

**COMMUNICATIONS
ALLIANCE LTD**



NSW GOVERNMENT
DEPARTMENT OF FAIR TRADING
Building and Construction Policy team

Statutory review of the Gas and Electricity
(Consumer Safety) Act 2017

COMMUNICATIONS ALLIANCE SUBMISSION
9 DECEMBER 2022

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Introduction

Communications Alliance welcomes the opportunity to provide this submission in response to the NSW Department of Fair Trading consultation paper on the statutory review of the *Gas and Electricity (Consumer Safety) Act 2017* (the Act).

Communications Alliance understands that this consultation represents the discovery phase of the project and that the Discussion Paper has only been circulated via email to targeted key stakeholders, with the formal public consultation to commence mid-2023.

The following comments are provided on specific issues and relevance to the telecommunications sector. The initial section (Section 2) outlines changes in the direction that international technology equipment safety standards are heading which needs to be taken into account. The last section (Section 3) provides responses to questions presented in the discussion paper.

Communications Alliance is also currently in discussions with ERAC on the issue of electrical safety limits that is discussed under Section 1 of this paper.

About Communications Alliance

Communications Alliance is the primary communications industry body in Australia. Its membership is drawn from a wide cross-section of the communications industry, including carriers, carriage and internet service providers, content providers, platform providers, equipment vendors, IT companies, consultants and business groups.

Its vision is to be the most influential association in Australian communications, co-operatively initiating programs that promote sustainable industry development, innovation and growth, while generating positive outcomes for customers and society.

The prime mission of Communications Alliance is to create a co-operative stakeholder environment that allows the industry to take the lead on initiatives which grow the Australian communications industry, enhance the connectivity of all Australians and foster the highest standards of business behaviour.

For more details about Communications Alliance, see <http://www.commsalliance.com.au>.

1 Electrical safety limits

Communications Alliance understands from the Discussion Paper that two of the driving issues behind the proposed changes to the Act concerning the definition of electrical work stem from advances in technology, specifically the stand alone generation of electricity such as solar & wind farms, and the growing use of low voltage electrical wiring in transportable structures and vehicles.

Communications Alliance suggests that there is a third element that should be taken into account in the review of the Act. This third element is, that the International Electrotechnical Commission (IEC), the publisher of international standards for all electrical, electronic and related technologies (electrotechnology), which addresses the safety of electronic equipment within the field of audio/video, information technology and communication technology, has moved from a product-driven safety analysis to *Hazards Based Safety Engineering* (HBSE), a systemic identification and analysis of hazards.

The international technology equipment safety standard

The IEC 62368-1:2018 Audio/video, information and communication technology equipment – Part 1: Safety requirements Standard¹, now Edition 3, with Edition 4 in development, is applicable to the safety of electrical and electronic equipment within the field of audio, video, information and communication technology, and business and office machines with a rated voltage not exceeding 600 V.

The standard is based on the energy sources, which can be either current limited or voltage limited within the equipment. It introduces a new model for safety using safeguards between specific energy sources and body parts, independent of the function of the product, and finally, it is the safety performance of the equipment that is specified, not the construction of the equipment.

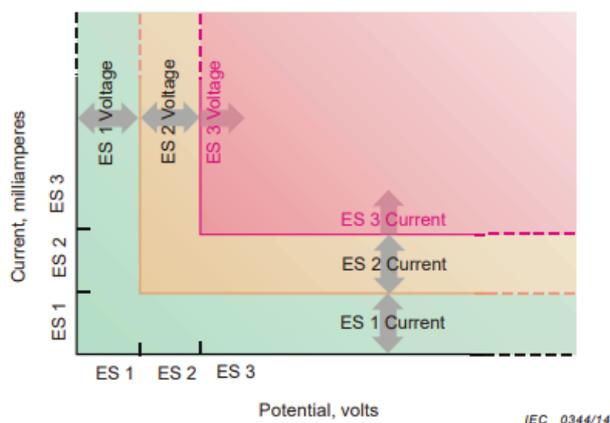


Illustration showing ES limits for voltage and current²

¹ IEC 62368-1:2018 Audio/video, information and communication technology equipment - Part 1: Safety requirements. <https://webstore.iec.ch/publication/27412>

² From AS/NZS 62368.1:2018, Clause 5.2.2.2 General. Available from <https://www.standards.org.au/standards-catalogue/sa-snz/other/te-001/as-slash-nzs--62368-dot-1-colon-2018>

In the above figure, for any voltage up to the voltage limit, there is no limit for the current. Likewise for any current up to the current limit, there is no limit for the voltage, except for the 600 V ceiling as specified in IEC 62368-1.

The focus of the Standard is on energy safety, addressing the following main hazards: electric shock; electrically caused fire; hazardous substances (chemical exposure); mechanical (stability, sharp edges, moving parts); thermal burns (hot surfaces); and radiation (laser, ionizing, acoustic). IEC 62368-1 identifies potentially hazardous energy sources in order to put safeguards into place, introducing a three-stage risk model against potentially increasing risks from rising energy levels, namely: those that are detectable without pain to users, those that cause pain on exposure, and finally, energy sources that cause injury when a transfer mechanism is present.

For electrical energy, these sources are classes ES1, ES2 and ES3. See the attachment in this submission for the definition of the Electrical Energy Sources and a comparison to Extra Low Voltage (ELV) and related voltages.

Australian communications equipment and cabling safety Standards

The telecommunications customer cabling industry is regulated by the *Telecommunications Cabling Provider Rules 2014*³ (CPRs), which are managed and enforced by the Australian Communications and Media Authority (ACMA). Telecommunications customer cabling work must comply with the AS/CA S009:2020 *Installation requirements for customer cabling* Standard called up by the CPRs.

The AS/CA S009 Standard applies to the installation and maintenance of fixed or concealed customer cabling or cabling equipment that is connected, or is intended to be connected, to a Carrier's Telecommunications Network. It does not apply to any electrical power cabling whose primary function is the distribution of AC Mains supply. The objective of AS/CA S009 is to protect the health and safety of any person who may operate, work on, use services supplied by means of, or be otherwise reasonably likely to be affected by the operation of a Carrier's Telecommunications Network or a facility.

The 2020 edition of AS/CA S009 introduced the ES1, ES2 and ES3 classification of electrical energy sources, derived from the AS/NZS 62368.1:2018 *Audio/video, information and communication technology equipment, Part 1: Safety requirements (IEC 62368-1:2014 (ED. 2.0) MOD)* Standard, which replaced the former AS/NZS 60950.1 equipment safety Standard. The requirements in AS/CA S009 have been revised, taking in account these new electrical energy source definitions, and now AS/NZS 62368.1:2022 has been published as well.

It is constructive to understand that while the electrical energy source ES1, ES2 and ES3 classification has been introduced, the existing technologies and services being supplied over telecommunications customer cabling remain the same. The safety provisions governed by telecommunications regulations and Standards that are applied to customer cabling and equipment using SELV, ELV, TNV, and hazardous voltages of AS/NZS 60950.1 continue to operate, now using the ES1, ES2 and ES3 classifications of AS/NZS 62368.1. In addition, ACMA registered cabling providers carrying out telecommunications customer cabling work, who have been trained to carry out work under existing telecommunications regulations, continue to be able to carry out telecommunications customer cabling work under the ES1, ES2 and ES3 classifications.

³ ACMA Telecommunications Cabling Provider Rules 2014. <https://www.acma.gov.au/cabling-provider-rules>

Safety for telecommunications customer equipment and telecommunications customer cabling is broader than electrical safety and has been adequately addressed to date by the telecommunications regulatory framework and associated standards. Telecommunication pathways, optical fibre, heat rise in cabling and fit for purpose obligations continue to be addressed by International and Australian Standards.

Internationally, both equipment safety Standards, IEC 60959.1 and IEC 62368.1, are being used within different jurisdictions, subject to individual country regulatory regimes. Equipment being designed and supplied to the global market are currently complying with both of those equipment safety Standards.

Although it appears that electrical energy classifications are not yet in common usage within ERAC or the electrical industry as a whole, it is worthy to note that the IEC 60335-1 Standard⁴ is being adopted by Standards Australia Committee EL-002⁵. IEC 60335-1 references IEC 62368-3 Standard⁶ which references the electrical energy classifications ES1, ES2 and ES3.

Telecommunications and electrical safety Standards

With the introduction of AS/CA S009:2020 under telecommunications regulations, and allowing telecommunication circuits to be current limited to achieve electrical safety, this has resulted in the telecommunication safety standards and regulations and the electrical standards and regulation to become out-of-step.

The definition of an electrical installation under the Act relates to fixed electrical equipment but excludes any electrical equipment operating at not more than 50 volts alternating current or 120 volts ripple-free direct current. On the other hand, telecommunications customer equipment and telecommunications customer cabling Standards are transitioning from using defined voltage limits. The defined electrical energy sources ES1 and ES2 of AS/CA S009:2020 allow for voltages greater than 50 volts AC which have effects on the body as described in AS/CA 62368.1, for ES1 are not painful but may be detectable, and for ES2 are painful but do not cause an injury.⁷ due to their touch-current limitations.

Electrical regulations and Standards are now no longer harmonised with international standards and the current AS/NZS 62368.1 equipment safety Standard that the telecommunications industry has adopted. This can cause contention with telecommunications customer cabling work under the ACMA's customer cabling regulations.

⁴ IEC 60335-1 *Household and similar electrical appliances - Safety - Part 1: General Requirements*. Available from <https://webstore.iec.ch/publication/61880>

⁵ Standards Australia Committee EL-002 : Safety of Household and Similar Electrical Appliances and Small Power Transformers and Power Supplies. <https://www.standards.org.au/standards-catalogue/sa-snz/electrotechnology/el-002>

⁶ IEC 62368-3:2017 Audio/video, information and communication technology equipment - Part 3: Safety aspects for DC power transfer through communication cables and ports. Available from <https://webstore.iec.ch/publication/26479>

⁷ AS/NZS 62368.1:2018 Clause 0.3 Table 1 Response to energy class

2 Responses to the Discussion Paper questions

Definition of electrical work

- 1 Do you support the changes to the definition of electrical installation work? If not, what changes should be made?
- 2 Do you support the changes to the definition of electrical equipment? If not, what changes should be made?
- 3 Do you support the changes to the definition of electrical installation? If not, what changes should be made?

The consultation paper presents the following amended definitions for inclusion in the Act:

electrical installation work means the physical work of installing, removing, repairing, altering, replacing, disconnecting, reconnecting, testing or maintaining electrical equipment or an electrical installation or the supervising of that work.

electrical equipment would mean any fixed appliances, wires, fittings, meters, batteries, energy storage systems, apparatus, cable, conductor or insulators that

- is used for controlling, generating, supplying, transforming, storing or transmitting electricity at a voltage greater than extra-low voltage, or
- is operated by electricity at a voltage greater than extra-low voltage, or
- includes a battery or energy storage system, operating at any voltage, which is used to supply an electrical installation

electrical installation means a group of fixed electrical equipment used for (or for purposes incidental to) the generation, storage, conveyance, measuring, control and use of electricity that:

- are permanently electrically connected together, and
- can be supplied with electricity from the works of an electricity supply authority or from a private generating source.

The definition will also expressly exclude the following:

- any electrical equipment owned or used by an electricity supply authority for the transmission or distribution of electricity
- any electrical article connected to, and extending or situated beyond, any electrical socket (other than an electrical outlet used to connect sections of fixed wiring)
- any electrical equipment in or about a mine
- any electrical equipment operating at not more than 50 volts alternating current or 120 volts ripple-free direct current, or
- any other electrical equipment, or class of electrical equipment, prescribed by the regulations.

It is noted that the definition for *electrical installations* uses the current definition of ELV of 50 volts alternating current or 120 volts ripple-free direct current based on AS/NZS 3000⁸ as the basis to exclude electrical equipment that is operating below this voltage limit.

⁸ AS/NZS 3000:2018 Electrical installations "Wiring Rules" Clause 1.4.128 Voltage. Available from <https://www.standards.org.au/standards-catalogue/sa-snz/other/el-001/as-slash-nzs-3000-colon-2018>

In reviewing the Act, Communications Alliance suggests that the NSW Department of Fair Trading takes into consideration the changes in the direction that international equipment safety Standards, as adopted by the telecommunications industry here in Australia, are taking.

Communications Alliance wishes to propose a couple of options for further consideration that would go towards harmonising the customer cabling obligations specified under telecommunications and electrical regulations:

1. To introduce an exclusion for telecommunications customer cabling work that support services at electrical energy source levels ES1 or ES2.
2. To introduce an exclusion for any low voltage electrical work on telecommunications customer equipment that is carried out by technical workers trained in the telecommunications industry.

Communications Alliance notes that the second option follows a precedent set by the Tasmania, under the *Occupational Licensing (Electrical Work) Regulations 2018*⁹ which states under Section 4 (3)(b) *Meaning of electrical work electrical work*, electrical work does not include 'any low voltage electrical work on telecommunications equipment that is carried out by technical workers trained in the telecommunications industry.'

ESV Electricity Safety Exemption Order 2020 – Carrier exemption

Of some relevance to the current topic, Communications Alliance participated in the Energy Safe Victoria (ESV) consultation in 2020 on the *Regulatory Impact Statement for the draft Electricity Safety (Registration and Licensing) Regulations 2020*.

In our submission¹⁰, Communication Alliance noted its concern with proposed adjustments to the regulatory framework that may have had unintended consequences – of introducing regulatory requirements on the information, communications and technology (ICT) sector at a cost with no tangible benefit. That is, to require an electrician's license for telecommunications work on systems operating at ELV or an equivalent energy source level e.g. for 48V DC in a Carrier's phone exchanges, data centres and on mobile phone base stations. The submission noted that this work has been satisfactorily self-regulated for decades with minimal safety issues. Communication Alliance recommended that ESV add an exclusion to the draft Regulations to continue to allow telecommunications related activities at ELV or an equivalent energy source level to be performed without requiring an electrician's licence.

Following the consultation, ESV concluded that, based on submissions received from the communications industry, the *Electricity Safety Exemption Order 2020*¹¹ was expanded to cover all electrical installation work carried out on electrical equipment that is owned or operated by a Carrier; and is used or to be used in connection with a Carrier's Telecommunications Network or telecommunications facility.

⁹ Tasmania Occupational Licensing (Electrical Work) Regulations 2018.

<https://www.legislation.tas.gov.au/view/whole/html/inforce/current/sr-2018-089>

¹⁰ COMMUNICATIONS ALLIANCE SUBMISSION SEPTEMBER 2020. ENERGY SAFE VICTORIA REGULATORY IMPACT STATEMENT Electricity Safety (Registration and Licensing) Regulations 2020 https://www.commsalliance.com.au/_data/assets/pdf_file/0018/72522/CA-response-to-ESV-on-Draft-Energy-Regulations-Sep-2020.pdf

¹¹ Electricity Safety Act 1998 ELECTRICITY SAFETY EXEMPTIONS ORDER 2020. SCHEDULE 6 Exemptions relating to electrical work. Item 40 Person employed or engaged by a carrier. Dated 22 December 2020. <https://esv.vic.gov.au/wp-content/uploads/2020/12/Electricity-Safety-Exemptions-Order-2020.pdf>

Electrical Installations

15 Should NSW regulate all ELV equipment? Why or why not?

Notwithstanding the previous comments on the electrical energy source classifications, Communications Alliance agrees with the premise in the consultation paper that bringing ELV into the scope of the Act would result in the unintended imposition of additional regulatory burden such as electrical licensing requirements on the telecommunications industry and that the cost of regulating ELV equipment would certainly outweigh any benefits.

Communications Alliance would not agree with the introduction of the regulation of all ELV equipment under *the Act*.

The AS/NZS 3820 Standard references applicable Australian Standards or AS/NZS Standards, and if there are none specific to the equipment, then the applicable IEC Standard applies directly (for example IEC 60799 Ed. 3.0 *Electrical accessories - Cord sets and interconnection cord sets*), and if there is none of those applicable, then the principles of safety in AS/NZS 3820 apply.

16 Do you support the inclusion of a power for the Secretary to declare some ELV equipment as high-risk? If not, why?

Communications Alliance sees merit in the approach to include a power for the Secretary in the Act to declare any ELV equipment as high-risk, to be addresses on a case by case basis should the need arise. Communications Alliance supports the proposed approach with the qualification that any decisions that are made, any unintended consequences for the telecommunications industry are to be considered.

Electrical appliances

25 Should NSW adopt the national EESS? Why or why not?

From the supplier's/user's perspective, Communications Alliance see in principle the benefits of having a single compliance scheme that is harmonised across Australia, with the expectation to simplify and reduce cost burden on equipment suppliers. In any case, the NSW suppliers are required to register their electrical equipment on the national Electrical Equipment Safety System (EESS) if they wish to also supply that electrical equipment to other States/Territories.

Examples of existing differences between EESS and NSW include the application of the arrangements at different points in the supply chain, and different risk classifications of some equipment, such as sewing machines which are Declared in NSW but only risk level 2 under the EESS.

28 Do you support the implementation of a Level 4 compliance scheme for electrical appliances? If not, why?

Communications Alliance is concerned with the costs and substantial compliance impost and disruption as the result of the proposal to implement a Level 4 compliance scheme for electrical appliances, and especially only in NSW. Having unique state-based provision would also be a barrier to trade interstate and internationally.

Communications Alliance strongly supports all efforts to maintain a harmonised approach to electrical safety across Australia, having in place a compliance scheme that is consistent across Australia, with the same certification levels with those in other states.

ATTACHMENT

AS/NZS 60950.1 and AS/NZS 62368.1 equivalence

From AS/CA S009:2020

1 General

The AS/CA S009:2020 Standard has been revised to use the terminology and requirements of the AS/NZS 62368.1 equipment safety Standard, which was published on 15 February 2018 as a replacement for AS/NZS 60950.1.

AS/NZS 62368.1 introduces revised terminology as used in AS/NZS 60950.1. The following specifies how equivalence between the two referenced safety Standards is implemented.

The term and definition for ELV is an exception to the above, since AS/CA S009:2020 uses the term with respect to electrical Building wiring in accordance with AS/NZS 3000, even though the term is no longer used in AS/NZS 62368.1.

2 Definitions for use with AS/NZS 60950.1 products

2.1 Extra-low voltage (ELV)

ELV is a voltage not exceeding 42.4 V peak or 60 V d.c.

Note: This differs from the ELV definition contained in AS/NZS 3000, which is more closely aligned to the TNV limits described below, i.e. 120 V d.c. or 70.7 V a.c. peak (50 V a.c. r.m.s.).

2.2 Safety Extra Low Voltage (SELV) circuit

An SELV circuit is a secondary circuit which is so designed and protected that—

- (a) under normal operating conditions, its voltages do not exceed ELV limits at any time; and
- (b) under single fault conditions, its voltages do not exceed ELV limits for longer than 200 ms and, in any case, do not exceed 71 V peak or 120 V d.c. at any time.

Note 1: An example of an SELV circuit is a power feed from a battery or a double insulated 'plug pack'.

Note 2: A circuit that meets the above requirements, but which is subject to overvoltages from a Telecommunications Network or a Cable distribution system, is classified as a TNV circuit.

[Adapted from AS/NZS 60950.1]

2.3 Telecommunications network voltage (TNV)

TNV is a voltage not exceeding—

- (a) when telephone ringing signals are not present—
 - (i) 71 V peak or 120 V d.c.; or
 - (ii) if a combination of AC voltage and DC voltage is present, the sum of the AC peak voltage divided by 71 and the DC voltage divided by 120 must not exceed 1; and
- (a) when telephone ringing signals are present, voltages such that the signal complies with the criteria of either Clause M.2 or Clause M.3 of AS/NZS 60950.1 (the signal is required to be current limited and cadenced).

[Adapted from AS/NZS 60950.1]

2.4 Hazardous energy source

A hazardous energy source is a voltage exceeding ELV limits existing in a circuit which does not meet the requirements for either a limited current circuit or a TNV circuit as defined in AS/NZS 60950.1.

2.5 Restricted access location

A restricted access location is a locked room or Enclosure where appropriate signage is used to ensure accidental access is not obtained by persons who are not qualified or authorised to gain access.

3 Definitions for use with AS/NZS 62368.1 products

For the purposes of this Standard, ES1, ES2 and ES3 refer to voltage and current classifications only.

Voltage and current limits for ES1 and ES2 are those specified in AS/NZS 62368.1.

Note: There are no voltage and current limits for ES3.

3.1 Electrical Energy Source Class 1 (ES1)

ES1 is a class 1 electrical energy source with touch current or prospective touch voltage levels not exceeding ES1 limits under—

- (a) normal operating conditions;
- (b) abnormal operating conditions; and
- (c) single fault conditions of a component, device or insulation not serving as a safeguard;

and not exceeding ES2 limits under single fault conditions of a basic safeguard or of a supplementary safeguard.

ES1 may be accessible to an Ordinary Person.

Note: ES1 provides the equivalent level of safety to SELV as specified in AS/NZS 60950.1.

[Adapted from AS/NZS 62368.1]

3.2 Electrical Energy Source Class 2 (ES2)

ES2 is a class 2 electrical energy source where both the prospective touch voltage and the touch current exceed the limits for ES1 and under—

- (a) normal operating conditions;
- (b) abnormal operating conditions; and
- (c) single fault conditions;

and either the prospective touch voltage or the touch current does not exceed the limit for ES2.

At least one basic safeguard is required between ES2 and an Ordinary Person. ES2 may be accessible to an Instructed Person and a Skilled Person.

A circuit with telephone ringing signals as defined in Annex H of AS/NZS 62368.1 is also considered ES2.

Note: ES2 provides the equivalent level of safety to ELV as specified in AS/NZS 60950.1.

[Adapted from AS/NZS 62368.1 MOD]

3.3 Electrical Energy Source Class 3 (ES3)

ES3 is a class 3 electrical energy source where both the prospective touch voltage and the touch current exceed the limit for ES2.

Note 1: ES3 is considered hazardous.

Note 2: ES3 is equivalent to 'hazardous energy source' as specified in AS/NZS 60950.1. Safety requirements for ES3 communications and other ES3 circuits are specified in this Standard.

[Adapted from AS/NZS 62368.1 MOD]

4 Comparison of AS/NZS 60950.1 and AS/NZS 62368.1 terms

An informative comparison of terms between AS/NZS 62368.1 and earlier Standards can be found in Annex W of AS/NZS 62368.1. Table W.3 of AS/NZS 62368.1 Annex W compares AS/NZS 60950.1 terms with AS/NZS 62368.1 terms. The following guidelines in the following Table are provided for information only. Where terms are compared, it means that they provide equivalent safety outcomes, provided all the requirements in the applicable standard have been fulfilled. Equivalence in these cases does not mean the technical parameters are identical.

TABLE 1
AS/NZS 60950.1 comparison of terms with AS/NZS 62368.1

AS/NZS 60950.1	AS/NZS 62368.1	Notes
ELV	ES2	ELV (up to 42.4 V peak or 60 V d.c. in AS/NZS 60950.1) is separated from hazardous energy source by basic insulation only. ELV may receive transient voltages or currents from circuits external to the Building, as such it is classified as ES2 for the purposes of this Standard.
SELV	ES1	SELV (60 V d.c. or 42.4 V peak) and ES1 both have protection against hazardous energy source by double or reinforced insulation (safeguards) and both may be touched by the user (Ordinary Person).
Limited current circuit	ES1	In AS/NZS 60950.1 a limited current circuit is limited to 2 mA d.c. or 0.7 mA peak. AS/NZS 62368.1 does not use the term 'limited current circuit' but does, have comparable requirements by way of current limits for ES1.
TNV	ES2	Telecommunications Network Voltage can be one of three levels. Generally, TNV-1 is up to 60 V d.c. but may have higher transients from circuits external to the Building; TNV-2 is up to 120 V d.c. but no transients; TNV-3 is up to 120 V d.c. but may have transients. The Ordinary Person must be separated from contact with possible transient circuits. All TNV circuits are classified as ES2 unless a professional engineer advises otherwise for each situation.
Hazardous voltage	ES3	AS/NZS 62368.1 does not use the term 'hazardous'. Instead it states that any energy source exceeding ES2 limits is classified as ES3 and as such is classified as hazardous. ES3 circuits must not be accessible to the Ordinary Person or the Instructed Person by the use of double or reinforced safeguards. The Skilled Person may have access to ES3 for safe work but protection must be provided to guard against accidental contact with another class 3 energy source.
Restricted access location	Restricted access area	Restricted Access Area is the term used in AS/NZS 62368.1. This is a change in terminology in the new safety standard.



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