**INTERNATIONAL ELECTROTECHNICAL COMMISSION SYSTEM FOR CERTIFICATION TO STANDARDS RELATING TO EQUIPMENT FOR USE IN EXPLOSIVE ATMOSPHERES (IECEx SYSTEM)**

**TITLE: Compilation of comments on ExTAG/417/CD Draft Decision Sheet - Ex Marking of surge protection device for an intrinsically safe circuit in Zone 0**

**Circulated to: ExTAG – IECEx Testing and Assessment Group**

**INTRODUCTION**

This document contains a compilation of comments received on the abovementioned Draft Decision Sheet and observations completed by the originator, CQM, CN, for consideration by ExTAG. The document is issued for consideration during the ExTAG Umhlanga Meeting under ExTAG Agenda Item 10.1 (see ExTAG/423B/DA).

Attention is drawn to ANNEX A of this document as a proposed alternative Draft Decision Sheet, prepared by NANIO CCVE, and considered by the Originator, for discussion during the Umhlanga 2016 Meeting.

As usual please inform the Secretariat immediately of any omissions or errors at

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***Julien Gauthier***

**Julien Gauthier**

**ExTAG Secretary**

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| **ExCB/**  **ExTL** | **Clause/ Sub-clause** | **Paragraph Figure/**  **Table** | **Type of**  **comment**  **General/**  **technical/**  **editorial** | **COMMENTS** | **Proposed change** | | **Observation**  **(to be completed by the originator)** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| CNEX  NL |  |  |  | We support the comments of Kiwa |  | | The same as to Kiwa |
| DEKRA Certification B.V.  NL |  |  | Ge | We support the comments of Kiwa |  | | The same as to Kiwa |
| FME  (GB) |  |  | te | We disagree with the proposed resolution to the question posed.  60079-25 clause 12 details the conditions for installation of a surge protection device. The only requirement is that device is installed outside the zone 0 but within 1 m of the boundary. This is an installation requirement, although we are not sure why this limit exists.  In an intrinsically safe loop for an ‘ia’ certified piece of equipment the whole loop has to be ‘ia’. The barrier has to be assessed as Associated Apparatus [ia], the Zone 0 located equipment and any electrical parts attached to the loop e.g. additional loop powered displays, hand held terminals etc. connected to the hazardous location terminals of the associated apparatus in Zone 0, 1 or 2 should all meet the requirements for ‘ia’. ~~The only additional consideration~~ if the design fully meets the requirements for ’ia’ then the use of non-linear elements ~~is that Intrinsically safe systems~~ utilizing surge suppression techniques shall be supported by an adequately documented analysis of the effect of indirect multiple earthing, taking into account the criteria set out in clause 12 of 60079-25. The capacitance and inductance of the surge suppression devices shall be considered in the assessment of the intrinsically safe system. | Cancel the draft ExTAG DS | | We don’t accept this proposition as the following reason:  1）In Zone 0, an explosive atmosphere consisting of a mixture with air of flammable  substances in the form of gas or vapour is present continuously or for long periods or frequently.  The surge protection device shall be capable of diverting a minimum peak discharge current of 10 kA (8/20 μs impulse according to IEC 60060-1 for 10 operations).  Such device obviously can not be installed in zone 0.  Surge protection devices can be considered as simple apparatus to use when the user assess the safety.  But if the surge protection devices certified with a resulting Ex marking string of “Ex ia IICT ... Ga”, the user would have the wrong impression of installing the devices in zone 0 which could cause danger.  2）CQM received the certification application for surge protection device with Marking Ex ia ... Ga, and for this matter, the applicant provided a IECEx CoC issued by an ExCB as evidence.  Such DS could help ExCBs to adopt a consistent approach to the problem. |
| Kiwa Unit ExVision  NL |  |  | Ge | Kiwa does not really see the need of this decision sheet.  Even if the device is marked Ex ia IIC Tx Ga, but the installation standard prohibits the installation in zone 0, as IEC 60079-25 does indeed, then it's not allowed to install that device in zone 0 (better wording is location requiring EPL "Ga").  For this conclusion, no Decision Sheet is necessary. | Reject the draft Decision Sheet.  But if ExCBs/ExTLs agree that the DS is needed, because there are designers/installers that look at labels, not in standards, then see next comments | | The same as above. |
| Kiwa Unit ExVision  NL | -- | Answer | te | A better prevention for the same device to be installed in zone 0 (which seems to be the intention of the Decision Sheet) is to mark it Ex ia [ia Ga] IIC Tx **Gb**; meaning this device is allowed to be installed in zone 1 or zone 2 only and has an "ia" circuit that may be extending into zone 0. The mentioned example (which indeed may be one of the options, but not the best) should require an additional Ex d enclosure.  The use of EPLs, invented by IEC, is just the way to indicate the equipment protection level, and hence the allowed location, of a device. So use the EPL concept for that purpose. | Replace second part of the answer into:  Conception Ex ia [ia Ga] IIC T .. Gb is the best option if the surge protection device is designed to protect the intrinsically safe circuits in the zone 0. | | We will take the proposition into account. |
| Kiwa Unit ExVision |  | Background | ed | Sentence "... taken into consider when assessing of the …" is not correct | change to:  " ... taken into consideration when assessing ~~of~~ the …" | | We will take the proposition into account. |
| LCIE  FR |  |  |  | If the surge protective device is assessed according to the standard IEC 60079-11 and meets every requirement, nothing prevents to issue an IECEx certificate with the marking Ex ia IIC Ga T .... | The matter should be transfer to MT of IEC 60079-11 and IEC 60079-25 in order to align requirements.  In addition, as a provisional measure, it shall be required to add :   * condition for safe use to CoC : the surge protection device must be installed outside but as near to the boundary of Zone 0 as is practicable, preferably within 1 m * a marking on the product : **WARNING: SURGE PROTECTION DEVICE MUST BE INSTALLED OUTSIDE THE ZONE 0 – SEE INSTRUCTIONS** | | Further step for MT. |
| NANIO CCVE (ExCB and ExTL) |  |  | Tech | We support the draft Decision sheet in principle, but we consider that the issue related to surge protection devices should be put in a broad perspective and we propose to discuss additional issues. The proposed draft Decision sheet is attached. | To consider the draft Decision sheet attached.  Annex A of this document. | We will take the proposition into account. | |
| NEPSI  CN |  |  | T | If the certification is requested based on IEC 60079-11, the example of marking can be as Ex ia IIC TX Gb;  If the certification is requested for use in Zone 0, the example of making can be as Ex d+ia IIC TX Ga |  | |  |
| NEPSI  CN |  |  |  | If the certification is requested based on IEC 60079-11,  the example of marking can be Ex ia IIC TX Gb;  If the certification is requested for use in Zone 0,  the example of making can as Ex d+ia IIC TX Ga |  | |  |
| SGS Baseefa  GB |  |  | **General** | **Change answer from:**  No, because the device with Ex ia IIC T… Ga may be allowed to be installed in Zone 0, which does not agree with the relevant provisions on the surge protection device of IEC 60079-25 and could cause danger.  Conception Ex d [ia Ga] IIC T .. Gb is one of the options if the surge protection device is designed to protect the intrinsically safe circuits in the zone 0. | **Change To:**  Yes. An IECEx Certificate can be issued marked Ex ia IIC T\* Ga.  When the device is not operating as a surge protector, it can be connected into an Ex ia IIC circuit in zone 0 as it does not affect the intrinsically safe circuit.  However, as a surge protector, it should be installed according to national installation conditions i.e. IEC 60079-14.  Concept Ex d [ia Ga] IIC T\* Gb is just one of the options if the surge protection device is designed to protect the intrinsically safe circuits in the zone 0. | | We don’t accept this proposition as the same reasons to FME(GB). |
| TIIS  JAPAN |  |  | G | TIIS supports ExTAG/417/CD without any comments | . | |  |
| TRA  AU |  |  | General | The question is not correct, because IECEx certificate is not necessary for simple apparatus, such as a surge protective device. | Revise the question to: Is a marking of Ex ia IIC T.. Ga allowable for surge protective devices? | | We will take the proposition into account and make editorial modification. |
| TRA  AU |  |  | General | After the question has been revised as suggested above by TRA, then the proposed change would be as provided on the right: | the answer should be ‘The surge protective devices should only be installed outside Zone 0. Therefore the marking should be Ex ia IIC T.. Gb | | We will take the proposition into account and make editorial modification. |
| TRA  AU |  |  | General | The proposal of using Ex d is not practical. The Ex d equipment would be bigger than the equipment it is protecting | Remove the second paragraph of the Answer | | We will take the proposition into account and make editorial modification. |
| UL-  USA | All |  | Technical | UL does not agree with the proposed DS. We feel that the answer is Yes, rather than No. | Replace the answer with the following:  IEC 60079-14 does address the use of these devices for protection of intrinsically safe circuits in EPL Ga or Da applications (see 16.3), and requires them to be installed “as near as is reasonably practicable…to the entrance to the locations requiring EPL Ga or Da”.  This would seem to relegate use of these devices to outside the EPL Ga or Da area, while not precluding them from installation in a lesser hazardous area.  Therefore, if requested by a manufacturer, these devices could be certified with a resulting Ex marking string of “Ex ia IIC T .. Gb” or “Ex ia IIIC T .. Db”. They would not be permitted to carry an EPL Ga or Da marking.  Furthermore, in answering this question, it should be noted that many surge protection devices could be considered simple apparatus, and not be required to have a certification at all. | | We will take the proposition into account and make editorial modification. |

**Annex A - Prepared by NANIO CCVE**

**IECEx Draft Decision sheet / ExTAG**

**Title: Surge protection device**

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| --- | --- | --- |
| Standard:  IEC 60079-11 | Clauses:  All as relevant |  |
| IEC 60079-25 | Clause 12 |
| **Subject:**  Surge protection device | Key words:  - Surge protection device  - Intrinsic safety | Date: 18 July 2016 **Originator of proposal:**  China Quality Mark Certification Group Co., Ltd, CQM with additional proposals by  NANIO CCVE  **TC/SC:** |
| **Related documents:** |  | |

**Background:**

Currently surge and lighting protection devices are widely used.

The requirements to surge protection devices are given in clause 12 of IEC 60079-25:2010. One of the requirements is that “any surge protection device introduced into an intrinsically safe circuit shall be suitably explosion protected for its intended location.

The use of surge protection devices which interconnect the circuit and the structure via non-linear devices such as gas discharge tubes and semiconductors is not considered to adversely affect the intrinsic safety of a circuit, provided that in normal operation the current through the device is less than 10 microamperes”.

Taking into account the above mentioned information the following questions are proposed for discussion:

**QUESTION 1:**

Does it mean that a surge protection device may have only one type of protection "intrinsic safety “i” and all the relevant requirements of IEC 60079-11 standard shall be applied, or

such a device has to be protected by other types of protection, such as flameproof enclosures “d” or encapsulation «m»?

Please choose the preferable answer:

**ANSWER 1:**

1. A surge protection device connected to an intrinsically safe circuit shall comply with the requirements of IEC 60079-11 and shall be protected by an additional type of protection suitable for its intended location, as some parts of its construction (gas discharge tubes, variable resistors) are not covered by IEC 60079-11:2011 requirements and can be potential sources of ignition. Examples of Ex-marking:

- Ex d [ia Ga] IIА/IIВ/IIC T… Gb;

- Ex mb [ia Ga] IIА/IIВ/IIC T…Gb;

- Ex mc [ib Gb] IIА/IIВ/IIC T…Gc;

or

1. A surge protection device connected to an intrinsically safe circuit shall comply with the requirements of IEC 60079-11 and can be protected by only one type of protection “intrinsically safe circuit”.

Examples of Ex-marking:

- [Ex ia Ga] IIА/IIВ/IIC T…;

- Ex ia IIC T…Gb;

- Ex ia [ia Ga] IIB T… Gb.

**QUESTION 2:**

Is the requirement for the limitation of the current through the device in normal operation to less than 10 microamperes the only requirement and surge protection devices meeting this requirement can be connected to intrinsically safe circuits?

**ANSWER 2:**

No, the requirement for the limitation of the current through the device to less than 10 microamperes in normal operation is necessary, but not sufficient to connect such devices to intrinsically safe circuits.

**QUESTION 3:**

Clause 12 IEC 60079-25:2010 states that surge protection devices shall be installed outside Zone 0. Is it permitted to assign EPL Ga to surge protection devices?

**ANSWER 3:**

No, it is not permitted assign EPL Ga to surge protection devices, as they are not intended to be installed in Zone 0 according to IEC 60079-25.