



**IECEX 03-5 FAR – Repair, overhaul
and reclamation of Ex equipment
Facility Assessment Report &
Non Conformity Report**



IECEX 03-5 Audit Report No.: NL/DEK/FAR24.0002/00

Applicant:

ACD nv
Postbaan 73
2910 Essen
België

Service facility (SF) location covered by this assessment:

ACD nv
Postbaan 73
2910 Essen
België

Percentage of business related to Ex equipment:

To be determined during next audit.

No. of employees:

A total of 65 employees on site, 6 involved in repair and overhaul of Ex equipment.

Responsible person(s):

Gauthier De Hert
Jef Hectors

Operatives:

Gauthier De Hert
Jef Hectors
Niels De Ren
Thomas Weyers
Tom Vandekeybus
Wouter Van Duyse

Scope of repair and overhaul work of the SF:

The repair, overhaul and maintenance of non-electrical rotating equipment consisting of pumps, ventilators, mixers, rotary valves, blowers, fans and gear boxes. Ex h, based on type of protection "b" (control of ignition source), "c" (constructional safety) and "k" (liquid immersion).

Any limitations to the scope of work:

(for example maximum voltage, electrical capacity, dimensions, weight limitations)

On-site services limited to inspection, alignment, mounting, dismantling and change of the mechanical seals and bearings.

Audit criteria:

- IEC 60079-19, Edition 4.0 (2019-10)
- OD 314-5, Edition 2.1 (2023-10)
- OD 315-5, Edition 2.1 (2023-10)
- IEC 60034-23, Ed. 1.0



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Type of audit:

- ☐ – initial assessment/reassessment of a SF with a verified certified QS
- ☒ – initial assessment/reassessment of a SF without a certified QS
- ☐ – surveillance of a SF with a certified QS
- ☐ – surveillance of a SF without a certified QS
- ☐ – special assessment visit, e.g. due to relocation or major changes at the Service Facility

Lead Assessor:

H.B.A. Vleeming

Lead Assessor:



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SUMMARY REPORT

Reference Documents:

Electr file name	New / revised	Number	Name	Rev	Date
1.	x	0-0	Inhoudsopgave Management systeem ACD nv	0	1-02-24
2.	x	1-1	Introductie, scope & kruisverwijzing	0	1-02-24
3.	x	2-1	Beleidsverklaring	0	1-02-24
4.	x	2-3	Organogram	0	1-02-24
5.	x	2-4	Functie profielen Algemeen	0	1-02-24
6.	x	3-1	Documentbeheersing Interne documentatie	0	1-02-24
7.	x	3-3	Competentie management	0	1-02-24
8.	x	3-5	Keuringen en calibraties	0	1-02-24
9.	x	4-1	Proces Rotating repair Ex	0	1-02-24
10.	x	5-1	Afwijkingen	0	1-02-24
11.	x	5-2	Beoordeling leveranciers	0	1-02-24
12.	x	5-4	Interne audits	0	1-02-24
13.	x	5-5	Management Indicatoren	0	1-02-24
14.	x	-	Aanwijzing Ex verantwoordelijke Jef Hectors		24/05/2024
15.	x	-	Intern audit rapport		24/05/2024
16.	x	-	Competentie matrix personeel Ex	-	14-mrt-2024
17.	x	-	Management review 2023/2024	-	May 2024
18.	x	-	Calibration overview all relevant Ex tools	-	actual version
19.	x	xxx	Internal job report template with types of protection process steps	0	14-8-2024
20.	x	-	Leveranciersbeoordeling	-	actual version

Note: An ☒ is included before the title of documents that are new or revised at an up- issue of the report.



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Summary of observations:

ACD nv requests with this initial audit the repair of non-electrical rotating equipment to be marked with either the square "R" or triangle "R" mark sign.

Since 1989 ACD nv already repairs non-electrical rotating equipment and has built up experience with this. Experienced employees are working on all levels with extensive knowledge of mechanical repair. ACD nv operates an ISO 9001 based quality system. The related Ex processes have been setup up by an external consultant (SEQ). An internal audit was performed and focused on IEC 60079-19. All persons involved in the process of explosion proof repair have been trained externally (MIBEX) and qualified. A workshop how to measure equipment (meetproof Ex monteurs) was part of the qualifications. During the audit, the complete repair process as well as the quality management system was evaluated and found to be effective in meeting its defined objectives.

Certification of this facility according the requirements of EN IEC 60079-19 is therefore recommended.

Nonconformities:

None:

Lead Assessor's recommendations:

- ☒ – FAR issued, indicating full compliance with IECEx Scheme Requirements, recommending that IECEx Facility Certification be issued/maintained
- ☐ – FAR issued, indicating general compliance with IECEx Scheme Requirements, even if minor non conformances are raised, recommending that IECEx Facility Certification be issued/maintained following receipt of satisfactory documentary evidence supporting effective corrective action. Corrective action to be verified at next surveillance visit
- ☐ – FAR issued, indicating non-compliance with IECEx Scheme Requirements, due to major non-conformances being raised, recommending that IECEx Facility Certification be issued only after a satisfactory follow-up visit. Services cannot be claimed as being covered by IECEx Certification until a follow up visit is conducted (must be within 2 calendar months of assessment).

Accepted by IECEx 03-5 ExCB:

DEKRA Certification B.V.

Date: 21 August 2024

E. ter Haar
EX Certification Manager



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2 AUDIT DATA

QS Registration: ☐ ISO 9001 Registrar
(Certification Body):

Certificate No.:

Expiration Date:

☒ SF does not hold a current ISO 9001 certificate

Composition of audit team:

- Mario Vleeming, Lead Assessor
- Hendrik Jan Sijrier, Observer (peer reviewer)

Date of the audit (mm, dd, yyyy):

12 August 2024

Number of man-days on-site:

1 man-day

Projectnumber:

228531000

Interviewed representatives of the Service Facility (auditees):

Name	Position
Jef Hectors	Team Leader, Ex responsible
Rud Pechthold	External Consultant (SEQ)

Where necessary other staff assisted during the assessment.



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3 ASSESSOR'S REPORT

3.1 Assessment to OD 314-5

(The requirements of each of the following Clauses are detailed in OD 314-5)

Clause	Subject	SF reference document	Audit findings	NCR No.
3.1	Documentation requirements			
3.1.1	<p>The Service Facility shall identify and record the range of test and measurement capabilities and limitations in accordance with IEC 60079-19:2019, Clause 4.3.2.1 c).</p> <p>Any "off-site" repair or overhaul performed by the Service Facility requires documented procedures and/or work instructions and shall be defined in their scope of IECEx Certified Service Facility Certification in accordance with IEC 60079-19:2019, Clause 4.3.2.1 p).</p>	<p>[1] 0-0 Inhoudsopgave Management systeem ACD nv [2] 1-1 Introductie, scope & kruisverwijzing; [3] Beleidsverklaring; [9] 4-1 Proces Rotating repair Ex</p>	<p>The scope indicates the IECEx03 repair. On-site and off-site repair with limitations are defined in the QMH and certificate.</p>	
3.1.2.	<p>Records <i>Ex process plan?</i> <i>Number of Ex repairs?</i> <i>Percentage of Ex repairs related to non-Ex repairs?</i></p>	<p>Records to be followed during next audit.</p>	<p>N/A for this initial audit.</p>	
3.2	<p>Management responsibility <i>Management representative deputy?</i> <i>The responsibilities and authorities of the responsible person and any deputies shall be documented</i></p>	<p>[4] 2-3 Organogram; [5] 2-4 Functie profielen Algemeen.; [14] Aanwijzing Ex verantwoordelijke Jef Hectors</p>	<p>Responsible persons have been assigned by the management.</p>	
3.3	<p>Resource management <i>Staff competence?</i></p>	<p>[5] 2-4 Functie profielen algemeen [7] 3-3 Competentie management [16] Competentie matrix personeel Ex [13] Management Indicatoren</p>	<p>Staff competence is defined and verified. Responsible persons and operatives have been assigned. Qualification skills overview are available.</p>	



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Clause	Subject	SF reference document	Audit findings	NCR No.
3.4	Product realization Type of service offered Type of equipment, for example, rotating machines, instruments Types of protection of equipment being serviced, for example, Ex d, Ex e, Ex i	[1] 0-0 Inhoudsopgave Management systeem ACD nv [2] 1-1 Introductie, scope & kruisverwijzing; [9] 4-1 Proces Rotating repair Ex; [19] Internal job report template with types of protection process steps	Type of services offered is defined.	
3.5	Measurement, analysis and improvement			
3.5.1	Planning	[9] 4-1 Proces Rotating repair Ex;	The process is available to plan a repair.	
3.5.2	Customer satisfaction	[1] Inhoudsopgave Management systeem ACD nv [9] 4-1 Proces Rotating repair Ex;	The process to maintain customer satisfaction is available.	
3.5.3	Internal audit The audit programme shall address the effectiveness of the elements of the QMS to ensure that the repair, overhaul and reclamation processes are in conformity with IEC 60079-19:2019, Clause 4.3.2.1 h) and information provided by IECEx OD 315-5. The period between audits should normally not exceed 12 months	[12] 5-4 Interne audits; [15] Intern audit rapport.	Planning of internal audits is part of the process. The latest internal audit was performed at 24 May 2024.	
3.5.4	Monitoring and measurement of processes (4.3.2.1.i)	[13] 5-5 Management Indicatoren; [17] Management review 2023/2024	Monitoring and measurement of process is annually performed.	
3.5.5	Monitoring and measurement of product (4.3.2.1.j)	[13] 5-5 Management Indicatoren;	Monitoring and measurement of product is performed after each repair.	
3.5.6	Control of nonconforming product (4.3.2.1.k) <i>Preventive action</i>	[10] 5-1 Afwijkingen	The process for the control of non-conforming products, analysis of data and corrective actions is available.	
3.5.7	Analysis of data			
3.5.8	Improvement			
3.5.9	Corrective action			
8	Process assessment by ExCBs			



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Clause	Subject	SF reference document	Audit findings	NCR No.
8.1	Compliance with OD 315-5 Ed 2.1 <i>See section 3.19 below</i> When the Ex Equipment being overhauled and repaired includes rotating electric machines, the ExCBs shall assess the Service Facility's procedures and processes for compliance to IEC 60034-23:2019 as required by IEC 60079-19:2019, Clause 4.3.6.1. Where the Service Facility has been third party assessed for compliance with IEC 60034-23 or an equivalent standard this may benefit in assisting them to meet the requirements of this OD.	See reference documents at cl. 3.1.1 of OD314-5.	N/A, the repair of electrical rotating equipment is not part of the scope. Only non-electrical equipment is part of the scope.	
8.2	Use of subcontractors <i>Agreement? Subcontractor assessment/audit</i>	[11] 5-2 Beoordeling leveranciers [20] Leveranciersbeoordeling	There is no use of subcontractors for the main Ex repairs tasks (for example assembly and measurements), beside of the delivery of parts.	
8.3	Assessment of competencies <i>Verification of competence Responsible person change control</i>	[6] 3-1 Documentbeheersing Interne documentatie; See also reference documents at cl. 3.2 and 3.3 of OD314-5	See also comment at cl. 3.2 and 3.3 of OD314-5.	
8.4	Records <i>Legibility, measurement traceability and retrievability</i>	[6] 3-1 Documentbeheersing Interne documentatie	The process for retention of records is available.	
8.5	Marking <i>R-Label</i>	Draft marking label	The marking is in accordance with IEC 60079-19. There is no use of IECEx logo's on the marking.	
8.6	Dimensional checks	[8] 3-5 Keuringen en calibraties [18] Calibration overview all relevant Ex tools	Dimensional checks of equipment is performed with calibrated equipment.	



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Clause	Subject	SF reference document	Audit findings	NCR No.
8.7	Conditions for Ex equipment release <i>Responsible person authorizes release</i> <i>Marking?</i> <i>Report to customer?</i> <i>Job records?</i>	[9] 4-1 Proces Rotating repair Ex	The Ex responsible person authorizes the release of the marking.	

3.2 Assessment to IEC 60079-19 – General

(The requirements of each of the following Clauses are detailed in IEC 60079-19)

Clause	Subject	SF reference document	Audit findings	NCR No.
4	General			
4.1	General principles	[2] 1-1 Introductie, scope & kruisverwijzing; [9] 4-1 Proces Rotating repair Ex	The process of repair is defined.	
4.2	Instructions for the user			
4.2.1	Ex Equipment Certificates and schedule drawings	[9] 4-1 Proces Rotating repair Ex	The requirements mentioned in this clause, are user responsibility.	
4.2.2	Records and work instructions			
4.2.3	Re-installation of repaired equipment			
4.2.4	Service facilities			
4.3	Instructions for the service facility			
4.3.1	Statutory requirements	[1] 0-0 Inhoudsopgave Management systeem ACD nv	This is defined in the QMS.	
4.3.2	Repair and overhaul			
4.3.2.1	General	[1 till 13] Complete QMS system.	The QMS describes the requirements 4.3.2.1 a) till p).	
4.3.2.2	Competence		The QMS describes the requirements 4.3.2.2, see also comment at OD 314-5 cl. 3.3	
4.3.2.3	Repair of components		The repair of parts of enclosures (so not a complete enclosure) have been discussed during the audit. The repair facility will communicate this clearly to the user in writing before continuing the repair.	
4.3.2.4	Documentation			
4.3.2.4.1	General	[19] Internal job report template with types of protection process steps; Some example job reports	During the sales phase, the service facility will seek to obtain all necessary information. This is described in the processes.	



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Clause	Subject	SF reference document	Audit findings	NCR No.
4.3.2.4.2	Job report to the user		The template contains all required items a) till g).	
4.3.2.4.3	Service facility records		The service facility records contains all the requirements as listed in this clause.	
4.3.2.5	Spare parts			
4.3.2.5.1	General	[19] Internal job report template with types of protection process steps	By preference, new parts from the manufacturer will be used. On a case by case situation, alternatives will be considered if new parts are not available.	
4.3.2.5.2	Fasteners			
4.3.2.5.3	Sealed parts			
4.3.2.6	Identification of repaired equipment		The repaired equipment is identified with a marking label.	
4.3.3	Reclamations			
4.3.3.1	General	[19] Internal job report template with types of protection process steps	General the same procedures applies as for repair.	
4.3.3.2	Exclusions			
4.3.3.3	Requirements			
4.3.3.3.1	General	[19] Internal job report template with types of protection process steps – checklist IEC 60079-19 en materiaal normen	General the same procedures applies as for repair.	
4.3.3.3.2	Responsibilities			
4.3.3.4	Reclamation procedures			
4.3.3.4.1	General	[19] Internal job report template with types of protection process steps – checklist IEC 60079-19 en materiaal normen	General the same procedures applies as for repair.	
4.3.3.4.2	Metal spraying			
4.3.3.4.3	Electroplating			
4.3.3.4.4	Sleeving			
4.3.3.4.5	Brazing and welding			
4.3.3.4.6	Metal stitching			
4.3.3.4.7	Threaded holes for fasteners			
4.3.3.4.8	Re-machining			
4.3.4	Alterations and modifications			
4.3.4.1	Alterations	[19] Internal job report template with types of protection process steps – checklist IEC 60079-19 en materiaal normen	Procedures are available how to handle alteration requests.	
4.3.4.2	Modifications			
4.3.5	Temporary repairs			
4.3.6	Electric machines			
4.3.6.1	General	[2] 1-1 Introductie, scope & kruisverwijzing; [19] Internal job report template with types of protection process steps – checklist IEC 60079-19 en materiaal normen	N/A, only non electrical equipment.	
4.3.6.2	Removal of damaged windings			
4.3.6.3	Test after repair			
4.3.6.3.1	Testing after repair of windings	[2] 1-1 Introductie, scope & kruisverwijzing ;	N/A, only non electrical equipment.	
4.3.6.3.2	Electric machines	[19] Internal job report template with types of	N/A, only non electrical equipment.	



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Clause	Subject	SF reference document	Audit findings	NCR No.
4.3.6.4	Additional requirements	protection process steps – checklist IEC 60079-19 en materiaal normen	N/A, only non electrical equipment.	
4.3.6.5	Lubricants and corrosion inhibitors		The proper selection of lubricants is part of the repair process.	
4.3.6.6.	Inverter fed electric machine		N/A, only non electrical equipment.	
4.3.6.7	Variable speed drives		N/A, only non electrical equipment.	
4.3.7	Control equipment		N/A, only non electrical equipment.	

3.14 Assessment to IEC 60079-19 – Annex A – Identification of repaired equipment by marking

Clause	Subject	SF reference document	Audit findings	NCR No.
A.1	Marking information	Example marking	The example marking contains all the required info as per a) till e).	
A.2	Symbols			
A.2.1	Repair in accordance with schedule drawings or manufacturer's specification	Example marking; [19] Internal job report template with types of protection process steps – checklist IEC 60079-19 en materiaal normen	The example marking contains all the required info as per a) till e).	
A.2.2	Repair in accordance with the type of protection standards but not the schedule drawings		The procedure contains descriptions how to mark.	
A.2.3	Other situations			



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3.15 Assessment to IEC 60079-19 – Annex B – Knowledge, skills and competence of responsible persons and operatives

Clause	Subject	SF reference document	Audit findings	NCR No.
B.1	General	See reference documents at cl. 3.2 and 3.3 of OD314-5	See comment at cl. 3.2 and 3.3 of OD314-5.	
B.2	Knowledge and skills			
B.2.1	Responsible persons			
B.2.2	Operatives			
B.3	Competence			
B.3.1	General			
B.3.2	Responsible persons			
B.3.3	Operatives			
B.4	Assessment			
B.5	Qualification of reclamation operatives			

3.16 Assessment to IEC 60079-19 – Annex C – Requirements for measurements in flameproof equipment during overhaul, repair and reclamation (including guidance on tolerances)

Clause	Subject	SF reference document	Audit findings	NCR No.
-	Requirements for measurements in flameproof equipment during overhaul, repair and reclamation (including guidance on tolerances)	[2] 1-1 Introductie, scope & kruisverwijzing ; [19] Internal job report template with types of protection process steps – checklist IEC 60079-19 en materiaal normen	N/A since Ex d type of protection is not in the scope.	

3.17 Assessment to IEC 60079-19 – Annex D – Evaluation of best practice during rewinding and repair (informative)

Clause	Subject	SF reference document	Audit findings	NCR No.
-	EASA / AEMT “The effect of repair / rewind on motor efficiency” (OD 301) applied	[2] 1-1 Introductie, scope & kruisverwijzing ; [19] Internal job report template with types of protection process steps – checklist IEC 60079-19 en materiaal normen	N / A, only non-electrical in the scope of protection.	
-	ExTAG 2013/006 applied			



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3.18 Assessment to IEC 60079-19 – Annex E – Additional requirements relating to Ex control equipment (informative)

Clause	Subject	SF reference document	Audit findings	NCR No.
E.1	General	[2] 1-1 Introductie, scope & kruisverwijzing ; [19] Internal job report template with types of protection process steps – checklist IEC 60079-19 en materiaal normen	N/A, only non electrical equipment.	
E.2	Common items			
E.3	Isolators and circuit interrupters			
E.4	Interlocks and mechanical linkages			
E.5	Earth fault devices			
E.6	Other devices			
E.7	Transformers			

3.19 Assessment to OD 315-5

Clause	Subject	SF reference document	Audit findings	NCR No.
4	Additional requirements associated with efficiency to maintain T Ratings of rotating machines	[2] 1-1 Introductie, scope & kruisverwijzing ; [19] Internal job report template with types of protection process steps – checklist IEC 60079-19 en materiaal normen	N/A, only non electric equipment.	
5	Additional requirements for Ex d			
5.1	Machining limits for Flameproof Surfaces (for Ex d)			
5.2	Over-pressure test (for Ex d)			
6	Additional requirements for rotating electric machines For the IECEx Service Facilities Scheme the requirements of IEC 60034-23 apply in addition to the requirements of IEC 60079-19. The additional information in Annex B and C provides a basic framework to assess a service facility.			



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7	Knowledge, skills and competencies of Responsible Persons and Operatives in accordance with IEC 60079-19 Annex B	[2] 1-1 Introductie, scope & kruisverwijzing ; [19] Internal job report template with types of protection process steps – checklist IEC 60079-19 en materiaal normen	See also comment at cl. 3.2 and 3.3 of OD314-5.	
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3.20 Assessment Non-electrical Equipment and Fans

C.14 Ex h – Non-electrical Equipment covered by ISO 80079-36

(Clause “C” numbering is related with ISO/IEC 80079-34:2018 Annex A numbering)

Clause	Subject	SF reference document	Audit findings	NCR No.
C.14.4	Earthing and equipotential bonding of conductive parts a) earthing terminal; b) effective connection of conductive parts; c) bonding cables.	[19] Internal job report template with types of protection process steps – aandachtspunten	The requirements in this clause C.14 are completely covered in the procedures for each type of protection which can be find in the internal job report template.	
C.14.6	Ingress protection (IP) a) weld continuity; b) fitting of gaskets and seals; c) continuity of moulded grooves and tongues;			



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C.15 Non Electrical Equipment protected by constructional safety “c” covered by ISO 80079-37

Clause	Subject	SF reference document	Audit findings	NCR No.
C.15.3	Machining a) compliance with tolerances for shape, position, concentricity, quality of finish; b) dimensional accuracy of functional surfaces (e.g. tolerances for diameters; especially for indicator units pre-adjustment and correct polarity); c) depth and configuration of cut-in to ensure the constructional intended stress concentration.	[19] Internal job report template with types of protection process steps – aandachtspunten	The requirements in this clause C.15 are completely covered in the procedures for each type of protection which can be find in the internal job report template.	
C.15.4	Cemented joints and potted assemblies			
C.15.5	Assembling a) correct components and parts; b) distances between moving parts or between fixed and moving parts; c) equipotential bonding between subassemblies; d) mechanical seals; e) protective covers.			



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Clause	Subject	SF reference document	Audit findings	NCR No.
C.15.6	Routine tests a) sealing systems (fit, lubrication, initial tension, primary pressure); b) dynamic vibrations (e.g. critical rotation speed, bearing at standstill or at transport); c) functional test of the complete assembly (distance between rotor/stator modules, clamping, clearance, free room of motion).		Refer to comment C15.3.	
C.15.7	Power transmission systems a) conditions of the lubrication; b) belt tension; c) equipotential bonding (especially couplings, belt drives, chain drives, gears, shafts).		Refer to comment C15.3.	



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C.16 Non-electrical equipment protected by control of ignition sources “b” covered by ISO 80079-37

Clause	Subject	SF reference document	Audit findings	NCR No.
C.16.1	General	[19] Internal job report template with types of protection process steps – aandachtspunten	The requirements in this clause C.16 are completely covered in the procedures for each type of protection which can be find in the internal job report template.	
C.16.2	Ignition protection system a) selection of appropriate sensors, actuators and other relevant parts (e.g. temperature range); b) indicating devices marked to indicate the maximum and minimum operating levels;			
C.16.3	Assembling a) installation of sensors and actuators (fail safe characteristics, separate power supply); b) connection installation of sensors; c) position of sensors; d) correct interfacing.			
C.16.4	Routine verifications and tests a) tests before initial operation or specification of these tests in the instructions; b) functioning; c) accuracy; d) response behavior; e) fail-safe; f) interlocking of settings;			



**IECEX 03-5 FAR – Repair, overhaul
and reclamation of Ex equipment
Facility Assessment Report &
Non Conformity Report**



IECEX 03-5 Audit Report No.: NL/DEK/FAR24.0002/00

C.17 Non-electrical equipment protected by liquid immersion “k” covered by ISO 80079-37

Clause	Subject	SF reference document	Audit findings	NCR No.
C.17.1	General	[19] Internal job report template with types of protection process steps – aandachtspunten	The requirements in this clause C.17 are completely covered in the procedures for each type of protection which can be find in the internal job report template.	
C.17.2	Protective liquid a) type of liquid; b) liquid level or flow rate or pressure (depending on the system).			
C.17.3	Casing a) leak tightness of the protective liquid closed loop; b) protections against unintentional or inadvertent of fastenings; c) measures against protective liquid impurity.			
C.17.4	Measuring or indicating devices a) dipstick; b) marking of maximum/minimum criteria for the protective liquid level; c) marking of maximum permissible angle of inclination.			

Fans (EN 14986)

Clause	Subject	SF reference document	Audit findings	NCR No.
ZB.9.1	General	[19] Internal job report template with types of protection process steps – aandachtspunten	The requirements in this clause C.17 are completely covered in the procedures for each type of protection which can be find in the internal job report template.	
ZB.9.2	Material			
ZB.9.3	Assembled equipment and protective systems			
ZB.9.4	Routine tests			