

STANDARD INFORMATION

This SUN establishes the Continuing Certification approach for UL 2572.

Standard Number: UL 2572

Standard Name: Mass Notification Systems

Standard Edition and Issue Date: 2nd Edition Dated March 28, 2016

Date of Revisions: March 28, 2016 and December 14, 2018

Date of Previous Revision of Standard: May 11, 2012

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **No action is required for currently certified products to maintain certification.**

This SUN is being presented to assist users of the standard to appreciate the significance of the changes made to the standard that will apply should the product described be modified after January 1, 2020. A Future SUN may require an update to the most recent version of the standard.

IMPACT, OVERVIEW, AND ACTION REQUIRED

Impact Statement: A review of all Listing Reports is necessary to determine which products comply with new/revised requirements and which products will require re-evaluation. **NOTE:** Effective immediately, this revised standard will be exclusively used for evaluation of new products unless the Applicant requests in writing that current requirements be used along with their understanding that their listings will be withdrawn on Effective Date noted above, unless the product is found to comply with new/revised requirements.

Overview of Changes:

Changes for March 28, 2016:

- Revisions to HPSA performance tests.
- Revision of the short-range radio frequency device test.
- Addition of performance-based requirements for RF interference test.
- Addition of minimum rechargeable standby power safety margin.
- Revisions to emergency voice alarm systems equipment requirements.

Changes for December 14, 2018:

- Alternative Means Utilizing Adhesives to Provide Mechanical Securement of Parts

Specific details of new/revised requirements are found in table below.



If the applicable requirements noted in the table are not described in your report(s), these requirements will need to be confirmed as met and added to your report(s) such as markings, instructions, test results, etc. (as required).

Client Action Required:

Information – To assist our Engineer with review of your Listing Reports, please submit technical information in response to the new/revised paragraphs noted in the attached or explain why these new/revised requirements do not apply to your product (s).

Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.

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CLAUSE	VERDICT	COMMENT
<i>Additions to existing requirements are <u>underlined</u> and deletions are shown lined out below.</i>		
<i>The following changes reflect the March 28, 2016 revision</i>		
<i>New clause added;</i>		
33.7		The standard alarm evacuation signal described in 33.6 shall be repeated for a period not less than 3 minutes. Exception: The minimum repetition period is permitted to be manually interrupted.
<i>New clause added;</i>		
33.9		The mass notification system shall have the capability to automatically revert to active fire alarm signals and to normal standby where no fire alarm is active upon relinquish of control of the audible and/or visible notification appliances of a fire alarm.
<i>New clause added;</i>		
33.12		Unacknowledged alarm signals shall not be interrupted if a fault on an initiating device circuit or a signaling line circuit occurs while there is an alarm condition on that circuit. Exception: Where the faulted circuit is used to interconnect control LOCs, ACUs or ECCUs.



CLAUSE	VERDICT	COMMENT
		<i>New clause added;</i>
33.13		An occupant notification alarm signal that has been deactivated shall a) Automatically reactivate the audible and visible alarm signal at the locations specified in 33.4 every 24 hours or less until alarm signal conditions are restored to normal, and b) The audible and visible alarm signal shall operate until it is manually silenced or acknowledged.
		<i>New clause added;</i>
33.16		Systems or equipment arranged to stop or reduce ambient noise shall comply with monitoring for integrity requirements in 40.4, Common Performance and Monitoring for Integrity, Section 41, and with the other applicable requirements of this standard.
		<i>New clause added;</i>
33.17		Products utilizing a low – frequency component signal shall meet the requirements of 40.2.7 and 40.2.8.
34	Info	In-Building Mass Notification Systems – LOC, ACU, and ECCU
		<i>New clause added;</i>
34.15		A supervisory signal that has been deactivated shall: a) Automatically reactivate the audible and visible supervisory signal at the locations specified in 33.4 every 24 hours or less until supervisory signal conditions are restored to normal, and b) The audible and visible supervisory signal shall operate until it is manually silenced or acknowledged.
36	Info	Wide Area ECS/MNS Systems
		<i>New clause added;</i>
36.1.12		A supervisory signal that has been deactivated shall: a) Automatically reactivate the audible and visible supervisory signal at the locations specified in 31.4 every 24 hours or less until supervisory signal conditions are restored to normal, and b) The audible and visible supervisory signal shall operate until it is manually silenced or acknowledged.
		<i>New clause added;</i>
36.1.14		A mass notification alarm signal of a unit/system shall be maintained continuously (locked in) by the unit/system until a resetting device in the unit/system is operated manually.



CLAUSE	VERDICT	COMMENT
		<i>New clause added;</i>
36.1.15		Products utilizing a low – frequency component signal shall meet the requirements of 40.2.7 and 40.2.8.
		<i>New clause added;</i>
36.1.16		Unacknowledged alarm signals shall not be interrupted if a fault on an initiating device circuit or a signaling line circuit occurs while there is an alarm condition on that circuit. Exception: Where the faulted circuit is used to interconnect control LOCs, ACUs or ECCUs.
		<i>New clause added;</i>
36.1.17		An alarm signal that has been deactivated shall: a) Automatically reactivate the audible and visible supervisory signal at the locations specified in 36.1.4 every 24 hours or less until supervisory signal conditions are restored to normal, and b) The audible and visible supervisory signal shall operate until it is manually silenced or acknowledged.
36.2	Info	High Power Speaker Array (HPSA)
36.2.3	Info	HPSA Supervision
36.2.3.3		A non-latching monitor/other signal shall be provided to the LOC, ACU, or ECCU as applicable whenever the HPSA <u>or HPSA zone</u> is active.
37	Info	Distributed Recipient Mass Notification Systems (DRMNS)
37.1	Info	Control Equipment
		<i>New clause added;</i>
37.1.11		The DRMNS control equipment shall have the capability of providing a backup configuration with automatic switch over. The switch over shall be accomplished in not more than 30 seconds, without loss of any signals.
40	Info	Live Voice and Pre-Recorded Message Communication
		<i>New clause added;</i>
40.1.4		Each ACU shall have the capability to provide the specific individual control status of each LOC controlled by the respective ACU.
40.2	Info	Functional sequence
40.2.1		In response to an initiating signal indicative of an emergency, systems providing prerecorded voice/alarm communication messages and/or signals shall minimally be capable of providing the following functions: a) Automatic activation of an evacuation signal to any or all zones in the system, consisting of a minimum of two cycles of the American National Standard Institute's ANSI S3.41 <u>standard alarm evacuation signal consisting of the three-</u>



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		<p><u>pulse temporal pattern detailed in the National Fire Alarm and Signaling Code, NFPA 72 audible evacuation signal pattern</u> followed by a recorded evacuation message to any or all zones in the system,</p> <p>Exception No. 1: Products intend to be constantly attended by trained operators with capability of a 30-second response need not provide automatic response.</p> <p>Exception No. 2: High power speaker array(s) need not provide the ANSI S3.41 audible evacuation pattern.</p> <p>b) Automatic alert tone (either separately produced or part of a pre-recorded message) of at least one second duration <u>1 second to 3 seconds</u> followed by a recorded message to any or all zones in the system. The alert tone/prerecorded message combination shall be repeated a minimum of three times. Preempting of the alert tone with a predetermined time delay is not prohibited, and</p> <p>Exception: Products intend to be constantly attended by trained operators with capability of a 30-second response need not provide automatic response.</p> <p>c) Manual activation of an evacuation signal or recorded message on an all-call basis. Additionally, manual activation by zone is permitted.</p> <p><u>d) If a previously initiated recorded message is interrupted by live voice instructions, upon releasing of the microphone, the previously initiated recorded messages to the selected notification zones shall have the capability of not resuming play automatically.</u></p>
		<i>New clause added;</i>
40.2.7		Products utilizing a low-frequency component for the pre-alert signals required by 40.2.1 (a) – (c) shall comply with the signal format described in the section for Determination of Low Frequency Signal Format in the Standard for Audible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories, UL 464.
		<i>New clause added;</i>
40.2.8		The signal components for the low frequency audio needed to meet 40.2.7 from tone generation to the output speaker shall be described in the installation instructions for the product.
41	Info	Common Performance and Monitoring for Integrity
		<i>New clause added;</i>
41.1.1.8		Where power to a device or appliance is supplied over a separate pathway from the initiating device, notification appliance, and/or signaling-line circuit(s), the operation of the power pathway shall meet the performance requirements of the initiating device, notification appliance, and/or signaling-line circuit(s) and the power circuit shall be defined by the applicable class in the product installation wiring diagram/instructions consistent with the operation of the particular power pathway during the specified fault conditions described in 41.1.2 – 41.1.4.
41.1.2	Info	Class A Circuits and Pathways
41.1.2.1		circuit or pathway shall be designated as Class A when it performs as follows:



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		<p>a) It includes a redundant path.</p> <p>b) Operational capability continues past a single open and the single open fault shall result in the annunciation of a trouble signal as required by Section 43.</p> <p>c) Conditions that affect the intended operation of the path are annunciated as a trouble signal in accordance with Section 43.</p> <p>d) Operational capability is maintained during the application of a single ground fault.</p> <p>e) A single ground condition shall result in the annunciation of a trouble signal in accordance with Section 43.</p> <p><u>f) Where operational capability is to be maintained during a fault, the operational capability shall be restored within 200 seconds of the application of the fault.</u></p> <p><u>g) Operational capability in a radio frequency and/or wireless pathway continues during a single fault consisting of each of the following applied separately: loss of a transceiver, loss of a repeater, application of an adverse condition at a transceiver/repeater. The fault shall result in the annunciation of a trouble signal.</u></p> <p><u>Exception No. 1: Requirements (d) and (e) shall not apply to non-conductive pathways.</u></p> <p><u>Exception No. 2: Requirement (b) shall not apply to radio frequency/wireless pathways.</u></p>
41.1.3	Info	<p>Class B Circuits and Pathways</p> <p>A circuit or pathway shall be designated as Class B when it performs as follows:</p> <p>a) It does not include a redundant path.</p> <p>b) Operational capability stops at a single open.</p> <p>c) Conditions that affect the intended operation of the path are annunciated as a trouble signal in accordance with Section 43.</p> <p>d) Operational capability is maintained during the application of a single ground fault.</p> <p>e) A single ground condition shall result in the annunciation of a trouble signal in accordance with Section 43.</p> <p><u>f) Where operational capability is to be maintained during a fault, the operational capability shall be restored within 200 seconds of the application of the fault.</u></p> <p>Exception: Requirements (d) and (e) shall not apply to non-conductive pathways.</p>
41.1.3.1		<p>a) It does not include a redundant path.</p> <p>b) Operational capability stops at a single open.</p> <p>c) Conditions that affect the intended operation of the path are annunciated as a trouble signal in accordance with Section 43.</p> <p>d) Operational capability is maintained during the application of a single ground fault.</p> <p>e) A single ground condition shall result in the annunciation of a trouble signal in accordance with Section 43.</p> <p><u>f) Where operational capability is to be maintained during a fault, the operational capability shall be restored within 200 seconds of the application of the fault.</u></p>
41.1.4	Info	<p>Class X Pathway</p> <p>pathway shall be designated as Class X when it performs as follows:</p> <p>a) It includes a redundant path.</p> <p>b) Operational capability continues past a single open and the single open fault shall result in the annunciation of a trouble signal as required by Section 43.</p> <p>c) Operational capability continues past a single short circuit and the single short circuit fault shall result in the annunciation of a trouble signal as required by Section 43.</p>
41.1.4.1		<p>a) It includes a redundant path.</p> <p>b) Operational capability continues past a single open and the single open fault shall result in the annunciation of a trouble signal as required by Section 43.</p> <p>c) Operational capability continues past a single short circuit and the single short circuit fault shall result in the annunciation of a trouble signal as required by Section 43.</p>



CLAUSE	VERDICT	COMMENT
		<p>d) Operational capability continues past a combination single open fault and a single ground fault.</p> <p>e) Conditions that affect the intended operation of the path are annunciated as a trouble signal in accordance with Section 43.</p> <p>f) Operational capability is maintained during the application of a single ground fault.</p> <p>g) A single ground condition shall result in the annunciation of a trouble signal in accordance with Section 43.</p> <p><u>h) Where operational capability is to be maintained during a fault, the operational capability shall be restored within 200 seconds of the application of the fault.</u></p> <p><u>i) Operational capability in a radio frequency and/or wireless pathway continues during a single fault consisting of each of the following applied separately: loss of a transceiver, loss of a repeater, application of an adverse condition at a transceiver/repeater. The fault shall result in the annunciation of a trouble signal.</u></p> <p><u>Exception No. 1: Requirements (c), (d), (f) and (g) shall not apply to non-conductive pathways.</u></p> <p><u>Exception No. 2: Requirement (b) shall not apply to radio frequency/wireless pathways.</u></p>
41.3.2		<p>A single break, single ground, or wire-to-wire short-circuit fault on the installation <u>physical (metallic) or a single break in fiber optic</u> conductors of one alarm notification appliance circuit shall not affect the operation of any other alarm notification <u>appliance circuit for more than 200 seconds, under both of the following separate conditions:</u></p> <p>a) <u>The fault is first present during the normal standby condition followed by activation of the same alarm notification circuit;</u></p> <p>b) <u>The fault is applied after the alarm notification circuit is activated.</u></p> <p><u>Exception: Alarm notification appliance circuits which do not have notification appliances connected directly to the circuit and which are monitored for integrity as indicated in 53.1.1.</u></p>
41.4	Info	Signaling line circuits
		<i>New clause added;</i>
41.4.4		<p>Any SLC pathway shall have the capability, either inherent or by use of external devices, to prevent a wire to wire fault from affecting the entire pathway.</p> <p>Exception No. 1: This does not apply to interconnected LOCs, ACUs and ECCUs.</p> <p>Exception No. 2: SLC pathways limited to a single zone.</p>
45	Info	Software



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45.1.8		<p><i>New clause added;</i></p> <p>Software and firmware within a fire alarm control system that interfaces to software in another system to provide required functions shall be functionally compatible and the compatibility shall be indicated in the installation instructions of one or both of the compatible products/systems. This does not apply to supplementary functions.</p>
46	Info	<p>Combination Systems with Non-Emergency, Security, Building Controls, and Other Non-Fire Equipment</p>
46.1		<p>When the following mass notification systems <u>are intended to share components, equipment, circuitry, and installation wiring with non-fire and non-emergency signaling systems, short circuits, open circuits, or grounds in the non-fire and non-emergency system equipment or the connections between the non-fire and non-emergency system equipment and the mass notification products shall not impair the required operation of the fire alarm or emergency signaling system or prevent appropriate mass notification alarm, supervisory, or trouble annunciation and signaling, or non-faulted fire safety control activation equipment, and the non-fire alarm equipment complies with this standard, or complies with one of the standards shown in 46.2, the requirements of 46.3 – 46.5 shall apply.</u></p> <p>a) In building mass notification systems; b) The control equipment at a contiguous location for wide area mass notification systems; and c) The control equipment at a contiguous location for distributed recipient mass notification systems.</p>
46.2		<p><i>New clause added</i></p> <p>With respect to 46.1, the following standards apply: a) The Standard for Control Units and Accessories, UL 864; b) The Standard for General-Purpose Signaling Devices and Systems, UL 2017, Type SM or AM; and c) The Standard for Proprietary Burglar Alarm Units and Systems, UL 1076.</p>
46.3		<p><i>New clause added;</i></p> <p>It shall be permitted to attach the non-fire alarm equipment to fire alarm circuits when the following requirements are met:</p> <p>a) The fire alarm equipment and circuits shall continue to meet the circuit requirements of Common Performance and Monitoring for Integrity, Section 41 with the non-fire alarm and non-emergency equipment attached. b) Failures of the non-fire and non-emergency alarm equipment that affect the operation of the fire alarm system shall be detected and reported at the LOC, ACU and/or ECCU. c) The installation document of the fire product shall specify that all wiring, including that to the non-fire and non-emergency alarm equipment, shall be</p>



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		<p>installed in accordance with the requirements of the National Fire Alarm and Signaling Code, NFPA 72.</p> <p>d) The non-fire and non-emergency equipment shall be compatible with the mass notification equipment or it shall have a contact closure interface for the connected load.</p>
		<i>New clause added;</i>
46.4		<p>When the non-fire alarm equipment is connected to the fire alarm system through separate wiring, opens and short circuits shall not impair the operation of the fire alarm system.</p>
		<i>New clause added;</i>
46.5		<p>Ground faults which impede or impair the monitoring for integrity of the mass notification system or impede or impair any mass notification supervisory or trouble signal transmission or operation shall be reported at the mass notification system as trouble signals when they occur on the wiring interconnecting the mass notification equipment with non-fire alarm/non-emergency equipment.</p>
		<p>To determine compliance with 44.1, the operation, removal, replacement, failure, or maintenance procedure on any hardware, software, or circuit not performing any of the mass notification system, fire, or emergency signaling functions shall not cause loss of any of the mass notification functions, including supervision, or prevent required alarm, supervisory, trouble, or fire safety annunciation, signaling, or actuation. When a mass notification system is intended to share components, equipment, circuitry, or installation wiring with non-fire and non-emergency</p>
46.6		<p><u>equipment, and that equipment does not comply with either this standard or any of the standards shown in 46.2, the requirements of 46.7 – 46.9 shall apply.</u></p> <p>Exception: With regard to the ground fault operation, where the interconnected equipment complies with the requirements contained in this standard, the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, or the Standard for General-Purpose Signaling Devices and Systems, UL 2017 and the ground condition is annunciated as a trouble condition at the LOC, ACU, or ECCU, as applicable, supervision of the mass notification circuits is permitted to be affected.</p>
		<i>New clause added;</i>
46.7		<p>Short circuits or open circuits in the non-fire or non-emergency equipment or in the wiring between the non-fire/non-emergency equipment and the mass notification system shall not impede or impair the monitoring for integrity of the mass notification system as described in Common Performance and Monitoring for Integrity, Section 41, nor impede or impair any mass notification signal transmissions or operations.</p>



CLAUSE	VERDICT	COMMENT
		<i>New clause added;</i>
46.8		Single ground faults in the non-fire alarm/non-emergency equipment shall not impede or impair the monitoring for integrity of the mass notification system, or impede or impair any mass notification supervisory or trouble signal transmissions or operation.
		<i>New clause added;</i>
46.9		The required operation of the mass notification equipment shall not be impaired by any failure of the non-fire alarm/non-emergency equipment hardware, software or circuits, or by any maintenance procedure, including removal or replacement of defective equipment or powering down of the non-fire/non-emergency equipment.
68	Info	Radio Frequency Interference Test
68.2		To determine compliance with 68.1, the product is to be energized from a source of rated voltage and frequency, interconnected as described in the installation wiring diagram/instructions, and subjected to the radio-frequency interference generated from the transceivers described in 68.3 <u>when the test method is based upon the power output from the antenna or 68.4 when the test method is based upon the field strength measured at the product under test.</u> Products intended to be connected to releasing devices shall have each device connected during the test. Only products utilizing a microprocessor shall be subjected to the testing. Products that require the opening of a door to gain access to the operating controls and display shall be tested with the door(s) in the open position.
68.3		The radio-frequency interference sources for the nominal frequencies <u>are specified in (a) – (i) are to be as indicated below Table 68.1.</u> The radiating antennas shall be placed 30 cm from the nearest edge of the product under test. The test is to be conducted with each antenna tip pointed directly directed at the product under test, in both the horizontal and vertical orientations, and repeated with the antenna at a right angle to the first position, centered on the product. The transmitter is to be in the same room as the product under test. A total of six energizations in each of the two orientations are to be applied for each nominal frequency $\pm 2\%$, five to consist of 5 seconds on and 5 seconds off, followed by one consisting of a single 15-second energization.
		<i>New clause added;</i>
68.4		Power output from the antenna method. The forward power to the antenna shall be compensated by the measured reflective power and the calibrated gain of the antenna to produce the minimum output power level specified in the Table 68.1 for each frequency.



CLAUSE	VERDICT	COMMENT
		<i>New clause added;</i>
68.5		Field strength method. The forward power required to produce the field strength at a given point in a room as measured by a field probe shall be recorded without the product under test in the room. The product under test is to replace the field probe in the room and the amount of power recorded earlier is to be put into the antenna to produce the minimum field at the product under test. Amplifiers employed to produce the forward power shall not be in saturation when the required AM or FM modulation is utilized.
76	Info	Wet Location and Outdoor-Use Tests
76.2	Info	Corrosion tests
76.2.2	Info	Salt spray test
		The apparatus <u>and test method</u> for salt spray (fog) testing <u>shall be in accordance with the Standard Practice for Operating Salt Spray (Fog) Apparatus, ASTM B117.</u> is to consist of:
76.2.2.1		<ul style="list-style-type: none"> a) A fog chamber having inside dimensions of 48 by 30 by 36 inches (1.2 by 0.8 by 0.9 m); b) A salt solution reservoir; c) A supply of conditioned compressed air; d) A dispersion tower constructed in accordance with the Standard Practice for Operating Salt Spray (Fog) Apparatus, ASTM B117, for producing a salt fog; e) Sample supports; f) Provision for heating the chamber; and g) Necessary means of control.
78	Info	HPSA Performance Tests
78.2	Info	HPSA System Performance
78.2.1	Info	HPSA System Performance Efficacy Testing
78.2.1.1	Info	HPSA Speech Intelligibility
		<i>New clause added;</i>
78.2.1.1.1.3		HPSA products utilizing microphone input(s) shall comply with 78.2.1.1.2 and 78.2.1.1.3.
		<i>New clause added;</i>
78.2.1.1.1.4		HPSA products utilizing direct injection input(s) shall comply with 78.2.1.1.4 and 78.2.1.1.5.
		<i>New clause added;</i>
78.1.1.1.5		HPSA products utilizing both microphone input(s) and direct injection inputs shall comply with 78.2.1.1.2 through 78.2.1.1.5.



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		Speech intelligibility measurement shall be made with the HPSA mounted in an anechoic chamber. During the measurement process:
78.2.1.1.1.6		<u>e) Measurements are to be made after the completion of each of the tests identified in Table 78.1 below. The sample shall be energized at nominal rated voltage and frequency per 31.1.2, and mounted in an anechoic or hemi-anechoic chamber.</u>
		<i>New table added;</i>
Table 78.1		Tests requiring intelligibility measurements
		See standard for details.
		<i>New section added;</i>
78.2.1.1.2		System Calibration via System Microphone Input
		See standard for details.
		<i>New section added;</i>
78.2.1.1.3		Talk Box STI Measurement
		See standard for details.
		<i>New section added;</i>
78.2.1.1.4		System Calibration via Direct Input Injection
		See standard for details.
		<i>New section added;</i>
78.2.1.1.5		Direct Input Injection STI Measurement
		See standard for details.
78.2.1.2	Info	Audibility
		The measurement shall be made with the HPSA or appliance mounted in an anechoic <u>or hemi-anechoic</u> chamber. During the measurement process:
78.2.1.2.3		a) No obstructions shall exist between the HPSA and microphone; b) The mounting platforms of the HPSA and microphone shall be free from acoustical interference while conducting measurements; c) The noise floor shall be more than 30 decibels lower than the sound pressure level of the HPSA at rated voltage; d) On speaker system where the largest sound source dimension is less than or equal to 20 inches (508 mm), the measurement microphone is to be placed 6.56 feet (2 m) from the front of the enclosure, and on axis with the physical center of the enclosure. If the source is greater than 20 inches (508 mm), the sound level



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		shall be measured in the linear response field where the sound output level decreases -6 dBA per doubling the distance. Normally this occurs at distances a minimum of 3 – 10 times the extent of the radiating array length; and <u>e) Measurements are to be made after the completion of each of the tests identified in Table 78.2 below. The sample shall be energized at nominal rated voltage and frequency per 31.1.2, and mounted in an anechoic or hemi-anechoic chamber.</u>
		<i>New table added;</i>
Table 78.2		Tests requiring audibility measurements See standard for details.
		<i>New section added;</i>
78.2.1.3		Determination of sound reduction See standard for details.
		<i>New table added;</i>
Table 78.3		Tests requiring sound reduction measurements See standard for details.
78.2.1.3.2		The sound pressure level is to be measured with both the test sample and sound level meter at their respective same location within the conditioning chamber before and after the conditions indicated in Table 78.3. The measurement is to be made using a sound level meter having an A weighting factor on a level scale that precludes meter saturation. The measurement is to be made with the output of the HPSA configured at a reduced level equivalent to approximately 100dB at 10 feet under the test conditions listed in Table 78.3. The sample shall be energized at nominal rated voltage and frequency per 31.1.2.
78.4	Info	Environmental Tests – Top of the Mast Subsystem (HPSAs and Solar Panels)
78.4.3	Info	Solar Radiation Test



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78.4.3.1		<p>The unit shall comply with the solar radiation test in the Department of Defense Test Method Standard for Environmental Engineering Considerations and Laboratory Test, MIL-STD-810F <u>with the following deviations:</u></p> <p>a) <u>Normal Operation is not required to be confirmed during the Solar Radiation Test;</u></p> <p>b) <u>The control subsystem of the HPSA shall be operated at full rated power via simulated load for 5 minutes of signaling with a 1 KHz alert tone at each peak cycle temperature; and</u></p> <p>c) <u>The sample shall comply with the Audibility Test, 78.2.1.2 and Speech Intelligibility, 78.2.1.1. Measurements are to be made after the completion of all cycles. The sample shall be energized at nominal rated voltage and frequency per 31.1.2 and mounted in an anechoic or hemi-anechoic chamber.</u></p>
78.4.4	Info	<p>Hosedown Test</p> <p><i>New clause added;</i></p>
78.4.4.2		<p>An enclosure constructed from a polymeric material shall be conditioned for 7 h at 70°C (158°F) prior to being subjected to the conditioning in 78.4.4.1.</p> <p><i>New clause added;</i></p>
78.4.4.4		<p>The samples shall comply with the Dielectric Voltage-Withstand Test, 78.3 within 5 min following the water spray application.</p>
78.4.5	Info	<p>Sand and Dust Test</p>
78.4.5.2		<p><u>At the completion of the exposure, the dust chamber is to be de-energized and the HPSA energized. Within 2 minutes of the HPSA being energized, sound level measurements described in 78.2.1.3 are to be recorded. The HPSA speaker shall operate as intended after the sand and dust exposure and shall not be reduced in sound level by more than 3 decibels from the reference sound level.</u></p> <p><u>“CAUTION: Portland cement is caustic when mixed with moisture and can burn eyes, sinus, lungs, etc.”</u></p>
78.4.6	Info	<p>Humidity Test</p> <p><i>New clause added;</i></p>
78.4.6.3		<p>At the completion of the exposure, while in the high humidity, the environmental chamber is to be de-energized and the HPSA re-energized. Within 2 minutes of the HPSA being energized, sound level measurements described in 78.2.1.3 are to be recorded. A HPSA shall not be reduced in sound level by more than 3 decibels from the reference sound level and shall operate without risk of fire or electric shock.</p>
78.4.8	Info	<p>External Icing Test</p>
78.4.8.3		<p>At the completion of the exposure, while in the high <u>low</u> temperature, the environmental chamber is to be de-energized and the HPSA control system energized. <u>Within 2 minutes of the HSPA being energized, sound level measurements described in 78.2.1.3 shall be recorded. The samples shall comply</u></p>



CLAUSE	VERDICT	COMMENT
		<p>with the Audibility Test, Section 78.2.1.3 and Speech Intelligibility per Section 76.2.1.1 A HPSA shall not be reduced in sound level by more than 3 decibels from the reference sound level and shall operate without risk of fire or electric shock.</p> <p><u>Exception: A HPSA shall be considered to have met the requirements of 78.2.1.3 when there is no ice build-up in the mouth of the HPSA.</u></p>
78.4.8.4		<p>Immediately following the sound level measurements, the The samples shall comply with the Dielectric Voltage-Withstand Test, 78.3.</p>
78.5	Info	Environmental Tests – Outdoor Control Subsystem
78.5.1	Info	High Temperature Test
78.5.1.2	Info	Operational
		<i>New clause added;</i>
78.5.1.2.2		<p>For the test method, the control system is to be placed in a position of intended use in an air-circulating environmental chamber. The microphone from an ANSI Type 1 sound level meter shall is also to be placed in the environmental chamber. Prior to conditioning, while in the environmental chamber, the control system is to be energized at rated voltage from band limited pink noise as show in Figure 78.1. The reference sound level is to be established and recorded per 78.2.1.3 and the control system is to then be de-energized. The environmental chamber is to be energized and maintained at the appropriate temperature and humidity indicated in 78.5.2.2.1.</p>
78.5.1.2.3		<p>At the completion of the exposure, while in the high temperature, the environmental chamber is to be de-energized and the control system energized. <u>Within 2 minutes of the test sample being energized, sound level measurements described in 78.2.1.3 shall be recorded.</u> The control system shall not be reduced in <u>sound level by more than 3 decibels from the reference sound level.</u> The samples shall comply with the Audibility Test and Speech Intelligibility per Section/</p>
78.5.1.2.4		<p>The samples shall comply with the Dielectric Voltage Withstand Test, Section 76.3. The samples shall comply with Speech Intelligibility, 78.2.1.1.</p>
78.5.2	Info	Low Temperature Test
78.5.2.2	Info	Operational
		<i>New clause added;</i>
78.5.2.2.2		<p>For the test method, the control system is to be placed in a position of intended use in an air-circulating environmental chamber. The microphone from an ANSI Type 1 sound level meter shall is also to be placed in the environmental chamber. Prior to conditioning, while in the environmental chamber, the control system is to be energized at rated voltage from band limited pink noise as show in Figure 78.1. The reference sound level is to be established and recorded per 78.1 and the control system is to then be de-energized. The environmental chamber is to be energized and maintained at the appropriate temperature and humidity indicated in 78.5.1.2.1.</p>



CLAUSE	VERDICT	COMMENT
78.5.2.2.3		At the completion of the exposure, while in the low high temperature, the environmental chamber is to be de-energized and the control system energized. <u>Within 2 minutes of the test sample being energized, sound level measurements described in 78.2.1.3 shall be recorded. The control system shall not be reduced in sound level by more than 3 decibels from the reference sound level. The samples shall comply with the Audibility Test, Section 76.2.1.2 and Speech Intelligibility per Section 76.2.1.1 and shall operate without risk of fire or electric shock.</u>
78.5.2.2.4		The samples shall comply with the Dielectric Voltage-Withstand Test, Section 76.3. The samples shall comply with Speech Intelligibility, 78.2.1.1.
78.5.3	Info	Solar Radiation Test
78.5.3.1		The unit shall comply with the solar radiation test in the Department of Defense Test Method Standard for Environmental Engineering Considerations and Laboratory Test, MIL-STD-810F <u>with the following deviations:</u> <u>a) Normal Operation is not required to be confirmed during the Solar Radiation Test;</u> <u>b) The control subsystem of the HPSA shall be operated at full rated power via simulated load for 5 minutes of signaling with a 1 KHz alert tone at each peak cycle temperature.; and</u> <u>c) The sample shall comply with the Audibility Test, 78.2.1.2 and Speech Intelligibility, 78.2.1.1. Measurements are to be made after the completion of all cycles. The sample shall be energized at nominal rated voltage and frequency per 31.1.2 and mounted in an anechoic or hemi-anechoic chamber.</u>
78.5.4	Info	Hosedown Test
78.5.4.2		<i>New clause added;</i> An enclosure constructed from a polymeric material shall be conditioned for 7 h at 70°C (158°F) prior to being subjected to the conditioning in 78.5.4.1.
78.5.4.4		The samples shall comply with the Dielectric Voltage-Withstand Test, 78.3 <u>within 5 min following the water spray application.</u>
78.5.6	Info	Humidity Test
78.6.2		<i>New clause added;</i> For the test method, the control system is to be placed in a position of intended use in an air circulating environmental chamber. The microphone from an ANSI Type 1 sound level meter is also to be located in the environmental chamber. Prior to conditioning, while in the environmental chamber, the control system is to be energized at rated voltage from band limited pink noise as shown in Figure 78.1. The reference sound level is to be established and recorded per 78.2.1.3 and the control system is then to be de-energized. The environmental chamber is to be energized and maintained at the appropriate temperature and humidity as indicated in 78.5.6.1.



CLAUSE	VERDICT	COMMENT
78.5.6.3		At the completion of the exposure, while in the high humidity temperature, the environmental chamber is to be de-energized and the control system energized. <u>Within 2 minutes of the test sample being energized, sound level measurements described in 78.2.1.3 are to be recorded. A control system shall not be reduced in sound level by more than 3 decibels from the reference sound level</u> The samples comply with the Audibility Test, Section 76.2.1.2 and Speech Intelligibility per Section 76.2.1.1, and operate without risk of fire or electric shock.
78.5.6.4		<u>Immediately following the sound level measurements the</u> The samples shall comply with the Dielectric Voltage-Withstand Test, 78.3.
78.5.6.5		<i>New clause added;</i> The samples shall comply with Speech Intelligibility, 78.2.1.1.
78.5.8	Info	External Icing Test
78.5.8.3		At the completion of the exposure, while in the <u>low</u> high temperature, the environmental chamber is to be de-energized and the HPSA energized. <u>Within 2 minutes of the HPSA being energized, sound level measurements described in 78.2.1.3 shall be recorded. The samples shall comply with the Audibility Test, Section 76.2.1.2 and Speech Intelligibility per Section 76.2.1.1.</u> A HPSA shall not be reduced in sound level by more than 3 decibels from the reference sound level and shall operate without risk of fire or electric shock.
78.5.8.4		<u>Exception: A HPSA shall be considered to have met the requirements of 78.2.1.3 when there is no ice build-up in the mouth of the HPSA.</u> <u>Immediately following the sound level measurements, the</u> The samples shall comply with the Dielectric Voltage-Withstand Test, 78.3.
78.6	Info	Environmental Tests – Indoor Control Subsystem
78.6.1	Info	High Temperature Test
78.6.1.2	Info	Operational
78.6.1.2.3		At the completion of the exposure, while in the <u>high</u> low temperature, the environmental chamber is to be de-energized and the control system energized. <u>Within 2 minutes of the test sample being energized, sound level measurements described in 78.2.1.3 are to be recorded. A control system shall not be reduced in sound level by more than 3 decibels from the reference sound level.</u> The samples shall comply with the Audibility Test, Section 76.2.1.2 and Speech Intelligibility per Section 76.2.1.1 and shall operate without risk of fire or electric shock.
78.6.1.2.4		The samples shall comply with the Dielectric Voltage-Withstand Test, Section 76.3 <u>Speech Intelligibility, 78.2.1.1.</u>
78.6.2.2	Info	Low Temperature Test



CLAUSE	VERDICT	COMMENT
78.6.2.2.3		At the completion of the exposure, while in the low temperature, the environmental chamber is to be de-energized and the control system energized. <u>Within 2 minutes of the test sample being energized, sound level measurements described in 78.2.1.3 are to be recorded. A control system shall not be reduced in sound level by more than 3 decibels from the reference sound. The samples shall comply with the Audibility Test, Section 76.2.1.2 and Speech Intelligibility per Section 76.2.1.1 and shall operate without risk of fire or electric shock.</u>
78.6.2.2.4		The samples shall comply with the Dielectric Voltage-Withstand Test, Section 76.3 <u>Speech Intelligibility, 78.2.1.1.</u>
78.6.3	Info	Humidity Test
78.6.3.2		At the completion of the exposure, while in the high <u>humidity temperature</u> , the environmental chamber is to be de-energized and the control system energized. <u>Within 2 minutes of the test sample being energized, sound level measurements described in 78.2.1.3 are to be recorded. The samples comply with the Audibility Test, Section 76.2.1.2 and Speech Intelligibility per Section 76.2.1.1, and operate without risk of fire or electric shock.</u>
78.6.3.3		<u>Immediately following the sound level measurements, the</u> The samples shall comply with the Dielectric Voltage-Withstand Test, 78.3.
78.6.3.4		<i>New clause added;</i> The samples shall comply with Speech Intelligibility, 78.2.1.1.
81	Info	Markings
81.1.19		<i>New clause added;</i> A product intended for installation in air handling spaces and complying with 7.5 shall be marked "Suitable for Use In Air Handling Spaces" or "Suitable for Use in Other environmental Air Space" in Accordance with Section 300.22, (C) of the National Electrical Code.
82	Info	Installation Wiring Diagram/Instructions
82.23		<i>New clause added;</i> Details on rechargeable standby power calculations, including: a) Maximum battery amp hour capacity supported by any integral charger; b) Normal Standby load and time period(s); c) Alarm load and time period(s); and d) Incorporate safety margin into the calculated amp hour rating of 20 %.
82.24		<i>New clause added;</i> Consistent with 45.1.8, indication of compatible version of the software employed in compatible systems, by part number and revision level.



CLAUSE	VERDICT	COMMENT
		<i>New clause added;</i>
82.25		In accordance with 40.2.8, the signal components from signal generation to and including output speaker utilized to meet the low frequency signal tone need to be specified.
83	Info	Operating Instructions
83.3		The instructions shall include a capsule description of pertinent conditions applicable to the particular control unit as described in 82.16 and 82.17. <u>Systems that have microphones for live voice announcements shall include instructions for using the microphone.</u>
<i>The following changes reflect the December 14, 2018 revision</i>		
	Info	CONSTRUCTION
6	Info	General
		<i>New clause added;</i>
6.5.1		Enclosure parts fastened with adhesive meeting 10.6 – 10.9 shall comply with the test requirements in Mechanical Strength Tests for Metal Enclosures and Guards and Enclosure Parts Fastened with Adhesive, Section 67.
CUSTOMERS PLEASE NOTE: This Table and column “Verdict” can be used in determining how your current or future production is or will be in compliance with new/revised requirements.		