



ExMC/280/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 Laboratory of  
Nanyang Explosion Protected Electrical Apparatus Research Institute  
(CNEx) / China National Quality Supervision and Test Center for  
Explosion Protected Electrical Products (CQST) as an IECEx Test  
Laboratory (ExTL)**

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**INTRODUCTION**

**This document contains the IECEx Assessment Report for the acceptance of  
Testing Laboratory of Nanyang Explosion Protected Electrical Apparatus Research  
Institute (CNEx) / China National Quality Supervision and Test Centre for Explosion  
Protected Electrical Products (CQST) 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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August 2005

# IECEX ASSESSMENT REPORT (TEST LABORATORY – ExTL)

## Type of Assessment:

Initial Assessment for Candidate ExTL ☒  
Surveillance Assessment for existing ExTL ☐

## 1. OBJECT AND FIELD OF APPLICATION

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

1.2 **Name of Candidate TL**  
Testing Laboratory of Nanyang Explosion Protected Electrical Apparatus Research Institute (CNEx) / China National Quality Supervision and Test Center for Explosion Protected Electrical Products (CQST)

1.3 **Members of the Assessment Team**

On Site  
Jim Munro, Lead assessor  
Michel Brenon, Assessor

Off Site  
Heinz Berger, Assessor

1.4 **Place and Date of Assessment**

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Fax: +86 377 6320 8175  
Http:// china-ex.com  
E-mail: [cqst@cn-ex.com](mailto:cqst@cn-ex.com)

4 and 5 July 2005

1.5 **Assessment References**

Document:

- i) IECEx 02 First Edition 1995-03
- ii) IECEx Operational Document OD/003
- iii) ISO/IEC 17025
- iv) IECEx Technical Guidance Documents
- iv) ExTL application documents

1.6 **Scope of Application**

**Product Category**

General Requirements  
Flameproof enclosure "d"  
Pressurized apparatus "p"  
Powder filling "q"

**Standard**

IEC 60079-0  
IEC 60079-1  
IEC 60079-2  
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 –General Requirements	IEC 61241-0
Combustible dust - Protection by Enclosures "tD"	IEC 61241-1

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

### 1.7 **Candidate TL Persons Interviewed**

Wang Jun	Director of CQST
Wu Jianguo	Administrative vice director of CQST
	Technical responsible person
Zhang Gang	Quality responsible person
Mu Dayu,	Vice director of CQST
Yang Li	Vice director of CQST
Wang Dayu	Leader of Management office
Liu Hengyun	Deputy leader of Management office
Xue Ji	Leader of motor test lab
Zhou Shaozhong	Leader of Electric appliance & environment test lab
Hou Yandong	Leader of explosion protection test lab
He Hongwen	Deputy leader of explosion protection test lab
Cheng Shuguang	Leader of Ex instrument test lab
Kou Xiaoguang	Leader of international service office

Plus various other staff

### 1.8 **Legal Entity of the Candidate TL**

CQST is one department of Nanyang Explosion Protected Electrical Apparatus Research Institute (CNEx). It is authorized by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ) as China National Quality Supervision and Test Center and accredited by China National Accreditation Board for Laboratories (CNAL) as a testing laboratory. The testing laboratory has independent position in the organization and finance and can run testing business independently. This is covered in China Authorized Certificate No. (2003) 070.

The certificate of authorization of this test lab in China is CNEx document (2004) No. 28 "notice of Authorization to CQST for the independently carrying out its business".

### 1.9 **Associated ExCB**

China Certification Center 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  
Fax: +86 10 68415026/88414325  
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 to 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 CQST that was viewed by the assessment team.

#### 1.10 **Financial Support**

The operation is completely self-supporting by the income from testing.

#### 1.11 **History**

In 1958 the predecessor of CNEx/CQST was founded in northeast China as Research House of Ex-motor of First Machinery Industrial Department. In 1970, it moved to Nanyang as the Nanyang Explosion Protected Electrical Apparatus Research Institute (CNEx), becoming State owned explosion protection research institute and establishing Ex-Testing Station. In 1977, the first formal China National Standards (GB-1336-77) were drawn up. In 1995, Ex-Testing Station of CNEx was approved as China National Test Center for Explosion Protected Electrical Products (CQST), representing China to carry out science research, testing, certification, quality supervision and other management functions. In 1999 CQST was recommended as China ExTL of IECEx Scheme by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ).

#### 1.12 **Subcontracting**

CQST advised that there was little need to subcontract work in the range of standards for which acceptance is being sought. However, where the need exists, there is a subcontract procedure CQST-QM-4.5. An example was viewed of an agreement to subcontract testing for exposure to UV light. The laboratory was checked by CQST, including ensuring that it had CNAL accreditation for the UV test.

## 2. ORGANISATION

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

Name	Title and responsibility	Experience in Ex
Wang Jun	Director of CQST	19 years
Wu Jianguo	Administrative vice director of CQST	30 years
	Technical responsible person	
Zhang Gang	Quality responsible person	18 years
Mu Dayu,	Vice director of CQST	18 years
	Also assists quality	
Yang Li	Vice director of CQST	20 years
Wang Dayu	Leader of Management office	13 years
Liu Hengyun	Deputy leader of Management office	14 years
Xue Ji	Leader of motor test lab	30 years
Zhou Shaozhong	Leader of Electric appliance & environment test lab	19 years



Hou Yandong	Leader of explosion protection test lab	12 years
He Hongwen	Deputy leader of explosion protection test lab	16 years
Cheng Shuguang	Leader of Ex instrument test lab	12 years
Kou Xiaoguang	Leader of international service office	16 years

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

Zhang Gang	Quality responsible person	18 years
Mu Dayu	Vice director of CQST	18 years
	Also responsible for quality	

## 2.3 Name and Title of Nominated Principal Contact

Name	Title and responsibility
Wu Jianguo	Administrative vice director of CQST Technical responsible person
Liu Hengyun	Vice-Leader of Management office

## 2.4 Employees

The total number of personnel in the Test Laboratory is 39. Of these 33 formed part of the assessment and testing laboratory for which recognition is being sought.

## 2.5 Organisational Structure

See Annex A

# 3. RESOURCES

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

CQST - QM - 4.1, Organization, and CQST - QM - 5.2, Personnel in the Quality Manual specify in detail the competence, qualification and working standards for the personnel. Training is also covered. Every year, the training plan is set down and carried out.

A record signed on 20 June 2005 lists the various test activities covered by CQST and the personnel authorised to do those activities.

The storage area for test items was viewed. This contained all the items that had completed test. Each was clearly identified with labels, one for receipt, and one for under test and one for completed. All with different colours. The complete samples were stored in a lockable room. Other samples under test in the large motor testing area were kept under covers for confidentiality and protection.

# 4. TEST METHODS

## 4.1 Procedures

CQST has a well-defined procedure in CQST-QP-23 for Procedure(s) for Testing at Site. This covers critical aspects such as appropriateness, number of people to be involved, calibration, use of CQST instruments for critical measurements, control of the process by CQST etc.

In addition it has documented its test methods, generally in documents called operation instructions.

#### 4.2 Staff Work Instructions

CQST has operation instructions (work instructions) for the technical work. These are listed separately to the Quality Manual in CQST-ZD001-2004. This currently lists 63 operation instructions. Samples of these were reviewed and found to be satisfactory for the Chinese standards for which they were written.

It was noted when reviewing the operation instruction for impact testing that it was to the Chinese standard which was an adoption of IEC 60079-0 3<sup>rd</sup> edition.

A number of practical test methods were examined as part of the assessment process, including temperature rise testing of a luminaire and Ex e motor, 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

Statistics for the years of 2003 and 2004

Type of Protection	2003	2004
d	683	728
e	170	168
i	151	170
p	6	5
o	0	0
q	0	3
n	37	67
m	13	22
DIP	13	26

### 5.2 Test Records

CQST retain detailed test records on file. Requirements are covered in CQST - QM - 4.12: Control of Record and CQST - QP - 11: Procedure(s) for Control of Record. The records include the data derived and equipment used in derivation of the data.

## 6. CALIBRATION

CQST has all its equipment calibrated annually by an external laboratory with NCAL accreditation. All equipment checked had calibration that was current.

## 7. DOCUMENTATION

### 7.1 Quality Manual

CQST has a comprehensive manual addressing all the elements of ISO/IEC 17025. This is supported in three further levels by procedures, operation instructions, and records and forms.

### 7.2 Document Change Control

CQST -QM - 4.3, Document Control, in Quality Manual and CQST - QP - 03 Procedure, covers document change control. It is a paper based system with each document having an issue number and identifying whom it is issued to. There is a register that allows documents to be withdrawn and replaced when changes occur. All documents reviewed

appeared to be controlled and in compliance with the CQST procedure. A similar approach is used for IECEx Scheme documents. They have a person dedicated to the purpose of collecting IEC standards and IECEx information. They also receive notification of new or changed documents from CQM.

They hold a comprehensive set of the relevant set of IEC standards and IECEx Scheme documents. In many instances these have also been translated into Chinese.

## **8. CONFIDENTIALITY**

CQST-QP-01 deals with protecting client confidentiality. In addition each member of staff signs confidentiality agreements. The signed agreements were sighted.

## **9. NATIONAL ACCREDITATION**

CQST holds current accreditation from NCAL, Certificate of Accreditation No.L0510 for the range of standards covered in this application. See Annexes B and C. The last surveillance visit by CNAL was in July 2004 and the next surveillance visit is scheduled for December 2005. Re- assessment occurs every 5 years.

## **10. RECOGNITION AND AGREEMENTS**

CQST has signed agreements on mutual acceptance of the test results with many international certification bodies, such as PTB, NEMKO, TestSafe, LCIE, UL, FMRC and CCVE.

CQST is also:

- 1) the testing laboratory for marine Ex protects accredited by China Classification Society (CCS);
- 2) the certificate testing laboratory for medium- and small-sized energy-saving three phase induction motors authorized by China Standard Certification Center (CSC).
- 3) an accredited NVLAP test lab (NVLAP lab code: 200609-0 – a US program).

## **11. INTERNAL AUDIT AND PERIODIC REVIEW**

Internal audit is covered by procedure CQST-QP-12. It specifies that audits shall take place once to twice a year. There is a plan for the audits that covers all the main requirements of ISO/IEC17025 and each of the areas of CQST. A summary is produced of the audits indicating where the need for corrective action has been identified. An example report of an audit on 10 April 2005 was sighted, showing 6 non-conformities. Corrective actions were raised for these and completed. The system appears to be systematic and comprehensive.

Management review is covered in procedure CQST-QP-13. The review is presided over by the Director. An example was seen of a review on 22 February 2005 for the year 2004. The records included reports to meeting, minutes and a report documenting the outcomes.

## **12. COMPLAINTS MECHANISM**

CQST-QP-07 is the procedure for complaints. An example was viewed where a complaint had been received, documented and dealt with.

## **13. SPECIAL FACTS TO BE NOTED**

There are two people accredited by CQM to act on their behalf. These are Wu Jianguo and Mu Dayu.



## **14. COMMENTS**

There were some findings from the assessment that required attention, regarding dust and water testing, review of procedures, and calibration of pressure transducers. These were subsequently resolved. The IECEx Scheme Secretariat, together with other supporting information from the assessment, holds full details.

## **RECOMMENDATION**

Based on the initial assessment performed during 4 to 5 July 2005 CQST 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**

**ANNEX B: CNAL accreditation certificate**

**ANNEX C: Accredited scope of facilities**

Jim Munro  
Lead Assessor

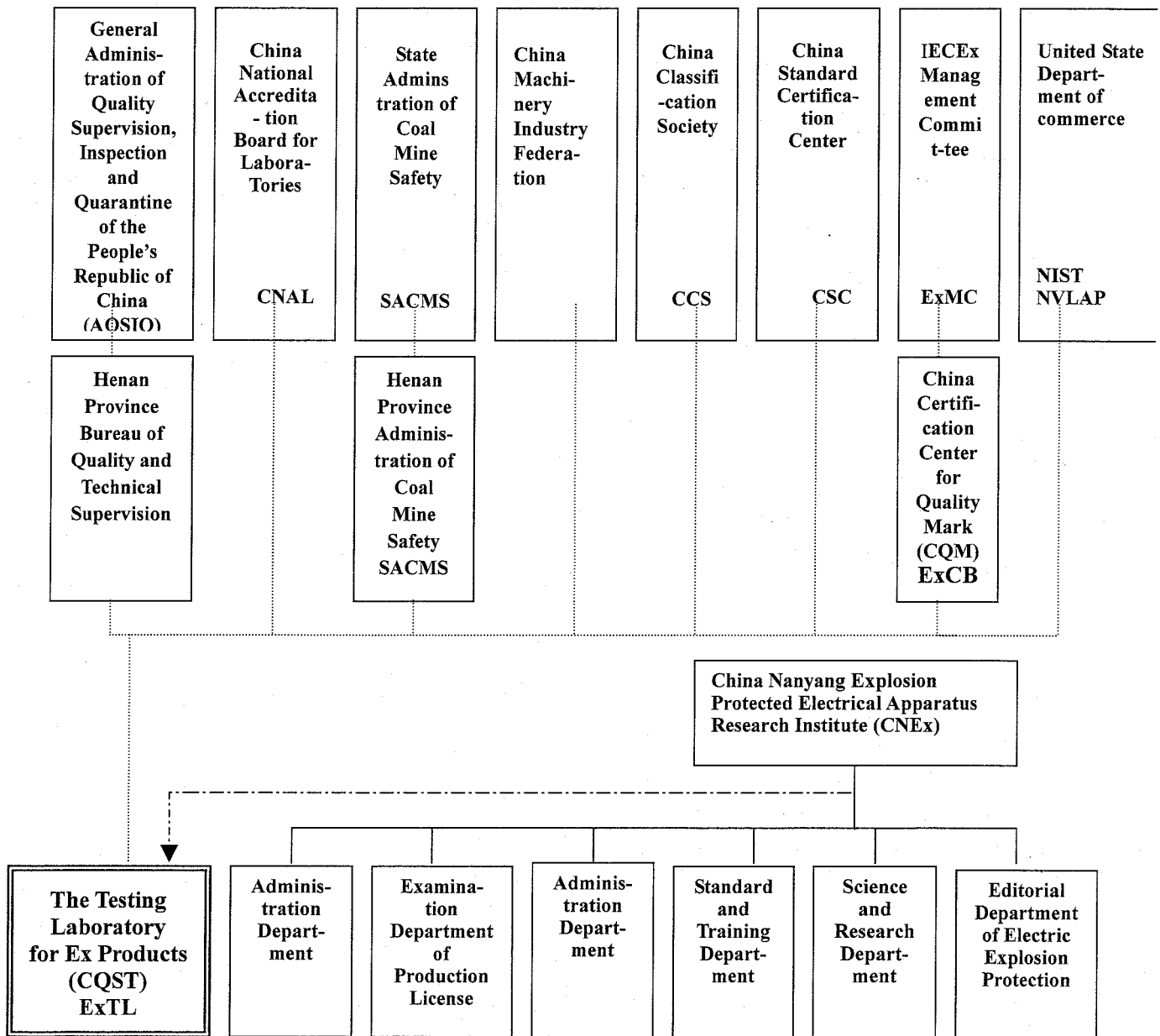
Heinz Berger  
Assessor

Michel Brénon  
Assessor

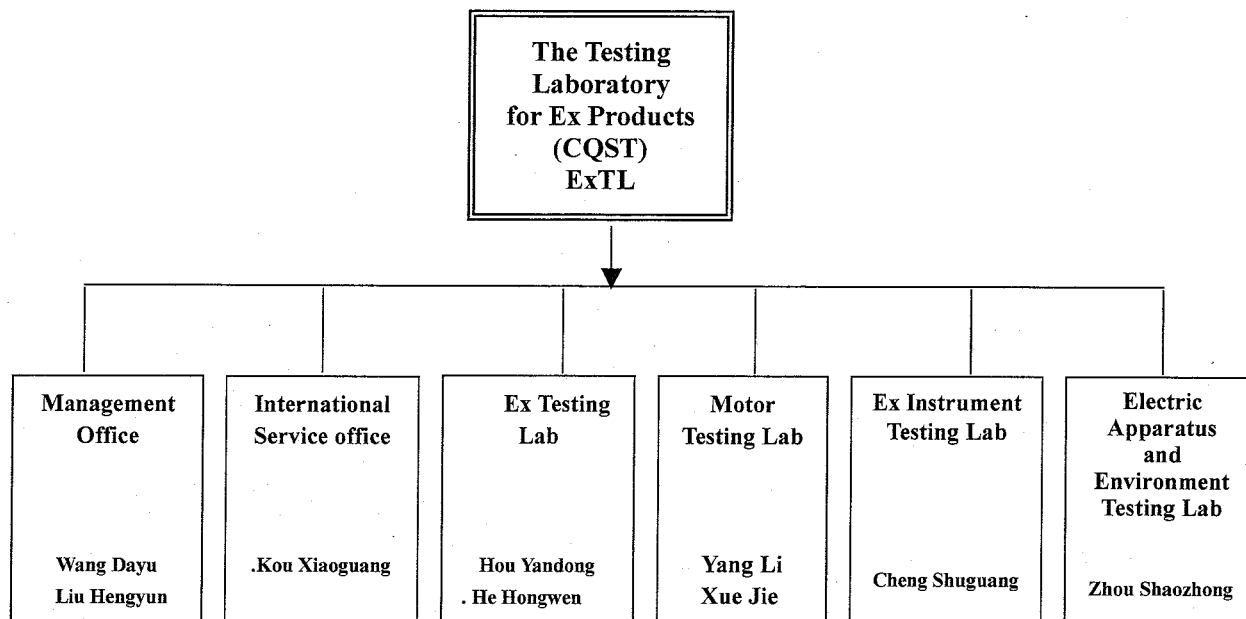
30 August 2005

## Annex A

### Framework of External Organization of the Testing Laboratory

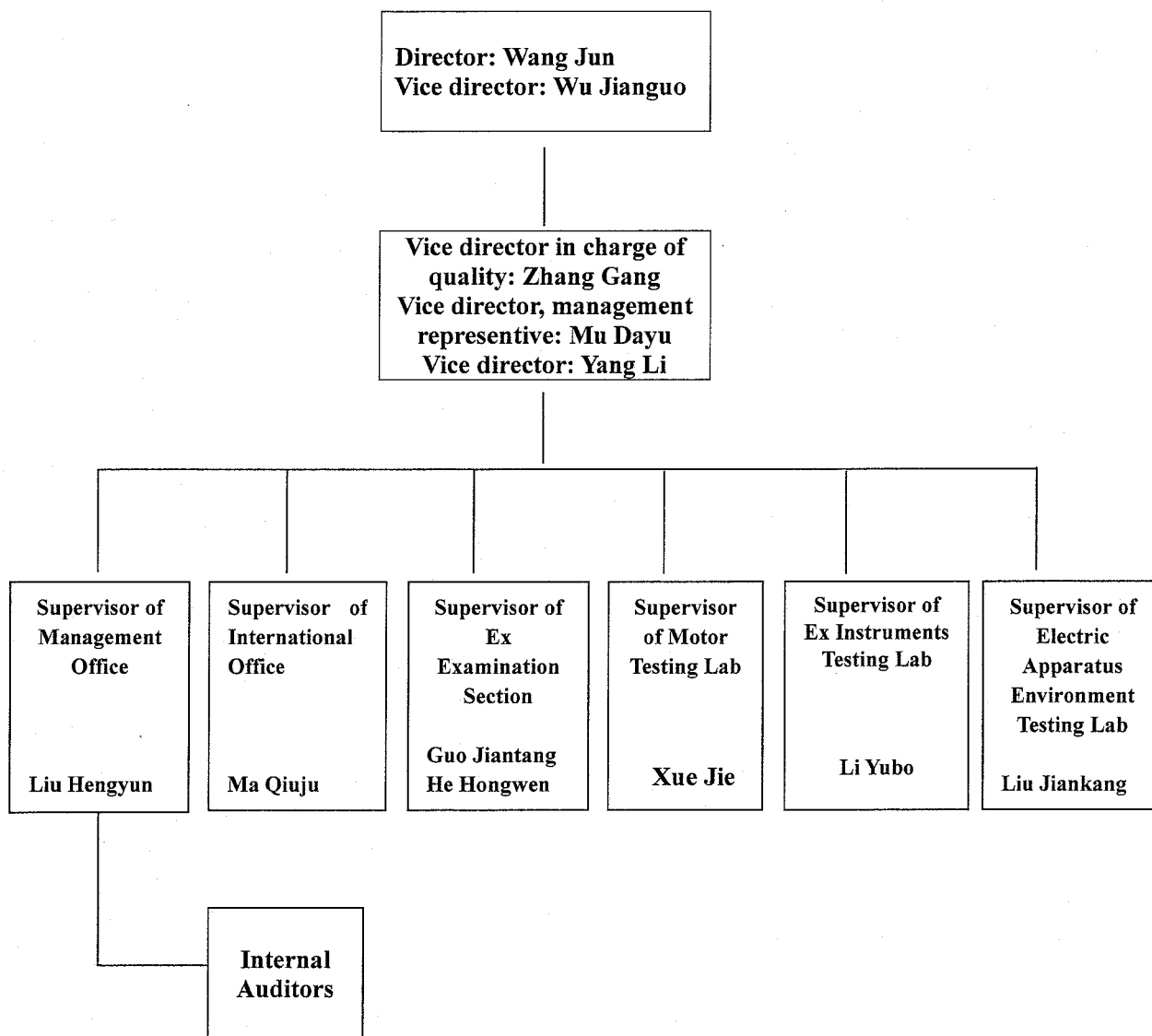


## Framework of Internal Organization of the Testing Laboratory



- \_\_\_\_\_ Administration and profession control
- ..... Profession control
- Administration control, but independent relatively on testing business and financial affairs

## Quality Supervision Diagram of the Testing Laboratory





**ACCREDITATION CERTIFICATE  
OF CHINA NATIONAL ACCREDITATION BOARD  
FOR LABORATORIES  
(No.L0510 )**

This is to certify that

**Nanyang Lab. of Testing Explosion Protected Electrical  
Products(China National Quality Supervision and Test Center  
for Explosion Protected Electrical Products)**

No.20, North Zhongjing Road, Nanyang, Henan, P.R.China

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: 2003.06.18

Date of Expiry: 2008.06.17

*Wei Hao*

Secretary General of CNAL

## ANNEX C

### LIST OF ACCREDITED TESTING SCOPE

№	Products materials, type of activity	Items, parameter, types of tests		Code of field	Name Code of Specification, standard or method used	Restriction or limitation and others
		№	Name			
1	Electrical apparatus for explosive gas atmospheres	1.1	All items	1110.05	GB3836.1-2000 Electrical apparatus for explosive gas atmospheres Part 1: General requirements	
		1.2	All items	1110.05	IEC60079-0:1998 Electrical apparatus for explosive gas atmospheres Part 0: General requirements	
2	Electrical apparatus, type of protection "d"	2.1	All items	1110.05	GB3836.2-2000 Electrical apparatus for explosive gas atmospheres Part 2: type of protection "d"	
		2.2	All items	1110.05	IEC60079-1:1990 Electrical apparatus for explosive gas atmospheres Part 1: type of protection "d"	
3	Electrical apparatus, type of protection "e"	3.1	All items	1110.05	GB3836.3-2000 Electrical apparatus for explosive gas atmospheres Part 3: Increased safety "e"	
		3.2	All items	1110.05	IEC60079-7:1990 Electrical apparatus for explosive gas atmospheres Part 3: Increased safety "e"	
4	Electrical apparatus, type of protection "i"	4.1	All items	1110.05	GB3836.4-2000 Electrical apparatus for explosive gas atmospheres Part 4: Intrinsic safety "i"	
		4.2	All items	1110.05	IEC60079-11:1999 Electrical apparatus for explosive gas atmospheres Part 11: Intrinsic safety "i"	

№	Products□materials, type of activity	Items, parameter, types of tests		Code of field	Name□ Code of Specification, standard or method used	Restriction or limitation and others
		№	Name			
5	Electrical apparatus, type of protection “p”	5.1	All items	1110.05	GB3836.5-1987 Electrical apparatus for explosive gas atmospheres Type of protection “p”	
		5.2	All items	1110.05	IEC60079-13:2001 Electrical apparatus for explosive gas atmospheres Part 13: Construction and use of rooms or buildings protected by pressurization	
6	Electrical apparatus, type of protection “o”	6.1	All items	1110.05	GB3836.6-1987 Electrical apparatus for explosive gas atmospheres Oil-immersion “o”	
		6.2	All items	1110.05	IEC60079-6: 1995 Electrical apparatus for explosive gas atmospheres Part 6: Oil-immersion “o”	
7	Electrical apparatus, type of protection “q”	7.1	All items	1110.05	GB3836.7-1987 Electrical apparatus for explosive gas atmospheres Powder filling “q”	
		7.2	All items	1110.05	IEC60079-5: 1995 Electrical apparatus for explosive gas atmospheres Part 5: Powder filling “q”	
8	Electrical apparatus, type of protection “n”	8.1	All items	1110.05	GB3836.8-2003 Electrical apparatus for explosive gas atmospheres type of protection “n”	
		8.2	All items	1110.05	IEC60079-15: 2001 Electrical apparatus for explosive gas atmospheres Part 15: type of protection “n”	

№	Products□materials, type of activity	Items, parameter, types of tests		Code of field	Name□ Code of Specification, standard or method used	Restriction or limitation and others
		№	Name			
9	Electrical apparatus, tape of protection “m”	9.1	All items	1110.05	GB3836.9-1990 Electrical apparatus for explosive gas atmospheres Encapsulation “m”	
9	Electrical apparatus, tape of protection “m”	9.2	All items	1110.05	IEC60079-18: 1992 Electrical apparatus for explosive gas atmospheres Part 18: Encapsulation “m”	
10	Electrical apparatus for use in the presence of combustible dust	11.1	All items	1110.05	GB12476.1-2000 Electrical apparatus for use in the presence of combustible dust Part 1: Electrical apparatus protected by enclosures and limited surface temperature	
		11.2	All items	1110.05	IEC61241-1-1: 1999 Electrical apparatus for use in the presence of combustible dust Part 1-1-1: Electrical apparatus protected by enclosures and limited surface temperature---- Technical requirements for electrical equipment	