ExMC/706/R
August 2011

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

Title: Re-assessment Report for the continued acceptance of *Shanghai Inspection and Testing Institute of Instruments and Automatic Systems (SITIIAS) / National Supervision and Inspection Centre for Explosion Protection and Safety of Instrumentation (NEPSI)* as an Accepted Test Laboratory (ExTL).

To: Members of the IECEx Management Committee, ExMC

Introduction

In accordance with the 5 year re-assessment plan for the surveillance and monitoring of bodies within the IECEx System, this document contains the IECEx Re-assessment Report for *Shanghai Inspection and Testing Institute of Instruments and Automatic Systems (SITIIAS) / National Supervision and Inspection Centre for Explosion Protection and Safety of Instrumentation (NEPSI)* as an Accepted ExTL.

This Report is issued for endorsement during the 2011 ExMC Split Meeting.

Chris Agius

IECEx Secretariat

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Secretariat

IECEx ASSESSMENT REPORT for

Shanghai Inspection and Testing Institute of Instruments and Automatic Systems (SITIIAS) / National Supervision and Inspection Centre for Explosion Protection and Safety of Instrumentation (NEPSI

ExTL
(IECEx Test Laboratory)

Type of Assessment: (please mark)

Initial assessment for Candidate ExTL

Re-Assessment of ExTL X

Scope Extension of ExTL X

1. OBJECT AND FIELD OF APPLICATION

1.1. *Country:*

People's Republic of China

1.2. *Name of Candidate TL*

Shanghai Inspection and Testing Institute of Instruments and Automatic Systems (SITIIAS)

National Supervision and Inspection Centre for Explosion Protection and Safety of Instrumentation (NEPSI)
103 Cao Bao Road, Shanghai 200233, PEOPLE'S REPUBLIC OF CHINA

1.3. Members of the Assessment Team

Heinz Berger - IECEx Officer - IECEx Lead Assessor
Ajay Maira - IECEx Expert Assessor

1.4. *Place and Date of Assessment*

Shanghai Inspection and Testing Institute of Instruments and Automatic Systems (SITIIAS)

National Supervision and Inspection Centre for Explosion Protection and Safety of Instrumentation (NEPSI)
103 Cao Bao Road, Shanghai 200233, P.R. of China

October 11th – 12th, 2010

1.5. *Assessment References*

i) IECEx 02 (current version)
ii) IECEx OD/003 (current version)
iii) IECEx OD/009 (current version)
iv) IECEx OD/18 (current version)
v) ISO/IEC 17025:2005
vi) IECEx Technical Guidance Documents (TGDs)
vii) ExTAG decision sheets (DSs)
viii) ExTL scope extension application documents of July 20th, 2010

1.6. Scope of Application

Standard	Title	Acceptance
60079-0 Edition5.0	Explosive atmospheres - Part 0: Equipment - General requirements	YES
60079-1 Edition6.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures 'd'	YES
60079-2 Edition5.0	Explosive atmospheres - Part 2: Equipment protection by pressurized enclosures 'p'	YES
60079-5 Edition3.0	Explosive atmospheres - Part 5: Equipment protection by powder filling 'q'	YES
60079-6 Edition3.0	Explosive atmospheres - Part 6: Equipment protection by oil immersion 'o'	YES
60079-7 Edition4.0	Explosive atmospheres - Part 7: Equipment protection by increased safety 'e'	YES
60079-11 Edition5.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety 'i'	YES
TR 60079-13 Edition1.0	Construction and use of rooms or buildings protected by pressurization Part 13	YES
60079-15 Edition4.0	Explosive atmospheres - Part 15: Equipment protection by type of protection 'n'	YES
TR 60079-16 Edition1.0	Artificial ventilation for the protection of analyzer(s) houses Part 16	YES
60079-18	Electrical apparatus for explosive gas atmospheres -	YES

Edition3.0	Part 18: Construction, test and marking of type of protection encapsulation 'm' electrical apparatus	
60079-25 Edition2.0	Explosive atmospheres - Part 25: Intrinsically safe systems	YES
60079-26 Edition2.0	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga	YES
60079-27 Edition2.0	Explosive atmospheres - Part 27: Fieldbus intrinsically safe concept (FISCO)	YES
60079-28 Edition1.0	Explosive atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation	YES Scope extension
60079-30-1 Edition1.0	Explosive atmosphere - Part 30-1: Electrical resistance trace heating - General and testing requirements	YES
60079-31 Edition1.0	Explosive atmosphere - Part 31: Equipment dust ignition protection by enclosure "t"	YES
61241-0 Edition1.0	Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements	YES
61241-1 Edition1.0	Electrical apparatus for use in the presence of combustible dust - Part 1: Protection by enclosures 'tD'	YES
61241-4 Edition1.0	Electrical apparatus for use in the presence of combustible dust - Part 4: Type of protection 'pD'	YES
61241-11 Edition1.0	Electrical apparatus for use in the presence of combustible dust - Part 11: Protection by intrinsic safety 'iD'	YES
61241-18 Edition1.0	Electrical apparatus for use in the presence of combustible dust - Part 18: Protection by encapsulation 'mD'	YES
62086-1 Edition1.0	Electrical apparatus for explosive gas atmospheres – Electrical resistance trace heating – Part 1: General and testing requirements	YES

1.7. *Candidate TL Persons Interviewed*

Name	Position
Xu Jianping	President of SITIIAS, Director of NEPSI
Lu Qiao	International Bussines Manager
Yao Zhihong	Quality Manager
Yang Deshuang	Head of Flameproof Lab.
Huang Yongwei	Head of IS Lab.
Hu Honghui	Head of Business Department
Zhao Hong	Engineer
Xu Junjun	Technician
Wang Yueming	Senior Technician
Li Hangchuan	Engineer
Jiang Xuqiang	Engineer
Xin Leifu	Engineer
Yao Beixin	Assistant Engineer

1.8. Legal Entity of The Candidate TL

SITIIAS is a state-owned enterprise with the status of an independent legal entity, providing services of calibration, verification, testing, certification and standardization for the relevant electrical apparatus, including instruments, luminaries, electrical motors etc.

Their registration number is 310104000265243 and is valid with no time limitation. This document was issued on July 10th, 2008.

National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation (Abbr. NEPSI) is one part of the SITIIAS, especially in the field of explosion protection.

The address at which it carries out its operations is at
103, Cao Bao Road, Shanghai, 200233, P. R. of China

1.9. *Associated ExCB*

China Quality Mark Certification Group Co., Ltd, (CQM), No.33 Zengguang Road, Haidian District, Beijing, Postal Code: 100048, P.R. China

Dr. Chen Quan, Vice General Manager of CQM was attending the re-assessment at NEPSI for the two days.

1.10. *Financial Support*

All the assets at SITIIAS remain the property of the Government, and its operation is financed from its services of testing, verification, inspection, national certification and standardization work. Sometimes they can get investment from local or central government in order to support research work.

1.11. History

The mother organization, SIPAI was founded in 1956. Initially SITIIAS was established for environmental testing, with about 50 years of history. In the 1980s it was nominated as the testing centre for process automation instrumentation, calibration and reliability. Testing of Ex equipment was initiated in 1979 and completed in 1985. In 1986, NEPSI was approved and authorized by the former Ministry of Labor. It was accredited to Guide 25 in 1987 and subsequently to ISO/IEC 17025 since 1999. SITIIAS was registered independently as legal enterprise in 2003. In 2004 it was accredited to ISO/IEC17020.

2. ORGANISATION

2.1. Names, Titles and Experience of the Senior Executives

Name	Title	Experience
Xu Jianping	President of SITIIAS Director of NEPSI	26 years at SITIIAS and in Ex field
Guo Aihua	Deputy President of SITIIAS Technical Manager General	12 years at SITIIAS, 3 years in current position
Yao Zhihong	Quality Manager	26 years at SITIIAS, 10 years in current position
Lu Qiao	International Business Manager	12 years in Ex field
Ge Qing	Deputy Director of NEPSI	27 years at SITIIAS, 20 years in Ex field
Yang Deshuang	Head of flameproof Lab.	13 years in Ex field
Huang Yongwei	Head of IS Lab.	19 years in Ex field

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

Name	Title	Experience
Yao Zhihong	Quality Manager	26 years at SITIIAS, 10 years in current position
Guo Aihua	Deputy Quality Manager	12 years at SITIIAS, 3 years in current position

2.3. Name and Title of Nominated Principal Contact

Name	Title	Comments
Xu Jianping	President of SITIIAS Director of NEPSI	xujianping@nepsi.org.cn Tel: +86 21 64516349 Fax: +86 21 64844580

2.4. Employees

Name	Title	Experience
Xu Jianping	President of SITIIAS Director of NEPSI	26 years at SITIIAS and in Ex field
Guo Aihua	Deputy President of SITIIAS Technical Manager General	12 years at SITIIAS, 3 years in current position
Yao Zhihong	Quality Manager	26 years at SITIIAS, 10 years in current position
Lu Qiao	International Business Manager	12 years in Ex field
Ge Qing	Deputy Director of NEPSI	27 years at SITIIAS, 20 years in Ex field

Yang Deshuang	Head of flameproof Lab.	13 years in Ex field
Huang Yongwei	Head of IS Lab.	19 years in Ex field
Hu Jie	Engineer	9 years in Ex field
Zhao Hong	Engineer	7 years in Ex field
Jin Zhaohui	Engineer	7 years in Ex field
Jiang Xuqiang	Engineer	5 years in Ex field
Li Hangchuan	Engineer	5 years in Ex field
Xin Leifu	Engineer	4 years in Ex field
Shi Lei	Engineer	3 years in Ex field
Yao Beixin	Assistant Engineer	2 years in Ex field
Xu Junjun	Technician	7 years in Ex field
Wang Yueming	Senior technician	7 years in Ex field

2.5. Organizational Structure

See ANNEX 1a and ANNEX 1b.

3. RESOURCES

The laboratory is well resourced with experienced staffs, good facilities and comprehensive procedures.

SITIIAS/NEPSI employs about 70 people in total, in which 17 personnel professionally working on testing and assessment of electrical equipment used for explosive atmospheres, and all the rest, mainly working for the tests of climate, vibration, electric safety, and the evaluation of reliability and functional safety. Parts of those support the testing of NEPSI, for example, thermal endurance test, IP test and vibration tests etc.

The main procedure for training is SITIIAS-G02-019 ”Procedure for personnel training”. This procedure lists the steps for personnel to be trained and judged as competent in activities. They also have procedures for how staff is judged for their competencies, including who can make those decision. There are lists with signatures showing the relevant competencies. Finally there is a skills matrix covering the various techniques broken in performing tests, checking design drawings and documents, serving as a project manager, and verifying reports/certificates. These cover each professional / technical member of staff.

Test equipment and environment requirements are covered under SITIIAS-G02-02 ”Procedure for Equipment Control”. It covers the whole IECEx scope of standards. However, for certain clauses subcontracting is used (see ExCB report of CQM).

4. DOCUMENTATION

4.1. Quality Manual

The SITIIAS Quality System consists of three levels. Level 1 is the Quality Manual, also valid for NEPSI. The second level concerns the procedures and the third level the work instructions.

SITIIAS/NEPSI has a comprehensive Quality Manual, SITIIAS-G01-001 Rev. C which includes reference to IECEx documentation.

In addition to the main quality manual a quality manual for IECEx operation exists under the number SITIIAS-G02-034. It describes the co-operation with ExCB (CQM) and the testing activities under the IECEx Scheme.

4.2. Procedures

There are 40 procedures relevant to the laboratory.

Test methods and procedures are generally covered in SITIIAS -G02-023 ”Control of Test and Calibration Methods”.

The requirements for the testing environment is specified in SITIIAS-G02-020 “Procedure for the Control of Facilities and Environmental Conditions”

Control of access to the assessment and testing areas is covered in SITIIAS-G02-021” Procedure for Internal Management”.

SITIIAS-G02-014 ”Procedure for the Control of Non-conforming Testing and /or Calibration Work” covers the system for detecting deficiencies in assessment and testing and their causes, and for correcting unfavourable trends.

Handling and storage of test samples is covered in SITIIAS-G02-028 ”Procedure for Sampling and Handling of Test and Calibration Items”.

The special requirements of IECEx operation is covered in SITIIAS-G02-034 "Type test procedure for certification of Ex electrical apparatus".

4.3. Work Instructions

There are 174 work instructions in SITIIAS / NEPSI, many of which are relevant to Ex testing. There 57 technical information sheets: these include the ExTAG decision sheets, special requirements of IECEx testing and some related to specific requirements for China. There are 124 equipment operation instructions.

4.4. Records

SITIIAS-G02-022 ”Working Program for Calibration and Testing” prescribes system for recording the method and results of assessment and testing activities. The procedure was checked and found to meet the IECEx requirements.

4.5. Document Change Control

There is prescribed system for documents control and procedure to change documents SITIIAS-G02-008 ”Procedure for document control”. The procedure was checked and found to meet the IECEx requirements.

4.6. Test Records

There is a prescribed system for recording the method and results of assessment and testing activities in SITIIAS-G02-022 ”Working Program for Calibration and Testing”. The procedure was checked and found to meet the IECEx requirements.

5. TEST REPORTS

5.1. Test Reports Issued

Number of **test reports** issued under the IECEx System and the national or regional schemes in the preceding four years for each type of protection:

Standards	Title	Number of issued test reports				
		2007	2008	2009	2010	Total
60079-0	Explosive atmospheres - Part 0: Equipment - General requirements	---	---	---	---	**Part 0 included in numbers below**
60079-1	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures 'd'	461	379	468	311	1619
60079-2	Explosive atmospheres - Part 2: Equipment protection by pressurized enclosures 'p'	10	1	15	5	31
60079-5	Explosive atmospheres - Part 5: Equipment protection by powder filling 'q'	2	4	5	1	12
60079-6	Explosive atmospheres - Part 6: Equipment protection by oil immersion 'o'	0	0	0	0	0
60079-7	Explosive atmospheres - Part 7: Equipment protection by increased safety 'e'	161	65	162	66	454

60079-11	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety 'i'	340	358	332	204	1234
TR 60079-13	Construction and use of rooms or buildings protected by pressurization Part 13	0	0	0	0	0
60079-15	Explosive atmospheres - Part 15: Equipment protection by type of protection 'n'	28	16	32	39	115
TR 60079-16	Artificial ventilation for the protection of analyzer(s) houses Part 16	0	0	0	0	0
60079-18	Electrical apparatus for explosive gas atmospheres - Part 18: Construction, test and marking of type of protection encapsulation 'm' electrical apparatus	57	32	48	9	146
60079-25	Explosive atmospheres - Part 25: Intrinsically safe systems	0	0	0	0	0
60079-26	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga	0	0	0	0	0
60079-27	Explosive atmospheres - Part 27: Fieldbus intrinsically safe concept (FISCO)	0	0	0	0	0
60079-28	Explosive atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation	0	0	0	0	0
60079-30-1	Explosiv atmosphere - Part 30-1: Electrical resistance trace heating - General and testing requirements	0	0	0	0	0
60079-31	Explosive atmosphere - Part 31: Equipment dust ignition protection by enclosure "t"	0	0	0	0	
61241-0	Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements	---	---	---	---	**Part 0 included in numbers below**
61241-1	Electrical apparatus for use in the presence of combustible dust - Part 1: Protection by enclosures 'tD'	0	0	0	0	0
61241-1-1	Electrical apparatus for use in the presence of combustible dust - Part 1: Electrical apparatus protected by enclosures and surface temperature limitation - Specification for apparatus	60	48	72	57	237
61241-4	Electrical apparatus for use in the presence of combustible dust - Part 4: Type of protection 'pD'	0	0	0	0	0

61241-11	Electrical apparatus for use in the presence of combustible dust - Part 11: Protection by intrinsic safety 'iD'	0	0	0	0	0
61241-18	Electrical apparatus for use in the presence of combustible dust - Part 18: Protection by encapsulation 'mD'	0	0	0	0	0
62086-1	Electrical apparatus for explosive gas atmospheres – Electrical resistance trace heating – Part 1: General and testing requirements	0	0	0	0	0

6. CALIBRATION

Documented procedures for calibrating all equipment and reference standards, which include method, periodicity, sealing after calibration are covered in SITIIAS-G02-026"Procedure for Equipment Control" and SITIIAS-G02-027 "Procedure for the Traceability of Measurement and Calibration of Measuring and Test Equipment", This last procedure also covers traceability to national or international standards of measurement. The procedure and several calibration certificates were checked and found to meet the IECEx requirements.

SITIIAS/NEPSI operates a comprehensive and accredited calibration laboratory.

7. CONFIDENTIALITY

Confidentiality is covered in SITIIAS-G02-00 "Procedure for the Protecting of Confidentiality and Proprietary Rights". All staffs have signed regarding impartiality, honesty and confidentiality of their work. During the assessment, the list with the signatures was checked. It was found to meet the IECEx requirements.

8. NATIONAL ACCREDITATION

STIIAS/NEPSI is accredited by the China National Accreditation Service for Conformity Assessment (CNAS), No L0130 to ISO/IEC 17025, valid from 8 Feb. 2010 to 7 Feb. 2013. See Annex 2. The accredited scope covers the range of activities covered by this application, except 60079-28. This accreditation is scheduled for the end of 2010. In case NEPSI is not in the position to present the accreditation for this standard within a one year period, an annual surveillance visit will take place.

Secretariat

9. RECOGNITION AND AGREEMENTS

SITIIAS/NEPSI has cooperation agreement with many Ex bodies. For example, FM, PTB, LCIE, KTL, KOSHA, TUV NORD, TIIS, LOM, DEKRA, SIRA, INERIS, BASEEFA, KGS, NANIO CCVE, KEMA, TestSafe and KEMA.

10. INTERNAL AUDIT AND PERIODIC REVIEW

Internal audit is covered by SITIIAS-G02-017 ”Procedure for Internal Audits of Quality System”. A specific Internal audit concerning IECEx is done at least once a year by the Quality Manager and other internal auditors. All audit records are retained. The last audit was conducted in September 2010. The internal audit plan for 2010 was checked as well as the results. They were found to meet the IECEx requirements.

The last management review took place on January 18, 2010. The meeting was attended by senior members of the organization. An agenda was forwarded to members beforehand and minutes of the meeting were issued. The latest minutes were discussed and found to meet the IECEx requirements.

11. COMPLAINTS AND APPEALS (Including appeals to IECEx)

Customer complaints are in procedure SITIIAS-G02-013. This includes the process that would be used if the complaint resulted in the need for retesting.
A survey is also made of customers each year, seeking their feedback. The form is available to customers on the website. The results are scored and an average calculated to rate the service. From the survey in the first three quarters of 2010 the rating was 98.52%. No complaint about IECEx testing was found in the past 5 years.

12. SPECIAL FACTS TO BE NOTED

12.1.1. ***Supporting Documentation***
Copies of additional supporting information for this assessment have been provided to the audited organization and the IECEx Secretariat. These include:

- On-Site Assessment report (IECEx OD/006)
- Details of issues raised and how these have been resolved
- Checklist for ISO/IEC 17025
- Completed technical guidance notes (TGDs)
- Reports and pictures from the technical assessment

12.1.2. Tests Witnessed

Witnessed tests included:

Standard: IEC 60079-0 General Requirements	
Clause 26.4.5	Degree of protection (IP) by enclosures – Dust ingress IPX2 and IPX3
Clause 26.4.5	Degree of protection (IP) by enclosures – Water ingress IPX4
Clause 26.4.5	Degree of protection (IP) by enclosures – Water ingress IPX5 and IPX6
Clause 26.8	Thermal endurance to heat
Clause 26.4.2	Resistance to impact
Clause 26.5.1.3	Maximum surface temperature
Clause 26.13	Surface resistance test of non-metallic enclosures

Standard: IEC 60079-1 Flameproof enclosures 'd'	
Clause 15.1.2 And 15.2	Determination of explosion pressure (reference pressure) And Test for non-transmission of an internal ignition
Clause 15.1.3	Overpressure test

Standard: IEC 60079-11 Intrinsic Safety	
Clause 10.1	Spark ignition test
Clause 10.5.3	Surface temperature of cells and batteries

Standard: IEC 60079-28 Protection of equipment and transmission systems using optical radiation	
Clause 5.2.2	Measurement of continuous wave radiation
Clause 5.2.3	Measurement of pulsed radiation

13. COMMENTS (Including issues found during assessment)

The representative of the ExCB (CQM), Dr. Chen Quan, was present throughout the assessment.
During the assessment, one non-conformance was found in the area of intrinsic safety. This was latter resolved and found to satisfy IECEx requirements.
There was no impact to

14. RECOMMENDATION

Based on the re- and scope extension assessment performed from 11th to 12th October 2010, the testing laboratory of NEPSI is recommended for continued acceptance in the IECEx scheme as an IECEx Testing Laboratory (ExTL) according to the scope of the standards listed in this document including the extension of scope.

Lead Assessor	Expert Assessor
Heinz Berger	Ajay Maira

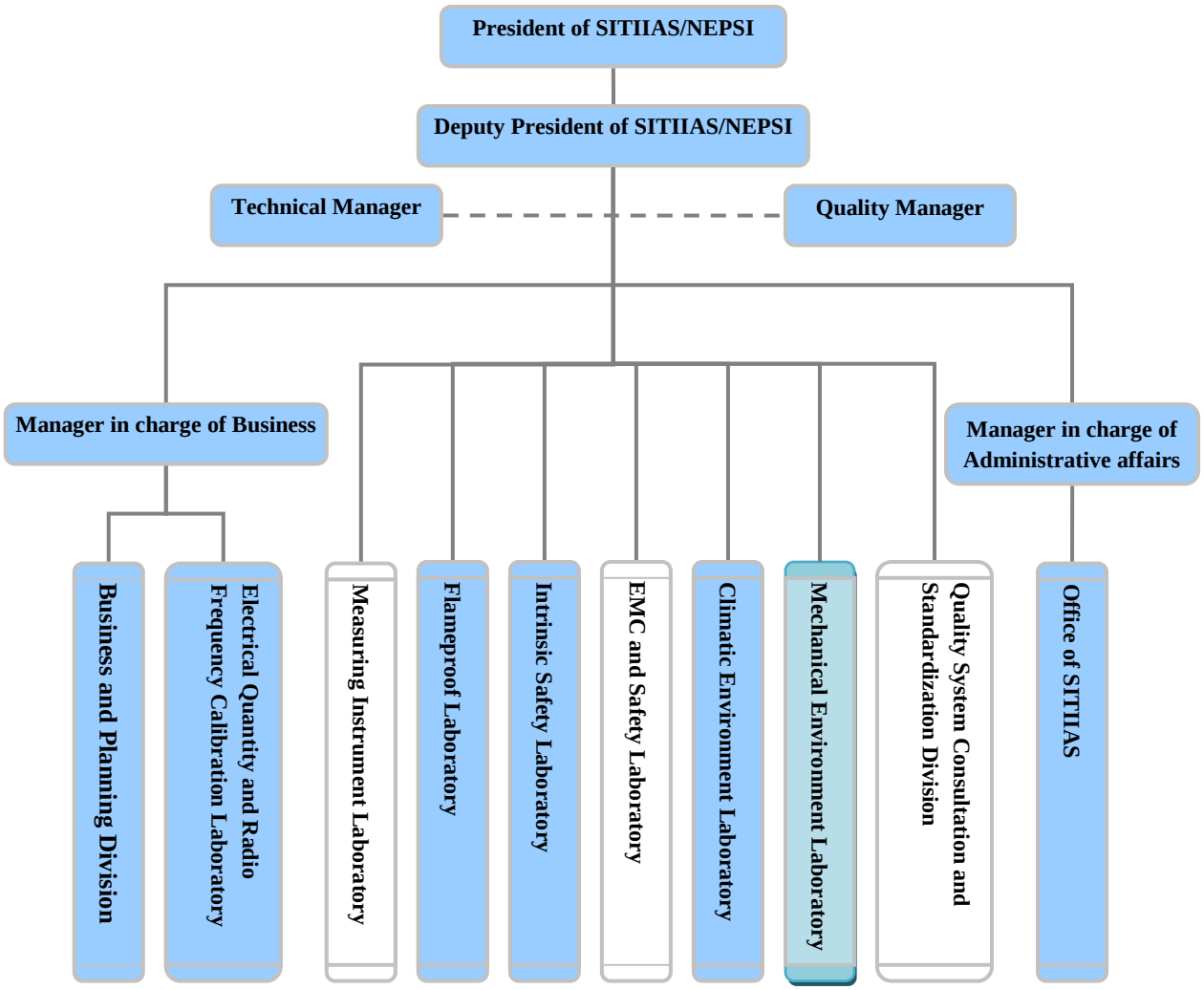
Date: October 12th, 2010

List of Annexes:

Annex 1a: Overall Organization Chart of SITIIAS / NEPSI
Annex 1b: Organization Chart of ExTL
Annex 2: Accreditation Certificate for the ExTL from CNAS for ISO/IEC 17025
Annex 3: List of subcontracted tests

ANNEX 1a: Overall organization Chart of

Structure and relation of SITIIAS/NEPSI



Subordinate relation — — — — **Supporting relation**

Note: those in blue are parts of NEPSI.

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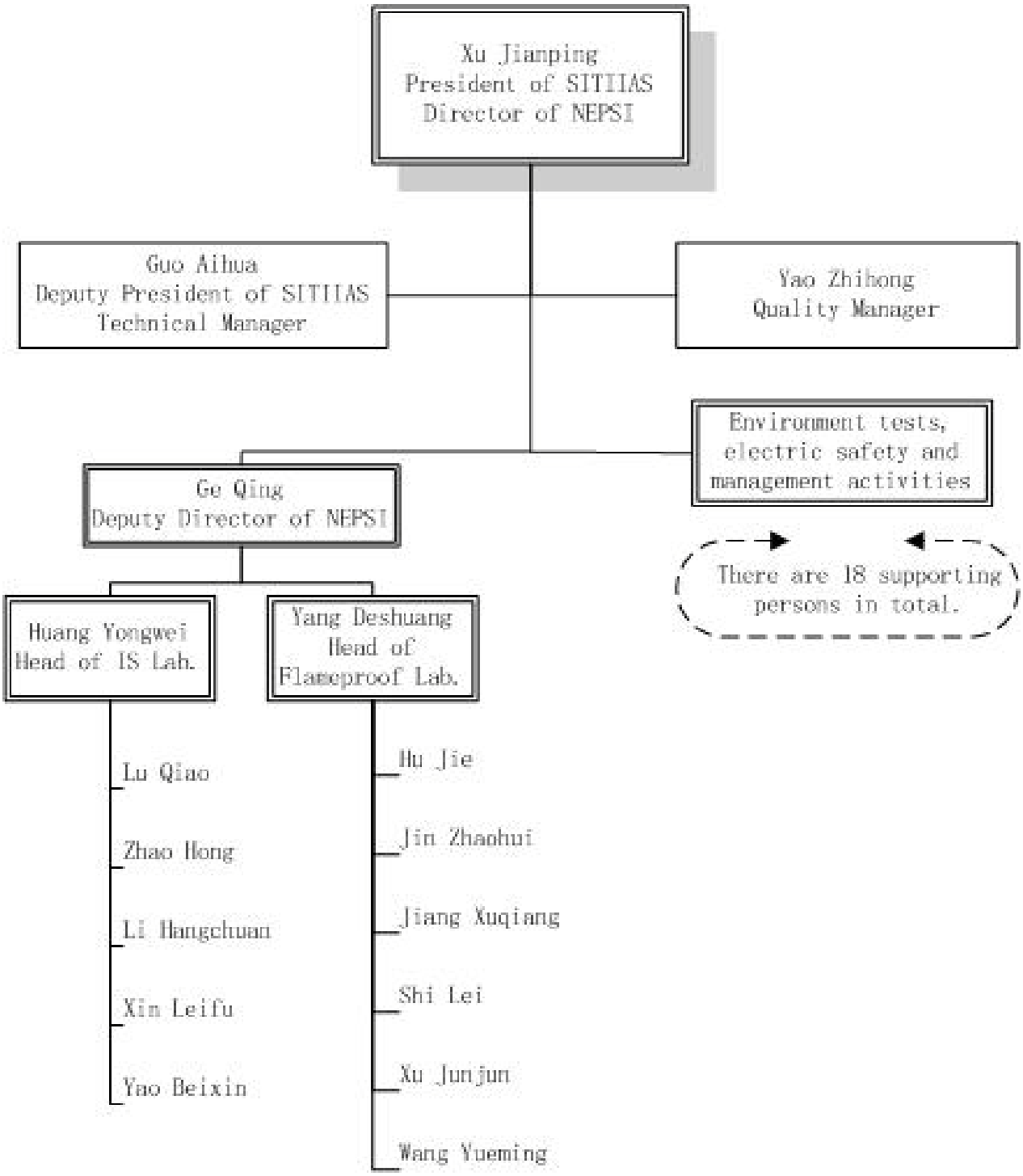
ANNEX 1b: Organization Chart of the ExTL



Annex 2: Accreditation Certificate according to ISO/IEC 17025

China National Accreditation Service for Conformity Assessment

LABORATORY ACCREDITATION CERTIFICATE

(No. CNAS L0130)

China National Accreditation Service for Conformity Assessment has accredited

Shanghai Inspection and Testing Institute of

Instruments and Automatic Systems(SITIIAS)

No.103, Caobao Road, Shanghai, China

to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing and calibration.

The scope of accreditation is detailed in the attached schedule bearing the same accreditation number as above. The schedule forms an integral part of this certificate.

Date of Issue: 2010-02-08

Date of Expiry: 2013-02-07

Date of Initial Accreditation: 2000-12-12

Signed on behalf of China National Accreditation Service for Conformity Assessment

China National Accreditation Service for Conformity Assessment(CNAS) is authorized by Certification and Accreditation Administration of the People's Republic of China (CNCA) to operate the national accreditation system for conformity assessment. CNAS is the signatory to International Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (ILAC MRA), and the signatory to Asia Pacific Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (APLAC MRA).

Annex 3: List of subcontracted tests

List of Subcontractors for IECEx Activities; NEPSI, P.R. of China

Annex E

Number	Name of subcontractor	Address of subcontractor	Standard(s)	Clause(s) under subcontract	Accreditation Information	Date and validity of accreditation
1			IEC 60079-0:2007 IEC 61241-0	26.10 23.4.6.5 (resistance to ligth)		
2			IEC 60079-0:2004	A.3.3 (aging test of sealing ring)		
3			IEC 60079-7:2007 IEC 60079-15:2010	4.4 6.4 (CTI testing)		

Note: (if any)