



ExMC/640/DV  
September 2010

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

**TITLE: IECEx Assessment Report for the acceptance of Główny Instytut Górnictwa  
(GIG) as an IECEx Test Laboratory (ExTL) within the IECEx System**

**Circulation to: Members of the IECEx Management Committee, ExMC**

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**INTRODUCTION**

This document contains the IECEx Assessment Report for the acceptance of Główny Instytut Górnictwa (GIG) as an IECEx Test Laboratory within the IECEx System.

This report is hereby submitted for voting.

Please consider this assessment report and return the completed voting form, (a separate document - in Word Format), to the IECEx Secretariat by **101029**.

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

*Chris Agius*

**IECEx Secretariat**

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## IECEX ASSESSMENT REPORT FOR GŁÓWNY INSTYTUT GÓRNICTWA (GIG) (IECEX TEST LABORATORY, ExTL)

**Type of Assessment: (please mark)**

Initial assessment for Candidate ExTL      X

Re-Assessment of ExTL

Scope Extension of ExTL

### 1. OBJECT AND FIELD OF APPLICATION

**1.1. Country:**

POLAND

**1.2. Name of Candidate TL**

Główny Instytut Górnictwa (GIG)  
Kopalnia Doświadczalna "BARBARA"

**1.3. Members of the Assessment Team**

Jim Munro, Lead Assessor  
Alain Czyz, Expert Assessor  
Vijay Varma, Expert Assessor

**1.4. Place and Date of Assessment**

Główny Instytut Górnictwa  
Kolonia Doświadczalna "BARBARA"  
ul. Podleska 72, 43-190 Mikołów, POLAND

28 September to 1 October 2009

**1.5. Assessment References**

- i) IECEx 02 Third Edition 2006-11 Equipment Certification Program covering equipment for use in explosive atmospheres,
- ii) IECEx Operational Document OD 003 IECEx Assessment procedures
- iii) IECEx Operational Document OD 009 Issuing of CoCs, ExTRs and QARs
- iv) ISO/IEC 17025:2005
- v) IECEx Technical Guidance Documents (TGDs)
- vi) ExTAG decision sheets (DS)
- vii) ExTL application documents dated 11 May 2009

### 1.6. Scope of Application (to be selected)

*During the opening meeting, the IECEx Assessment Team and GIG reviewed the scope of application and agreed to the following scope.*

Number	Title
60079-0 Edition 4 & Edition 5	Explosive atmospheres - Part 0: Equipment - General requirements
60079-1 Edition 6	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures “d”
60079-2 Edition 5	Explosive atmospheres - Part 2: Equipment protection by pressurized enclosure «p»
60079-5 Edition 3	Explosive atmospheres - Part 5: Equipment protection by powder filling «q»
60079-6 Edition 3	Explosive atmospheres - Part 6: Equipment protection by oil immersion «o»
60079-7 Edition 4	Explosive atmospheres - Part 7: Equipment protection by increased safety “e”
60079-11 Edition 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety “i”
60079-15 Edition 3	Electrical apparatus for explosive gas atmospheres - Part 15: Construction, test and marking of type of protection “n” electrical apparatus
60079-18 Edition 2 & Edition 3	Electrical apparatus for explosive gas atmospheres - Part 18: Construction, test and marking of type of protection encapsulation “m” electrical apparatus
60079-25 Edition 1	Electrical apparatus for explosive gas atmospheres - Part 25: Intrinsically safe systems
60079-26 Edition 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga
60079-27 Edition 2	Explosive atmospheres – Part 27: Fieldbus intrinsically safe concept (FISCO)
60079-28 Edition 1	Explosive atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation With restriction of scope for the testing in explosive mixtures (Clause 6)
60079-29-1 Edition 1	Explosive atmospheres - Part 29-1: Gas detectors – Performance requirements of detectors for flammable gases
60079-30-1 Edition 1	Explosive atmospheres – Part 30-1: Electrical resistance trace heating – General and testing requirements
60079-31	Explosive atmospheres –

<b>Number</b>	<b>Title</b>
Edition 1	Part 31: Equipment dust ignition protection by enclosure "t"
61241-0 Edition 1	Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements
61241-4 Edition 1	Electrical apparatus for use in the presence of combustible dust Part 4: Protection by enclosures "tD"
61241-11 Edition 1	Electrical apparatus for use in the presence of combustible dust – Part 11: Protection by intrinsic safety 'iD'
61241-18 Edition 1	Electrical apparatus for use in the presence of combustible dust Part 18: Protection by encapsulation "mD"
62013-1 Edition 2	Caplights for use in mines susceptible to firedamp Part 1: General requirements - Construction and testing in relation to the risk of explosion
62086-1 Edition 1	Electrical apparatus for explosive gas atmospheres – Electrical resistance trace heating Part 1 General and testing requirements

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

<b>Name</b>	<b>Position</b>
Gerard Kałuża	Head of laboratory
Ksawery Graboś	Technical specialist
Michał Górny	Mgr inż.
Adam Klimek	Mgr (Quality Manager for testing laboratory only)
Plus many of the other staff shown in 2.4	

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

The Central Mining Institute (GIG), of which the Product Certification Team "BARBARA" is a part, has been established as a legal entity by means of a statute signed and issued by the Minister of Economy. The latest statute which was dated 28 May 2008 was viewed.

#### **1.9. Associated ExCB**

The associated ExCB is also part of the GIG and operates at the same location. The ExCB and ExTL have separate reporting lines to the GIG Director who is located in Katowice.

#### **1.10. Financial Support**

The operation for testing and certification is funded through the fees charged for these services.

#### **1.11. History**

The Central Mining Institute is a scientific-research institute acting on the basis of the act on research-development units. The Central Mining Institute was established on 16 June 1945 on the basis of a Resolution of the Council of Ministers of 11 April 1945 (at that time named Scientific-Research Institute of the Coal Mining Industry) on the basis

of the established on 8 March 1945 by the Central Board of the Coal Mining Industry – Central Laboratory of Coal Mining Industry, a part of which constituted the Experimental Mine “Barbara”. The present name was conferred on the Institute on 24 March 1950, and the statute on 17 November 1951. The present statute of the Central Mining Institute by the Scientific Council of the Central Mining Institute and approved by the Minister of Industry and Trade, who was the founding organ for the Institute. The statute provides for in § 4 point 5 conducting of scientific research and research-development works with respect to the assessment and attestation of machines, equipment and materials used in the industry, and first of all in mining.

The Experimental Mine “Barbara” was established in 1925 on the strength of an act passed by the Parliament as the first in Poland experimental station involved in the problems of occupational safety in mining. In 1926 the station was transferred from Pniowiec to Mikołów in order to conduct research work relating to the control of methane and coal dust explosion hazard and mine rescue.

## **2. ORGANISATION**

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

<b>Name</b>	<b>Title</b>	<b>Experience</b>
Józef Dubiński	Prof. dr hab. inż., General Director GIG	None in Ex
Jan Wachowicz	Dr hab. inż., Deputy of General Manager in Scope of Research and Implementation	None in Ex
Krzysztof Cybulski	Dr hab., Director Experimental Mine “Barbara”	None in Ex
Wojciech Kwiatkowski	Mgr inż. Head of Ex department	39 (35 in Ex)
Gerard Kałuża	Mgr inż. Head of ExTL	25 (16 in Ex)
Ksawery Graboś	Mgr inż. Technical specialist (supervising physical testing)	6 (5 in Ex)

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

<b>Name</b>	<b>Title</b>	<b>Experience</b>
Adam Klimek	Mgr (Quality Manager for testing laboratory only)	22 (7 in quality)

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

<b>Name</b>	<b>Title</b>	<b>Comments</b>
Michał Górny	Mgr inż.	

## 2.4. Employees

Name	Title	Experience
Gerard Kałuża	Mgr inż	25 (16 in Ex)
Ksawery Graboś	Mgr inż	6 (5 in Ex)
Piotr Madej	Mgr inż	13 (13 in Ex)
Henryk Orawski	Inż	44 (12 in Ex)
Jerzy Jurczyk	Mgr inż	19 (19 in Ex)
Andrzej Trębaczewski	Inż	30 (29 in Ex)
Tadeusz Socha	Mgr inż	37 (30 in Ex)
Stanisław Trzcionka	Dr inż	30 (11 in Ex)
Łukasz Surowy	mgr inż.	8 (8 in Ex)
Witold Podoliński	Testing officer	31 (9 in Ex testing)
Michał Szczepanek	Testing officer	8 (4 in Ex testing)

## 2.5. Organizational Structure

Annex 1 shows the reporting structure for the GIG IECEx ExCB and ExTL. More detail on the structure of the ExTL is included on Annex 2

## 3. RESOURCES

The GIG ExTL is well resourced with competent staff and a good range of test equipment located in appropriate facilities. Two members of the ExCB above may also work in the ExTL. When they carry out an ExTL role for a project they cannot operate in an ExCB role for that project (with except of assessment of manufacturers).

## 4. DOCUMENTATION

### 4.1. Quality Manual

There is a general GIG quality manual for the whole operation of GIG related to operation under ISO 9001.

In addition, there are more specific quality manuals for the various areas. There is one dedicated to the part of the testing laboratory involved in the carrying out physical tests. There is a separate quality manual related to the operation of the certification unit that also applies to other activities within the ExTL not specifically related to physical testing. These were found to meet IECEx requirements.

### 4.2. Procedures

The above laboratory quality manual includes 13 procedures in annexes, which were reviewed and found to meet IECEx requirements.

### 4.3. Work Instructions

At the assessment visit it was found that there were a lack of procedures/work instructions for a number of the tests carried out that could be subject to differences in approach or for which there is specialized local equipment involved. Subsequently appropriate work instructions were developed and reviewed by the assessment team, and found to meet the IECEx System requirements.

### 4.4. Records

All records are kept in hard copy form. To date no records have been destroyed. However, the Quality Manual at present specifies 10-years from the date of certificate validity expiration.

At present for each project there is a common file for records for certification and testing. However, there is a plan to separate the original testing records from the certification records. When this is done, a copy of the test report used for certification will be stored with the certification file. There will also be an electronic copy of the report on the intranet. The new approach is planned for commencement in January 2010.

To date no records have been destroyed. However, the Quality Manual at present specifies 10-years from the date of certificate validity expiration. Control of records is addressed chapter XII of Quality Manual and Procedure No 1

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

All quality documents are available and controlled on hard copy version. The procedure for control is shown chapter 8 of the quality manual. Most standards used are available in hard copy form, although some are available in electronic form. All are subject to documentation control.

Procedures were reviewed after the assessment to implement a clearer system to ensure that at the start of a project for IECEx the latest relevant forms of the standards are used, including any corrigendum and interpretation sheets, together with any relevant IECEx operational documents (ODs) and ExTAG decision sheets.

#### **4.6. Test Records**

All test records are kept in hard copy form. There are specific test forms (protocols) developed for each test carried out.

For each project there is a common file for records for certification and testing at present. However, there is a plan to separate the original testing records from the certification records. However, a copy of the test report used for certification will be stored with the certification file. There will also be an electronic copy of the report on the intranet. The new approach is planned for commencement in January 2010.

## **5. TEST REPORTS**

### **5.1. Test Reports Issued**

Number of test reports issued under ATEX years for each type of protection:

Standards	Title	Number of issued test reports				Total
		2006	2007	2008	2009	
60070-0	Explosive atmospheres - Part 0: Equipment - General requirements	167	161	107	46	<b>481</b>
60079-1	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"	151	137	110	37	<b>435</b>
60079-2	Explosive atmospheres -	-	1	-	-	<b>1</b>

Standards	Title	Number of issued test reports				
	Part 2: Equipment protection by pressurized enclosure «p»					
60079-11	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety “i”	137	92	78	14	<b>321</b>
60079-18	Electrical apparatus for explosive gas atmospheres - Part 18: Construction, test and marking of type of protection encapsulation “m” electrical apparatus	4	4	-	2	<b>10</b>
61779-1	Electrical apparatus for the detection and measurement of flammable gases - Part 1: General requirements and test methods	5	-	-	-	<b>5</b>
61779-2	Electrical apparatus for the detection and measurement of flammable gases - Part 2: Performance requirements for group I apparatus indicating a volume fraction up to 5% methane in air	18	-	-	-	<b>18</b>
61779-3	Electrical apparatus for the detection and measurement of flammable gases - Part 3: Performance requirements for group I apparatus indicating a volume fraction up to 100% methane in air	17	-	-	-	<b>17</b>
62013-1	Caplights for use in mines susceptible to firedamp - Part 1: General requirements - Construction and testing in relation to the risk of explosion	1	4	-	-	<b>5</b>

Note: For correlation between certificates and test reports issued GIG have provided the following explanation. For one certificate they may produce many test reports. For example, there may be a report for visual checking, one for impact, one for IP testing etc. In this case there are may be many more test reports than certificates for a type of protection. In contrast, when they re-certify equipment to later editions of standards, then they may use earlier test reports and hence in this case the number of certificates may exceed the number of test reports. They do produce an assessment report for each certificate but these have not been included in the report numbers.



## **6. CALIBRATION**

Most equipment is calibrated externally. Exceptions are the interferometer for flameproof testing which is calibrated internally and the torque gauges which are checked before use on a calibrated device. The new microscope purchased for measuring distances on printed circuit boards is also calibrated before use.

The calibration program is monitored by the quality manager and who arranges calibration of the equipment when it falls due.

All equipment checked was found to be in calibration but for the new equipment subsequently purchased for the checking of threads and the microscope used for measuring distances on circuit boards, it was necessary to establish how traceability was established. This was done to the satisfaction of the assessment team.

## **7. CONFIDENTIALITY**

Chapter 15.7 of the quality manual requires written agreements to maintain confidentiality to be included in the individual folder of each employee. An example of such a signed document was viewed.

## **8. NATIONAL ACCREDITATION**

GIG holds Certificate Nr AB 043 from Polskie Centrum Akredytacji (PCA) to PN-EN ISO/IEC 17025:2005, valid to June 2010. See Annex 3.

The accreditation is provided for specific tests as defined in the standards, not for any assessment processes that might be part of the standards.

The product accreditation scope reviewed mainly covered earlier editions of standards than the ones covered by this application. A letter has been sent to PCA requesting that the latest standards be included in their accreditation.

The report of the latest audit by PCA had not been issued at the time of the IECEx assessment visit.

## **9. RECOGNITION AND AGREEMENTS**

GIG is a notified body under ATEX. GIG does not have any bi-lateral testing agreements with other bodies in the Ex field.

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

The report from the last internal audit on 9 December 2008 was viewed. An auditor from another part of GIG was used for this audit. Findings from the audit were resolved through corrective actions which were sighted.

Comment: they do not use a technical expert for internal audits. It is suggested that consideration could be given to including an internal expert in Ex as part of the team. An example of an audit in 2003 was shown using this approach.

The quality manual addresses internal audit in Chapter XIII and management review in Chapter XIV. In addition, there is a procedure 9 for internal audit and 10 for management review. The periodic review is carried out once a year in December.

The last periodic review occurred on 19 December 2008. Minutes of that meeting were reviewed and found to be satisfactory.

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

Chapter 8.1 of the quality manual covers complaints and appeals and there is more detail in procedure No 7. However, this specifically relates the testing part of the operation. Appeals related to the IECEx operation will be dealt with through the ExCB.

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

### **12.1. Supporting Documentation**

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

- Site Assessment Report incorporating details of issues raised and how these have been resolved
- Checklist for ISO/IEC 17025
- Completed technical guidance notes (TGDs) for 60079-0, 60079-1, 60079-2, 60079-7, 60079-11, 60079-15, 60079-18, 60079-28, 60079-29-1 and 60079-31.
- Photos of the facilities

### **12.2. Witnessed Tests**

The following tests were witnessed during the assessment visit:

- For 't', 'e' and other standards - IP5X dust test and IPX4 water test
- For 'i' - Tests for temperature rise/determination of the maximum short current - use of battery short-circuit testing equipment
- For 'i' - Spark ignition test - use of spark test apparatus on a power supply
- For 'd' - Flameproof pressure determination using methane and ethylene
- For 'd' - Test for non-transmission using hydrogen/methane mixture
- For 'e' - Temperature rise on a luminaire
- For gas detector performance testing to 60079-29-1:
  - 5.4.3.2 Calibration curve
  - 5.4.10 Air velocity
  - 5.4.16 Time of response
- For optical radiation - Measurement of optical power and irradiance

The assessment concluded that all tests were conducted in a competent manner and in accordance with the relevant standards.

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

A number of issues were found during the assessment. These included a lack of data included for intrinsic safety, a lack of documented procedures for critical tests, ensuring control of a chart in the testing area, records to cover the number of dust tests before changing dust, version control for software, verification of test probes, calibration of



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humidity of the environmental chamber, lack of equipment for checking threads, and lack of equipment for measuring distances between trackwork on PCBs. All these were resolved to the satisfaction of the assessment team.

#### **14. RECOMMENDATION**

Based on the assessment performed on 28 September to 1 October 2009 Główny Instytut Górnictwa (GIG) Kopalnia Doświadczalna "BARBARA" is recommended for acceptance in the IECEx scheme as a IECEx Testing Laboratory (ExTL) according to the scope of the standards listed in this document.

Jim Munro  
Lead Assessor

Alain Czyz  
Expert Assessor

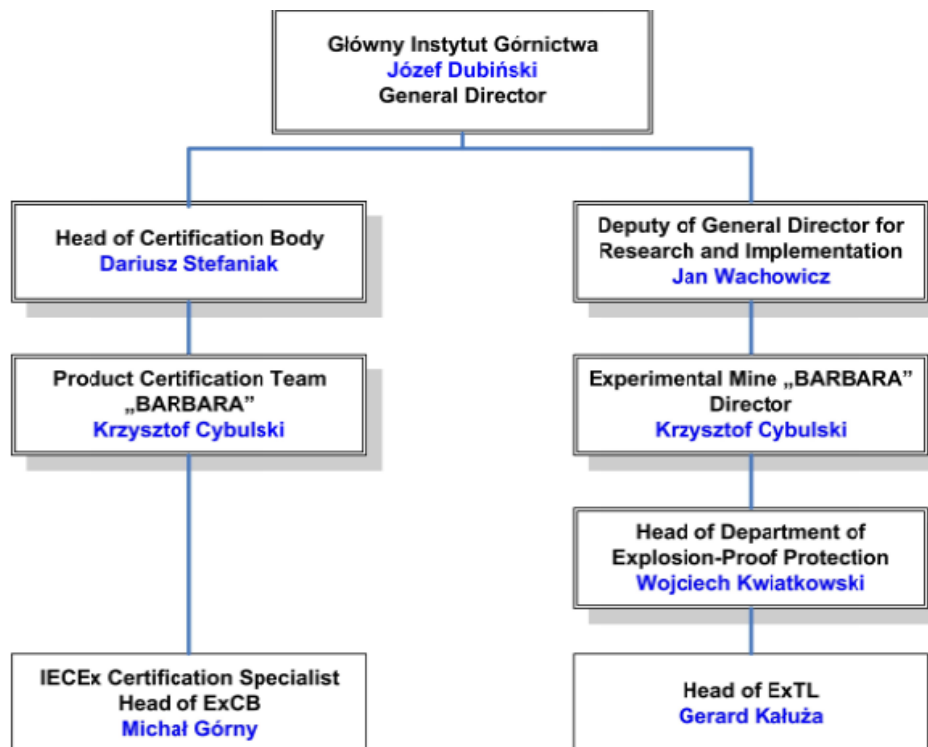
Vijay Varma  
Expert Assessor

Date: 14 March 2010

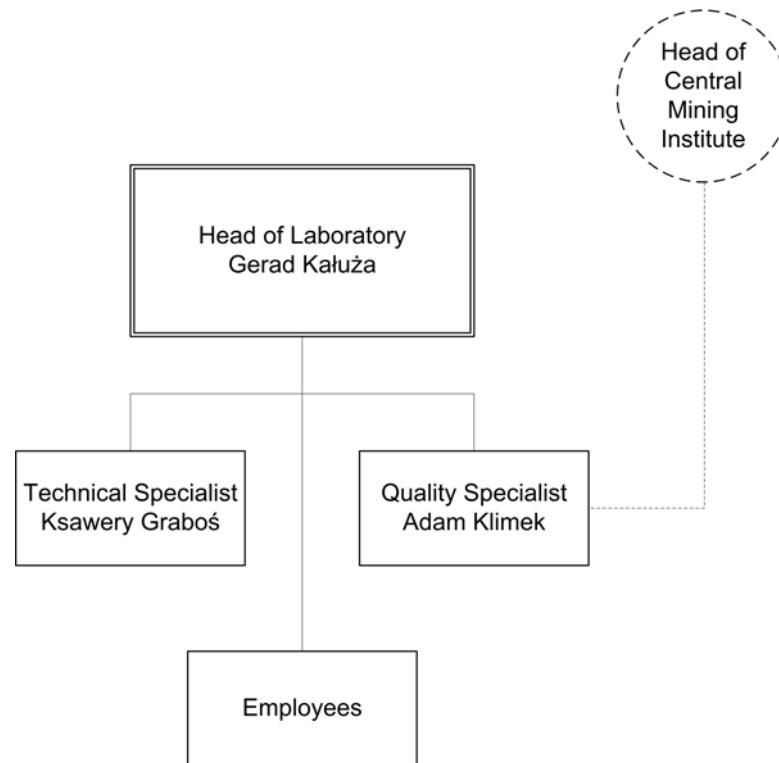
#### **List of Annexes:**

1. Overall Organization Chart
2. Structure of ExTL
3. Accreditation Certificate for ISO/IEC 17025

**Annex 1**  
**Overall Organization Chart**  
**(Showing reporting lines)**



## Annex 2 Structure of ExTL



ANNEX 3

**POLSKIE CENTRUM AKREDYTACJI**  
POLISH CENTRE FOR ACCREDITATION



Sygnatariusz EA MLA  
EA MLA Signatory

**CERTYFIKAT AKREDYTACJI**  
**LABORATORIUM BADAWCZEGO**  
ACCREDITATION CERTIFICATE OF TESTING LABORATORY  
**Nr AB 005**

Potwierdza się, że: / This is to confirm that:

**GŁÓWNY INSTYTUT GÓRNICTWA**  
**ZESPÓŁ LABORATORIÓW BADAWCZYCH**  
**I WZORCUJĄCYCH**  
Pl. Gwarków 1, 40-166 Katowice

spełnia wymagania normy PN-EN ISO/IEC 17025:2005  
meets requirements of the PN-EN ISO/IEC 17025:2005 standard

Akredytowana działalność jest określona w Zakresie Akredytacji Nr AB 005  
Accredited activity is defined in the Scope of Accreditation No AB 005

Akredytacja pozostaje w mocy pod warunkiem przestrzegania  
wymagań jednostki akredytującej określonych w kontrakcie Nr AB 005  
This accreditation remains in force provided the Laboratory observes  
the requirements of Accreditation Body defined in the Contract No AB 005

Certyfikat akredytacji ważny do dnia 30.12.2010 r.  
The certificate of accreditation is valid until 30.12.2010

Akredytacji udzielono dnia 01.12.1993 r.  
Accreditation was granted on 01.12.1993



DYREKTOR  
POLSKIEGO CENTRUM AKREDYTACJI

EUGENIUSZ W. ROGUSKI

Warszawa, dnia 26 kwietnia 2010 roku