

Subject 60079-17

February 17, 2017

SUMMARY OF TOPICS

The following changes in requirements for the Standard for Explosive Atmospheres - Part 17: Electrical Installations Inspection and Maintenance, UL 60079-17, are being recirculated:

1. This proposal provides revisions to the proposal document dated July 15, 2016 for the Adoption of IEC 60079-17, Explosive Atmospheres - Part 17: Electrical Installations Inspection and Maintenance, (fifth edition, issued by IEC November 2013) as a new IEC-based UL standard, UL 60079-17 to applicable requirements per comments received.

COMMENTS DUE: APRIL 3, 2017

For your convenience in review, proposed additions to the previously proposed requirements dated July 15, 2016 are shown underlined and proposed deletions are shown ~~lined-out~~.

1. This proposal provides revisions to the proposal document dated July 15, 2016 for the Adoption of IEC 60079-17, Explosive Atmospheres - Part 17: Electrical Installations Inspection and Maintenance, (fifth edition, issued by IEC November 2013) as a new IEC-based UL standard, UL 60079-17 to applicable requirements per comments received.

RATIONALE

Responses to comments have been posted within the UL 60079-17 Proposal Review Work Area dated July 15, 2016.

PROPOSAL

1DV DR Modification of Clause 1 to replace with the following:

This ~~part of the IEC 60079 standard series~~ applies to users and covers factors directly related to the inspection and maintenance of electrical installations within hazardous areas only, where the hazard may be caused by flammable gases, vapours, mists, dusts, fibres or flyings.

It does not include:

- other fundamental installation and inspection requirements for electrical installations;
- the verification of electrical equipment;
- the repair and reclamation of explosion protected equipment (~~see IEC 60079-19~~).

This standard supplements the requirements of ~~IEC 60364-6~~ NFPA 70B.

In the case of dusts, fibres or flyings the level of housekeeping may influence the inspection and maintenance requirements.

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This standard is intended to be applied where there can be a risk due to the presence of explosive gas or dust mixtures with air or combustible dust layers under normal atmospheric conditions. It does not apply to:

- underground mining areas,
- dusts of explosives that do not require atmospheric oxygen for combustion,
- pyrophoric substances.

Where references are made to other IEC 60079 standards, the reference requirements found in these standards shall apply as modified by any applicable U.S. National Differences.

2DV DR Modification of Clause 2 references to replace with the following:

~~IEC 60079-0, Explosive atmospheres — Part 0: Equipment — General requirements~~

~~IEC 60079-1, Explosive atmospheres — Part 1: Equipment protection by flameproof enclosures "d"~~

~~IEC 60079-2, Explosive atmospheres — Part 2: Equipment protection by pressurized enclosures "p"~~

~~IEC 60079-7, Explosive atmospheres — Part 7: Equipment protection by increased safety "e"~~

~~IEC 60079-10-1, Explosive atmospheres — Part 10-1: Classification of areas — Explosive gas atmospheres~~

~~IEC 60079-10-2, Explosive atmospheres — Part 10-2: Classification of areas — Combustible dust atmospheres~~

~~IEC 60079-11, Explosive atmospheres — Part 11: Equipment protection by intrinsic safety "i"~~

~~IEC 60079-14, Explosive atmospheres — Part 14: Electrical installations design, selection and erection~~

~~IEC 60079-15, Explosive atmospheres — Part 15: Equipment protection by type of protection "n"~~

~~IEC 60079-19, Explosive atmospheres — Part 19: Equipment repair, overhaul and reclamation~~

~~IEC 60079-31, Explosive atmospheres — Part 31: Equipment dust ignition protection by enclosure "t"~~

~~IEC 60364-6, Low-voltage electrical installations — Part 6: Verification~~

~~IEC 61241-4, Electrical apparatus for combustible dust atmospheres — Part 4: Type of protection "pD"~~

ISA 60079-10-1, Explosive atmospheres — Part 10-1: Classification of areas — Explosive gas atmospheres

ISA 60079-10-2, Explosive atmospheres — Part 10-2: Classification of areas — Combustible dust atmospheres

ISA 60079-29-1 (12.13.01), Explosive atmospheres — Part 29-1: Gas Detectors — Performance Requirements for Detectors for Flammable Gases

NEPA 70, National Electrical Code

NEPA 70B, Recommended Practice for Electrical Equipment Maintenance

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NFPA 70E, Standard for Electrical Safety in the Workplace

UL 121203 Portable Electronic products suitable for use in Class I and II, Division 2, Class I, Zone 2 and Class III, Division 1 and 2 hazardous (classified) locations

UL 60079-0 Explosive atmospheres – Part 0: Equipment – General requirements

UL 60079-1 Explosive atmospheres – Part 1: Equipment protection by flameproof enclosures "d"

UL 60079-2 Explosive atmospheres – Part 2: Equipment protection by pressurized enclosures "p"

UL 60079-7 Explosive atmospheres – Part 7: Equipment protection by increased safety "e"

UL 60079-11 Explosive atmospheres – Part 11: Equipment protection by intrinsic safety "i"

UL 60079-15 Explosive atmospheres – Part 15: Equipment protection by type of protection "n"

UL 60079-31 Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t"

3.9DV DR Modification of Clause 3.9 to add the following Note:

Note to entry: The National Electrical Code refers to non-hazardous areas as unclassified locations.

4.1DV DE Modification of Clause 4.1 to replace with the following:

For the purposes of inspection and maintenance, up-to-date documentation (verification dossier) including any modification records, of the following items shall be available:

- a) zone classification of areas and, if included, the equipment protection level (EPL) required for each location (see IEC ISA 60079-10-1 and IEC ISA 60079-10-2),
- b) for gases: equipment group (IIA, IIB or IIC) and temperature class requirements,
- c) EPL (equipment protection level), when provided,
- e d) for dusts: equipment group (IIIA, IIIB or IIIC) and maximum surface temperature requirements,
- d e) equipment characteristics e.g. temperature ratings, type of protection, IP rating, corrosion resistance,
- e f) records sufficient to enable the explosion protected equipment to be maintained in accordance with its type of protection (see IEC ~~60079-14~~ NFPA 70), (for example list and location of equipment, spares, certificates, technical information),
- f g) copies of previous inspection records,
- g h) copy of the ~~additional~~ initial inspection records ~~as detailed in IEC 60079-14.~~

NOTE The EPL (or Equipment Protection Level) may appear in the product marking and documentation. EPLs are designated as G for gas, D for dust, or M for mining and are then followed by a letter (a, b, or c) to give the user a better understanding as to whether the equipment provides either (a) a "very high," (b) a "high," or (c) an "enhanced" level of protection against ignition of an explosive atmosphere. For example, an Class I, Zone 1 AEx d IIC T3 luminaire (which is suitable by protection concept for an application in Zone 1) may additionally be marked with an EPL or "Gb" to indicate that it was provided with a high level of protection, such as Class I, Zone 1 AEx d IIC T3 Gb.

Requirements for other documentation that may be necessary are provided in IEC 60079-14 and IEC 60079-19.

4.3.1.1DV.1 DE Modification of Clause 4.3.1.1, first paragraph to replace with the following:

4.3.1.1DV.1.1 Before a plant also referred to as "facility" or equipment is brought into service, it shall be given an initial inspection. As part of the plant commissioning and start up procedures, initial inspection and other additional requirements are provided in IEC 60079-14.

To ensure that the installations are maintained in a satisfactory condition for continued use within a hazardous area, either

- a) regular periodic inspections, or
 - b) continuous supervision by skilled personnel,
- and, where necessary, maintenance shall be carried out.

NOTE 1 In the case of dusts, fibres or flyings, housekeeping can influence the inspection and maintenance requirements.

Following any adjustment, maintenance, repair, reclamation, modification or replacement, the equipment or relevant parts of equipment concerned shall be inspected in accordance with the relevant items of the detailed column of Tables 1, 2 and 3.

4.3.3DV.1 D1 Modification of Clause 4.3.3 to replace with the following:

4.3.3DV.1.1 Types of inspections include:

- a) Initial inspections used to check that the selected type of protection and its installation are appropriate based on detailed inspections. The requirements are covered in IEC 60079-14. They are to be detailed inspections in accordance with Tables 1, 2, and 3 or modified tables in accordance with 5.7 as appropriate.

NOTE A full initial inspection is not required if an equivalent inspection has been performed by the manufacturer and it is unlikely that the installation process will have affected those items inspected by the manufacturer. For example, an initial detailed inspection of internal flamepaths of a flameproof motor or the internal joints of a Zone 21 AEx tb motor is not required; however, the terminal housing cover, which would have been removed to facilitate connection of the field wiring, should be inspected after as part of the installation process.

- b) Periodic inspections which may be visual, close or detailed in accordance with Tables 1, 2 and 3, or modified tables in accordance with 5.7, as appropriate.
- c) Sample inspections which may be visual, close or detailed in accordance with Tables 1, 2 and 3, or modified tables in accordance with 5.7, as appropriate. The size and composition of all samples shall be determined with regard to the purpose of the inspection.

Sample inspections should not be expected to reveal faults of a random nature, such as loose connections, but should be used to monitor the effects of environmental conditions, vibration, inherent design weakness, etc.

d) Continuous supervision utilizing the visual or close inspections in accordance with Tables 1, 2 and 3, or modified tables in accordance with 5.7, as appropriate and in accordance with 4.5. Where the installation falls outside the capability for continuous supervision it shall be subject to periodic inspection.

The results of all (a – d above) inspections shall be recorded and retained, and may lead to a need for further actions. The requirements for continuous supervision are detailed in 4.5.5.

4.5.6DV.1 DR Modification of Clause 4.5.6, third paragraph to replace with the following:

4.5.6DV.1.1 The knowledge requirements of the technical person with executive function shall should include a full understanding of the provisions of IEC ISA 60079-10-1, IEC ISA 60079-10-2 as applicable to the location, IEC 60079-14 and NFPA 70, and IEC 60079-19 in relation to area classification and/or EPLs and selection, erection, installation, repair and reclamation of equipment.

4.8.1DV D1 Modification of Clause 4.8.1 to replace with the following:

Electrical equipment containing live parts, which is located in a hazardous area, shall not be opened except as described in a), b) or c): below:

a) Specific maintenance activities may require diagnostic tools and practices that require exposure of such circuits to facilitate testing or repair with tools or other diagnostic electrical equipment that may not be suitable for use in hazardous (classified) areas. In these cases, one methodology that may be utilized to control and mitigate the ignition risk hazards associated with this equipment or practice is a Gas Free Work Permit (GFWP) or comparable permitting process for a combustible dust location. The GFWP is a permit of operation that is controlled by a documented work management process, stating that work involving potential ignition sources may be performed in a hazardous (classified) location by ensuring that the atmosphere is free of ignitable concentrations of flammable gases or vapours. This permit is a written document requiring the review and approval by an authorized person as documented by the work management process in a position of authority for the location. A GFWP should incorporate the following:

- 1) A measurement to confirm the absence of an ignitable concentration of any flammable gas or vapour.
- 2) Sampling to confirm the continued absence of a flammable gas or vapour.
- 3) Contingency plans for emergencies.

a b) Work, for which the exposure of live parts is necessary, may be carried out subject to the precautions which would be applied in a non-hazardous area; and under a safe work procedure (see IEC 60079-14 NFPA 70E).

This may require isolating of all incoming and outgoing connections including the neutral conductor. "isolation" in this context means withdrawal of fuses and links or the locking off of an isolator or switch in accordance with local lock out and tag out procedures.

Sufficient time may need to be allowed to permit any surface temperature or stored electrical energy to decay to a level below which it is incapable of causing ignition.

NOTE 1 The protective capabilities of an Class I, Zone 1 AEx d enclosure are always compromised by opening it, whereas Class I, Zone 1 AEx e and Class I, Zone 1 AEx n enclosures may be of lesser concern if moisture ingress is unlikely while they are opened.

~~b c) Work. A relaxation of the requirements for on increased safety "e" equipment which also contains intrinsically safe apparatus is permitted on the intrinsically safe portion of the equipment, if all bare live parts that are increased safety "e" not protected by the type of protection "i" have a separate internal cover and partitions providing at least the degree of protection IP30 when the enclosure of the apparatus is opened.~~

This equipment should be provided with an external label stating:

"WARNING – DO NOT OPEN WHEN NON-INTRINSICALLY SAFE CIRCUITS ARE ENERGIZED". Technically equivalent text may be used and multiple warnings may be combined.

NOTE 2 The purpose of the internal cover, when fitted, is to provide a minimum acceptable degree of protection against the access to energized non-intrinsically-safe circuits when the enclosure is opened for short periods to permit live maintenance of intrinsically-safe circuits. The cover is not intended to provide protection from electrical shock.

~~c) In locations requiring EPL Gc or Dc, the work may be carried out subject to the precautions which would be applied in a non-hazardous area, if a safety assessment shows that the following conditions are satisfied:~~

- ~~1) the proposed work on energized equipment does not produce sparks capable of ignition;~~
- ~~2) the circuits are of such a design as to preclude the production of such sparks;~~
- ~~3) the equipment and any associated circuits within the hazardous area do not include any hot surfaces capable of producing ignition.~~

~~If these conditions can be met, then work may be carried out subject only to the precautions which would be applied in a non-hazardous area.~~

~~The results of the safety assessment shall be recorded in documents which shall contain:~~

- ~~• the form(s) which the proposed work on energized equipment may take;~~
- ~~• the results of the assessment, including the results of any testing carried out during the assessment;~~
- ~~• any conditions in association with the maintenance of energized equipment which the assessment has shown to be necessary.~~

~~The assessors of the equipment shall:~~

- ~~• be familiar with the requirements of any relevant standards, the recommendations of any codes of practice, and any current interpretation;~~
- ~~• have access to all information necessary to carry out the assessment.~~

4.9DV DR Modification of Clause 4.9 to replace with the following:

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