



ExMC/282/DV
August 2005

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

Ex Management Committee, ExMC

TITLE: IECEx Assessment Report for acceptance of Testing Lab for Explosion-proof Products of Tianjin Research and Design Institute of Chemical Industry / Supervision & Test Centre of Ex-products of China Chemical & Petroleum Industry, abbreviated to (PCEC) as an IECEx Test Laboratory (ExTL)

INTRODUCTION

This document contains the IECEx Assessment Report for the acceptance of Testing Lab for Explosion-proof Products of Tianjin Research and Design Institute of Chemical Industry / Supervision & Test Centre of Ex-products of China Chemical & Petroleum Industry, abbreviated to (PCEC) within the IECEx Scheme.

Please consider the assessment report, which is issued for final vote during the coming ExMC Buxton Meeting to be held in October.

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IECEX ASSESSMENT REPORT (TEST LABORATORY – ExTL)

Type of Assessment:

Initial Assessment for Candidate ExTL
Surveillance Assessment for existing ExTL

X
<input type="checkbox"/>

1. OBJECT AND FIELD OF APPLICATION

1.1 **Country:**
People's Republic of China

1.2 **Name of Candidate TL**
Testing Lab for Explosion-proof Products of Tianjin Research and Design Institute of Chemical Industry / Supervision & Test Centre of Ex-products of China Chemical & Petroleum Industry, abbreviated to PCEC
IECEX Scheme Secretariat should note slight change from application

1.3 **Members of the Assessment Team**
Jim Munro, Lead assessor
Michel Brenon, Assessor
Heinz Berger, Assessor (second day)

1.4 **Place and Date of Assessment**
No. 85 Road 3, Dingzigu Hongqiao District, Tianjin, China
Post code: 300131
Tel: 86—22—26541594
Fax: 86—22—26541594
Website: www.sinocecx.com
E-mail: xug@sinocecx.com

7 to 8 July 2005

1.5 **Assessment References**

Documents:

- i) IECEx 02 Second Edition 2003-06
- ii) IECEx Operational Document OD/003 and OD009
- iii) ISO/IEC 17025
- iv) IECEx Technical Guidance Documents and Decision Sheets
- v) ExTL application documents



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1.6 Scope of Application

Product Category	Standard
General Requirements	IEC 60079-0
Flameproof enclosure "d"	IEC 60079-1
Pressurized apparatus "p"	IEC 60079-2
Powder filling "q"	IEC 60079-5
Oil immersion "o"	IEC 60079-6
Increased safety "e"	IEC 60079-7
Intrinsic safety "i"	IEC 60079-11
Non sparking "n"	IEC 60079-15
Encapsulation "m"	IEC 60079-18
Combustible dust	IEC 61241-1-1

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

Ex q and Ex o have been added since the application was made. The CNAL accreditation covers these types of protection.

1.7 Candidate TL Persons Interviewed

Name	Position
Mr. Xu Gang	Director PCEC
Numerous other members of staff.	

1.8 Legal Entity of the Candidate TL

TRICI is a legal body that can carry out work independently. It is a registered company covered by certificate 1200001001691 from the Tianjin City Industry and Commercial Administration Bureau, on 22 February 2003. This establishes it as a state owned enterprise.

PCEC is relatively independent with TRICI. It has its own account number and official seal. For products testing and certification, it performs independently and is not affected by any administrative interference. This is a declaration signed on 1 September 2002 by the president of TRICI ensuring impartiality of PCEC. There is a 'Authorized Paper by the Legal Person' signed on the same date that establishes PCEC according to Tianjin Research and Design Institute of Chemical Industry (2000) No.087. This states that the head of the testing laboratory is fully responsible for the testing laboratory.

1.9 Associated ExCB

China Certification Centre for Quality Mark (CQM)
12th Floor, Bldg. B of Keyuan Plaza,
A-105 Xisanhuan North Road.
Haidian District,
Beijing city,
People's Republic of China
Postal code: 100037
Tel: +86 10 88411888
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E-mail: cqm@cqm.com.cn

CQM have advised that the Certification and Accreditation Administration of the People's Republic of China (CNCA) exercises unified management, supervision and overall coordination of nation-wide certification and accreditation activities in China, and China operates a unified Ex certification system.

China National Accreditation for Laboratories (CNAL) is responsible for accreditation and supervision of testing laboratories.

CQM, as a Certification Body, engages in certification activities based on unified Ex certification rules and procedures announced by CNCA.

There is a contract between CQM and PCEC. This was updated after the assessment to also cover 'q', 'o' and 'n' and a copy provided to the assessment team.

1.10 **Financial Support**

PCEC depends on income from testing. Research projects are funded from the Government, Tianjin City and in particular the Chinese petrochemical industry. There is also funding from the parent body TRICI as development fund for improvement of facilities or for research projects. The income from all the above meet all the expenses for the operation of PCEC.

1.11 **History**

PCEC is a division of Tianjin Research and Design Institute of Chemical Industry (abbr. TRICI). TRICI was founded in 1958 as a Government owned body. In 2000 it became a state owned enterprise. Within TRICI, PCEC was established as a Supervision and Testing Centre of Explosion-proof Quality of Electric Products Ministry of Chemistry to undertake testing of explosion-proof products for explosive atmospheres (gas/ vapor/ mist/ dust) and performance testing of electric products used in chemical corrosion and sea mist such special environment. In 2002, it renewed its name as the Supervision & Test Centre of Ex-products of China Chemical & Petroleum Industry.

1.12 **Subcontracting**

Tests for resistance to light are subcontracted to "National Printing Product Quality Supervision Testing Centre", located in Tianjin. The certificate issued by the Chinese National Accreditation Service is valid until 2009-07-05.

2. ORGANISATION

2.1 **Names, Titles and Experience of the Senior Executives**

Xu Gang	Director of PCEC, Senior engineer	26 years
Xu Jianwen	Quality Manager, Head of laboratory 1;	11 years
Xue Dingfa	Senior engineer;	45 years
Pang Jianjun	Head of general office;	14 years
Feng Xiaoqiu	Head of Testing laboratory 3;	28 years
Wang Lihong	Head of Testing laboratory 2.	35 years

2.2 **Name, Title and Experience of the Quality Management Representative**

Xu Jianwen.	Quality Manager, Head of Testing Laboratory 1, Senior engineer 8 years
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2.3 **Name Title of Nominated Principal Contact**

Xu Gang	Director of PCEC, Senior engineer
Yang Jinnan	Engineer

2.4 Employees

There is a total of 19 personnel with 16 involved in Ex. There will be an additional person starting in August 2005. 13 employees have professional qualifications. PCEC has a comprehensive training program. Each year a program is developed for the next twelve months. When people do training often an examination is set for them to do to test their competency. All records of training and exams are retained in each person's file. A sample file was examined. The training and exams covered a wide range of activities. This included Ex testing activities, IECEx Scheme training by CQM and Quality Manual training each time a new edition was issued. There were also other records on what courses have been run and who had attended those courses. Training methods applied to attain and maintain skills with due attention to quality requirements can be found in the Quality Manual, Clause 20.4. Procedure FB/P09-2002 covers the retention of the records.

Standards of professional ability, skills and job descriptions are prescribed in the Quality Manual, chapter 20

2.5 Organisational Structure

The organisational structure of PCEC is shown in Annex A.

3. RESOURCES

PCEC is well resourced with experienced staff, good facilities and a comprehensive management system.

Major items of test equipment at PCEC include:

- Dust test chamber
- IP water testing facilities
- Impact test device
- Temperature measurement chamber incorporating thermal shock test
- Flameproof testing facilities, including chamber, mixing facilities and pressure measurement
- Spark test apparatus with mixing facilities
- Environmental chambers
- High voltage test device
- Pressure testing of cable sealing and static Ex pressure test
- LCR meter
- CTI test apparatus
- Various measurement instruments for physical measurement
- Surface roughness tester
- Various meters for measuring electrical parameters
- Motor load test facilities to 10 kW
- High current impulse test apparatus.

Work and inspection instructions are prescribed and implemented for the handling, storage and return to the client of materials and samples. See Quality Manual, Chapter 26 procedure

FB/P23-2002 Management procedure for testing samples. The system for receipt, labelling, control and return of samples was examined and found acceptable. There is a manual spreadsheet maintained to allocate numbers for samples and who is responsible for them. The samples when not under test are kept in a locked room. All samples checked when identified with a unique number.

4. TEST METHODS

4.1 Procedures

There is a prescribed system for detecting deficiencies in assessment and testing and their causes, and for correcting unfavourable trends. See Quality Manual, Chapter 13.

Many of the requirements in the Quality Manual are supported by more detailed procedures. There is also a wide range of forms in the quality documentation that are accessed via the computer network. This system in the network was demonstrated and appeared to operate effectively. IECEx Scheme documents are included in the system. The IECEx website is checked at least once a week for new documents. Generally new documents are translated into Chinese. A master index is kept on the system to provide access to documents, including Scheme Rules and ExTAG Decision Sheets.

4.2 Staff Work Instructions

Work instructions are divided into categories; maintenance of equipment, operation instructions for the equipment and test rules. There are also safety instructions to be followed when testing.

A number of practical test methods were examined as part of the assessment process, including temperature rise testing of a luminaire, Ex d pressure determination, Ex d flame transmission, and IP54 testing. Measurement techniques for Ex d were also examined.

5. TEST REPORTS AND RECORDS

5.1 Test Reports Issued (according to Chinese National Ex Scheme)

Type of Protection	Number of Test Reports	
	2003	2004
d	456	547
p	3	5
e	160	189
q	0	0
o	0	0
i	171	191
n	13	29
m	68	74
DIP	10	14

5.2 Test Records

There is a prescribed system for recording the method and results of assessment and testing activities. See Quality Manual, Chapter 16.

Observations and calculations are recorded and stored as to provide a permanent test record. See Quality Manual, Chapter 16.

A review of files indicated that in general there is a good level of record keeping of assessments and tests on the files.

There are arrangements for ensuring that records are current, complete, accurate and held in confidential storage where required. See Procedure Document FB/P09-2002 of the Quality Manual: Management Procedure of Quality Record and Technical Record.

Test records are stored for at least 10 years according to Procedure Document clause FB / P01 – 2002.

6. CALIBRATION

Calibration is mostly done externally by a variety of providers all of whom are accredited by CNAL. The laboratories used for each instrument are clearly shown in the Quality Manual the Annex to Chapter 24.

There is a procedure FB/P19-2002 that covers calibration and the approach for selection of a calibration laboratory or metrological institute to carry out calibration for PCEC.

There is some internal calibration done, for example for the intrinsic safety spark test apparatus. A record was viewed of how this had been done and it covered the critical aspects of the operation of the device.

The Quality Management System specifies that the equipment is of accuracy compatible with the assessment and testing undertaken. See Quality Document FB/Q25-2002 of the Quality Manual: Table of Instrument and Equipment.

There are documented procedures for calibrating all equipment and reference standards, including method, periodicity, sealing after calibration, etc (Procedure Document FB/P21-2002 of the Quality Manual: Procedure of Metrology Traceability).

Reference standards used for calibration are traceable to national or international standards of measurement. See Quality Document FB/Q22-2002 of the Quality Manual: Figure of Metrology Traceability.

7. DOCUMENTATION

7.1 *Quality Manual*

There is a comprehensive Quality Manual covering all the key elements of ISO/IEC 17025. This is available in English as well as in Chinese.

7.2 *Document Change Control*

Document Control follows Chapter 7 of the quality manual. They have all quality records available on the network for those with computer access, but also operate a manual system.



8. CONFIDENTIALITY

With the employment contract, a confidentiality agreement will be signed. Evidence was given by PCEC during the assessment.

9. NATIONAL ACCREDITATION

PCEC is accredited by the China National Accreditation Board for Testing Laboratories (CNAL), No L0381 to ISO/IEC 17025, valid from 15 June 2004 to 11 December 2005 (see Annex B). See Annex C for the accreditation scope.

10. RECOGNITION AND AGREEMENTS

LCIE and PCEC have signed a Declaration of Cooperation not directly related to the IECEx activities.

11. INTERNAL AUDIT AND PERIODIC REVIEW

Chapter 17 of the Quality Manual deals with the internal audits. Detail procedure is given with document FB/P31 -2002. Evidence was given by PCEC during the assessment that this is occurring.

12. COMPLAINTS MECHANISM

Chapter 12 of the Quality Manual deals with the complaints issue. However, complaints concerning IECEx are directed to the ExCB (CQM) where PCEC is supporting the ExCB by resolving the complaints.

13. SPECIAL FACTS TO BE NOTED

There is one person accredited by CQM to act on their behalf. This is Sun Ming.

14. COMMENTS

There were some findings from the assessment that required attention, regarding the gas mixing system, water testing, procedures, temperature rise measurement, uncertainty of measurement, capacitors and inductors for intrinsic safety testing, and calibration of pressure transducers. These were subsequently resolved. The IECEx Scheme Secretariat, together with other supporting information from the assessment, holds full details.

15. RECOMMENDATION

Based on the initial assessment performed during 8 to 9 July 2005 PCEC is recommended for acceptance into the IECEx scheme as a Testing Laboratory (ExTL) according to the scope of the standards listed in this document.

LIST OF ANNEXES

ANNEX A: Organisational chart of PCEC

ANNEX B: CNAL accreditation certificate

Jim Munro
Lead Assessor

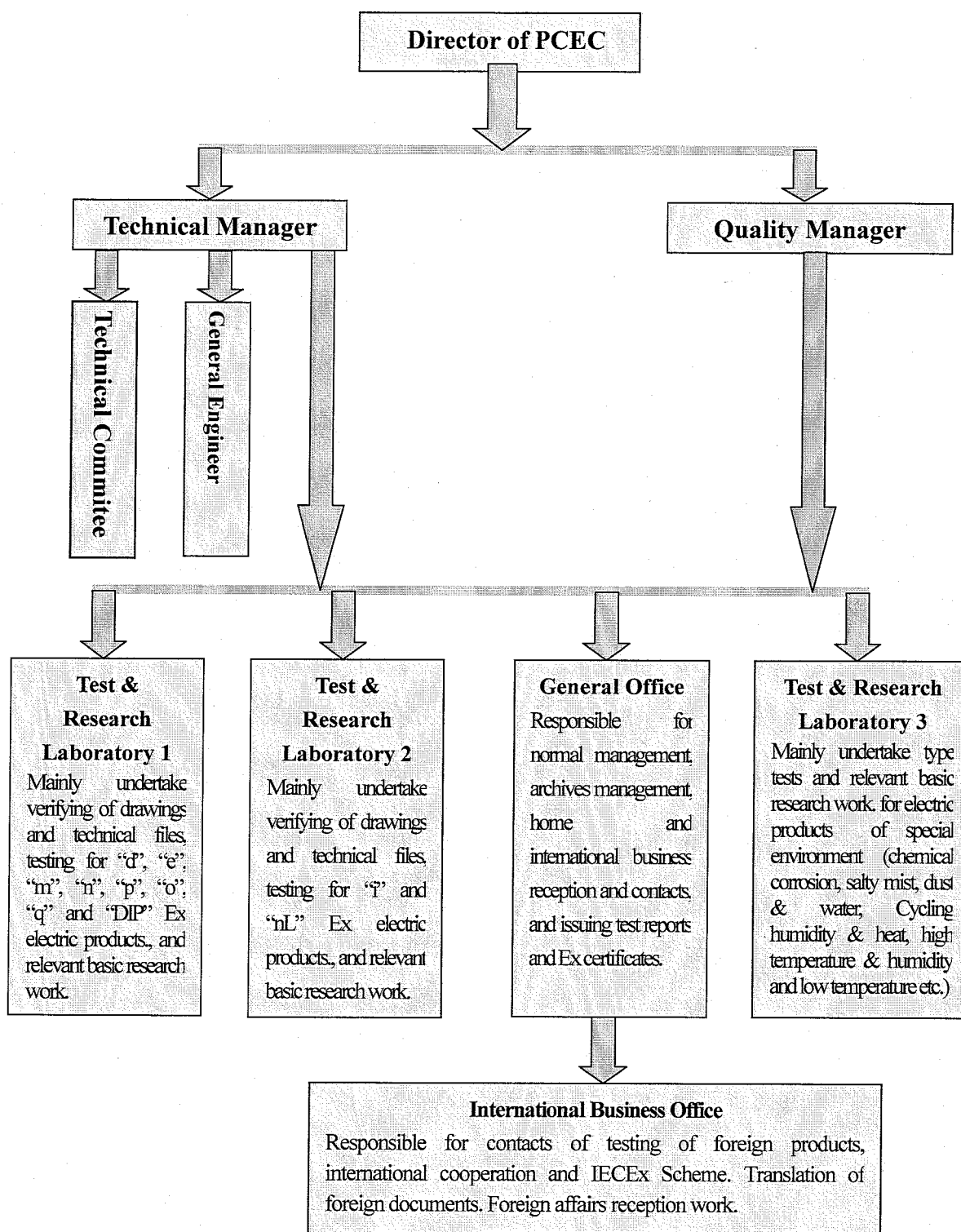
Heinz Berger
Assessor

Michel Brenon
Assessor

30 August 2005

Annex A

PCEC Organization chart.



Annex B



**ACCREDITATION CERTIFICATE
OF CHINA NATIONAL ACCREDITATION BOARD
FOR LABORATORIES
(No.L0381)**

This is to certify that

**Testing Lab for Explosion-proof Products of Tianjin
Research and Design Institute of Chemical
Industry(Supervision and Test Center of Explosion-proof
Quality for Petroleum and Chemical Industry Electric
Products)**

No.85 Road 3 Dingzigu Hongqiao District Tianjin

has been assessed and proved to be in compliance with CNAL/AC01:
2002 Accreditation Criteria for Testing and Calibration Laboratories
(identical to ISO/IEC17025: 1999 *General Requirements for the
Competence of Testing and Calibration Laboratories*).

Accreditation scope of the laboratory is listed in the attachment.

Date of Issue: 2003.11.12

Date of Expiry: 2006.05.24

魏昊

Wei Hao

Secretary General of CNAL