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

**TITLE: IECEx Assessment Report for the acceptance of *The State Work Safety Changzhou Inspection and Testing Center for Mine Communication and Monitoring Devices (CCCMT), CN,* to become an Accepted Ex Testing Laboratory (ExTL), within the IECEx Equipment Scheme, 02.**

**Circulation to: Members of the IECEx Management Committee, ExMC**

**INTRODUCTION**

This document contains the IECEx Assessment Report for the acceptance of **the State Work Safety Changzhou Inspection and Testing Center for Mine Communication and Monitoring Devices (CCCMT), CN,** to become an Accepted IECEx Test Laboratory (ExTL) within the IECEx Scheme, 02.

***This document is hereby submitted for ExMC approval via correspondence using the IECEx on-line voting system.  ExMC Members are requested to submit their vote via the IECEx On-line*** [***Ballot System***](https://www.iecex.com/ballot) ***by the closing date 2020 04 29***

***Please refer to OD 050 for guidance on the “IECEx On-line voting system.”***

***Chris Agius***

**IECEx Secretariat**

|  |  |
| --- | --- |
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IEC System for certification to standards relating to equipment for use in Explosive Atmospheres (IECEx System)

IECEx Assessment Report Form

IECEx Assessment Report Form for use by IECEx Assessment Teams to report Assessments conducted according to the IECEx Assessment Procedures of

1. Operational Document IECEx OD003-2 for the Certified Equipment Scheme
2. Operational Document IECEx OD316-5 for the Certified Service Facility Scheme
3. Operational Document IECEx OD422 for the IECEx Conformity Mark Licensing System

IECEx ExTL assessment report for

The State Work Safety Changzhou Inspection and Testing Center for Mine Communication and Monitoring Devices (CCCMT)

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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# Assessment information

## Type of Body covered by this assessment:

|  |  |
| --- | --- |
| ExCB for IECEx Certified Equipment Scheme |  |
| ExTL for IECEx Certified Equipment Scheme | ✓ |
| ExCB for IECEx Certified Service Facilities Scheme |  |
| ExCB for IECEx Conformity Mark Licensing System |  |

NOTE 1 ExCB - IECEx Certification Body

NOTE 2 ExTL - IECEx Testing Laboratory

## Type of assessment:

|  |  |
| --- | --- |
| Pre-assessment for candidate body |  |
| Initial assessment for candidate body | ✓ |
| Surveillance |  |
| Re-assessment |  |
| Scope extension |  |

## Details of body

### Country

China

### Name of body

The full name of the body is:

Mine Communication and Monitoring Devices Laboratory of CCTEG Changzhou Research Institute/The State Work Safety Changzhou Inspection and Testing Center for Mine Communication and Monitoring Devices/Coal Industry Changzhou Quality Supervision and Inspection Center for Communication and Monitoring Products (CCCMT)

NOTE 1 The long title includes the names that are used by the different government departments to which the body reports.

NOTE 2 The legal entity name is shown in 2.1

For the purposes of IECEx, due to limitations on name size in certification documentation and the website, the following shorter name will be used:

The State Work Safety Changzhou Inspection and Testing Center for Mine Communication and Monitoring Devices (CCCMT)

### Name and title of nominated principal contact

|  |  |  |
| --- | --- | --- |
| Name | Title | E-mail address |
| Huang Chen | Quality system specialist | 670043169@qq.com |

## Assessment information

### Members of the assessment team

|  |  |
| --- | --- |
| Name | Role |
| Dr Jim Munro | IECEx Lead Assessor |
| Marino Kelava | IECEx Assessor |

### Place(s) of assessment

|  |
| --- |
| No. 1 Mushu Road, Changzhou City, Jiangsu Province, China |

### Assessment date(s)

The on-site assessment dates were 14 to 17 January 2020. The assessment period took into account the extra time needed to witness testing relevant for past IECEx proficiency testing programs.

## Application information and background information on the assessment

The first application to be accepted as an IECEx ExTL was dated 3 June 2019. A further application was made on 18 December 2019 to expand the proposed scope of standards.

Both applications were reviewed and accepted by the Secretariat. The assessment team was allocated after the first application and the team agreed to address the increased scope as part of its assessment visit.

## Scopes

### ExTL scope for equipment certification scheme

The following scope has been requested by CCCMT in their application. All standards are in the scope of their proposed ExCB, Shanghai Inspection and Testing Institute of Instruments and Automation Systems Co., Ltd./National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation (SITIIAS/NEPSI).

| Number | Title | Comments, eg if scope change |
| --- | --- | --- |
| IEC 60079-0  Edition 7.0 | Explosive atmospheres - Part 0: Equipment - General requirements | Capability demonstrated |
| IEC 60079-1  Edition 7.0 | Explosive atmospheres - Part 1: Equipment protection by flameproof  enclosures “d” | Capability demonstrated |
| IEC 60079-2  Edition 6.0 | Explosive atmospheres - Part 2: Equipment protection by pressurized  enclosure «p» | Capability demonstrated |
| IEC 60079-5  Edition 4.0 | Explosive atmospheres - Part 5: Equipment protection by powder filling «q» | Capability demonstrated |
| IEC 60079-6  Edition 4.0 | Explosive atmospheres - Part 6: Equipment protection by oil immersion «o» | Capability demonstrated |
| IEC 60079-7  Edition 5.1 | Explosive atmospheres - Part 7: Equipment protection by increased  safety "e" | Capability demonstrated |
| IEC 60079-11  Edition 6.0 | Explosive atmospheres - Part 11: Equipment protection by intrinsic safety “i” | Capability demonstrated |
| IEC 60079-15  Edition 5.0 | Explosive atmospheres – Part 15: Equipment protection by type of protection "n" | Capability demonstrated |
| IEC 60079-18  Edition 4.1 | Explosive atmospheres – Part 18: Equipment protection by encapsulation “m” | Capability demonstrated |
| IEC 60079-25  Edition 2.0 | Explosive  atmospheres – Part 25: Intrinsically safe electrical systems | Capability demonstrated |
| IEC 60079-31  Edition 2.0 | Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t" | Capability demonstrated |

NOTE 1 Standards shown with an asterisk (\*) are superseded standards

NOTE 2 Unless otherwise indicated, earlier editions of standards (even if with a different number) are considered to be covered in the above scope for the purposes of the assessment.

NOTE 3 The above list highlights any extension of scope in the list above for new standards or later editions of standards already in scope.

All gas standards are for Group II only, where relevant, based on the scope of the ExCB at the time of the assessment, but the assessment also covered capability for Group I. Once the ExCB has Group I in its scope, it is recommended that Group I be added to the scope of CCCMT without any further onsite visit.

### ExCB scope

The following is the associated ExCB (SITIIAS/NEPSI) scope:

IEC 60079-0: Part 0: Equipment - General requirements

IEC 60079-1: Part 1: Equipment protection by flameproof enclosures 'd'

IEC 60079-2: Part 2: Equipment protection by pressurized enclosures 'p'

IEC 60079-5: Part 5: Equipment protection by powder filling 'q'

IEC 60079-6: Part 6: Equipment protection by oil immersion 'o'

IEC 60079-7: Part 7: Equipment protection by increased safety 'e'

IEC 60079-11: Part 11: Equipment protection by intrinsic safety 'i'

IEC 60079-13: Part 13: Equipment protection by pressurized room "p" and artificially ventilated room "v"

IEC 60079-15: Part 15: Equipment protection by type of protection 'n'

IEC 60079-16: Part 16: Artificial ventilation for the protection of analyser (s) houses

IEC 60079-18: Part 18: Equipment protection by encapsulation “m”

IEC 60079-25: Part 25: Intrinsically safe electrical systems

IEC 60079-26: Part 26: Equipment with equipment protection level (EPL) Ga

IEC 60079-27: Part 27: Fieldbus intrinsically safe concept (FISCO)

IEC 60079-28: Part 28: Protection of equipment and transmission systems using optical radiation

IEC 60079-29-1: Part 29-1: Gas detectors - Performance requirements of detectors for flammable gases

IEC 60079-30-1: Part 30-1: Electrical resistance trace heating - General and testing requirements

IEC 60079-31: Part 31: Equipment dust ignition protection by enclosure 't'

IEC 60079-33: Part 33: Equipment protection by special protection 's'

IEC/TS 60079-46: Edition 1 Explosive atmospheres - Part 46: Equipment assemblies

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

IEC 61241-1: Part 1: Protection by enclosures 'tD'

IEC 61241-4: Part 4: Type of protection 'pD'

IEC 61241-11: Part 11: Protection by intrinsic safety 'iD'

IEC 61241-18: Part 18: Protection by encapsulation 'mD'

IEC 62086-1: Part 1: General and testing requirements - Electrical apparatus for explosive gas atmospheres – Electrical resistance trace heating

IEC 62784: Vacuum cleaners and dust extractors providing equipment protection level Dc for the collection of combustible dusts - Particular requirements

ISO 80079-36: Part 36: Non-electrical equipment for explosive atmospheres - Basic method and requirements

ISO 80079-37: Part 37: Non-electrical equipment for explosive atmospheres - Non electrical type of protection constructional safety "c", control of ignition source "b", liquid immersion "k"

All gas standards are for Group II only, where relevant.

# Common information

## Legal entity of body

The legal entity is the Changzhou Research Institute Co., Ltd. of China Coal Technology and Engineering Group. The business licence for the Changzhou Research Institute Co., Ltd. of China Coal Technology and Engineering Group was viewed during the assessment visit. The name “CCTEG Changzhou Research Institute” is commonly used by this legal entity. CCCMT is owned by the CCTEG Changzhou Research Institute.

## Financial support

CCTEG Changzhou Research Institute is a state-owned business. The money to establish the IECEx ExTL was provided by CCTEG Changzhou Research Institute. Income from testing operations is used to help fund the operation of the Institute.

## History

In 1990, the Mine Communication and Monitoring Devices Laboratory of CCTEG Changzhou Research Institute (CCCMT) was set up under the authority of the Department of Energy document (1990）No.403. It was primarily established to carry testing and research for the coal mining industry (Group I). In 2008 it added the testing capability to test for Groups II and III.

In June 2007, CCCMT first obtained laboratory accreditation from the China National Accreditation Service for Conformity Assessment (CNAS), number CNAS L3096, and has continued to maintain that accreditation.

## Documentation

### Quality manual

The Quality Manual for the operation of the testing laboratory is contained in document Quality Manual Code: MTJ1001-2018. The version reviewed during the assessment visit was approved by Wang Haibo on 20 July 2018. Within the manual many of the chapters have later approved revisions, with the latest revision being 6 March 2019 meets IECEx requirements.

### Procedures

Procedures MTJ2001 to MTJ2040 are used for the operation of the testing laboratory. For IECEx the key procedure is MTJ2040-2019 *Special procedures required by IECEx testing*. This procedure demonstrates how CCCMT meets the requirements of IECEx.

### Work instructions

There are 148 work instructions used by the test technicians. Many of these were reviewed as part of the assessment process, in particular those used for tests that were witnessed at the assessment.

### Records (including test records where relevant)

There are 205 record forms that are used to record results of testing. They include provision to identify the equipment used, and those carrying out the tests. Currently procedure MTJ2012-2018 *Record Control Procedures* references OD 207 and includes retention times that are in accordance with OD 207. All records are stored in hard copy.

### Document change control

CCCMT has set up and implemented MTJ2004-2018 *File Control Procedures*. This procedure describes the arrangement of the quality manual, procedures and work instructions. It includes the process of document control with all controlled documents being in hard copy form. The system complies with ISO/IEC 17025 and IECEx requirements.

## Confidentiality

CCCMT has set up and implemented MTJ2001-2018, *Confidentiality and Protection of Ownership Procedures*. In addition, they have MTJ2003-2018, *Guaranteed notarization procedure* addressing code of conduct. The procedures were reviewed and found to meet the requirements of the IECEx. There is one document, which was viewed, with signatures from all staff committing to complying with the requirements MTJ2001-2018 regarding confidentiality, impartiality and conflict of interest. The system meets the requirements of IECEx.

## Communication with public and customers (Hard copy and Electronic)

CCCMT maintains the website http://www.cccmt.cn/ for communication with the public and clients. In addition, CCCMT has set up and implemented MTJ2001-2018, *Confidentiality and Protection of Ownership Procedures*. In addition, they have MTJ2008-2018, *Service Customer and Litigation Procedures*.

## Internal audit

CCCMT has set up and implemented MTJ2013-2018 *Internal Review Procedures*. CCCMT last performed its annual internal audit from 1 to 15 April 2019. There was a report issued for the internal audit dated 16 April 2019. There were five minor corrective actions identified. Evidence was provided that the issues were resolved in accordance with the procedure. IECEx was not included since it was not at that time covered under CCCMT’s scope.

MTJ2040-2019 *Special procedures required by IECEx testing*,, contains requirements for inclusion of IECEx in future internal audits in accordance with the IECEx Rules.

The system meets the requirements of IECEx.

## Management review

The responsibilities regarding management review are addressed in the Quality Manual and in procedure MTJ2014-2018 *Management Review Procedures.*

CCCMT conducted the last annual management review on 31 May 2019, with the meeting attended by top management. The minutes of the meeting were reviewed.

The 2019 management review did not include the IECEx items listed in the procedure since CCCMT was not accepted as an ExTL at that time.

## Contracting, subcontracting and witness testing

### Contracting

CCCMT does not contract work.

### Subcontracting

There isn’t any subcontracting being done for Ex equipment being tested at present. However, based on the TCD, four tests that may need to be subcontracted in the future were identified. These tests are:

|  |  |  |
| --- | --- | --- |
| Standard | Clause | Test to be subcontracted |
| IEC 60079-0 | 26.10 | Resistance to UV light |
| IEC 60079-1 | B.1.3 | Sintered metal elements - Density |
| IEC 60079-1 | B.1.4 | Sintered metal elements - Open porosity and/or fluid permeability |
| IEC 60079-7 | 6.3.5 | Sulphur dioxide test for level of protection "eb" for the connection of bi-pin lamp caps to lampholders |

Proposed subcontractors are IECEx TLs. More details are included in the site assessment report.

### Witness testing

CCCMT has included reference to IECEx OD024 and its requirements in MTJ2006-2018, *Testing/Calibration Subcontracting Procedures*, and hence is in compliance with the IECEx requirements. They plan to implement the procedure once they are accepted as an ExTL.

## Training and competence

Clause 5.5 of the Quality Manual addresses responsibilities of laboratory personnel.

CCCMT has set up and implemented MTJ2016-2018 *Personnel Training and Management Procedures* which addresses training, assessment and management of staff.

Examples of staff files incorporating qualifications and training records were viewed. Staff competencies are included in those records. During assessment visit a competency matrix was developed. The system meets IECEx requirements.

## Complaints and appeals (including appeals to IECEx)

CCCMT has set up and implemented MTJ2008-2018 *Service Customer and Litigation Procedures* which deals with complaints. Appeals will need to be dealt with in accordance with the ExCB procedures.

## Impartiality

CCCMT has set up and implemented MTJ2003-2018 *Guaranteed notarization procedure*, which is in compliance with the IECEx requirements.

## Commenting on ExTAG Documents

CCCMT has set up and implemented MTJ2040-2019 *Special procedures required by IECEx testing*, which addresses commenting on ExTAG documents and meets IECEx requirements.

## Special facts to be noted

Procedure MTJ2040-2019 *Special procedures required by IECEx testing* addresses the application of IECEx requirements to the operation of CCCMT as an ExTL and its relationship with SITIIAS/NEPSI.

## Supporting documentation

Copies of additional supporting information for this assessment have been provided to the applicant and the IECEx Secretariat. These are included in a site assessment report or provided separately and include:

* Details of issues raised and how these were resolved during the visit
* Checklist for ISO/IEC 17025
* Completed Technical Capability Document (TCD)
* Photos of the facilities/tests witnessed are included in the above TCD
* Assessors’ notes

## Recommendations

Based on the assessment performed on 14 to 17 January 2020, The State Work Safety Changzhou Inspection and Testing Center for Mine Communication and Monitoring Devices (CCCMT) is recommended for acceptance in the IECEx scheme as:

* An ExTL in the IECEx Certified Equipment Scheme

This is according to the scope of the standards listed in this document.

|  |  |
| --- | --- |
| Dr Jim Munro | Marino Kelava |
| IECEx Lead Assessor | IECEx Assessor |

Date: 22 February 2020

# ExTL for IECEx Certified Equipment Scheme

## Assessment references

### General references

1. IECEx02 IECEx Certified Equipment Scheme covering equipment for use in explosive atmospheres – Rules of Procedure
2. IECEx OD003-2 Assessment, surveillance assessment and re-assessment of ExCBs and ExTLs operating in the IECEx 02, IECEx Certified Equipment Scheme
3. IECEx OD009 Issuing of CoCs, ExTRs and QARs
4. ISO/IEC 17025:2017 Edition 3, General requirements for the competence of testing and calibration laboratories
5. IECEx Technical Capability Document (TCD)
6. ExTAG decision sheets (DSs)
7. OD 202 IECEx Certified Equipment Scheme – IECEx Proficiency Testing Program

NOTE The latest editions of the above documents were applied.

### Additional references applied for this assessment

No additional references were applicable for this assessment.

## Candidate ExTL and other persons interviewed

All members for the ExTL (shown in 3.4) participated actively in the assessment process.

Two representatives from the ExCB, SITIIAS/NEPSI, were present for the whole on-site assessment. In addition, a representative from the Certification and Accreditation Administration of the People's Republic of China (CNCA), which is the National Member Body of China for IECEx, was present for the last part of the on-site assessment.

## Associated ExCB(s)

The associated ExCB is SITIIAS/NEPSI. A signed agreement addressing this relationship was viewed and found to meet the requirements of IECEx.

## Organisation

### Names, titles and experience of the senior executives

|  |  |  |
| --- | --- | --- |
| Name | Title | Experience (years) |
| Wang Haibo | Director | 21 |
| Liang Hong | Technical manager | 21 |

### Name, title and experience of the quality management representatives

|  |  |  |
| --- | --- | --- |
| Name | Title | Experience (years) |
| Wang Xiaosong | Quality manager | 13 |
| Huang Chen | Quality system specialist and staff engineer | 5 |

### Other employees in ExTL activity

|  |  |  |
| --- | --- | --- |
| Name | Title/responsibility | Experience in Ex (years) |
| Wang Jinhui | Staff engineer | 7 |
| Zhu Qianwei | Senior engineer | 10 |
| Ji Xiaohua | Staff engineer | 10 |
| Xu Zhi | Senior engineer | 9 |
| Gao Wencheng | Senior engineer | 7 |
| Wang Bo | Staff engineer | 6 |
| Zhang Yajun | Staff engineer | 6 |
| Zhang Ping | Staff engineer | 6 |
| An Yong | Staff engineer | 7 |
| Zhu Mingjie | Staff engineer | 7 |
| Sun Hao | Staff engineer | 3 |
| Meng Fanmeng | Staff engineer | 6 |

## Organizational structure

Please see the organization chart, Annex A, for the organizational structure.

## Resources

The laboratory is well resourced with sufficient staff, facilities and comprehensive procedures.

## Test reports issued

Number of national test reports issued under for the preceding four years for each type of protection:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Standard numbers | Type of protection or other identifying information | Number of issued reports (for last 4 years) | | | | Total |
| 2016 | 2017 | 2018 | 2019 |
| IEC 60079-1 | Equipment protection by flameproof enclosures “d” | 223 | 263 | 271 | 281 | 1038 |
| IEC 60079-7 | Equipment protection by increased safety "e" | 2 | 5 | 3 | 7 | 17 |
| IEC 60079-11 | Equipment protection by intrinsic safety “i” | 729 | 756 | 771 | 743 | 2999 |
| IEC 60079-18 | Equipment protection by encapsulation “m” | 14 | 17 | 15 | 17 | 63 |
| IEC 60079-31 | Equipment dust ignition protection by enclosure "t" | 2 | 0 | 0 | 0 | 2 |
| IEC 60079-2 | Equipment protection by pressurized enclosure “p” | 0 | 0 | 0 | 2 | 2 |
| IEC 60079-5 | Equipment protection by powder filling “q” | 0 | 0 | 0 | 1 | 1 |
| IEC 60079-6 | Equipment protection by oil immersion “o” | 0 | 0 | 0 | 12 | 12 |
| IEC 60079-15 | Equipment protection by type of protection "n" | 0 | 0 | 0 | 3 | 3 |
| IEC 60079-25 | Intrinsically safe electrical systems | 0 | 0 | 0 | 1 | 1 |

NOTE 1 Above include reports to IEC 60079-0 unless otherwise shown

NOTE 2 The number of reports is based on GB 3836 series standards which are similar to IEC standards.

## National accreditation

CCCMT holds accreditation to ISO/IEC 17025 from CNAS, number L3096 valid to 2025-01-31. A copy is included in Annex B. All standards shown the proposed scope in this report are in the scope of that accreditation. The accreditation is under the name “Mine Communication and Monitoring Devices Laboratory of CCTEG Changzhou Research Institute”, but also makes reference to the legal entity: “Changzhou Research Institute Co., Ltd. of China Coal Technology and Engineering Group”.

NOTE The national accreditation is checked annually by the IECEx Secretariat.

## Calibration

CCCMT has two procedures addressing their approach to calibration, *Instrument Maintenance and Management procedures* (MTJ2021-2018)and *Quantitative Traceability Program* (MTJ2022-2018). All equipment is calibrated externally by accredited calibration laboratories. All equipment checked during the assessment visit was in calibration. There was one issue regarding an out of date calibration label that was resolved during the on-site assessment, with measures put in place to prevent a reoccurrence. The system meets ISO/IEC 17025 and IECEx requirements.

## Tests witnessed during the assessment visit

Tests witnessed during the assessment visit included tests from completed PTB proficiency testing programs and other tests.

The following are the tests and assessments from past proficiency testing programs. The tests were performed on artefacts provided by SITIIAS/NEPSI and so this introduced some uncertainty regarding possible changes in the samples since the programs were conducted. However, for the flame transmission program, a new set of nozzles was obtained from PTB. For all testing, the amount of testing was reduced compared to that in the formal programs, because of time restraints for the assessment and this may also have impacted on results. They were also missing, compared with performing tests in the proficiency testing system, the opportunity to improve testing from Phase I to Phase II. Notwithstanding the above, all results provided evidence of their competence in doing this testing, with very good results for several programs. However, some areas for investigation and, if necessary, improvement were identified as part of this witnessed testing. Details of the results and their comparison with assigned values are included in the site assessment report.

|  |  |  |
| --- | --- | --- |
| Program | Tests witnessed | Comments |
| 1. Program 3 – flame transmission (with reduced number of tests) | Test done in accordance with PTB\_Ex\_PTS\_Procedure\_Instruction\_FT\_2013-08-01 but tests reduced from 10 to 5 for each nozzle. | Testing performed competently. |
| 2. Program 4 – temperature classification (with reduced number of tests) | Test done in accordance with PTB\_Ex\_PTS\_Procedure\_Instruction\_TC\_2013\_Version\_2 but with test on glass surface only. | Testing performed competently. |
| 3. Program 5 – electrostatic charge (with reduced number of tests) | Test done in accordance with PTB\_Ex\_PTS\_Procedure\_Instruction\_EC\_\_2016-02-05\_\_Update but surface resistance test only to IEC 60079-0 Edition 7.0 on each of the two samples. | Testing performed competently. |
| 4. Program 6 - intrinsic safety (assessment, with results reviewed by assessment team) | Assessment done in accordance with PTB\_Ex\_PTS\_Procedure\_Instruction\_IS\_2015\_\_2015-11-12. | Assessment performed competently. |
| 5. Program 7 – explosion pressure (with reduced number of tests) | Test done in accordance with PTB\_Ex\_PTS\_Procedure\_Instruction\_EP2017\_\_2017-11-28 using 3.3.1 Configuration a), Pipe A and the following tests: • Three (3) ignition tests with explosive mixture (1) (ethylene 8 % ± 0.5 %) at normal ambient temperature (ignition side 1) • Three (3) ignition tests with explosive mixture (1) (ethylene 8 % ± 0.5 %) for use at an ambient temperature of - 40 °C (ignition side 1) | Testing performed competently. |
| 6. Program 8 – pressurized enclosure (with reduced number of tests) | Test done in accordance with PTB\_Ex\_PTS\_Procedure\_Instruction\_PE\_PHASE\_II\_\_2018-09-26 but with reduced testing as follows: 1. Determination of leakage flow rate according to IEC 60079-2, Clause 16.3.1 3. Filling with He until concentration of at least 70 % is reached at each measuring point. Purging with air until concentration of He is less than 1 % (IEC 60079-2, Clause A.2) according to IEC 60079-2, Clause 16.4. | Testing performed competently. |

Other witness tests witnessed:

|  |  |  |  |
| --- | --- | --- | --- |
| Standard and edition | Clause number | Test | Comments |
| 7. IEC 60079-0 Ed 7.0 | Clause 26.4.2 | Resistance to impact test for Group I and Group II | Testing performed competently. |
| 8. IEC 60079-11 Ed 6.0 | Clause 10.1 | Use of the spark test apparatus on an active power supply | Testing performed competently. |
| 9. EC 60079-11 Ed 6.0 | Cause 10.5.2 a) | Electrolyte leakage test for cells and batteries, short circuit test of battery. Test of one battery/cell | Testing performed competently. |
| 10. IEC 60079-15 Ed 5.0 | Clause 11.3.2.1.1 | Type test for restricted breathing | Testing performed competently. |
| 11. IEC 60079-18 Ed 4.1 | Clause 8.1.1 | Water absorption test | Testing performed competently. |
| 12. IEC 60079-31 Ed 2.0 | Clause 6.1.1.3 | Pressure test for "ta" followed by  IP6X test to IEC 60529 Clause 13.4 and IEC 60079-0 Clause 26.4.5 | Testing performed competently. |
| 13. IEC 60529 Ed 2.1 and IEC 60079-0 Ed 7.0 | Clause 14.2.420 February 2020  Clause 26.4.5 | IP X4 test | Testing performed competently. |

## Participation in IECEx Proficiency Testing Programs

Program: PTB Ex PT Scheme

CCCMT is participating in the latest two programs as shown below but has not participated in past programs.

|  |  |  |
| --- | --- | --- |
| Year(s) of participation | IECEx Proficiency Testing program | General information about results |
| 2019 | Program “Tests of Enclosures– Test Round 2019” | Program not yet complete |
| 2019 | Program “Battery Testing – Test Round 2019” | Program not yet complete |

As noted in testing that was witnessed, past PTB programs were used for establishing many of the tests to be witnessed, utilising the artefacts of those proficiency testing programs. This was done in accordance with OD 202 requirements, which states (as an alternative to having participated in past programs):

* demonstrate satisfactory compliance by other means with past programs, for example by demonstrating tests on program artefacts as part of the assessment process.

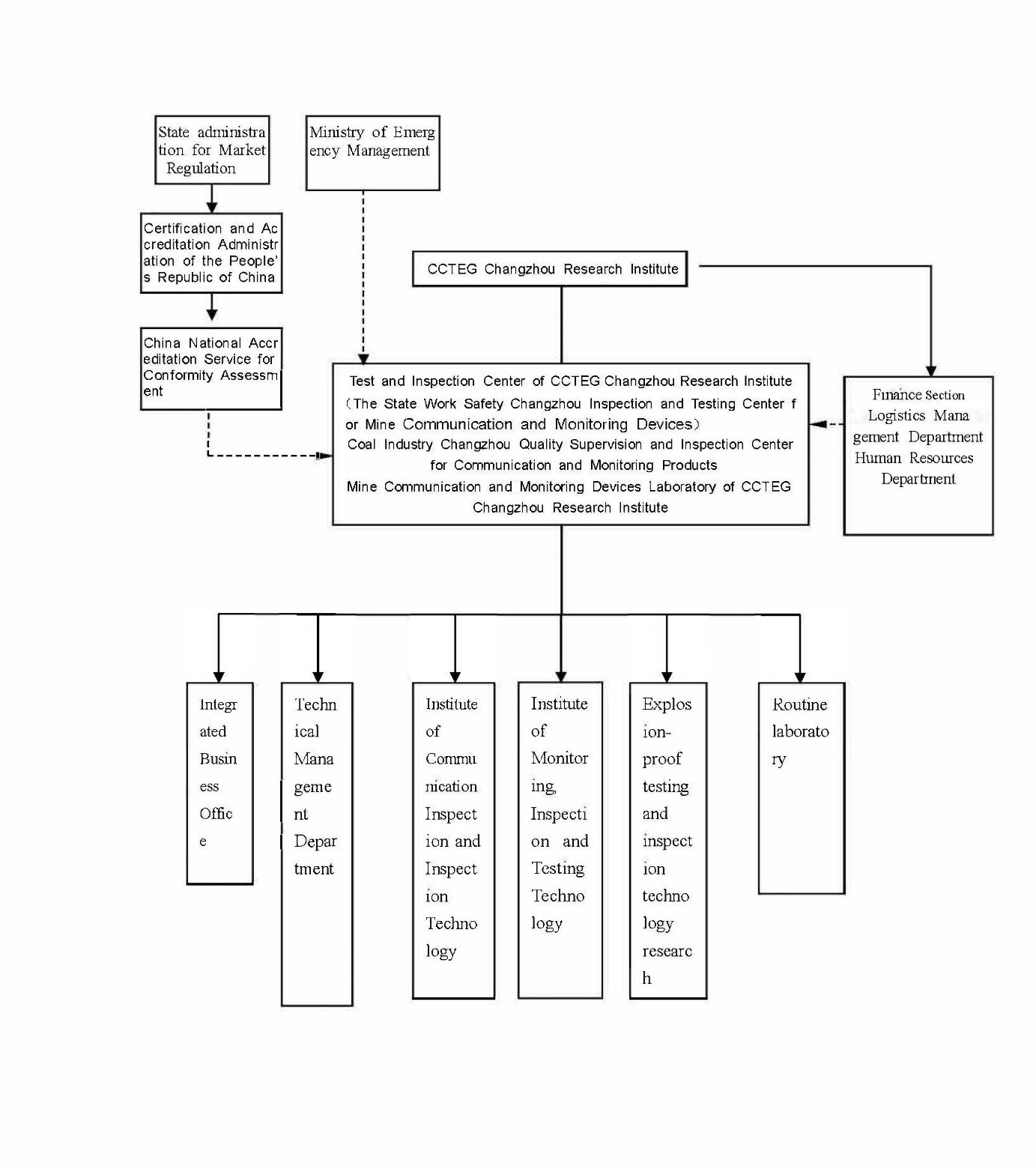
All past programs that are still open were addressed in this way.

## Comments (including issues found during assessment)

At the end of the site assessment visit, there were no issues remaining to be resolved. There were 13 issues raised during the site assessment visit, but all of these were resolved by the end of the visit to the satisfaction of the assessment team. The issues included: errors in work instructions, means of checking of gas analysers before starting tests, means of measuring ambient temperature for temperature rise, ensuring impact rig meets latest edition of IEC 60079-0, record retention periods, and availability of a competency matrix for use by ExCB and ExTL when developing test plans. An issue regarding calibration has been shown earlier in this report.

# Annexes

1. Overall/ ExTL Organisation Chart



1. Accreditation Certificate for ISO/IEC 17025

