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

**Circulation to: Ex Management Committee**

**Title: IECEx Re-assessment Report for, Underwriters Laboratories, UL, an Accepted Certification Body (ExCB), and a request for an extension of scope**

## INTRODUCTION

**This document contains the IECEx Re-assessment Report for Underwriters Laboratories, UL, an Accepted Certification Body (ExCB). During the re-assessment visit an assessment for an extension of scope was also carried out. ExMC Members are asked to consider UL's request for an extension of scope.**

**Please complete and return the completed voting form to the Secretariat by 2008 10 30**

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

***Chris Agius***
**IECEx Secretariat**

**Address:**
**SAI Building**
**286 Sussex Street**
**Sydney NSW 2000**
**Australia**

**Contact Details:**
**Tel: +61 2 8206 6940**
**Fax: +61 2 8206 6272**
**e-mail: chris.agius@iecex.com**
**http://www.iecex.com**

# IECEx RE-ASSESSMENT REPORT FOR UL

# ExCB
# (IECEx Certification Body)

## Type of Assessment: (please mark)

| | |
|---|---|
| **Re-Assessment of ExCB** | **X** |
| **Scope extension of ExCB** | **X** |

## 1. OBJECT AND FIELD OF APPLICATION

***1.1. Country:***
US

***1.2. Name of Candidate ExCB***
Underwriters Laboratories (Note: this is a recent change from the name 'Underwriters Laboratories Inc')

***1.3. Members of the Assessment Team***
Jim Munro – Chairman Panel of Assessors – Lead IECEx Assessor
Xu Jianping – Director of NEPSI - IECEx Assessor

***1.4. Place and Date of Assessment***
Underwriters Laboratories
333 Pfingsten Road
Northbrook, IL 60062-2096

13-14 September 2007 - Jim Munro

20 September 2007 – Xu Jianping

***1.5. Assessment References***

i) IECEx 02 Third Edition 2006-11 IECEx Scheme rules of procedure
ii) IECEx OD 003/V1 IECEx Assessment procedures
iii) IECEx OD 005/V2 Quality System requirements for manufacturers
iv) IECEx OD 009/V1 Issuing of CoCs, ExTRs and QARs
v) IECEx OD 025/V1 (ExMC/161/CD) Management of assessment and surveillance programs for manufacturers (includes QAR forms)
vi) ISO/IEC Guide 65:1996
vii) IECEx Document OD 17/V3 Drawing and documentation guidance
viii) Application for scope extension 1 November 2007

### 1.6. *Scope of Application*

The following was the existing scope of UL at the time of the assessment visit.

| Number | Title |
|---|---|
| 60079-0 | Electrical apparatus for explosive gas atmospheres<br>Part 0: General requirements |
| 60079-1 | Electrical apparatus for explosive gas atmospheres<br>Part 1: Construction and verification test of flameproof enclosures of electrical apparatus |
| 60079-2 | Electrical apparatus for explosive gas atmospheres<br>Part 2: Electrical apparatus, type of protection 'p' (Pressurization) |
| 60079-5 | Electrical apparatus for explosive gas atmospheres<br>Part 5: Powder filling "q" |
| 60079-6 | Electrical apparatus for explosive gas atmospheres<br>Part 6: Oil-immersion 'o' |
| 60079-7 | Electrical apparatus for explosive gas atmospheres<br>Part 7: Increased safety 'e' |
| 60079-11 | Electrical apparatus for explosive gas atmospheres<br>Part 11: Intrinsic safety 'i' |
| 60079-15 | Electrical apparatus for explosive gas atmospheres<br>Part 15: Electrical apparatus with type of protection 'n' (Non-Sparking) |
| 60079-18 | Electrical apparatus for explosive gas atmospheres<br>Part 18: Encapsulation 'm' |
| 60079-30-1 | Explosive atmospheres - Electrical resistance trace heating - Part 1: General and testing requirements |
| 61779-1 | Electrical apparatus for the detection and measurement of flammable gases<br>Part 1: General requirements and test methods |
| 61779-4 | Electrical apparatus for the detection and measurement of flammable gases<br>Part 4: Performance requirements for group II apparatus indicating up to 100% lower explosive limit |
| 61779-5 | Electrical apparatus for the detection and measurement of flammable gases<br>Part 5: Performance requirements for group II apparatus indicating a volume fraction up to 100% gas |
| 62086-1 | Electrical apparatus for explosive gas atmospheres –<br>Electrical resistance trace heating – Part 1: General and testing requirements |

On 1 November 2007 after the assessment visit, UL submitted a request for a scope extension for the following standards:

| | |
|---|---|
| 61241-0 | Electrical apparatus for use in the presence of combustible dust<br>Part 0: General requirements |
| 61241-1 | Electrical apparatus for use in the presence of combustible dust<br>Part 1: Electrical apparatus protected by enclosures |

| | |
|---|---|
| 61241-4 | Electrical apparatus for use in the presence of combustible dust<br>Part 4: Type of protection 'pD' |
| 61241-11 | Electrical apparatus for use in the presence of combustible dust Part 11:<br>Protection by intrinsic safety 'iD' |
| 61241-18 | Electrical apparatus for use in the presence of combustible dust<br>Part 18: Protection by encapsulation 'mD' |

**1.7. *Candidate ExCB Persons Interviewed***

| Name | Position |
|---|---|
| Kerry McManama | General Manager, Global HazLoc, Gas&Oil |
| Paul Kelly | Lead Operations Manager |
| Katy Holdredge | Senior staff engineer |
| Timothy Russell | Quality Manager |
| Alexander Madison | Business Line Manager Quality Registration Services |

**1.8. *Legal Entity of the Candidate ExCB***
UL is a not-for-profit incorporated organization. There are bylaws and an Article of incorporation. Copies of these were viewed.

**1.9. *Associated Testing Laboratories***
The ExTL is integral with the ExCB at the same site. In addition UL Demko located in Denmark are an associated ExTL.

**1.10. *Associated Certification Functions***
The major certification activities are associated with the UL Mark. This includes such areas as construction materials, plumbing products, roof coverings, electrical products & electronic products, medical devices, environmental and occupational health and safety, machinery, market place products, and non-metallic minerals and products. UL is accepted by the IECEE Scheme.

**1.11. *National Marks and Certificates***
The UL Mark is the main mark used by UL. The C-UL mark is also issued for Canada

**1.12. *Financial Support***
UL is funded by its testing, certification and other operations.

**1.13. *History***
Underwriters Laboratories Inc. (UL) is an independent, not-for-profit product safety certification organization, whose corporate mission is to serve the public by testing products for safety. UL's principal activity is investigating the safety of many kinds of products, including electrical and electronic equipment and products, mechanical products, building materials, construction systems, fire protection equipment, burglary protection systems and equipment, and marine products. UL also devotes its resources to the development of UL Standards for Safety. These documents contain the safety requirements for products tested by UL. Since the first Standard was developed in 1903, the number of UL Standards for Safety has increased to over 700.

UL was founded in 1894. In the past 113 years, UL has grown to about 6500 employees, some 1000 of which are Engineers. UL's Corporate Headquarters are in

Northbrook, Illinois. Additionally, there are four other major domestic testing locations, several local engineering centers, several overseas subsidiaries, and one affiliated laboratory in Canada and also about 200 Inspection Centers. Today, more than 22 billion UL Marks appear on new products annually.

**1.14. *Standards Accepted***
See clause 1.6 of this report

**1.15. *National Differences to IEC Standards***
National differences to IEC standards are listed in the latest version of the IECEx Scheme Bulletin.

## 2. ORGANISATION

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

| Name | Title | Experience |
|---|---|---|
| Kerry McManama | General Manager, Global HazLoc, Gas&Oil | 15 years in Ex |
| Paul Kelly | Lead Operations Manager | 14 years in Ex<br>22 at UL |

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

| Name | Title | Experience |
|---|---|---|
| Timothy Russell | Quality Manager | 33 years at UL over 20 in Quality |

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

| Name | Title | Comments |
|---|---|---|
| Kerry McManama | General Manager, Global HazLoc, Gas&Oil | Kerry.McManama@us.ul.com |

**2.4. *Name and Title of Signatories for Certification***

| Name | Title | Comments |
|---|---|---|
| Kerry McManama | General Manager, Global HazLoc, Gas&Oil | |
| Paul Kelly | Lead Operations Manager | |

**2.5. *Other Employees in ExCB activity***

| Name | Title | Responsibility |
|---|---|---|
| None (Auditors are attached to the ExTL) | | |

**2.6. *Organizational Structure***
See Annex 1 for the overall UL organization and Annex 2 for the UL IECEx operation.

**2.7. *Administration***

2.7.1. Administrative Structure
See Annex 2,

2.7.2. Indemnity Insurance
UL has a policy for professional liability insurance covering its operations. A copy of the policy and valid insurance order were viewed.

# 3. RESOURCES

There are two people in the ExCB supported by 2 lead auditors in the ExTL.

# 4. COMITTEES / Governing Board / Appeals / Advisory Board

There is a board of trustees for all of UL. This has responsibility for:

- Election of officers of the corporation
- Overview of the finances of the corporation
- Overview of formulation of strategic matters relating to policy of UL
- Overview of implementation of UL policies

It draws its members from a wide range of interest groups.

# 5. CERTIFICATION OPERATIONS

**5.1. *National Approval/Certification Methods***
As noted earlier there is the UL Mark and C-UL mark.

**5.2. *Certification Policy***
There is a document titled 'Global product certification policy' that is structured in accordance with ISO/IEC Guide 65.

**5.3. *Application for Certification***
This is addressed in an IECEx Scheme Manual. There is no application form as such. When a customer seeks certification the scope they are looking for is discussed with the technical staff and the quote developed. The test plan is developed at that time. Customer Service then arrange for customers to complete a contract based on the agreed scope. The engineer (project handler) who did the quoting and prepared the test plan then handles the job when it comes in for evaluation and testing.

**5.4. *Withdrawal and Cancellation of Certificates***
Details for withdrawing and suspending certificates are contained in the Scheme Manual and procedure 80-EX-W0025.

# 6. STATISTICS

**6.1. Certificates Issued**
Number of certificates, ExTRs and QARS issued under the IECEx, for the preceding four years for each type of protection:

**2007**

| ExTR | CoC | QAR |
|---|---|---|
| Flameproof (d) **7** | Flameproof (d) **7** | Flameproof (d) **5** |
| Intrinsic Safety (i) **11** | Intrinsic Safety (i) **12** | Intrinsic Safety (i) **4** |
| Increased Safety (e) **1** | Increased Safety (e) **1** | Increased Safety (e) **2** |

| | | |
|---|---|---|
| | | Encapsulation (m) **1** |
| Heat Tracing **1** | Heat Tracing **1** | Heat Tracing **1** |
| **TOTAL 20** | **21** | **13** |

## 2006

| ExTR | CoC | QAR |
|---|---|---|
| Flameproof (d) **4** | Flameproof (d) **2** | Intrinsic Safety (i) **2** |
| Intrinsic Safety (i) **22** | Intrinsic Safety (i) **12** | Increased Safety (e) **2** |
| Increased Safety (e) **5** | Increased Safety (e) **4** | Flameproof (d) **2** |
| Zone 2 (n) **2** | | Encapsulation (m) **1** |
| Heat Tracing **2** | | |
| **TOTAL 35** | **18** | **7** |

## 2005

| ExTR | CoC | QAR |
|---|---|---|
| Flameproof (d) **4** | Flameproof (d) **1** | Flameproof (d) **5** |
| Intrinsic Safety (i) **12** | Intrinsic Safety (i) **4** | Intrinsic Safety (i) **5** |
| | | Increased Safety (e) **1** |
| | | Zone 2 (n) **1** |
| | | Heat Tracing **1** |
| **TOTAL 16** | **5** | **13** |

## 2004

| ExTR | CoC | QAR |
|---|---|---|
| Flameproof (d) **7** | Flameproof (d) **3** | Flameproof (d) **2** |
| Intrinsic Safety (i) **10** | Intrinsic Safety (i) **7** | Intrinsic Safety (i) **2** |
| **TOTAL 17** | **10** | **4** |

There are about 1500 projects involving testing and certification in the Ex field completed each year.

# 7. DOCUMENTATION

### *7.1. Quality Manual*

There is a global quality manual and under this sits the dedicated product certification policy manual. There is also a dedicated manual for the IECEx Scheme.

### *7.2. Procedures*

In addition to the above there are a significant number of detailed procedures many of which are referenced in the manuals.

### *7.3. Work Instructions*

There are also some work instructions such as on the completing of ExTRs.

### *7.4. Records*

Originals of everything are stored electronically. However, some records such as ExTRs and drawings are also retained in hard copy. All records relevant to the IECEx operation are retained, none are destroyed at this time.

### *7.5. Document Change Control*

There is a defined approval process via the electronic system for making changes to documents. Only electronic documents are considered to be controlled. There is an SOP for document management supported by a number of procedures and forms.

## 8. CONFIDENTIALITY

Confidentiality is covered in the standards of business conduct. The employee manual has a section in confidentiality. All new employees and longer term staff have to sign an agreement. An example of a signed confidentiality agreement was viewed. It was advised that existing employees have 'signed electronically' that they agree to the confidentiality requirements.

## 9. PUBLICATIONS

There are none that are relevant to IECEx. However, they do provide a significant amount of information on their website.

## 10. NATIONAL ACCREDITATION

UL Northbrook (USA) has three accreditations covering its certification activities; these are:
a) Third party Accreditation by Standards Council of Canada (Annex 3) which is valid to July 2009. The scope for this lists the relevant IEC standards.
b) Accreditation by ANSI (Annex 4) which is based on ISO/IEC 65.
c) The OSHA, NRTL Scheme (Annex 5) based on ISO/IEC Guide 65 and 17025 and supplemented by their own requirements. Since 13 August 2007 OSHA has been recognising the Zone classification approach of IEC, but it is not yet reflected in the scope for UL.

## 11. RECOGNITIONS AND AGREEMENTS

UL is a recognized foreign testing body with Japan. They also have agreements with PTB (DE) and CQST(CN).

## 12. INTERNAL AUDIT AND PERIODIC MANAGEMENT REVIEW

During the re-assessment visit a copy of the report for the most recent audit was viewed. This audit occurred from 1 to 2 August 2007. The audits are done against the relevant ISO/IEC standards. There is a comprehensive audit program that covers each area once a year.

The agenda and minutes from the last management review meeting on 10 July 2007 were viewed. These meetings are held annually.

## 13. SUBCONTRACTING, USE OF OTHER LABS AND USE OF OTHER LOCATIONS

They have the capacity to do all testing and so do not need to subcontract. However, UL advised that although they are set up to do all of the charging tests in IEC 60079-0 Clause 26.14, there is one test they have some trouble with. This is a test that many other laboratories are also having trouble with and so these charging tests are being re-examined by TC 31. In general UL expect to perform the charging tests but if difficulty is found in obtaining correct results the test will be subcontracted.

They have procedures covering testing at other locations (00-IC-S0036). These are comprehensive and cover the approach well.

## 14. TRAINING

They hold monthly technical meetings and special training as required. Earlier in 2007 training for staff in ExTAG decision sheets was held. Staff are graded a four levels 1, 2, 3 and 4. Records are retained of staff and the standards that they are evaluated as being competent for in relation to those levels. Records were viewed of staff training showing sessions run and staff attending.

Lead auditors for the Scheme require lead auditor qualification plus technical knowledge and knowledge of Ex/OD005.

There had been a significant number of new staff put on in the year prior to the re-assessment visit. They were given introductory training. Each new staff member is assigned a mentor who trains them individually and as part of teams, and keeps track of their progress. Not all hazloc staff are used for IECEx work; only if they are deemed competent.

## 15. ASSESSMENT OF MANUFACTURERS AND ISSUE OF QARS

There is a procedure from ATEX and IECEx Scheme quality audits. At present for audits they use an auditor and an expert. The following QARS were reviewed:
UL QAR 07.0003 – this was found to be satisfactory. It was noted the agenda was not on corporate system, but their procedures have more recently been changed to require this.
UL QAR 07.0004 – This was done in a satisfactory manner in accordance with their scope.
QAR 06.0012 – found satisfactory but it was noted that amount of information reported in this QAR was not as great as the later ones. This indicates an improvement in the reporting process.

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

9.5.1 of the IECEx Scheme Manual covers complaints and appeals, including the provision for a complainant to appeal to the IECEx Scheme. There is an IECEx Scheme Service Terms and Conditions document that is provided to customers. This includes reference to their right of appeal to the Scheme.

A complaint that was received from another body about an ExTR was formally dealt with through the complaint and CAR processes.

## 17. SPECIAL FACTS TO BE NOTED

### *17.1. Supporting Documentation*

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

- A site assessment report
- Checklist for ISO/IEC Guide 65
- Assessors' notes

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

The UL ExCB operation was found to be operating very well. The quality documentation, in particular that covering the IECEx Scheme, was found to be particularly good. There were no issues found that required resolving.

The application for scope extension was also considered by the assessors. This was considered in the basis of:

- Evidence obtained during the assessment visit that was relevant to the scope extension (such as dust testing)
- Documentation that was later submitted covering procedures and competency of staff.
- An interview by telephone with one of the members of staff involved in this work (Katy Holdredge)

## 19. RECOMMENDATION

Based on the re-assessment performed on 14-15 September 2007 and 20 September 2007, UL is recommended for continued acceptance in the IECEx scheme as a Certification Body (ExCB) according to the scope of the standards listed in this document together with the addtitional standards sought for the scope extension.

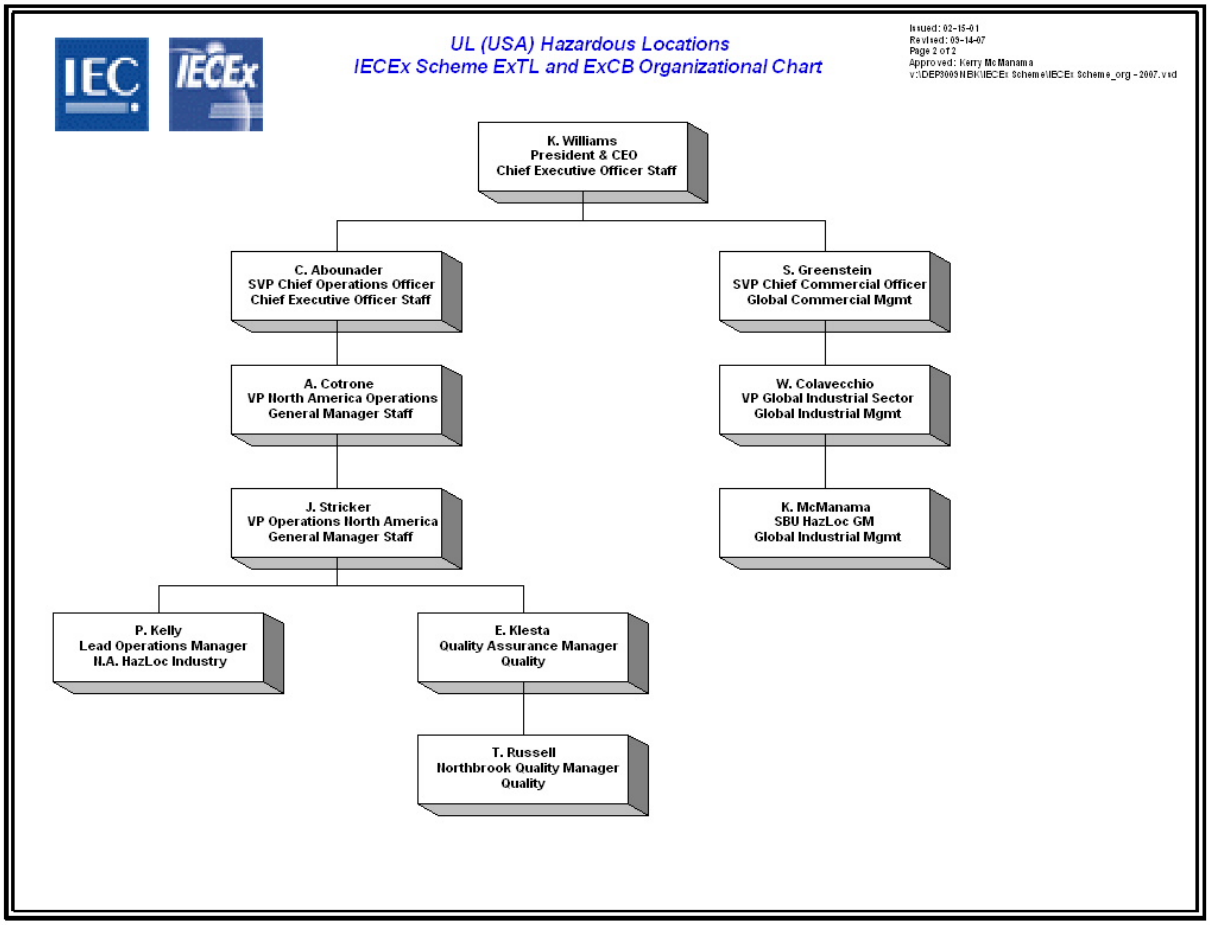
| | |
|---|---|
| Jim Munro | Xu Jianping |
| Lead Assessor | Expert Assessor |

Date: 11 September 2008

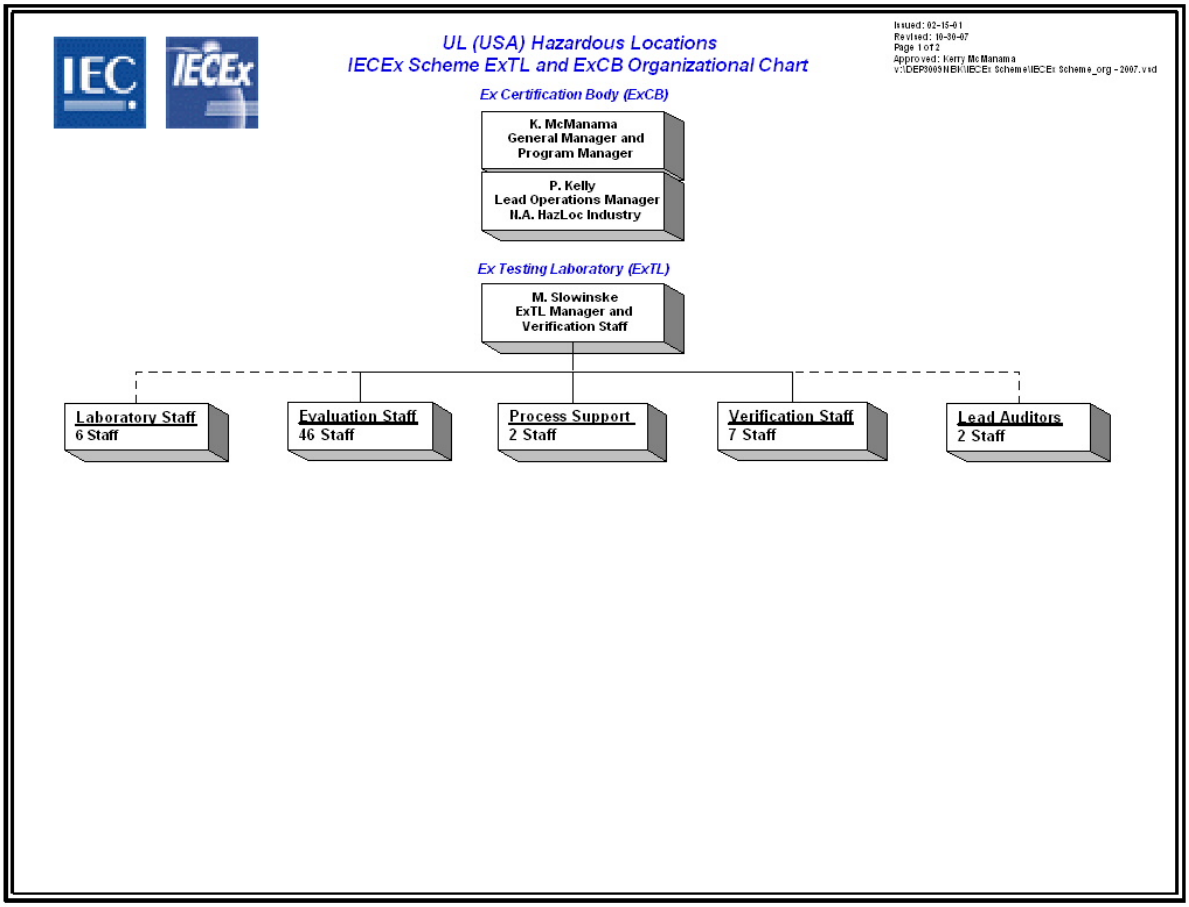
## List of Annexes:

1. UL Overall Organization Structure
2. Organization Charts of the UL IECEx Operation
3. Accreditation Certificate from the Standards Council of Canada
4. Accreditation Certificate from ANSI
5. Certificate from the OSHA NRTL Scheme

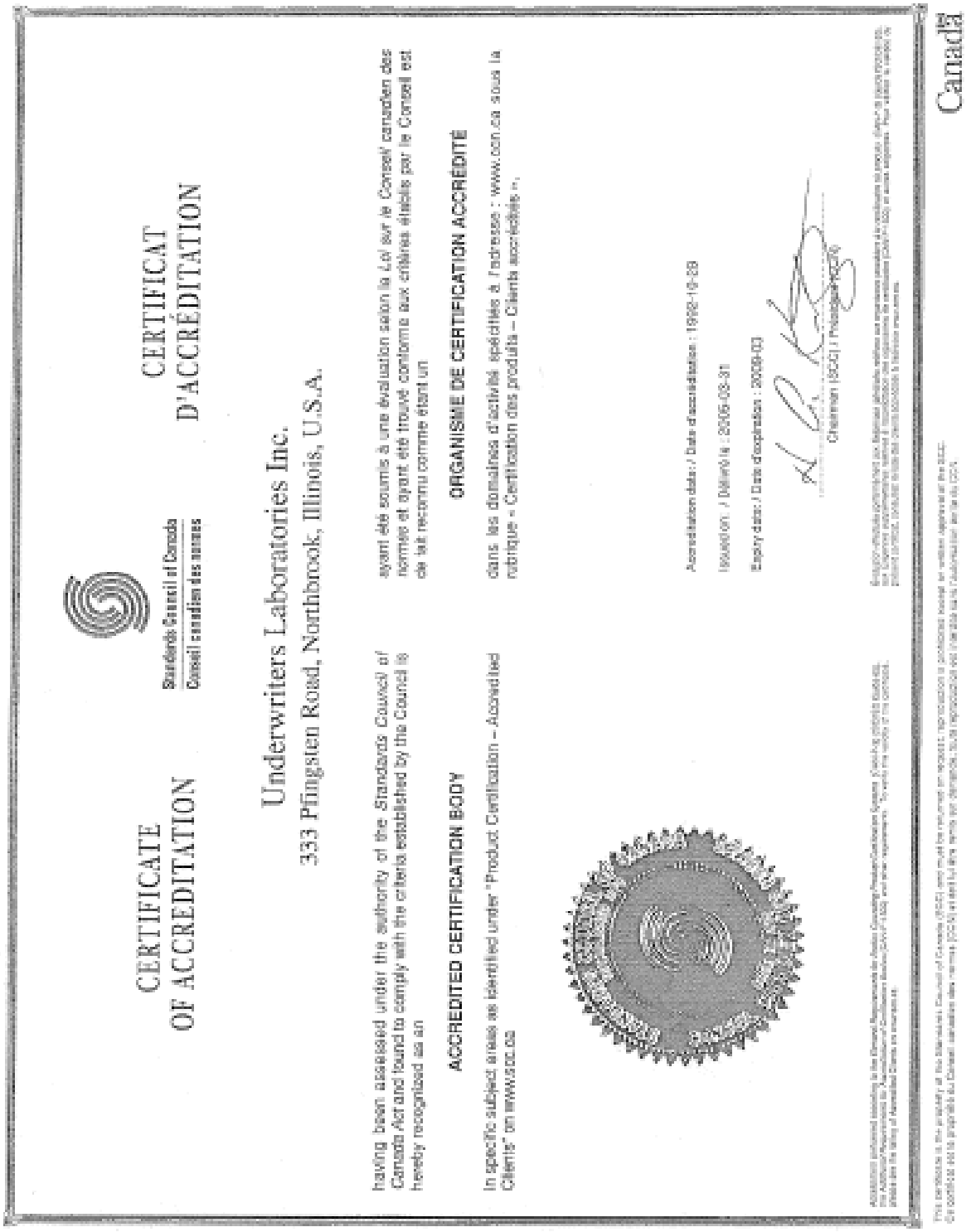
## Annex 1
## UL Overall Organization Structure



## Annex 2
## Organization Charts of the UL IECEx Operation



**Annex 3**
**Accreditation Certificate from the Standards Council of Canada**



CERTIFICATE
OF ACCREDITATION

Standards Council of Canada
Conseil canadien des normes

CERTIFICAT
D'ACCRÉDITATION

Underwriters Laboratories Inc.
333 Pfingsten Road, Northbrook, Illinois, U.S.A.

having been assessed under the authority of the Standards Council of Canada Act and found to comply with the criteria established by the Council is hereby recognized as an

ACCREDITED CERTIFICATION BODY

In specific subject areas as identified under "Product Certification – Accredited Clients" on www.scc.ca

ayant été soumis à une évaluation selon la Loi sur le Conseil canadien des normes et ayant été trouvé conforme aux critères établis par le Conseil est de lui reconnu comme étant un

ORGANISME DE CERTIFICATION ACCRÉDITÉ

dans les domaines d'activité spécifiés à l'adresse : www.scc.ca sous la rubrique « Certification des produits – Clients accrédités ».

Accreditation date: / Date d'accréditation : 1998-10-28

Issued on: / Délivrée le : 2006-03-31

Expiry date: / Date d'expiration : 2009-03

Chairman (SCC) / Président (CCN)

Canada

**Annex 4**
**Accreditation Certificate from ANSI**

# CERTIFICATE OF ACCREDITATION
## PRODUCT CERTIFICATION PROGRAM

The American National Standards Institute hereby affirms that

**UNDERWRITERS LABORATORIES, INC.**
**NORTHBROOK, IL**

Certification ID #0198

meets the ANSI accreditation program requirements
and those set forth in

**ISO/IEC GUIDE 65:1996**
**GENERAL REQUIREMENTS FOR BODIES OPERATING PRODUCT CERTIFICATION SYSTEMS**

for programs within the following

**SCOPE OF ACCREDITATION**

- Automotive Equipment
- Burglary Protection Equipment
- Burning Characteristics of Building Materials and Furnishings
- Components and Materials
- Electrical and Electronic Products, Processes, Systems, and Services
- Fire Protection Equipment
- Fire Resistance Construction
- Food Equipment and Related Products (Sanitation)
- Fuel Burning Equipment
- Fuel Handling Equipment
- Grading Western Red Cedar Shingles and Shakes
- Hazardous Location Equipment
- Health Care and Health Hazard Technologies
- Liquids and Materials Classified as Fire Hazard
- Marine Products
- Mechanical Equipment
- Personal Protective Clothing
- Plumbing, Sewage Handling, and Piping, Product
- Ventilating and Conditioning Equipment for Buildings
- Ventilating Equipment for Products of Combustion
- Water Quality, Drinking Water Additives, Drinking Water Treatment Units-Health and Aesthetic Effects, Drinking Water System Units

(Please refer to ANSI website [illegible] for site listings for each scope)

**ANSI Accredited Since 1981**

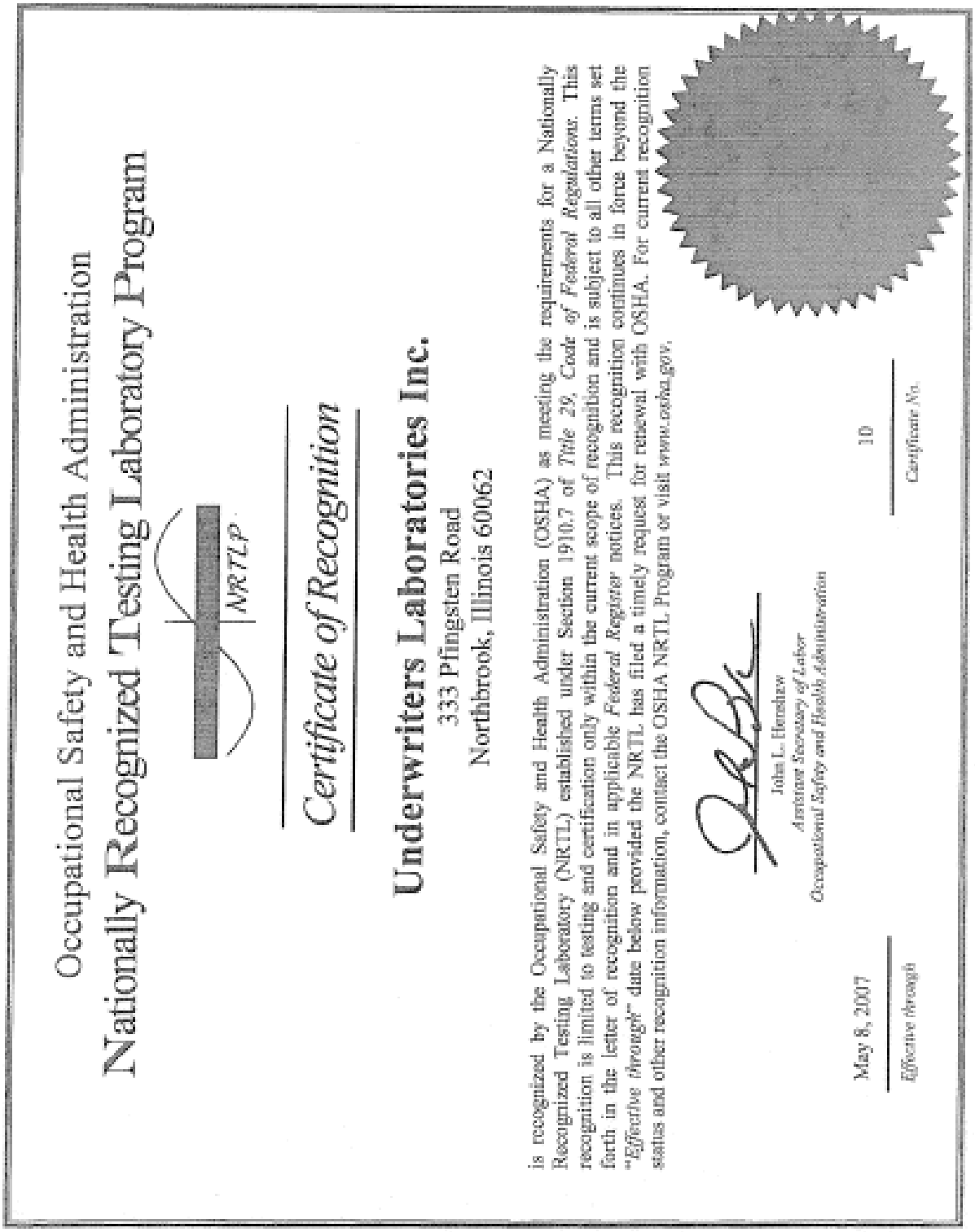
May 31, 2008
Valid Through

ANSI Vice President, Accreditation Services

June 1, 2006
Date

ANSI Accredited Program
PRODUCT CERTIFICATION

**Annex 5**
**Certificate from the OSHA NRTL Scheme**



Occupational Safety and Health Administration

Nationally Recognized Testing Laboratory Program

NRTLP

*Certificate of Recognition*

**Underwriters Laboratories Inc.**
333 Pfingsten Road
Northbrook, Illinois 60062

is recognized by the Occupational Safety and Health Administration (OSHA) as meeting the requirements for a Nationally Recognized Testing Laboratory (NRTL) established under Section 1910.7 of *Title 29, Code of Federal Regulations*. This recognition is limited to testing and certification only within the current scope of recognition and is subject to all other terms set forth in the letter of recognition and in applicable *Federal Register* notices. This recognition continues in force beyond the "*Effective through*" date below provided the NRTL has filed a timely request for renewal with OSHA. For current recognition status and other recognition information, contact the OSHA NRTL Program or visit *www.osha.gov*.

John L. Henshaw
*Assistant Secretary of Labor*
*Occupational Safety and Health Administration*

May 8, 2007
*Effective through*

10
*Certificate No.*