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Interested committees:

Title: BS EN IEC 60079-19 Explosive atmospheres

Part 19: Equipment repair, overhaul and reclamation

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



31J/344/CD

COMMITTEE DRAFT (CD)

PROJECT NUMBER:
IEC 60079-19 ED5

DATE OF CIRCULATION:
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CLOSING DATE FOR COMMENTS:
2023-08-11

SUPERSEDES DOCUMENTS:
31J/339/RR

IEC SC 31J : CLASSIFICATION OF HAZARDOUS AREAS AND INSTALLATION REQUIREMENTS

SECRETARIAT:
Croatia

SECRETARY:
Mr Marino Kelava

OF INTEREST TO THE FOLLOWING COMMITTEES:
TC 18

PROPOSED HORIZONTAL STANDARD:
☐

Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.

FUNCTIONS CONCERNED:

☐ EMC

☒ ENVIRONMENT

☐ QUALITY ASSURANCE

☒ SAFETY

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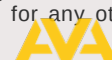
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TITLE:

Explosive atmospheres - Part 19: Equipment repair, overhaul and reclamation

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

EXPLOSIVE ATMOSPHERES –

Part 19: Equipment repair, overhaul and reclamation

FOREWORD

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IEC 60079-19 has been prepared by subcommittee TC 31J: Classification of hazardous areas and installation requirements of IEC technical committee 31: Equipment for explosive atmospheres. It is an International Standard.

This edition includes the following significant technical changes with respect to the previous edition are listed below:

Note for National Committees the following list of changes has not been updated since the DC it will be updated by the next meeting of MT60079-19 in November

Explanation of the significance of the changes	Clause	Type		
		Minor and editorial changes	Extension	Major technical changes
Reference to IEC 60079 series moved before IEC 60034 series	Introduction	X		
Re-introduce “-assumes that good engineering practices are adopted throughout” this was removed in Ed 4 but reintroduced in this edition for non-electrical reclamations	Scope		X	
alteration added to 1st bullet point	1	X		
Standard for electrical resistance trace heating added New bullet point added to clarify applicability for manufacturers	1		X	
Definitions 3.2.1, & 3.2.2 deleted these are in IEC 60079-0	3	X		
Definition “Schedule Drawing” amended to align with part -0	3.2.1	X		
New definition “revalent schedule documentation” to assist manufacturers who consider “Schedule Drawings” intellectual property not accessible by others	3.2.2			
Definitions Responsible person and service facility re-numbered (swopped) to maintain alphabetic listing	3.26 3.27			
Definition 3.23 amended to align with IEC 60079-0 a new Note was added to change definition when used in IEC 60079-19	3.22		X	
New Definition added Method of Protection “h”	3.13		X	
New Definition added Non-Electrical Equipment type of protection control of ignition sources “b”	3.13.1		X	
New Definition added Non-Electrical Equipment type of protection constructional safety “c”	3.13.2		X	
New Definition added Non-Electrical Equipment type of protection liquid immersin “k”	3.13.3		X	
New Definition added Non-Electrical Equipment	3.15		X	
Clauses increased from 15 to 16 new Method of Protection Ex “h” include “or method” for non-electrical equipment	4.1		X	
Include “ functional and visual inspection of Ex “m” is the oly option to validate the ongoing use of Ex”m”	4.1 Para 2		X	
New paragraph to clarify IEC 60079-19 is used in conjunction with IEC 60079 series and other relevant standards such as IEC 60034 series- clarification of scope requirement	4.1 Para 3		X	
New paragraph clarifying the requirements for use of “relevant schedule documents”	4.1 Para 4		X	
Clarification of requirement to agree status with user previously in Ed 4 Clause 4.3.2.1 m)	4.1 Para 5		X	
New sub-Clause clarifying “relevant schedule documentation” previously 4.3.2.4.2 b), c), f0, i)	Error! Reference source not found.		X	
New clause clarifying status of equipment after overhaul and repair previously in 4.1, 4.3.2.4.2 g), 4.3.2.6 & Annex A	4.2		X	
New paragraph clarifying repair to Schedule drawings 1st option repair to standards permitted whin Schedule Drawings not available	4.2.1		X	
New paragraph providing guidance for repair of non-electrical equipment	4.2.1		X	
Note 2 moved from Ed 4 4.1 to 4.2.1	4.2.2		X	

Explanation of the significance of the changes	Clause	Type		
		Minor and editorial changes	Extension	Major technical changes
New clause clarifying status of repair to Schedule Drawings or relevant schedule documentation, previously 4.1, 4.3.2.2 g), 4.3.2.6 a)	4.2.2		X	
New clause clarifying status of repair to relevant standards, previously 4.1, 4.3.2.2 1) -3), 4.3.2.6 b), A2.2 a)	4.2.3		X	
New clause clarifying status repair to repairs with expert evaluation previously 4.1, 4.3.2.2 1) & 2), 4.3.2.6 d), A.2.2 b)	4.2.4		X	
New clause clarifying status of legacy equipment , previously 4.1, 4.3.2.6 e) IEC 60079-17	4.2.5		X	
New clause clarifying status of equipment not in compliance with the relevant standards, previously 4.1, 4.3.2.6 c), A2.3	4.2.6		X	
Title corrected in line with IEC 60079-0 definition	4.3.1	X		
"The equipment user" changed to "the user of Ex Equipment"	4.3.1	X		
Note from Ed 4 4.2.4 moved to new 4.3.1	4.4.2	X		
Minor editorial changes to content	4.3.2	X		
Clause title changed to clarify purpose "Service facility requirements"	4.4		X	
Statutory requirements new clause number	4.4.1			
Restructure clause relocating "General" to replace old 4.3.2 Repair and overhaul which and 1st paragraph from previous 4.3.2.4.1	4.4.2		X	
Schedule of QMS requirements in previous Ed 4 4.3.2.1 b)-f), h)-k), p moved to Annex D	4.4.2			
Previous Ed 4 4.3.2.1 l) now new paragraph	4.4.2		X	
Previous Ed 4 3.2.4.1 first 3 paragraphs moved into new clause general	4.4.2			
New-sub-clause "Control of overhaul, repair and reclamation" where previous 4.3.2.1 was	4.4.3			
Clarification of need for responsible person at each service facility site	4.4.3		X	
New paragraph to clarify role of responsible person which had been implied but had not been clearly stated in previous editions	4.4.3	X		
New sub-clause to clarify role of responsible person which had been implied but had not been clearly stated in previous editions	4.4.3.2		X	
Paragraphs in previous 4 4.3.4.2 competence moved into responsible person clarified to ensure 1 RP per site and they are employees of the service facility	4.4.3.2			
Two new paragraphs clarifying delegation to other responsible persons and holiday and sickness coverage	4.4.3.2		X	
Clear statement clarifying situation where there is no responsible person at a service facility site	4.4.3.2	X		
New sub-clause Duties and responsibilities of the RP in previous editions these were implied now clarified	4.4.3.3			
New sub-clause "Overhaul, repair and reclamation requirements previously in Ed 4 sub-clause 4.3.2.1 "General"	4.4	X		
Previous Ed 4 4.3.2.1 m)- q) now paragraphs with editorial changes to clarify	4.4.4	X		
Ed 4 4.3.2.3 "Repair of components" paragraph moved into new "Overhaul, repair and reclamation requirements"	4.4.4		X	

Explanation of the significance of the changes	Clause	Type		
		Minor and editorial changes	Extension	Major technical changes
New flow chart to clarify overhaul, repair and reclamation process which also identifies when the responsible person has to be involved in reviews or decisions	4.4.4 Fig 1		X	
Previous 4.3.2.1.1 clarified to align with clarification in new 4.4.3.1	4.4.4	X		
Clause Alteration and modification previously Ed 4.3.4 renumbered and relocated	4.4.5			
Last paragraph from B4 moved to Competence clause	4.4.7		X	
Clause "Documentation" re-numbered	4.4.8			
Sub-clause "General" renumbered bulk of content moved to 4.1.1 "Relevant schedule documentation" only bit left is period of retention	4.14.4.8.2	X		
Job report to the user renamed User Job Report clause renumbered	4.4.9.2	X		
New bullet point a) requiring Ex Equipment identification, full nameplate together with Ex information this was previously required but had not been clearly stated in previous editions	4.4.9.2 a)	X	X	
Bullet point reworded previously in Ed 4- 4.3.2.4.2.a) & 4.3.2.4.3.3.c)	4.4.9.2 b)	X		
bullet point relocated in list previously in Ed 4- 4.3.2.4.2.d)	4.4.9.2 c)		X	
Relocated from Ed 4- 4.3.2.1).g) "as left" changed to "as returned" meaning when all work is completed	4.4.9.2 d)			
Relocated from Ed 4- 4.3.2.4.3.b)	4.4.9.2 e)			
Combination of Ed 4- part of 4.2.3.4.2.c)	4.4.9.2 f)			
Relocated from 4.3.2.4.3.3.d) reference "including software/firmware" introduced	4.4.9.2 g)			
Combination of 1st Part of 4.3.2.4.2c) & 4.2.3.4.3.e)	4.4.9.2 h)			
New bullet point linking reclamation records with job records this includes previous Ed 4- 4.3.2.4.3.3.f)	4.4.9.2 j)			
bullet point relocated previously in Ed 4 4.3.2.4.3.g)	4.4.9.2 j)			
bullet point previously in Ed 4- 4.3.2.4.2.e)	4.4.9.2 m)			
New bullet points clarifying job report statements as previously in Ed 4- 4.1, - 4.3.2.4.2 g) and Annex A	4.4.9.2 n)			
1st Paragraph clarify requirement for reclamation records	4.4.9.3		X	
Combination of previous Ed 4 4.3.2.4.3.4).e) & h)	4.4.9.3 e)	X		
Sub clause "Service facility records" renumbered	4.4.9.4	X		
Job records new sub clause	4.4.9.4.1	X		

Explanation of the significance of the changes	Clause	Type		
		Minor and editorial changes	Extension	Major technical changes
Two new short paragraphs	4.4.9.4.1		X	
QMS records new sub-clause	4.4.9.4.2		X	
Clause title changed to <i>Mechanica reclamation procedures</i>	4.4.12.5		X	
Clarification re duty of responsible person added in last paragraph	4.4.12.5.1			
New paragraph added for non-electrical equipment	4.4.12.5.6			
Title changed to <i>electric reclamation procedure</i>	4.4.13			
In 2nd paragraph the scope is increased to equipment other than electric machines	4.4.13.1			
New paragraphs introduced to clarify electrical rewind requirements presumed but not specified in previous edition	4.4.13.1			
2nd paragraph where applicable added	4.4.14.1			
4th paragraph lamination added for clarification	4.4.14.1			
New sub-clause requiring Ex Equipment to be tested to the relevant industrial equipment standards	4.4.14.4.1			
Sub-clause title changed to <i>electric machine tests after winding repair</i>				
New sub-clause <i>Bearings</i>	4.4.12.5.9			
New sub-clause <i>Rolling element bearings</i>	4.4.12.5.9.1			
Clause from Ed 4- 5.3.5 moved to new clause <i>sleeve bearings</i>	4.4.12.5.9.2			
Clause from Ed 4- 4.3.6.5 moved into <i>mechanical reclamations</i>	0			
1st & 2nd paragraphs amended to include non-electrical equipment	0			
New sub-clause <i>bearings</i>	4.4.12.5.9			
New sub-clause <i>rolling element bearings bearings</i>	4.4.12.5.9.1			
New sub-clause <i>sleeve bearings</i>	4.4.12.5.9.2			
Clause title amended to include other electrical equipment with windings such as transformers, actuators etc.	4.4.13		X	
Editorial change in 1st paragraph	4.4.13.1			
Reference to industrial standards clarified for equipment other than electric machines	4.4.13.1			
Clause for Ed 4- Annex D moved to this clause	4.4.13.1			
New paragraphs clarifying rewind process	4.4.13.1			
Clarification that this applies to laminated cores	4.4.14.1			
New sub-clause in <i>Test after repair General with paragraph addressing other relevant industrial equipment standards</i>	4.4.14.4.1			
Sub-clause title amended	4.4.14.4.2			
List item a) amended other winding such as transformer should be balanced but electric machines permit unbalance as in previous editions	4.4.14.4.2 a)			
Sub-clause Ed 4- 4.3.6.3.2 combined with test after repair deleted and content merged with new 4.4.12.3.2	4.4.14.4.2 i) to m)			
Previous Ed 4 "Lubricants and corrosion inhibitors" moved to <i>Mechanica reclamation</i>	4.4.12.5.11			
Clarification that records are required for any calculations relating to performance assessment	4.4.14			

Explanation of the significance of the changes	Clause	Type		
		Minor and editorial changes	Extension	Major technical changes
Auxiliary equipment transferred from Type of Protection clauses	4.4.17			
“or “eb” added	8.0			
All details related to copy rewinding moved to Annex E	8.2.6			
“or “ec” added	9.0			
All details related to copy rewinding moved to Annex E	9.2.6			
Copy rewinding requirements from previous Ed 4- 8.2.6.1.2 moved to Annex E	Annex E			
Copy rewinding requirements from previous Ed 4- 8.2.6.1.3 moved to Annex E	Annex E			
Copy rewinding requirements from previous Ed 4- 9.2.6.1.5 moved to Annex E	Annex E			
New Clause added for method of Protection Ex “h”	16			
Further work required on Annex A	Annex A			
Clarification of knowledge and skill requirements for responsible person	B.2.1 a)			
Clarification of knowledge and skill requirements for responsible person	B.3.2			
Clarification of introduction and use of Annex C	Annex C			
New Annex D with QMS requirements	Error! Reference source not found.			
New Annex E for copy rewinding	Annex E	X		
		X		

287

288 NOTE 1 The technical changes referred to include the significance of technical changes in the revised IEC standard,
 289 but they do not form an exhaustive list of all modifications from the previous version. More guidance can be found
 290 by referring to the Redline version of the standard.

291 Explanations:

292 A) Definitions

293 Minor and editorial changes

- 294 – clarification
- 295 – decrease of technical requirements
- 296 – minor technical change
- 297 – editorial corrections

298 These are changes which modify requirements in an editorial or a minor technical way. They
 299 include changes of the wording to clarify technical requirements without any technical change,
 300 or a reduction in level of existing requirement.

301 Extension

- 302 – addition of technical options

These are changes which add new or modify existing technical requirements, in a way that new options are given, but without increasing requirements from the previous standard.

Major technical changes

- addition of technical requirements
- increase of technical requirements

These are changes to technical requirements (addition, increase of the level or removal) made in a way that an overhaul or repair of product to the preceding edition will not always be able to fulfil the requirements given in the later edition. For these changes additional information is provided in clause B) below.

NOTE These changes represent current technological knowledge. However, these changes do not normally have an influence on equipment already placed on the market.

B) Information about the background of ‘major technical changes’

C1 Due to the detailed nature of Type of Protection “i”, repair to other than manufacturers schedule drawings risks violation of the Type of Protection. Some components such as multi-layer boards are not suitable for repair.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
31J/XXX/FDIS	31J/XXX/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60079 series, published under the general title *Explosive atmospheres*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC web site under [“http://webstore.iec.ch”](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

When equipment is installed in areas where dangerous concentrations and quantities of flammable gases, vapours or dusts may be present in the atmosphere, protective measures are applied to reduce the likelihood of explosion due to ignition by arcs, sparks or hot surfaces produced either in normal operation or under specified fault conditions.

This part of IEC 60079 is supplementary to [the IEC 60079 series of standards and](#) other relevant IEC standards [for the design requirements of electrical equipment](#), for example [for rotating electric machines](#) the IEC 60034 series, ~~in particular IEC 60034-23, and also refers to the IEC 60079 series and its their~~ appropriate parts ~~for the design requirements of suitable electrical equipment in particular IEC 60034-23.~~

The nature of the explosion protection offered by each Type of Protection varies according to its unique features.

This document gives guidance on the practical means of maintaining the explosion protection of repaired equipment. This document also defines procedures for repair, overhaul or reclamation and verification of continued compliance of the equipment with the provisions of the Ex Equipment Certificate or with the provisions of the appropriate explosion protection standard where an Ex Equipment Certificate is not available.

It is intended that the users utilize the most appropriate service facilities for any particular item of equipment, whether they be the facilities of the manufacturer or a suitably competent and equipped repairer.

This document recognizes the necessity of a required level of competence for the repair, overhaul and reclamation of the equipment. Some manufacturers may recommend that the equipment be repaired only by them.

Much of the content of this document is concerned with the repair and overhaul of electric machines. This is because they are items of repairable Ex equipment in which, irrespective of the Type of Protection involved, sufficient commonality of construction exists as to make possible more detailed instructions for their repair, overhaul, reclamation or modification.

EXPLOSIVE ATMOSPHERES –

Part 19: Equipment repair, overhaul and reclamation

1 Scope

This part of IEC 60079:

- gives instructions, principally of a technical nature, on the repair, overhaul, reclamation, and alteration and modification of Ex equipment designed for use in explosive atmospheres;
- applies to overhaul and repair which mitigates deficiencies identified during operation, inspection and maintenance;
- applies to manufacturers who overhaul and repair Ex Equipment which has been manufactured by other manufacturers;
- assumes that good engineering practices are adopted throughout;
- does not give advice on cable and wiring systems which can require a renewal when the equipment is re-installed; ~~and~~
-
- is not applicable to Type of Protection “m”; and-
- is not applicable to manufacturers who overhaul and repair equipment which they have manufactured, however they may take into consideration the requirements of marking and user records for the user’s verification record.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60034-1, *Rotating electrical machines – Part 1: Rating and performance*

IEC 60034-23: *Rotating electrical machines – Part 23: Repair, overhaul and reclamation*

IEC 60079-0:2017, *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 enclosure “p”*

IEC 60079-5, *Explosive atmospheres – Part 5: Equipment protection by powder filling “q”*

IEC 60079-6, *Explosive atmospheres – Part 6: Equipment protection by liquid immersion “o”*

IEC 60079-7, *Explosive atmospheres – Part 7: Equipment protection by increased safety “e”*

IEC 60079-11:2011, *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 60079-26, *Explosive atmospheres – Part 26: Equipment with equipment protection level (EPL) Ga*

IEC/IEEE 60079-30-1, *Explosive atmospheres – Part 30-1: Electrical resistance trace heating – General and testing requirements*

IEC/IEEE 60079-30-2, *Explosive atmospheres – Part 30-2: Electrical resistance trace heating – Application guide for design, installation and maintenance*

IEC 60079-31, *Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure “t”*

IEC 60085, *Electrical insulation – Thermal evaluation and designation*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 61241-0¹, *Electrical apparatus for use in the presence of combustible dust – Part 0: General requirements*

IEC 61241-1², *Electrical apparatus for use in the presence of combustible dust – Part 1: Protection by enclosures “tD”*

IEC 61241-1-1³, *Electrical apparatus for use in the presence of combustible dust – Part 1-1: Electrical apparatus protected by enclosures and surface temperature limitation – Specification for apparatus*

IEC 61241-4⁴, *Electrical apparatus for use in the presence of combustible dust – Part 4: Type of Protection “pD”*

ISO 4526, *Metallic coatings – Electroplated coatings of nickel for engineering purposes*

ISO 6158, *Metallic coatings – Electrodeposited coatings of chromium for engineering purposes*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60079-0 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>

¹ Withdrawn.

² Withdrawn.

³ Withdrawn.

⁴ Withdrawn.

- ISO Online browsing platform: available at <https://www.iso.org/obp>

NOTE Additional definitions applicable to explosive atmospheres can be found in IEC 60050-426.

alteration

change to a product that results in an alternative construction that is described in the certificate

~~documentation~~

~~3.1~~

3.1

certificate

document that conveys the assurance of the conformity of a product, process, system, person, or organization with specified requirements

Note 1 to entry: The certificate can be either the supplier's declaration of conformity or the purchaser's recognition of conformity or certification (as a result of action by a third party) as defined in ISO/IEC 17000.

[SOURCE: IEC 60050-426:2020, 426-04-23]

~~3.1.1~~

~~Ex Component Certificate~~

~~certificate prepared for an Ex Component~~

~~3.1.2~~

~~Ex Equipment Certificate~~

~~certificate prepared for Ex Equipment~~

~~3.1.3~~ 3.1.1

~~schedule~~ Schedule drawing ~~Drawing~~

drawing or document listed in the certificate or test report

[SOURCE: IEC 60050-426:2020, 426-04-43]

3.1.2

related drawing

drawing or document not listed in the certificate but linked to the Schedule Drawing, and used for example, for detailed manufacture of component parts

Note 1 to entry: For IEC 60079-19, related drawings includes documentation providing information necessary to ensure the Ex Equipment being, installed, inspected, maintained, overhauled or repaired remains in compliance with the Type of Protection requirements and the Scheduled Drawings.

3.2

competence

ability to apply knowledge and skills to achieve intended results

[SOURCE: ISO/IEC 17024:2012, 3.6]

~~3.2~~ 3.3

component part

indivisible item

Note 1 to entry: Normally an assembly of components constitutes an equipment.

3.3.3.4**copy winding**

process by which a winding is totally or partially replaced by another, the characteristics and properties of which are at least as good as those of the original

3.5 ~~[SOURCE: IEC 60050-426:2008, 426-15-12]~~**dust ignition protection by enclosure “t”****dust ignition protection “tD”**

Type of Protection for explosive dust atmospheres where electrical equipment is provided with an enclosure providing dust ingress protection and a means to limit surface temperatures

Note 1 to entry: Type of Protection “tD” has been replaced by Type of Protection “t” in accordance with IEC 60079-31, Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure “t”.

[SOURCE: IEC 60050-426:2020, 426-16-01]

3.4.3.6**encapsulation “m”**

Type of Protection whereby parts that are capable of igniting an explosive atmosphere by either sparking or heating are fully enclosed in a compound or other non-metallic enclosure with adhesion in such a way as to avoid ignition of a dust layer or explosive atmosphere under operating or installation conditions

[SOURCE: IEC 60050-426:2020, 426-12-01]

3.7**Ex Equipment (Electrical)**

equipment with explosion-protection

Note 1 to entry: Such equipment often includes Ex Components, but additional evaluation is always required as part of their incorporation into equipment.

[SOURCE: IEC 60050-426:2020, 426-01-14]

3.8**Ex Equipment (Non-Electrical)**

equipment where measures have been applied to ensure that effective ignition sources are mitigated as required by the Equipment Protection Level (EPL)

Note 1 to entry: This includes the ignition hazard assessment and/or protective measures in accordance with this standard.

[SOURCE: IEC 80079-36:2016, 3.11]

~~[SOURCE: IEC 60079-18:2014, 3.1]~~

3.5.3.9**flameproof enclosure “d”**

enclosure in which the parts that can ignite an explosive gas atmosphere are placed, and which can withstand the pressure developed during an internal explosion of an explosive mixture, and which prevents the transmission of the explosion to the explosive gas atmosphere surrounding the enclosure

~~Type of Protection in which the parts capable of igniting an explosive gas atmosphere are provided with an enclosure which can withstand the pressure developed during an internal explosion of an explosive mixture, and which prevents the transmission of the explosion to the explosive gas atmosphere surrounding the enclosure~~

[SOURCE: IEC 60050-426:2008, 426-06-01]

3.63.10

increased safety “e”

Type of Protection applied to electrical equipment or an Ex Component in which additional measures are applied so as to give increased security against the possibility of excessive temperatures and against the occurrence of arcs and sparks in normal service or under specific abnormal conditions

[SOURCE: IEC 60050-426:2020, 426-08-01]

[SOURCE: IEC 60050-426:2008, 426-08-01, modified — “apparatus” has been replaced with “equipment” and “specified” has been replaced with “specific”.]

3.73.11

intrinsically safe circuit

circuit, in which any spark or any thermal effect produced under specific conditions, which include normal operation and specified fault conditions, is not capable of causing ignition of a given explosive atmosphere

Note 1 to entry: The conditions are specified in IEC 60079-11, Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i”

circuit, in which any spark or any thermal effect produced in the conditions specified in IEC 60079-11, including normal operation and specified fault conditions, is not capable of causing ignition of a given explosive atmosphere

[SOURCE: IEC 60050-426:2020, 426-1-01]

3.83.12

Liquid immersion “O”

Oil immersion “O”

Type of Protection in which the electrical equipment or parts of the electrical equipment are immersed in a protective liquid in such a way that an explosive gas atmosphere, which can be above the liquid or outside the enclosure, cannot be ignited

[SOURCE: IEC 60050-426:2020, 426-xx-xx]

[SOURCE: IEC 60079-11:2011, 3.1.4]

3.93.13

Liquid immersion “K”

Type of Protection where potential ignition sources are made ineffective or separated from the explosive atmosphere by either totally immersing them in a protective liquid, or by partially immersing and continuously coating their active surfaces with a protective liquid in such a way that an explosive atmosphere which can be above the liquid, or outside the equipment enclosure, cannot be ignited
~~DEPRECATED: oil immersion “o”~~

~~Type of Protection in which the electrical equipment or parts of the electrical equipment are immersed in a protective liquid in such a way that an explosive gas atmosphere which may be above the liquid or outside the enclosure cannot be ignited~~

{

[SOURCE: IEC 60079-36:2015, 3.1]

3.103.14**maintenance**

combination of routine actions taken to preserve the fully serviceable condition of the installed apparatus combination of any actions carried out to retain an item in, or restore it to, condition in which it is able to meet the requirements of the relevant specification and perform its required functions

[SOURCE: IEC 60050-426:2020, 426-14-01]

3.113.15**manufacturer**

maker of the equipment (who may also be the supplier, the importer or the agent) in whose name usually the certification, where appropriate, was originally registered

[SOURCE: IEC 60050-426:2008, 426-15-07, modified – "apparatus" has been replaced with "equipment" –]

3.16**method of protection "h"**

Method of protection whereby a risk assessment has been conducted to ensure that, in normal operation and in certain specified regular expected occurrences, it is not capable of igniting a surrounding explosive gas atmosphere

Note 1 to entry: A Level of Protection is not applied to the letter "h".

[SOURCE: IEC 80079-36:2016, 11.2]

3.16.1**control of ignition sources "b"**

ignition protection where mechanical or electrical devices are used in conjunction with nonelectrical equipment to manually or automatically reduce the likelihood of a potential ignition source from becoming an effective ignition source

Note 1 to entry: This might for example be a level sensor used to indicate loss of oil, a temperature sensor to indicate a hot bearing or a speed sensor to indicate over-speed

[SOURCE: IEC 80079-37:2016, 3.3]

3.16.2**constructional safety "c"**

ignition protection where constructional measures are applied so as to protect against the possibility of ignition from hot surfaces, sparks and adiabatic compression generated by moving parts

[SOURCE: IEC 80079-37:2016, 3.1]

3.123.17**modification**

change to the design of the equipment which affects material, fit, form or function

Note 1 to entry: As the schedule drawings certificate describe a specific construction of the equipment, a modification of the equipment would no longer comply with the construction described in the Ex-Equipment Certificate schedule drawings and schedule-related drawings.

3.18**non-electrical equipment**

equipment that can achieve its intended function mechanically

[Note 1 to entry: The prime mover for this equipment can be powered by any kind of energy, including electrical.](#)

[\[SOURCE: IEC 60050-426:2020, 426-28-06\]](#)

~~3.13~~3.19

operative

person who can demonstrate a combination of knowledge and skills to effectively carry out activities on, or associated with, hazardous area equipment

~~3.14~~3.20

overhaul

action to restore to a fully serviceable condition, equipment which has been in use or in storage for a period of time, but which is not faulty

~~3.15~~3.21

powder filling “q”

sand filling “q”

Type of Protection in which the parts capable of igniting an explosive gas atmosphere are fixed in position and completely surrounded by filling material to prevent the ignition of an external explosive atmosphere

[Note 1 to entry: This Type of Protection cannot prevent the surrounding explosive gas atmosphere from penetrating into the equipment and components and being ignited by the circuits. However, due to the small free volumes in the filling material and due to the quenching of a flame that can propagate through the paths in the filling material, an external explosion is prevented.](#)

[\[SOURCE: IEC 60050-426:2020, 426-07-01\]](#)

[\[SOURCE: IEC 60050-426:2008, 426-07-01, modified – The note has been deleted.\]](#)

~~3.16~~3.22

pressurization “p”

Type of Protection for guarding against the ingress of the external atmosphere into an enclosure by maintaining a protective gas therein at a pressure above that of the external atmosphere

[\[SOURCE: IEC 60050-426:2020, 426-09-01\]](#)

[\[SOURCE: IEC 60050-426:2008, 426-09-01, modified – "or " has been deleted.\]](#)

~~3.17~~3.23

reclamation

means of repair involving, for example, the removal or addition of material to reclaim component parts which have sustained damage, in order to restore such parts to a serviceable condition in accordance with the relevant standard

[Note 1 to entry: The “relevant standard” means the standard according to which the individual parts were originally manufactured.](#)

[\[SOURCE: IEC 60050-426:2008, 426-15-05\]](#)

~~3.18~~3.24

repair

action to restore faulty equipment to its fully serviceable condition, [and complying complies](#) with the relevant standard

[Note 1 to entry: The “relevant standard” means the standard according to which the individual parts were equipment was originally designed manufactured.](#)

[SOURCE: IEC 60050-426:2008, 426-15-02, modified – "apparatus" has been replaced with "equipment", "in " with "complying" and in the note "apparatus has been replaced with "individual parts".]

3.193.25

responsible person service facility

repair facility

facility providing a service that consists of repairs, overhauls, or reclamations of Ex Equipment who can be the manufacturer, the user or a third party (repair agency) person who can demonstrate a combination of knowledge and skills to effectively carry out, and supervise, activities on hazardous area equipment

3.203.26

responsible person

service facility

repair facility

facility providing a service that consists of repairs, overhauls, or reclamations of Ex Equipment who can be the manufacturer, the user or a third party (repair agency) facility

person who can demonstrate a combination of knowledge and skills to effectively carry out, and supervise, activities on hazardous area equipment

3.213.27

serviceable condition

condition which permits a replacement or reclaimed component part to be used without prejudice to the performance or explosion protection aspects of the equipment, with due regard to the certification requirements schedule drawings – as applicable, in which such a component part is used

[SOURCE: IEC 60050-426:2008, 426-15-01, modified – "apparatus" has been replaced with "equipment".]

3.22

"X"

suffix to the certificate number used to denote Specific Conditions of Use for Ex Equipment

Note 1 to entry: The symbol "X" is used to provide a means of identifying that essential information for the installation, use, and maintenance of the equipment is contained within the certificate.

[SOURCE: IEC 60079-0:2017, 3.84]

3.233.28

Type of Protection "n"

Type of Protection applied to electrical equipment such that, in normal operation and in certain specified regular expected occurrences, it is not capable of igniting a surrounding explosive gas atmosphere

Note 1 to entry: Additionally, the requirements of IEC 60079-15, Explosive atmospheres – Part 15: Equipment protection by Type of Protection "n", are intended to ensure that a malfunction capable of causing ignition is not likely to occur. Additionally, the requirements of IEC 60079-15 are intended to ensure that a fault capable of causing ignition is not likely to occur

[SOURCE: IEC 60050-426:2020, 426-13-01]

~~[SOURCE: IEC 60050-426:2008, 426-13-01, modified – "apparatus" has been replaced with "equipment" and Note 2 has been deleted.]~~

~~3.24~~**3.29**

Type of Protection "pD"

Type of Protection whereby a protective gas is applied to an enclosure in order to prevent the formation of an explosive dust atmosphere inside the enclosure by maintaining an overpressure against the surrounding atmosphere

Note 1 to entry: Type of Protection "pD" has been replaced by Type of Protection "p" in accordance with IEC 60079-2, Explosive atmospheres – Part 2: Equipment protection by pressurized enclosure "p".

[SOURCE: IEC 60050-426:2020, 426-09-23]

~~[SOURCE: IEC 60050-426:2008, 426-17-01]~~

~~3.25~~**3.30**

special protection "s"

concept to allow design, assessment and testing of equipment that cannot be fully assessed within a recognized Type of Protection or combination of recognized Types of Protection because of functional or operational limitations, but which can be demonstrated to provide the necessary equipment protection level (EPL)

[SOURCE: IEC 60050-426:2020, 426-26-01]

3.26

dust ignition protection by enclosure "t"

~~Type of Protection for explosive dust atmospheres where electrical equipment is provided with an enclosure providing dust ingress protection and a means to limit surface temperatures~~

~~Note 1 to entry: The Type of Protection "t" was formerly referred to as "tD".~~

~~3.27~~**3.31**

user

organization or person which is the owner, or operator, of the equipment, and that is primarily responsible for repairing it; not the equipment manufacturer or repairer

~~3.28~~**3.32**

verification dossier

set of documents showing the compliance of electrical equipment and installations,

[SOURCE: IEC 60050-426:2020, 426-21-02]

Note 1 to entry: For IEC 60079-19 this including includes certificates, manufacturer's instructions, records of previous repairs, overhauls and reclamations

3.33

"X"

suffix to the certificate number used to denote Specific Conditions of Use for Ex Equipment

Note 1 to entry: The symbol "X" suffix to the certificate is used to provide a means of identifying that essential information for the installation, use, maintenance and repair of the Ex Equipment is contained within the Ex Equipment certificate.

Note 2 to entry: These Specific Conditions of Use are in addition to the installation design, erection, inspection, maintenance, repair and overhaul requirements of the IEC 60079 Series and the ISO/IEC 80079 Series and they do not repeat those requirements.

[SOURCE: IEC 60079-0:2025, 3.90]

4 General

4.1 General principles

A service facility cannot assume the role of a manufacturer or assemble new equipment, for example the population of an empty Ex Component Certified enclosures with suffix “U”. Service facilities shall only overhaul, repair or reclaim components using this document.

Clause 4 covers those aspects of repair, overhaul, reclamation, alteration, and modification which are common to all Ex Equipment. Clauses 5 to 15-16 provide instructions for the additional requirements relevant to specific Type(s) or method of Protection. When Ex Equipment incorporates more than one Type of Protection, reference shall be made to the appropriate clauses.

Where Type of Protection “m” is used in association with other Type(s) of Protection, for example “d” or “e”, the relevant clauses of this document apply for the overhaul or repair of those other Type(s) of Protection but, functional and visual inspection of Ex “m” equipment is the only option to validate the ongoing use of Ex “m”. ~~but~~ if the “m” ~~component equipment~~ is defective, it can only be replaced.

NOTE 1 Additional requirements for Type of Protection “~~mm~~” have not been defined.

Overhauls, repairs and reclamations using this document shall also make reference to the General Requirements (IEC 60079-0) and relevant Type or method of Protection standards from the IEC 60079 and ISO 80079 series of standards used in the equipment design and manufacture together with any Specific Conditions of Use related to the equipment, where applicable. Reference shall also be made to the relevant industrial standards which relate to the function of the equipment.

Where the information in the Scheduled Drawings is considered by the manufacturer to be intellectual property which cannot be provided to the user, related drawings are an alternative method for the manufacturer to provide the information, which is necessary to ensure that the equipment can be overhauled or repaired and remain in compliance with the Type of Protection requirements as detailed in the Schedule Drawings.

The status of Ex Equipment after overhaul & repair shall be agreed with the user before any overhaul, repair or reclamation is undertaken. This agreement shall be recorded and documented.

4.1.1 Related drawings

The ~~data~~ information necessary for the installation, inspection, maintenance, overhaul or repair or overhaul to the schedule drawings and related drawings depends upon the type of equipment and Type of Protection of the equipment being repaired. Such data can include, but is not limited to, details of the following:

- a) Ex Equipment Certificate and schedule drawings with Specific Conditions of Use, where specified;
- a) relevant Type(s) of Protection standards;
- b) marking (including Ex marking);
- c) technical specification for example bearings, fluids, gaskets and seals where applicable;
- d) drawings containing the essential information for inspection, maintenance, overhaul and repair, examples as follows:

1) Ex d maximum flamepath gaps, min/max diameters, minimum flamepath lengths, with bolt torques when less than 85% proof load, and maximum explosion pressure when it exceeds 2 000 kPa

2) Ex e minimum stator air gap when less than in IEC 60079-7 Clause 5.2. method c)6, specific seals, temperature sensors and test requirements for Equipment with voltage >1 000v

e) recommended methods of installation, operation, maintenance, repair or overhaul for the equipment;

f) operating conditions (such as environment, supply converter, lubricants, duty, etc.);

g) dismantling and assembly instructions; and

h) list of spare parts.

NOTE 1 The documentation and records are normally retained in the users verification dossier for the lifetime of the equipment, (see IEC 60079-14 for further information).

NOTE 2— As from the fourth edition of IEC 60079-0 (2004), IEC 60079-0 requires that manufacturers prepare instructions including with regard to repair.

In circumstances where the relevant documentation in accordance with 4.3.2.4.1 is not available, then the repair or overhaul shall be carried out on the equipment in accordance with this document and other relevant standard(s), to which the equipment was originally verified. The steps taken to obtain the relevant documentation shall be recorded in the service facility records (see 4.3.2.4.3).

4.2 Status of equipment after overhaul or repair

4.2.1 General

For electrical equipment overhauls and repairs should be carried out using the Schedule Drawings or related drawings, repair to relevant standards may only be performed when the Scheduled Drawings and OEM detailed repair information are not available. Steps taken to obtain the Scheduled Drawings or relevant documentation, shall be recorded in the service facility records (see 4.4.9).

For non-electric equipment where ISO 80079-36 and ISO 80079-37 standards have been used, repair to Schedule Drawings is preferred. However when the Schedule Drawings are not available the equipment instructions shall be reviewed, where available. The initial repair assessment must use good engineering practices to determine the repair requirements to maintain the method of protection for the equipment after the equipment has been overhauled or repaired.

The manufacturer's labels should not be removed.

NOTE 2—In some countries, in accordance with legal requirements, repair of Ex Equipment cannot be carried out without relevant documentation for Group I equipment unless the equipment is subjected to complete retesting and a new Ex Equipment Certificate issued.

4.2.2 Repair to Schedule Drawings or related drawings

Repairs-Overhauls and overhauls-repairs impacting the Type of Protection shall be presumed as being in conformity with the ~~schedule~~-Schedule drawings-Drawings and Specific Conditions of Use when:

a) manufacturer's parts or parts specified according to the documentation ~~given in~~see 4.3.2 4.3.2.4 are used;

b) repairs or alterations are carried out specifically as detailed in this document and the schedule drawings; ~~and~~

c) when performed by competent persons according to 4.4.3 ~~4.3.2.2~~ and

d) the repairer has sufficient evidence of full compliance with the Schedule Drawings, related drawings or manufacturer's specification.

4.2.3 Repair to relevant standards

Repairs and overhauls impacting the Type of Protection shall be presumed as being in conformity with the relevant Type of Protection standards when:

a) overhauls, repairs and reclamations are carried out specifically as detailed in this document, the relevant standards and Specific Conditions of Use, where applicable;

b) when performed by competent persons according to 4.4.3; and

c) the repairer has insufficient evidence of full compliance with the schedule drawings

4.2.4 Repairs with expert evaluation

Repairs and overhauls impacting the Type of Protection shall be presumed as being in conformity with the relevant Type of Protection standards when:

a) the standards to which the previously certified equipment was manufactured are not known, the requirements of this document and the current edition of the relevant Type(s) of Protection standards;

b) performed by competent persons according to 4.4.3

c) the expert performing the assessment shall not be connected to the service facility and shall be part of a recognized body competent in the examination, testing, and certification of Ex Equipment; and

d) the expert shall be a person competent in assessing Ex Equipment has been conducted to verify compliance with the relevant level of safety Type of Protection Standard prior to release of the equipment by the repairer and shall provide the report for the user

~~a) — An assessment, by a person competent in assessing Ex Equipment has been conducted to verify compliance with the relevant level of safety prior to release of the equipment by the repairer.~~

4.2.5 Legacy Group II and III equipment repairs with user evaluation

Where documentation is not available, repairs and overhauls shall be assessed for fitness for purpose when:

a) overhauls, repairs and reclamations are carried out specifically as detailed in this document and the relevant standards; and

b) when performed by competent persons according to 4.4.3

c) a fitness for purpose assessment, according to IEC 60079-17, has been carried out by the users appointed competent person, which may be with service facility assistance. An IEC 60079-17 Fitness for Purpose label may then be created. The fitness for purpose assessment shall not be undertaken by the service facility.

4.2.6 Repairs of equipment not in compliance with the relevant standards

If after repair, overhaul, alteration, or modification, the equipment is changed such that it no longer conforms with the schedule drawings or Type of Protection standards the equipment is not suitable for use within a hazardous area and the user advised and documented.

~~In circumstances where the relevant documentation in accordance with 4.3.2.4.1 is not available, then the repair or overhaul shall be carried out on the equipment in accordance with this document and other relevant standard(s), to which the equipment was originally verified. The steps taken to obtain the relevant documentation shall be recorded in the service facility records (see 4.3.2.4.3).~~

~~If other repair or alteration techniques are used which are not in accordance with this document, then it shall be necessary to confirm, from the manufacturer or the certificate issuer, that the equipment is suitable for continued use in an explosive atmosphere.~~

~~If the equipment has been modified, it shall comply with the requirements of 4.3.2.6 where a new certificate is required to be issued or the equipment is no longer suitable for use in a hazardous area.~~

~~NOTE 2 – In some countries, in accordance with legal requirements, repair cannot be carried out without relevant documentation to Group I equipment unless subjected to complete retesting and a new Ex Equipment Certificate issued.~~

~~If other repair or alteration techniques are used which are not in accordance with this document, then it shall be necessary to confirm, from the manufacturer or the certificate issuer, that the equipment is suitable for continued use in an explosive atmosphere.~~

4.2.4.3 Instructions for the user

4.2.14.3.1 Ex Equipment Certificates and ~~schedule~~ Schedule drawingsDrawings

The ~~equipment~~ user ~~of Ex Equipment~~ should be aware of any relevant legislation with respect to periodic inspection and verification to ensure that ~~electrical~~ equipment installed in explosive atmospheres is fit for purpose.

~~summary of previous history of the repaired product including information as gathered under 4.2.2.~~

The user should consider whether sufficient facilities and competencies are available to undertake the repair or overhaul of such equipment by the user or whether it should be contracted to specialist repair and overhaul service providers. In addition, the user should be aware that sufficient information has to be provided to third-party service facilities and installers to meet occupational health and safety obligations.

~~NOTE – It is possible the user has to ascertain that the service facility concerned can demonstrate compliance with the relevant stipulations of this document and any regulatory requirements.~~

~~The user is responsible for obtaining the Ex Equipment Certificate and other related documents (see 4.3.2.4) as part of the original purchase agreement for Ex Equipment.~~

4.2.24.3.2 Records and work instructions

All relevant documentation (which was obtained by the user as part of the original purchase contract, together with records of any previous repairs, overhauls or modifications, should be kept in a verification dossier or maintenance records and made available to the service facility.

The data necessary for the service facility can include, but is not limited to, details of the following:

a) technical specification;

b) drawings;

c) relevant Type(s) of Protection standards;

d) operating conditions (such as environment, supply (inverter), lubricants, duty, etc.);

e) dismantling and assembly instructions;

f) Ex Equipment Certificate and schedule drawings with Specific Conditions of Use, where specified;

g) marking (including Ex marking);

h) recommended methods of installation, operation, maintenance, repair or overhaul for the equipment; and

i) list of spare parts

NOTE 1 The documentation and records are normally retained in the users verification dossier for the lifetime of the equipment, (see IEC 60079-14 for further information).

The user should prepare a summary of previous repair history of the Ex Equipment for the service facility.

Note 2 Previous repair reports may be retained in a maintenance database

It will be in the interests of the user that the repairer is notified, whenever possible, of the fault and nature of the work to be done and any special application information, for example when an electric machine had been supplied by an inverter converter.

Special requirements stipulated in the user's specifications, which are supplementary to the various standards, for example enhanced ingress protection, specific environmental conditions, should be brought to the attention of the repairer.

The repairer shall be informed of any statutory requirement for compliance with the Ex Equipment Certificate.

4.2.34.3.3 Re-installation of repaired equipment

Re-installation of repaired equipment shall be in accordance with IEC 60079-14.

NOTE It is a requirement of IEC 60079-14 that before the repaired equipment is re-commissioned, cable and wiring systems are checked to ensure that they are undamaged and are appropriate to the Type of Protection.

4.2.4 Service facilities

Specific requirements in relevant national or regional legislation may govern repair or overhaul operations

~~NOTE It is possible the user has to ascertain that the service facility concerned can demonstrate compliance with the relevant stipulations of this document and any regulatory requirements.~~

4.34.4 Instructions for the Sservice facility requirements

4.3.14.4.1 Statutory requirements

The service facility, which may be the a manufacturer, user or a third-party, shall be aware of any specific requirements in relevant national or regional legislation which can govern the repair or overhaul operation.

4.4.2 General

Service facilities shall operate an effective quality management system (QMS) which shall include the requirements detailed below in Annex D:

NOTE ISO 9001 and ISO/IEC 80079-34 provide additional guidance.

~~The service facility shall have adequate repair and overhaul facilities as well as the appropriate equipment necessary and trained personnel with the required competency (see Annex B) and authority to carry out the activities, taking into account the specific Type of Protection.~~

The service facility shall seek to obtain all necessary information and data from the user or manufacturer for the repair or overhaul of the equipment see 4.3.2. This shall include reference to the relevant Type of Protection standard, schedule drawings and information relating to previous repairs, overhauls or modifications.

The steps taken to obtain the Ex Certificate and schedule drawings or related schedule documentation shall be recorded.

The service facility shall maintain and refer to copies of current and past copies relevant Type of Protection standards or other relevant standards or instructions with which repaired/overhauled equipment is claimed to comply.

4.4.3 Control of overhaul, repair and reclamation

4.4.3.1 Competence

All personnel directly concerned with the overhaul, repair or reclamation of Ex Equipment shall be competent or shall be supervised by a competent operative. All such operatives and competent operatives shall be monitored and supervised by the responsible person. Competence may be specific to the type of work.

~~All personnel directly concerned with the repair or overhaul of the equipment shall be competent or shall be supervised by a responsible person or competent operative. The competence may be specific to the type of work.~~Appropriate training and assessment of competence shall be undertaken from time to time at intervals depending on the frequency of utilization of the technique or skill and change of standards or regulations.

The interval between assessment of competence should normally not exceed three years however where utilisation of the technique or skill is not continuous additional measures may be required. -

Training and assessments are specified in Annex B ~~Annex B~~.

~~Any reclamation shall be carried out by competent personnel, skilled in the process to be employed and using good engineering practices (see Annex B).~~ Operators of reclamation techniques which cannot be verified by tests, for example welding or metal spraying, shall be required to undertake an initial and periodic practical skill test as specified in Clause B.5.

4.4.3.2 Responsible person

Each service facility and operating site shall appoint a “responsible person” with the required competence (see Annex B), within the management organization, to accept responsibility and authority for ensuring that the overhauled/repaired equipment complies with the Ex Equipment Certificate status as agreed with the user.

The person so appointed shall have a working knowledge of the appropriate explosion protection standards and an understanding of this document. The responsible person shall be a full time employee of the service facility site.

A service facility site can have multiple responsible persons authorised and working under the supervision of the site responsible person.

For organisations with multiple sites all working to a common QMS and processes responsible persons from other sites within the organisation, with the required competency and knowledge of the site, are able to provide short term absence cover.

When there is no responsible person at the site, no Ex overhaul, repair and reclamation work to this document can be reviewed to permit release of repaired equipment to the user.

4.4.3.3 Duties and responsibilities of the responsible person(s)

The duties of the responsible person shall typically include, but not limited to:

- a) ensure that status of equipment of Ex Equipment after overhaul and repair has been agreed with user;
- b) check if any symbol “X” Specific Conditions of Use apply, and if applicable place the equipment work on hold until the Specific Conditions of Use has been reviewed to identify any which are applicable for overhaul and repair;
- c) review the results of the initial inspection and when applicable for Ex “d” equipment check and verify how Annex C has been applied;
- d) agree the scope of work necessary to return the equipment to serviceable condition;
- e) agree process to be used during overhaul and repair;
- f) agree any change to the scope of work as agreed with the user when applicable;
- g) approve and document any reclamation of parts together with the reclamation process;
- h) review the results of all final inspection during and after assembly;
- i) review all documentation and check final job report;
- j) when all the evidence to confirm the status of the equipment after overhaul or repair has been verified/reviewed, the status statement in the job report is signed and authorise the appropriate repair label to be attached to the overhauled or repaired equipment;
- k) monitor work activities of all competent operatives and other operatives to validate their work activities in relation to Ex Equipment overhaul, repair and reclamation;
- l) audit processes and procedures used for Ex Equipment, to assess their ability to ensure that the Ex Equipment meets the requirements necessary to verify the status of the Ex Equipment after overhaul or repair as agreed with the user; and
- m) participate in site QMS reviews to ensure the system continues to meet the requirements for the overhaul and repair of Ex Equipment to IEC 60079-19;

4.4.4 Overhaul, repair and reclamation requirements

All overhaul or repair shall require the service facility to confirm all Ex requirements relating to the Type of Protection to be able to verify compliance with either the ~~s~~Schedule ~~d~~Drawings, related drawings or other relevant Type of Protection standards, ~~and~~ including any Specific Conditions of Use.

~~The service facility shall conduct an initial assessment of the status of the condition and compliance of equipment to be overhauled or repaired with Schedule Drawings, relevant documentation or relevant Type of Protection standards, and agree with the user the scope of work to be performed and the expected status of the equipment after repair, and the scope of work to be done.~~

~~The assessment shall be documented and shall address the relevant clauses of the appropriate Type of Protection standard, this document, and be included in the job report to the user.~~

~~Mechanical tests cannot be omitted but some electrical tests may be omitted with justification for omission of any tests within this document that the user could reasonably assume to be included. Such assessments justifications shall be conducted reviewed and agreed by the responsible person supported by appropriate operatives.~~

~~The responsible person shall only conduct assessments with the Types of Protection for which they have demonstrated competence.~~

~~When a component part of an Ex Equipment is taken off a user's site for repair, for example a rotor of an electric machine or a cover from an enclosure, and it is impracticable to carry out certain tests as required by this document or the relevant Type of Protection standard, the~~