CERTIFICATION IMPACT ANALYSIS:
(CSA) (UL) (EN) IEC 60950-22, EDITION No. 2,
Information technology equipment – Safety –
Part 22: Equipment to be installed outdoors

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This analysis is intended to identify and analyze the impact of notable differences between the latest versions of the IEC and UL standards for Safety of Information Technology Equipment (ITE)–Equipment to be installed outdoors, and their predecessors. In particular, **IEC 60950-22 Edition No. 2** is being analyzed and compared to its predecessors, mainly **IEC 60950-22, Edition No. 1** and **UL 60950-22, Edition No. 1.**

IEC 60950-22, Edition No. 2 was published in **January 2016**. The corresponding version of **CSA CC2.2 No. 60950-22/UL 60950-22, Second Edition** was published on **March 31, 2017.** Included is analysis of any changes to the **National Differences** associated with this bi-national standard.

This analysis will permit persons already familiar with IEC 60950-22 and UL 60950-22 to become familiar with the likely impact on ITE of the latest Safety Standards for Outdoor ITE. Other select observations are included that may be of interest to the reader. This analysis will be updated as additional information on the application of the new Standards becomes known.

It is noted that IEC TC108 has made a commitment for no further revisions of IEC 60950-1 and its Part 2 standards, so that work can be concentrated on **IEC 62368-1, *Audio/video, information and communication technology equipment – Part 1: Safety requirements***, the Standard replacing **IEC 60065** (AV Equipment) and **IEC 60950-1** (ICT Equipment). IEC 62368-1 Edition No. 2 was published in February 2014, and Edition No. 3 is likely to be published during Q3 or Q4 2018. Therefore, most of these changes in IEC 60950-22 were adopted to allow for continued effective application of IEC 60950-22 during the transition.

Note that IEC TC108 plans to incorporate the requirements in this Part 2 standard into the main document IEC 62368-1 as part of its Edition No. 3. Therefore, under the IEC 62368 series, there would be no similar Part 2 standard for outdoor equipment – the requirements would be in the Part 1 standard, IEC 62368-1, starting with its Edition No. 3.

Background

IEC 60950-1 is the International Standard for Safety of Information Technology Equipment. It encompasses under its scope information technology equipment, communication technology equipment, office appliances and multi-media equipment for use in the home, office, business, school, computer room and similar locations.

Its Part 2 standard, **IEC 60950-22**, applies to ITE intended to be installed permanently in an outdoor location, and it supplements (used in conjunction with) IEC 60950-1 (i.e., it does not replace 60950-1).

IEC TC 108 also is responsible for the following standards, among others,

- IEC 60950-21, Information technology equipment – Safety – Part 21: Remote power feeding;
- IEC 60950-23, Safety of Information Technology Equipment – Part 23: Large Data Storage Equipment;
- IEC 60990, Methods of Measurement of Touch Current and Protective Conductor Current.

In the U.S. and Canada, the Bi-National Standard (BNS) for 60950-22, formally designated CSA C22.2 No. 60950-22/UL 60950-22, Edition No. 2, is based on IEC 60950-22, Edition No. 2. It includes U.S./Canadian deviations (National Differences) to address needed national requirements that are not in the base IEC document.

The technical content of the BNS is developed and maintained by the Technical Harmonization Committee (THC), which consists of representation from UL, CSA, and a representative number of AV, IT and communication technology equipment manufacturers.

The **Effective Date** for UL 60950-22 Second Edition will be posted on the UL website - http://industries.ul.com/blog/effective-date-information/ - it is anticipated to be **April 14, 2020** to align with the **DOW** for **EN 60950-22:2017.**

Notes to this Analysis:

- Unless otherwise noted, all Sub-clause/Annex references are to the IEC 60950-22, Edition No. 2.
- Discussion of changes and differences associated with IEC 60950-22, Edition No. 2 is in plain text.
- Discussion of new or revised national differences specifically associated with revisions of the Bi-National Standard, CSA C22.2 No. 60950-22/UL 60950-22, Edition No. 2 are noted, ***CAN/U.S. ND***. See UL Bulletin dated Sept. 30, 2016.
- Discussion of new or revised special national conditions (differences) associated with CENELEC EN 60950-22:2017 are noted**, *CENELEC ND.***

Explanation of Impact Statements:

Statement	Impact
None	Anticipate no impact on the present certification practice of most Outdoor ITE due to the change.
Minor*	Anticipate limited impact on the present certification practice of some, or all Outdoor ITE due to the change.
Considerable*	Anticipate considerable impact on the present certification practice of some, or all Outdoor ITE due to the change.

* For new/revised requirements that are considered as of the date of this analysis **more onerous** than existing requirements, the Impact Statement (Minor, Considerable) will be followed by a (+). For new/revised requirements that are considered as of the date of this analysis **less onerous** than existing requirements, the Impact Statement (Minor, Considerable) will be followed by a (-). No symbol next to a Minor statement indicates that, although there could be limited impact associated with the change, it is indeterminate as of the date of this analysis whether it will be slightly more or less.

Revision History:
n/a

Clause 1 (Scope)		
Sub-clause	**Discussion**	**Impact**
1.1 Equipment covered	Minor editorial revisions/clarifications, including removal of the provision that the standard only covers "empty" **Outdoor Enclosures** since experience shows that such enclosures come in many forms, some of which may have additional components/ subassemblies important for outdoor use, such as fans, filters, etc.	None.
1.2 Additional requirements	Existing reference to the IEC standard for information on direct lightning strikes has been changed from, *IEC 61024-1, Protection of structures against lightning - Part 1: General principles - Section 1: Guide A: Selection of protection levels for lightning protection systems*, which has been withdrawn, to, *IEC 62305-1, Protection against lightning – Part 1: General principles*, its replacement.	None.

Clause 4 (Conditions for Outdoor Equipment)		
Sub-clause	**Discussion**	**Impact**
4.1 Ambient air temperature	Compliance criteria clarifies that *data provided by the manufacturer* also may be used to determine compliance with this sub-clause, in addition to *inspection*.	None.
4.2 Mains supply - General	Existing sub-clause *4.2, AC Mains supply*, has been restructured and rewritten to now reflect, *4.2, Mains supply, 4.2.1, General, 4.2.2, Mains transient voltage on AC mains supply*, and *4.2.3, Mains transient on DC mains supply.* Generally, the technical content is the same, except for new requirements for DC mains supply.	Minor.

Clause 4 (Conditions for Outdoor Equipment)		
Sub-clause	**Discussion**	**Impact**
4.2.3 Mains transient voltage on DC mains supply	New content generally is consistent with how mains transients are treated in 60950-1, but with minor adjustment for an outdoor environment. Manufacturer is required to declare the mains transient voltage on the DC mains supply in the installation instructions.	Minor (+). Generally reflects present practice, except for new declaration in installation instructions.

Clause 6 (Protection from electric shock in outdoor locations)		
Sub-clause	**Discussion**	**Impact**
6.1 Protection from electrical shock in an outdoor location- Voltage limits of user-accessible parts in outdoor locations **CENELEC ND**	New country note for Denmark that, installation rules require the maximum safe to touch nominal voltage to be 6 V a.c. r.m.s. or 15 V ripple-free d.c. for outside environment, where the installation normally can be humid or wet due to the weather condition including area with shelters, but not in protected walls, e.g. carports.	None. Informative.
6.3 Mains protection for socket-outlet in outdoor locations	New requirement that a *residual current protective device (RCD)* with rated residual operating current not exceeding 30 mA is required in the Mains Supply for socket-outlets intended for general use and with a rated current not exceeding 20 A. The RCD is required to be an integral part of the equipment or of the building installation. If the RCD is part of the building installation, instructions for installations of the RCD are required to be provided with the equipment.	Minor (+). New requirement for IEC, although it is expected that this reflects general practice. **Parallels existing requirement in UL 60950-1 (Annex NAE (1.2)) that such outlets in outdoor equipment are required to have a GFCI for Personnel protection per UL 943. See Annex NAE (6.3) in this analysis statement.**

Clause 8 (Construction requirements for outdoor enclosures)		
Sub-clause	**Discussion**	**Impact**
8.3.1 Resistance to corrosion – General **CAN/US ND**	**Material examples added which are considered to comply with 8.3.1 without testing, including:** **a) Copper, aluminum, or stainless steel; and** **b) Bronze or brass containing at least 80 percent copper.**	**Minor (-). Provides examples of constructions that are considered to inherently comply with 8.3.1 without testing.**
8.3.3 Resistance to corrosion – Test procedure	A challenge with Edition No. 1 of IEC 60950-22 has been identifying suitable methods to meet the standard's *corrosion resistance* principles/requirements without having to do full testing per the conditions in this sub-clause and in the environment described in Annex AA. Other alternative test methods and standards can similarly qualify materials as *corrosion resistant*, and the compliance criteria has been updated to include, *ISO 21207 Method B, ISO 14993* or with the additional provision "any other equivalent standard."	Minor (-). Generally reflects present practice - will provide additional options for manufacturers. Note, it is not expected UL will be testing to ISO 21207 or ISO 14993.
8.3.4 Compliance criteria	A challenge with Edition No. 1 of IEC 60950-22 has been identifying what types of visual *corrosion* constitute non-compliance in the context of this safety standard. The compliance criteria in 8.3.4 has been expanded to give additional details in a safety context, i.e., such corrosion shall not impact – *continued protection against access to hazardous parts, including after mechanical strength tests; – continued protection against ingress of dust and water; and – continued provision of earth continuity.*	Minor. Generally reflects present practice.

Clause 8 (Construction requirements for outdoor enclosures)		
Sub-clause	**Discussion**	**Impact**
8.5.1 Gaskets – General **CAN/US ND**	**In North America, gaskets often are also tested to *UL 157* or *CSA 94/UL 50E* as an alternative to the gasket requirements/tests in 8.5.1 and Annex D. This practice now has been acknowledged as a suitable alternative in NA as a CAN/US National Difference.**	**Minor (-). Generally reflects present practice.**

Clause 9 (Protection of equipment within an outdoor enclosure)		
Sub-clause	**Discussion**	**Impact**
9.3.1 Protection from excessive dust – General	Edition No 1 has very vague requirements for protection from excessive dust since a minimum level was not specific and some of the requirements in *IEC 60529* require the end product technical committee to define application-specific test methodology/ conditions, which were not included in Edition No. 1. In Edition No. 2, IP5X or IP6X, or equivalent, are specified as the general requirement, with additional details provided in 9.3.2 (IP5X) and 9.3.3 (IP6X).	Minor (+). Although additional content providing clarification of the intent of IEC TC108 has been added to 9.3.1 – 9.3.3, the resulting requirements generally reflect present practice.
CAN/US ND	**Since the IEC requirement now specifies a minimum requirement, D1 National Differences have been added providing *NEMA/UL 50E* equivalency, essentially Types 3, 3X, 3S, 3SX, 4, 4X, 6 and 6P are allowed as an alternative to IP5X; and 3, 3X, 3S, 3SX are allowed as an alternative to IP6X.**	Minor. Will provide additional options for manufacturers, which are consistent with present practice.
9.3.2 IP5X equipment	See 9.3.1.	-
9.3.3 IP6X equipment	See 9.3.1	-

Clause 10 (Mechanical strength of enclosures)		
Sub-clause	**Discussion**	**Impact**
10.2 Mechanical strength of enclosures – Impact test	Clarifies that the low temperature conditioning is to take place before the impact test, and that the impacts are to be performed within 2 min of removal of the EUT from the climatic chamber.	Minor. Generally reflects present practice.

Clause 11 (Outdoor equipment containing valve regulated or vented batteries)		
Sub-clause	**Discussion**	**Impact**
11.1 Outdoor equipment containing valve regulated or vented batteries – Risk of explosion from lead acid, NiCd and NiMH batteries	A challenge with Edition No. 1 of IEC 60950-22 has been that the requirements for ventilation of batteries are relatively general, with some general examples provided of what can be used to comply, including an associated test method, but not enough detail has been provided to allow for consistent and complete assessment of associated constructions. Edition No. 2 introduces more details, including the single fault principle that such ventilation is required to remain effective even if a single mechanical fault occurs in the ventilation system – field experience has shown that such ventilation system are prone to such fault conditions. As part of this update, the existing Clause 11 also has been restructured into, 11.1, *Risk of explosion from lead acid, NiCd and NiMH batteries*, 11.2, *Ventilation preventing an explosive gas concentration*, and 11.3, *Ventilation test.* Also, additional alignment with IEC 62368-1 has been included, including incorporation of some planned changes for Edition No. 3 of that standard.	Minor (+). For constructions with batteries covered by this clause, there will be additional steps required to confirm compliance, although the test methodology now in 11.3 remains the same. It is expected that most manufacturers have been transitioning to these requirements due to education within the industry, but some (relatively few) constructions using these sorts of battery designs may need additional design modification.

Clause 11 (Outdoor equipment containing valve regulated or vented batteries)		
Sub-clause	**Discussion**	**Impact**
11.2 Ventilation preventing an explosive gas concentration	See 11.1	-
11.3 Ventilation test	See 11.1	-

Annexes		
	Discussion	**Impact**
Annex C Ultraviolet light conditioning test		
C.1 Test apparatus	Additional details now provided on minimum continuous exposure time for *twin enclosed carbon-arc* (720 h) and *xenon-arc* (1000 h) to align with similar changes in IEC 62368-1.	Minor. Generally reflects present practice.
Annex D Gasket tests		
D.3 Compression test	Allows for manufacturer to specify cool down temperature for compression testing, with -33 C now specified as the default if such information is not provided – aligns closer with the source gasket test standards.	Minor. Generally reflects present practice.
Annex E Rationale		
E.2 Electric Shock	Clarifies that it is the intent of the standard that the lower voltage limits associated with wet contact only are applicable to parts that are user accessible. Circuits at higher voltage, such as 48 Vdc located in a PoE surveillance camera system, are perfectly acceptable if the electrical enclosure meets the requirements of an OUTDOOR ENCLOSURE.	None. Rationale statement.

Annexes		
	Discussion	**Impact**
Annex NAE U.S. and Canadian Regulatory Requirements		
6.3 Ground-Fault Circuit-Interrupter for Personnel **CAN/US ND**	**Existing requirement in UL 60950-1 that receptacles associated with equipment installed outdoors require a GFCI has been copied into 60950-22 since this Part 2 IEC standard now has a parallel requirement.**	**None. Reflects present requirement via existing inclusion in CSA/UL 60950-1.**