



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

**Circulation to: Ex Management Committee, ExMC**

**TITLE: IECEx Re-Assessment Report for the continued acceptance of SP Technical  
Research Institute of Sweden as an Accepted ExTL in the IECEx System and an  
extension of scope.**

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**INTRODUCTION**

This document contains the IECEx scheduled 5 year Re-assessment Report for, SP Technical Research Institute of Sweden an Accepted IECEx Test Laboratory (ExTL). During the re-assessment visit an assessment for an extension of scope was also carried out.

ExMC Members are asked to consider SP Technical Research Institute of Sweden's request for an extension of scope to include IEC 60079-28 as identified in 1.6 of this report.

Please complete and return the completed voting form to the Secretariat by  
**2010 08 06**

Your speedy response to the voting process will be very much appreciated.

*Chris Agius*

**IECEx Secretariat**

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# **IECEX ASSESSMENT REPORT FOR SP, BORAS, SWEDEN IECEX TEST LABORATORY (EXTL)**

**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:**

Sweden

### **1.2. Name of Candidate TL**

SP Technical Research Institute of Sweden

### **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**

SP Technical Research Institute of Sweden  
Box 857  
501 15 Boras  
Sweden  
October 1 - 2, 2009

### **1.5. Assessment References**

- i) IECEx 02 Third Edition 2006-11 IECEx Equipment Certification Program Rules of Procedure
- ii) IECEx Operational Document OD 003 V1 IECEx Assessment procedures
- iii) IECEx Operational Document OD 009 Issuing of CoCs, ExTRs and QARs
- iv) ISO/IEC 17025
- v) IECEx Technical Guidance Documents (TGDs)
- vi) ExTAG decision sheets (DSs)
- vii) ExTL application documents dated 16.4.2009 and 21.4.2009

### 1.6. Scope of Application

Number	Title	Acceptance
60079-0 Edition 3.1 Edition 4 Edition 5	Explosive atmospheres - Part 0: Equipment - General requirements	OK
60079-1 Edition 3.2 Edition 4 Edition 5 Edition 6	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"	OK
60079-2 Edition 4 Edition 5	Explosive atmospheres - Part 2: Equipment protection by pressurized enclosure «p»	OK
60079-5 Edition 2 Edition 3	Explosive atmospheres - Part 5: Equipment protection by powder filling «q»	OK
60079-6 Edition 2 Edition 3	Explosive atmospheres - Part 6: Equipment protection by oil immersion «o»	OK
60079-7 Edition 3 Edition 4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"	OK
60079-11 Edition 4 Edition 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"	OK
60079-15 Edition 1 Edition 2 Edition 3	Electrical apparatus for explosive gas atmospheres - Part 15: Construction, test and marking of type of protection "n" electrical apparatus	OK
60079-18 Edition 1 Edition 2 Edition 3	Electrical apparatus for explosive gas atmospheres - Part 18: Construction, test and marking of type of protection encapsulation "m" electrical apparatus	OK
60079-25 Edition 1	Electrical apparatus for explosive gas atmospheres - Part 25: Intrinsically safe systems	OK
60079-26 Edition 1 Edition 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga	OK
60079-27 Edition 1 Edition 2	Electrical apparatus for explosive gas atmospheres - Part 27: Fieldbus intrinsically safe concept (FISCO) and Fieldbus non-incendive concept (FNICO)	OK
60079-28 Edition 1	<b>Scope extension</b> Explosive atmospheres -	OK

Number	Title	Acceptance
	Part 28: Protection of equipment and transmission systems using optical radiation <b>Restricted to covering "op is" according to 5.2.4 of 60079-28</b>	
60079-31 Edition 1	Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t"	OK
61241-0 Edition 1	Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements	OK
61241-1 Edition 1	Electrical apparatus for use in the presence of combustible dust - Part 1: Protection by enclosures 'tD'	OK
61241-1-1 Edition 2	Electrical apparatus for use in the presence of combustible dust - Part 1: Electrical apparatus protected by enclosures and surface temperature limitation - Specification for apparatus	OK
61241-4 Edition 1	Electrical apparatus for use in the presence of combustible dust Part 4: Protection by pressurized enclosures "pD"	OK
61241-11 Edition 1	Electrical apparatus for use in the presence of combustible dust – Part 11: Protection by intrinsic safety 'iD'	OK
61241-18 Edition 1	Electrical apparatus for use in the presence of combustible dust Part 18: Protection by encapsulation "mD"	OK

#### 1.7. Candidate TL Persons Interviewed

Name	Position
Anders Nilsson	Head of section Product Safety
Peter Bremer	Technical Officer
Lisbeth Pilgard	Quality Manager Electronics Department
Robert Carlsson	Technical Officer
Thomas Berg	Technical Officer
Sven Byheden	Technical Officer
Dr. Gosta Werner	Optical radiation
Lena Bengtsson	UV tests

#### 1.8. Legal Entity of The Candidate TL

SP Sveriges Tekniska Forskningsinstitut AB is a limited company fully owned by the Swedish State, Ministry of Industry and Commerce. Registration - Bolagsverket – Swedish Registration Office - Registration Number 556464-6874.

#### 1.9. Associated ExCB

The ExTL is integral with the ExCB. ExTL and ExCB are organisationally separated in different departments within SP. The quality management system and the operational procedures provide sufficient separation of the testing and certification activities.

#### 1.10. Financial Support

SP is self-funded under a not for profit concept.

### 1.11. History

In 1975 SP was moved from Stockholm to Borås.

Before 1993, SP (named Statens provningsanstalt) was a national authority. Since 1994, SP has been a company (Ltd.) fully owned by the Swedish Government. In 2007, the name of the company was changed to SP Technical Research Institute of Sweden.

SP applies its competence to the development and evaluation of technologies, material, products, and processes. SP provides certification of products and quality systems as an independent third party certification body. SP has six subsidiaries.

Type approval of explosion protected equipment started in the early 1960s. SP has provided certification according to European Directives for explosion protected equipment since 1994 and according to the ATEX Directive since 1997. SP is an approved ExCB in the IECEx system since 2 August 1999.

## 2. ORGANISATION

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

Name	Title	Experience
Maria Khorsand	CEO Chief Executive Officer, SP	
Peter Leisner	Head of Department, Electronics	
Anders Nilsson	Section Manager, Product Safety	

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

Name	Title	Experience in QM
Magnus Holmgren	Quality Manager, SP	14 years
Peter Leisner	Head of Department, Electronics	15 years
Lisbeth Pilgård	Quality Manager, Electronics	10 years

### 2.3. Name and Title of Nominated Principal Contact

Name	Title	Comments
Peter Bremer	Senior Technical Officer	<a href="mailto:peter.bremer@sp.se">peter.bremer@sp.se</a>

### 2.4. Employees

Name	Title	Experience in Ex
Peter Bremer	Senior Technical Officer	24 years
Robert Carlsson	Technical Officer	11 years
Thomas Berg	Technical Officer	1 year
Sven Byheden	Technical Officer	20 years

## **2.5. Organizational Structure**

The organisation is appropriately structured and satisfies the requirements of ISO/IEC 17025. A copy of organisational arrangement is attached in organization charts in **Annex 1**.

## **3. RESOURCES**

Five employees are working for IECEx. The ExTL facility is a small group within a large organisation and it is apparent that both physical and human resources may be expanded or contracted as necessary to suit the need. The laboratories used for Ex testing have ample space. Those areas used for flameproof and intrinsic safety spark testing have recently been upgraded.

Subcontracted testing is presently not required in the Ex field. However, if it will be necessary, the procedure for acceptance of subcontractors is well documented.

## **4. DOCUMENTATION**

### ***4.1. Quality Manual***

The quality manual used by the ExTL is the SP Corporate manual together with the department (Electronics) manual, which is well structured to the business of testing. The Management System provides a clear differentiation between the operating procedures for testing and certification, under the requirements of IECEx and that conducted as part of national accreditation by SWEDAC.

### ***4.2. Procedures***

The on-site assessment confirmed availability of suitable and well defined test procedures and work instructions for testing. IECEx test methods are well documented on an internal network and in method binders. Methods also provide calculation instructions for "Uncertainty of Measurement". Relevant IECEx documents are downloaded on regular basis and forwarded to the test personnel also informing them about their proper use. Document SP-Metod 3891 is dealing with this issue. The procedure was checked and found to meet the requirements of the IECEx System

### ***4.3. Work Instructions***

The relevant work instructions, found to meet the requirements of the IECEx System, are available to test personnel on Intranet.

### ***4.4 Records***

According to procedure SP-Method 3891. The procedure was checked and found to meet the requirements of the IECEx System

### ***4.5 Document Change Control***

Documents are controlled according to instruction SP-QD 02, documents # 1341/CE-QD 02: 4:0 4275.

#### 4.6 Test Records

According to procedure SP-Method 3891. The procedure was checked and found to meet the requirements of the IECEx System

## 5. TEST REPORTS

### 5.1. Test Reports Issued

Number of **test reports** issued under the IECEx, national (ATEX) or regional schemes in the preceding four years for each type of protection:

Standards	Title	Number of test reports issued				Total
		2006	2007	2008	2009	
60079-0	Explosive atmospheres - Part 0: Equipment - General requirements	7	17	3	6	33
60079-1	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"	7	4	1	1	13
60079-2	Explosive atmospheres - Part 2: Equipment protection by pressurized enclosure «p»	1			1	2
60079-5	Explosive atmospheres - Part 5: Equipment protection by powder filling «q»					0
60079-6	Explosive atmospheres - Part 6: Equipment protection by oil immersion «o»					0
60079-7	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"	3	5	2	2	12
60079-11	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"		10	2	4	16
60079-15	Electrical apparatus for explosive gas atmospheres - Part 15: Construction, test and marking of type of protection "n" electrical apparatus					0
60079-18	Electrical apparatus for explosive gas atmospheres - Part 18: Construction, test and marking of type of protection encapsulation "m" electrical apparatus					0
60079-25	Electrical apparatus for explosive gas atmospheres - Part 25: Intrinsically safe systems					0

Standards	Title	Number of test reports issued				Total
		2006	2007	2008	2009	
60079-26	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga	1	7		3	11
60079-27	Electrical apparatus for explosive gas atmospheres - Part 27: Fieldbus intrinsically safe concept (FISCO) and Fieldbus non-incendive concept (FNICO)					0
60079-28	Explosive atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation					0
60079-31	Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t"					See 61241-1
61241-0	Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements	5	3	4		12
61241-1	Electrical apparatus for use in the presence of combustible dust - Part 1: Protection by enclosures 'tD'	5	3	5		13
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					Included in 61241-1
61241-4	Electrical apparatus for use in the presence of combustible dust Part 4: Protection by enclosures 'tD' plus -1					0
61241-11	Electrical apparatus for use in the presence of combustible dust – Part 11: Protection by intrinsic safety 'pD'					0
61241-18	Electrical apparatus for use in the presence of combustible dust Part 18: Protection by encapsulation "mD"					0

## 6. CALIBRATION

SP is the National Measurement Laboratory for Sweden and it was evident from examination of equipment used for testing Ex products that the calibration of equipment is well maintained. Instruments were in calibration.



## 7. CONFIDENTIALITY

Confidentiality is described in document SP-QD 03: 6; # 1326. Several confidentiality agreements were checked and found to meet the requirements of the IECEx System

## 8. NATIONAL ACCREDITATION

SP holds an accreditation for ISO/IEC 17025:2005 from SWEDAC (Swedish Accreditation Body) last issued on December 1<sup>st</sup>, 2008. **Annex 2** shows the accreditation certificate. The last surveillance audit by SWEDAC was performed in April 2009.

All of the standards in the IECEx Scope of Standards are listed in the Accreditation Schedule.

## 9. RECOGNITION AND AGREEMENTS

Test reports issued by SP are recognized on national level and regional level (Europe) as well as from other IECEx members.

## 10. INTERNAL AUDIT AND PERIODIC REVIEW

Internal audits are performed according to SP Quality Manual SP-QD 05, document 1069. The audits are performed on an annual schedule. The present internal audit plan covers the years 2009. The 2009 internal audit will be performed in the 4<sup>th</sup> quarter of 2009. The present internal audit plan covers the years 2008 to 2010. The records were checked and found to be appropriate.

## 11. COMPLAINTS AND APPEALS (Including appeals to IECEx)

Appeals are handled according to the IECEx Rules, according to sub-clause 6.7 in SPCR 154 and SP Quality Manual SP-QD 05.

## 12. SPECIAL FACTS TO BE NOTED

### 12.1. *Supporting Documentation*

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

- Site report
- Details of issues raised and how these have been resolved
- Checklist for ISO/IEC 17025
- Completed technical guidance notes (TGDs) for 60079-28
- Photos of the facilities

### 12.2. *Tests Witnessed*

Witnessed tests included:

Standard: IEC 60079-0 General Requirements	
Clause 26.4.5	Degree of protection (IP) by enclosures – Dust ingress IP5X and IP6X

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 26.10	Resistance to light
Clause 26.4.2	Resistance to impact
Clause 26.5.1.3	Maximum surface temperature
Clause 26.5.1.3	Small component ignition test
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 60079-7 Increased Safety ‘e’**

Clause 6.2.3.1	Stator winding insulation system – ignition tests
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**Standard: IEC 60079-11 Intrinsic Safety**

Clause 10.1	Spark ignition test
Clause 10.5.3	Surface temperature of cells and batteries

### 13. COMMENTS (Including issues found during assessment)

During the assessment it was found, that the engineers working for IECEx are very knowledgeable across a number of protection techniques. A few non conformities were found in the area of intrinsic safety and increased safety, however none of these are considered to affect previously issued ExTRs and Certificate of



Conformity. All NCRs have since been resolved to the satisfaction of the assessment team.

## **14. RECOMMENDATION**

Based on the re-assessment performed on October 1st and 2nd, 2009, the ExTL of SP is recommended for continued acceptance in the IECEx scheme as an Accepted IECEx Testing Laboratory (ExTL) according to the scope of the standards listed in this document including the extension of scope,

Lead Assessor  
Heinz Berger

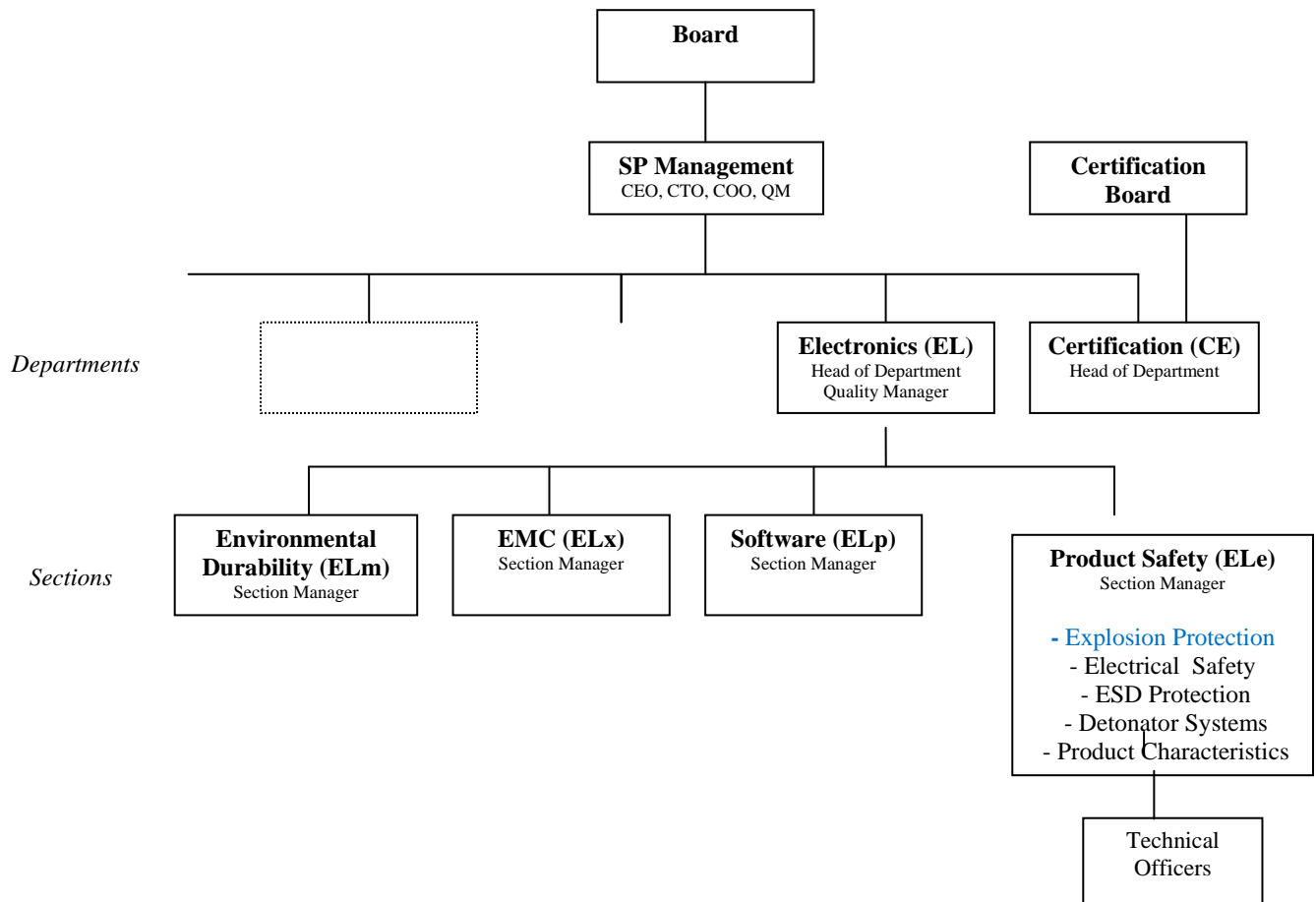
Expert Assessor  
Ajay Maira

Date: October 2nd, 2009

### **List of Annexes:**

Annex 1: Organization Chart of SP and department Electronics  
Annex 2: Accreditation Certificate ExTL for ISO/IEC 17025:2005

## Annex 1: Organization Chart of SP



## Annex 2: Accreditation Certificate according to ISO/IEC 17025

### ACKREDITERINGSCERTIFIKAT/ACCREDITATION CERTIFICATE



1002  
ISO/IEC 17025

**SP Sveriges Tekniska Forskningsinstitut /**  
**SP Technical Research Institute of Sweden**

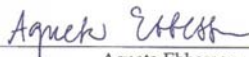
Organisationsnummer 556464-6874

är ackrediterat som laboratorium för uppgifter enligt bilaga 2, daterad 2008-12-01. Villkor för ackrediteringen framgår av bilaga 1./is accredited as a laboratory for the scope specified in enclosure 2, dated 2008-12-01. The terms of the accreditation are specified in enclosure 1.

Laboratoriet är ackrediterat enligt den internationella standarden ISO/IEC 17025:2005. Ackrediteringen innebär att laboratoriet har bedömts inneha erforderlig teknisk kompetens inom de områden som definieras i bilaga 2 och tillämpar ett kvalitetsledningssystem som uppfyller ställda krav. Se också ISO-ILAC-IAF kommunique bifogad som bilaga 3. Det ackrediterade laboratoriet ansvarar för resultatet av utförda provningar och bedömningar samt, i förekommande fall, för val av och tillämpning av arbetsmetoder inom ramen för den meddelade ackrediteringen./This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated 18 June 2005). The accredited laboratory is responsible for the results of performed testings and submitted judgements as well as, where applicable, for the selection and application of work methods within the scope of the granted accreditation.

Ackrediteringen gäller tills vidare. Styrelsen för ackreditering och teknisk kontroll (SWEDAC) genomför regelbundet tillsyn, och vart fjärde år en förnyad bedömning, för att bekräfta att ackrediteringens villkor enligt bilaga 1, daterad 2008-12-01, uppfylls./The accreditation is valid until further notice. The Swedish Board for Accreditation and Conformity Assessment (SWEDAC) regularly carries out surveillance, and a full reassessment every fourth year, in order to verify that the requirements for accreditation, see enclosure 1 dated 2008-12-01, are continually fulfilled.

Detta ackrediteringscertifikat utfärdades **2008-12-01** av/This accreditation certificate was issued 2008-12-01 by



Agneta Ebbesson,

Enhetschef enheten för industri/Manager of the Industry Division

Beslutet om ackreditering utfärdades med stöd av 15§ i Lagen om teknisk kontroll (1992:1119). SWEDAC är enligt förordningen om teknik kontroll (2005:894) nationellt ackrediteringsorgan ansvarigt för bedömning av kompetensen hos certifieringsorgan, kontrollorgan och laboratorier som ansöker om ackreditering./Accreditation was granted with the mandate given in §15 of the Law on Technical Conformity Assessment (1992:1119). SWEDAC is, according to the ordinance on Technical Conformity Assessment (2005:894), the national accreditation body responsible for the assessment of the competence of certification bodies, inspection bodies and laboratories applying for accreditation