSTEMS *(continued)*

3.3 Elevator Emergency Communications Systems

Number of elevators with stations: 2 Location of central control point: Fire Control Room

Days and hours when central control point is attended: 24

Location of alternate control point: None

Days and hours when alternate control point is attended: None

3.4 Other Two-Way Communications System

Describe: _____

4. CONTROL FUNCTIONS

This system actuates the following control functions specific to emergency communications systems:

Type	Quantity
Mass Notification Override of Alarm Signaling Systems or Appliances	1

See Main System Record of Completion for additional information, certifications, and approvals.

▲ FIGURE A.7.8.2(1)(b) *Continued*

POWER SYSTEMS SUPPLEMENTARY RECORD OF COMPLETION

This form is a supplement to the System Record of Completion. It includes systems and components specific to power systems that incorporate generators, ESS systems, remote battery systems, or other complex power systems.

This form is to be completed by the system installation contractor at the time of system acceptance and approval.

It shall be permitted to modify this form as needed to provide a more complete and/or clear record.

Insert N/A in all unused lines.

Form Completion Date: 2 November 2019 Number of Supplemental Pages Attached: 0

1. PROPERTY INFORMATION

Name of property: World Storage and Transfer Headquarters

Address: 27132 Santa Anita Boulevard, Hilo, HI

2. SYSTEM POWER

2.1 Control Unit

2.1.1 Primary Power

Input voltage of control panel: 120 volt Control panel amps: 7.3

Overcurrent protection: Type: Circuit Breaker Amps: 20

Location (of primary supply panelboard): Main Electrical Room in Basement

Disconnecting means location: Panel E2 — Electric Room

2.1.2 Engine-Driven Generator

Location of generator: _____

Location of fuel storage: _____ Type of fuel: Diesel

2.1.3 Energy Storage Systems

Equipment powered by ESS system: None

Location of ESS system: _____

Calculated capacity of ESS batteries to drive the system components connected to it:

In standby mode (hours): _____ In alarm mode (minutes): _____

2.1.4 Batteries

Location: FACU Type: Gel Cell Nominal voltage: 24 Amp/hour rating: 16

Calculated capacity of batteries to drive the system:

In standby mode (hours): 24 In alarm mode (minutes): 15

2.2 In-Building Fire Emergency Voice Alarm Communications System or Mass Notification System

2.2.1 Primary Power

Input voltage of EVACS or MNS panel: 120 volt EVACS or MNS panel amps: 8.8

Overcurrent protection: Type: Circuit Breaker Amps: 20

Location (of primary supply panelboard): Main Electrical Room in Basement

Disconnecting means location: Panel E2 — Electric Room

▲ FIGURE A.7.8.2(1)(c) Example of Completed Power Systems Supplementary Record of Completion.

POWER SYSTEMS SUPPLEMENTARY RECORD OF COMPLETION *(continued)*

2. SYSTEM POWER *(continued)*

2.2.2 Engine-Driven Generator

Location of generator: _____

Location of fuel storage: _____ Type of fuel: Diesel

2.2.3 Energy Storage Systems

Equipment powered by ESS system: None

Location of ESS system: N/A

Calculated capacity of ESS batteries to drive the system components connected to it:

In standby mode (hours): N/A In alarm mode (minutes): N/A

2.2.4 Batteries

Location: ECS Panel Type: Gel Cell Nominal voltage: 24 Amp/hour rating: 20

Calculated capacity of batteries to drive the system:

In standby mode (hours): 24 In alarm mode (minutes): 15

2.3 Notification Appliance Power Extender Panels

☐ This system does not have power extender panels.

2.3.1 Primary Power

Input voltage of power extender panel(s): 120 volt Power extender panel amps: 8

Overcurrent protection: Type: Circuit Breaker Amps: 20

Location (of primary supply panelboard): See Table

Disconnecting means location: _____

2.3.2 Engine-Driven Generator

Location of generator: _____

Location of fuel storage: _____ Type of fuel: Diesel

2.3.3 Energy Storage Systems

Equipment powered by ESS system: None

Location of ESS system: _____

Calculated capacity of ESS batteries to drive the system components connected to it:

In standby mode (hours): _____ In alarm mode (minutes): _____

2.3.4 Batteries

Location: Power Panel Type: Gel Cell Nominal voltage: 24 Amp/hour rating: 12

Calculated capacity of batteries to drive the system:

In standby mode (hours): 24 In alarm mode (minutes): 15

See Main System Record of Completion for additional information, certifications, and approvals.

▲ FIGURE A.7.8.2(1)(c) *Continued*

POWER SYSTEMS SUPPLEMENTARY RECORD OF COMPLETION *(continued)*

2. SYSTEM POWER *(continued)*

2.4 Supervising Station Transmission Equipment

☒ This system does not use transmission equipment within the building powered by any other source than the alarm system control unit.

2.4.1 Primary Power

Input voltage of shared transmission equipment: 120 VAC

Shared transmission equipment panel amps: 73 amps

Overcurrent protection: Type: Breaker Amps: 20 amps

Location (of primary supply panelboard): Breaker Panel B-23

Disconnecting means location: Electric Room

2.4.2 Engine Driven Generator

Location of generator: _____

Location of fuel storage: _____ Type of fuel: _____

2.4.3 Energy Storage Systems

Equipment powered by ESS system: _____

Calculated capacity of ESS batteries to drive the system components connected to it:

In standby mode (hours): _____ In alarm mode (minutes): _____

2.4.4 Batteries

Location: FACU Type: Gel Nominal voltage: 12 Amp/hour rating: 16

Calculated capacity of batteries to drive the system:

In standby mode (hours): 24 In alarm mode (minutes): 15

See Main System Record of Completion for additional information, certifications, and approvals.

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▲ FIGURE A.7.8.2(1)(c) *Continued*

Once a system or a change to a system has been accepted, the inspection needs also change. The purpose for periodic inspections is to assure that obvious damages or changes that might affect the system operability are visually identified. Those persons performing periodic system inspections might or might not be familiar with all the specific system design goals and requirements. While many periodic inspections could uncover design faults, the intent of this Code is for such problems to be discovered at the acceptance inspection. The Code does not intend to require persons performing periodic inspections necessarily to be knowledgeable or qualified for inspecting and verifying the design of a system.

A.10.5.3.2 Testing personnel knowledge should include equipment selection, placement, and installation requirements of this Code and the manufacturer's published documentation.

A.10.5.3.4(1) Factory training and certification is intended to allow an individual to service equipment only for which he or she has specific brand and model training.

A.10.5.3.4(2) Nationally recognized fire alarm certification programs might include those programs offered by the International Municipal Signal Association (IMSA), National Institute for Certification in Engineering Technologies (NICET), and the Electronic Security Association (ESA). NOTE: These organizations and the products or services offered by them have not been independently verified by the NFPA, nor have the products or services been endorsed or certified by the NFPA or any of its technical committees.

A.10.5.3.4(3) Licenses and certifications offered at a state or local level are intended to recognize those individuals who have demonstrated a minimum level of technical competency in the area of fire alarm servicing.

A.10.5.3.5 This is not intended to require certification where it is not offered or required by the manufacturer.

INTERCONNECTED SYSTEMS SUPPLEMENTARY RECORD OF COMPLETION

This form is a supplement to the System Record of Completion. It includes a list of types and locations of systems that are interconnected to the main system.

This form is to be completed by the system installation contractor at the time of system acceptance and approval.

It shall be permitted to modify this form as needed to provide a more complete and/or clear record.

Insert N/A in all unused lines.

Form Completion Date: 2 November 2019 Number of Supplemental Pages Attached: _____

1. PROPERTY INFORMATION

Name of property: World Storage and Transfer Headquarters

Address: 27132 Santa Anita Boulevard, Hilo, HI

2. INTERCONNECTED SYSTEMS

Description	Location	Purpose
Fan Shutdown	Roof	Shut down fans on fire alarm activation
Elevator Recall	Elevator Room	Recall elevators in case of alarm on lobby smoke detectors

See Main System Record of Completion for additional information, certifications, and approvals.

▲ FIGURE A.7.8.2(1)(e) Example of Completed Interconnected Systems Supplementary Record of Completion.

DEVIATIONS FROM ADOPTED CODES AND STANDARDS SUPPLEMENTARY RECORD OF COMPLETION

This form is a supplement to the System Record of Completion. It enables the designer and/or installer to document and justify deviations from accepted codes or standards.

This form is to be completed by the system installation contractor at the time of system acceptance and approval.

It shall be permitted to modify this form as needed to provide a more complete and/or clear record.

Insert N/A in all unused lines.

Form Completion Date: 2 November 2019 Number of Supplemental Pages Attached: _____

1. PROPERTY INFORMATION

Name of property: World Storage and Transfer Headquarters

Address: 27132 Santa Anita Boulevard, Hilo, HI

2. DEVIATIONS FROM ADOPTED CODES OR STANDARDS

Description	Purpose
Waterflow switch set to a 120-second trip	Issue has been identified that there are water surges during evening hours

See Main System Record of Completion for additional information, certifications, and approvals.

△ FIGURE A.7.8.2(1)(f) Example of Completed Deviations from Adopted Codes and Standards Supplementary Record of Completion.

A.10.5.5.1(2) An example of an organization providing alarm monitoring operator training is the Central Station Alarm Association (CSAA). Note that this reference is for information purposes only, information concerning the product or service has been provided by the manufacturer or other outside sources, and the information concerning the product or service has not been independently verified nor has the product or service been endorsed or certified by the NFPA or any of its technical committees.

A.10.5.6.4.2(2) An example of an organization providing public emergency alarm reporting system certification is the International Municipal Signal Association. Note that this reference is for information purposes only. Information concerning the product or service has been provided by the manufacturer or other outside sources, and the information concerning the product or service has not been independently verified, nor has the product or service been endorsed or certified by NFPA or any of its technical committees.

A.10.5.6.4.2(4) Factory training and certification are intended to allow individuals to service only the equipment for which they have specific brand and model training.

N A.10.6.1 Exceptions exist in Chapter 23 for low-power wireless systems and in Chapter 29 for household low-power wireless systems and smoke alarms.

N A.10.6.4 ESS classifications are found in NFPA 111. Previous editions of *NFPA 72* referenced uninterruptible power supplies (UPS) systems, which is one type of an ESS.

N A.10.6.5.1.2 Multiple pieces of system equipment can be connected to a branch circuit, subject to the current capacity of the circuit. It is not intended that a branch circuit be limited to a single piece of equipment. It is not intended that the circuit supply power to other than system equipment. For example, a branch circuit could power both a fire alarm control unit and an NAC power supply, but it could not power both a fire alarm control unit and a sprinkler system air compressor.

Δ A.10.6.5.2.2 The purpose of this requirement is to ensure that circuit disconnecting means for fire alarm and signaling systems are readily identifiable so that users will not mistakenly disconnect the power to the system or so that they can quickly disconnect power without having to search the electrical panel-board chart to identify the circuit. The intent of this requirement is not to require specific text for identification. Marking can include one of the following:

- (1) "FIRE ALARM" for fire alarm systems
- (2) "EMERGENCY COMMUNICATIONS" for emergency communications systems
- (3) "FIRE ALARM/ECS" for combination fire alarm and emergency communications systems
- (4) "CARBON MONOXIDE" for carbon monoxide detection systems

It would be acceptable to show the text using upper and/or lower case, such as "fire alarm," or "Fire Alarm," or "FIRE ALARM."

A.10.6.6 Where a computer system of any kind is used to receive and process alarm or supervisory signals, an ESS with sufficient capacity to operate the system until the secondary supply is capable of operating the fire alarm system might be required in order to prevent signal loss or a greater than 10-second signal delay.

ESS equipment often contains an internal bypass arrangement to supply the load directly from the line. These internal bypass arrangements are a potential source of failure. ESS equipment also requires periodic maintenance. It is, therefore, necessary to provide a means of promptly and safely bypassing and isolating the ESS equipment from all power sources while maintaining continuity of power supply to the equipment normally supplied by the ESS.

A.10.6.7.2 When a fire alarm system is used to alert occupants, the associated premises are generally evacuated during prolonged power outages. When this is not the case, as in emergency shelters or certain government facilities, additional secondary power should be required to address a more prolonged outage. These outages might be expected to result from weather or earthquake in locations subject to these events. Reasonable judgment should be employed when requiring additional secondary capacity.

When a fire alarm system is used to protect property, the associated premises might be vacant for prolonged periods (weekend, long holiday) or in very remote locations. When this is the case, and when the risk of loss is significant, additional secondary power should be required to address a more prolonged outage. These outages might be expected to result from weather or earthquake in locations subject to these events. Reasonable judgment should be employed when requiring additional secondary capacity.

Δ A.10.6.7.2.1.1 The 20-percent safety margin is intended to address normal aging effects on battery capacity. As a battery ages, rated capacity will decrease to 80 percent, which is considered the end of service life. As a minimum, a 20-percent correction factor should be applied for aging to ensure the battery can meet its current demand at the end of service life. At initial installation, battery capacity can be as low as 90 percent and should gradually increase when it is subjected to several deep discharge/charging cycles or when it remains on float-charge for several weeks. For additional information on battery sizing considerations refer to IEEE 485, *Recommended Practice for Sizing Lead-Acid Batteries for Stationary Applications*.

N A.10.6.7.2.3 For combination systems, such as a combination carbon monoxide and fire alarm system, where the carbon monoxide notification appliances are capable of being operated separately from the fire alarm system notification appliances, only the carbon monoxide notification appliances are required to operate for 12 hours.

A.10.6.7.3 The secondary power supply is not required to supply power to the fire alarm system through parallel distribution paths. Automatic transfer switches are commonly used to allow secondary power to be supplied over the same distribution system as the primary power.

The generator does not need to be dedicated to the fire alarm system.

A.10.6.8.1 Examples include the following:

- (1) A building lighting power supply required for illumination in a required video image smoke detection means
- (2) A notification appliance circuit power supply located remotely
- (3) A power supply for transmitter required to transmit signals off premises

- (4) Power over ethernet (PoE), where provided for control units, circuit interfaces, or other equipment essential to system operation, and located remotely from the main control unit

A.10.6.9.2 Because digital alarm communicator systems establish communications channels between the protected premises and the central station via the public switched telephone network, the requirement to supervise circuits between the protected premises and the central station (*see 12.6.1 and 12.6.2*) is considered to be met if the communications channel is periodically tested in accordance with 26.6.4.1.5.

A.10.6.9.3 This requirement is intended to prevent all of the supervising station alarm systems in a given geographic area from transmitting simultaneous trouble signals (and overwhelming the associated supervising stations) in the event of a widespread power failure. A trouble signal is not intended to be transmitted if primary power is restored within the time delay.

A.10.6.10 The valve-regulated lead-acid (VRLA) battery type of rechargeable battery is currently used in protected premises applications.

This rechargeable-type battery is generally used in place of primary batteries in applications that have a relatively high current drain or that require the extended standby capability of much lower currents. The nominal voltage of a single starved electrolyte cell is 2 volts, and the battery is available in multiples of 2 volts (e.g., 2, 4, 6, 12). Batteries should be stored according to the battery manufacturer's published instructions. These batteries are often incorrectly referred to as "sealed lead-acid," "gel" or "maintenance-free batteries."

There are two technologies available. The most common type is referred to as "absorbed glass mat" or AGM. In this technology, the electrolyte is immobilized by being absorbed into fiberglass mats that surround the plates. Nearly all VRLA batteries in use in U.S. fire protection applications are AGM.

The second technology is referred to as gelled electrolyte. In this technology, the electrolyte is immobilized in a silica gel. This technology is predominately seen in European applications. While some manufacturers refer to the battery as a gel battery in the literature, this needs to be confirmed by the technician. Gel batteries require higher float voltages than AGM, and floating an AGM battery at gel voltages will shorten the battery life.

A.10.6.10.3.4 The circuitry and methods for charging batteries of various types are to be evaluated by a nationally recognized testing laboratory to ensure they are appropriate for the purpose. During primary power use, batteries are trickle-charged if they are off-line and waiting to be put under load in the event of a loss of power.

Float-charged batteries are fully charged and connected across the output of the rectifiers to smooth the output and to serve as a standby source of power in the event of a loss of line power. Other charging methods are used to restore capacity to a battery after it has been utilized during a loss of primary power.

A.10.7.3 Mass notification signals might, at times, be more important to the building or area occupants than the fire alarm signal. Stakeholders should perform a risk analysis in accord-

ance with 24.3.12 to determine which, if any, messages should receive priority.

A.10.7.9 In addition, the override of circuits should be indicated at the control panel of each system to ensure signals are restored to normal.

A.10.10.4 Control unit signals can be audible, visual, or both for any particular function. Some older systems used only audible indicators that had to be coded for users to know what the signal meant. Where a control unit uses both audible and visual indicators, the purpose of the audible signal is to get someone's attention. In large system configurations, there might be multiple control units with audible signals. Also, there might be several different functions requiring an audible alert as a part of the whole signal. Thus, there could be several different audible signals. It is not the intent of this Code to have separate and distinct audible signals where clear visual distinction provides the user with the needed information. Visual signals, whether a lamp with a text label, an LCD screen, a computer monitor, or other textual visual appliances, are better forms of human interface.

A.10.10.5 A valve supervisory, a low-pressure switch, or another device intended to cause a supervisory signal when activated should not be connected in series with the end-of-line supervisory device of initiating device circuits, unless a distinctive signal, different from a trouble signal, is indicated.

A.10.11.1 Activation of an initiating device is usually the instant at which a complete digital signal is achieved at the device, such as a contact closure. For smoke detectors or other automatic initiating devices, which can involve signal processing and analysis of the signature of fire phenomena, activation means the instant when the signal analysis requirements are completed by the device or fire alarm control unit software.

A separate fire alarm control unit contemplates a network of fire alarm control units forming a single large system as defined in Section 23.8.

For some analog initiating devices, activation is the moment that the fire alarm control unit interprets that the signal from an initiating device has exceeded the alarm threshold programmed into the fire alarm control unit.

For smoke detectors working on a system with alarm verification, where the verification function is performed in the fire alarm control unit, the moment of activation of smoke detectors is sometimes determined by the fire alarm control unit.

It is not the intent of this paragraph to dictate the time frame for the local fire safety devices to complete their function, such as fan wind-down time, door closure time, or elevator travel time.

A.10.11.2 The intent of this requirement is to ensure that persons who are deaf or hard of hearing are alerted to seek additional information regarding an emergency situation. Persons who are deaf or hard of hearing are not always alerted by the loudspeakers that provide evacuation tones or voice instructions. It is intended that the loudspeakers and visual notification appliances located in the same area be activated together whenever tones, recorded voice instructions, or live voice instructions are being provided. (SIG-ECS)