

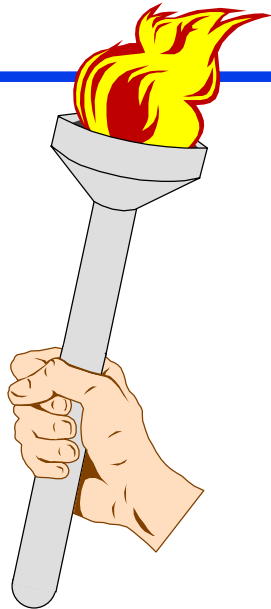
Welcome
at the
PLCopen presentation

PLCopen:
**changing the world
of industrial automation**

Eelco van der Wal
Managing Director PLCopen

The association PLCopen

It is not just about IEC 61131-3 anymore...



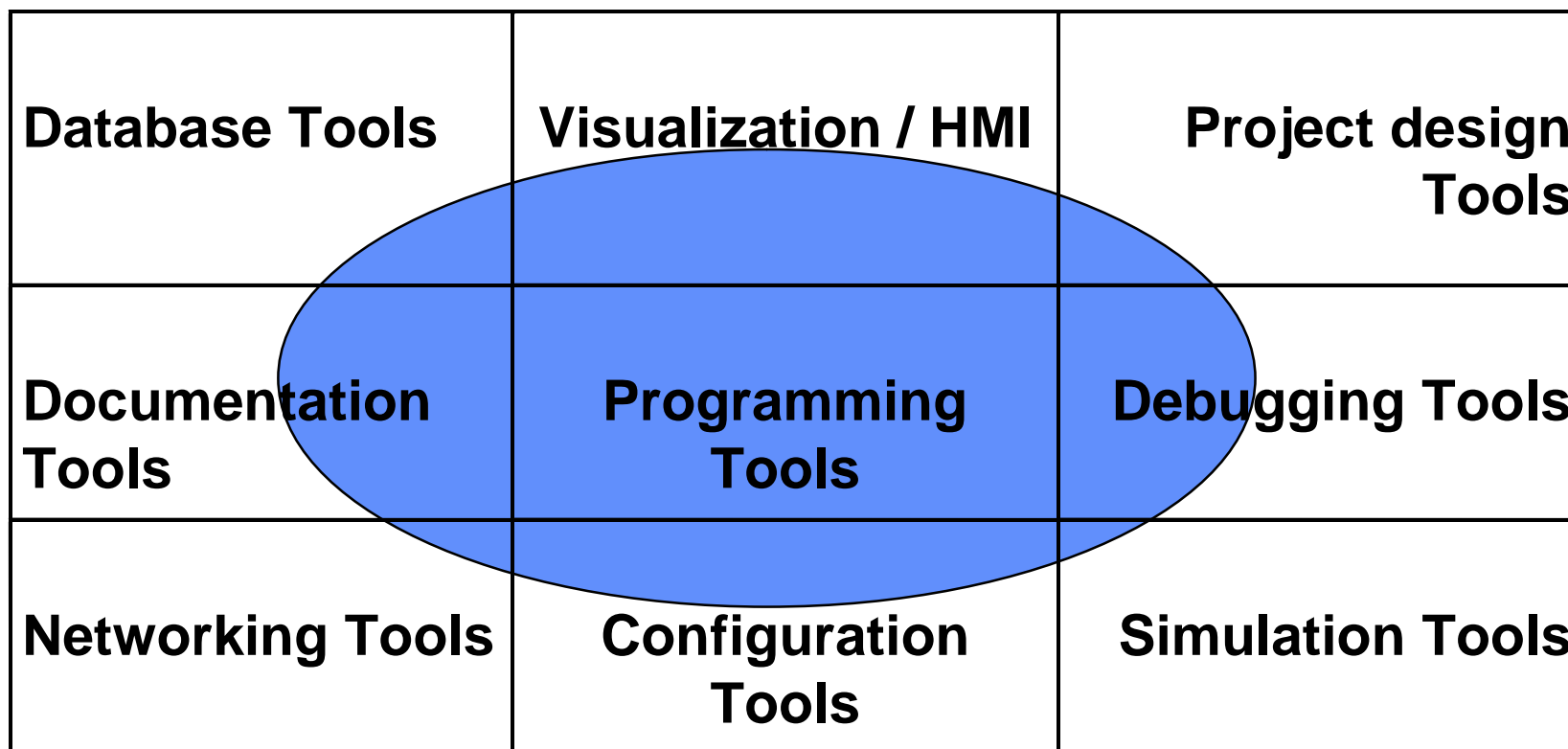
PLCopen *Mission*

**We want to be the leading association
resolving topics related to
control programming
to support the use of
international standards in this field.**

PLCopen tagline

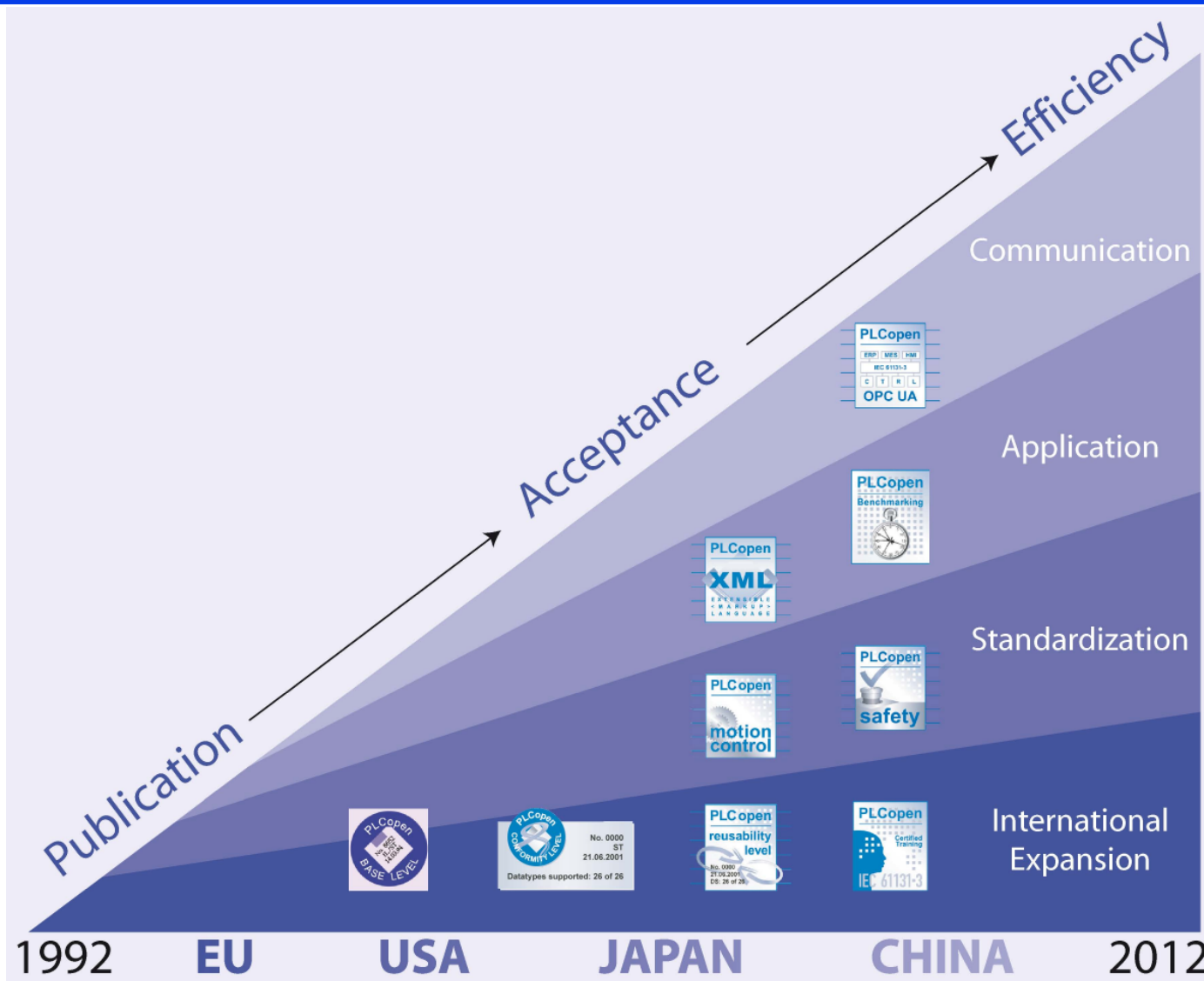
for efficiency in automation

Programming in its environment



PLCopen

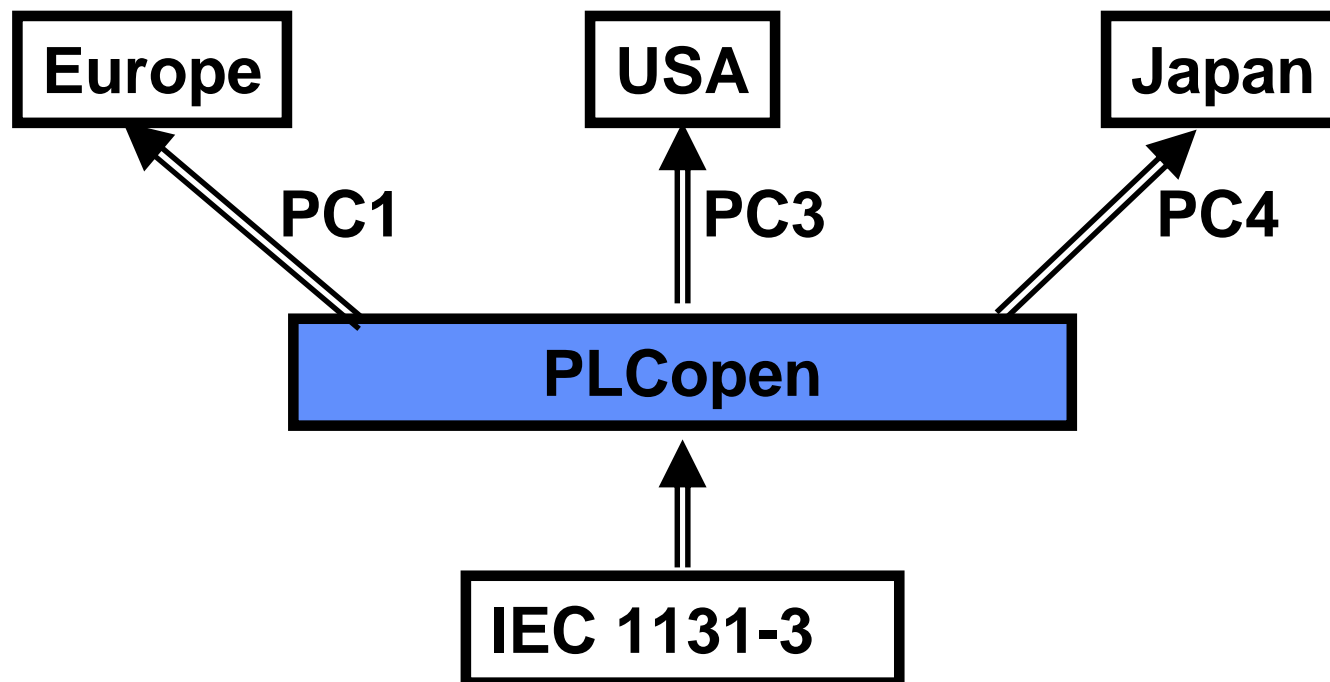
Founded in 1992



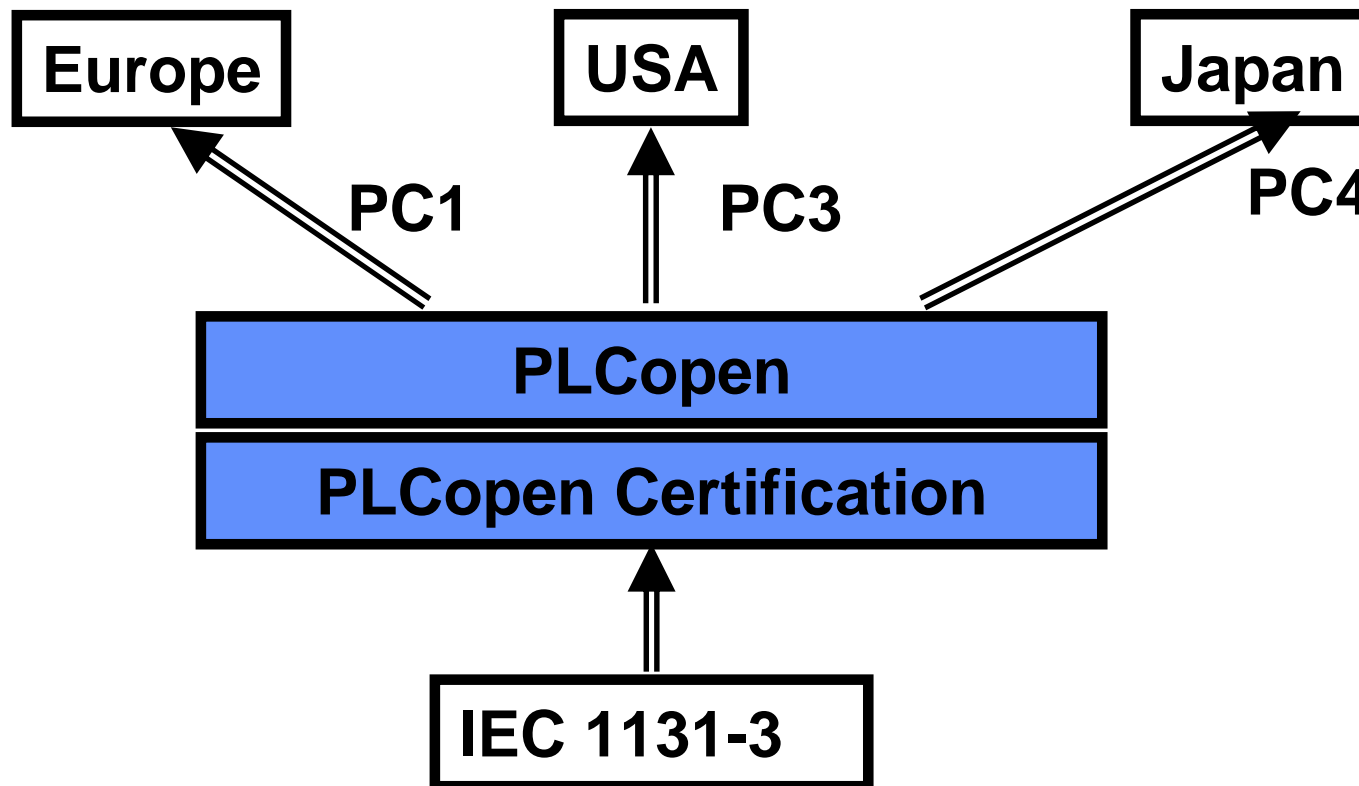
The beginning

- **IEC published the IEC 1131-3 standard**
- **PLCopen started to promote the usage and/or supply of products conforming to this standard**
- **Areas of promotion: Europe (PC1), USA (PC3), Japan (PC4)**

The beginning



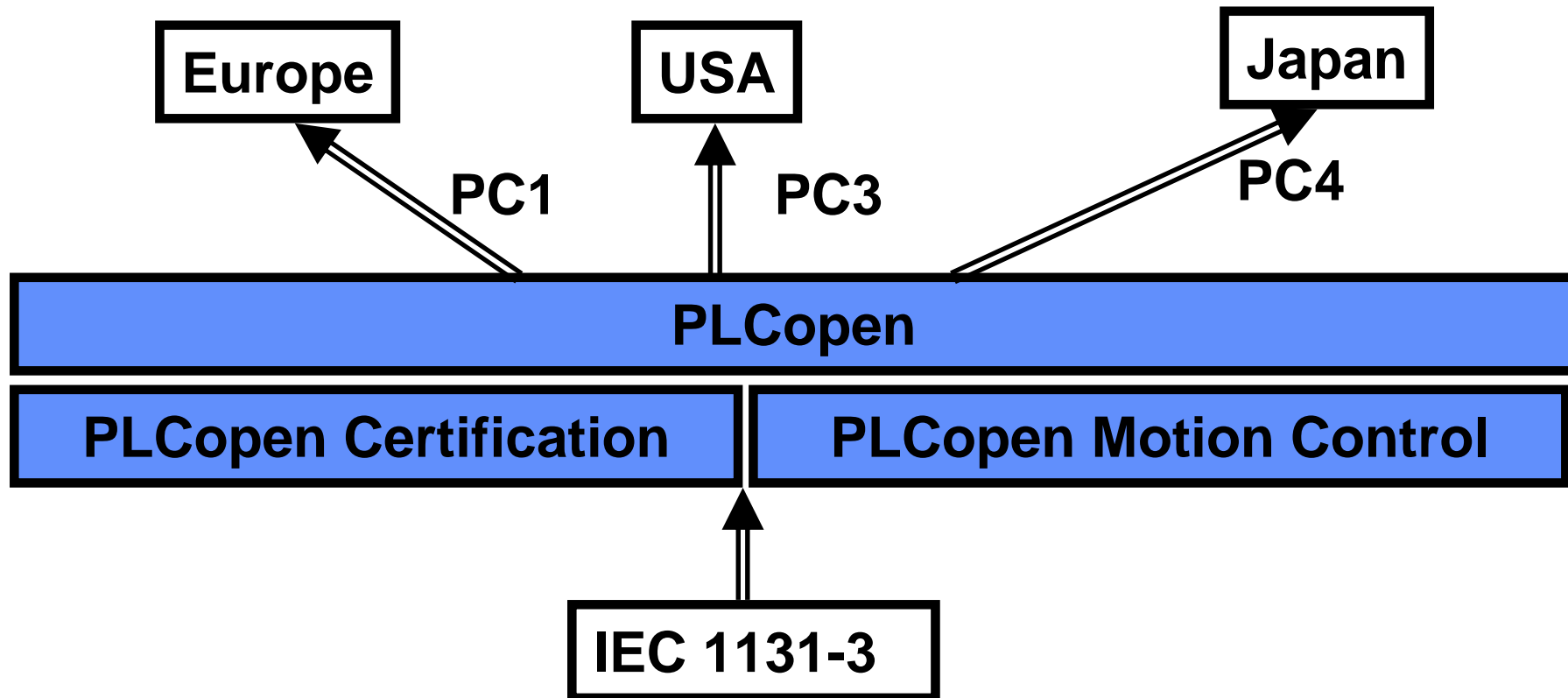
Second step - Certification



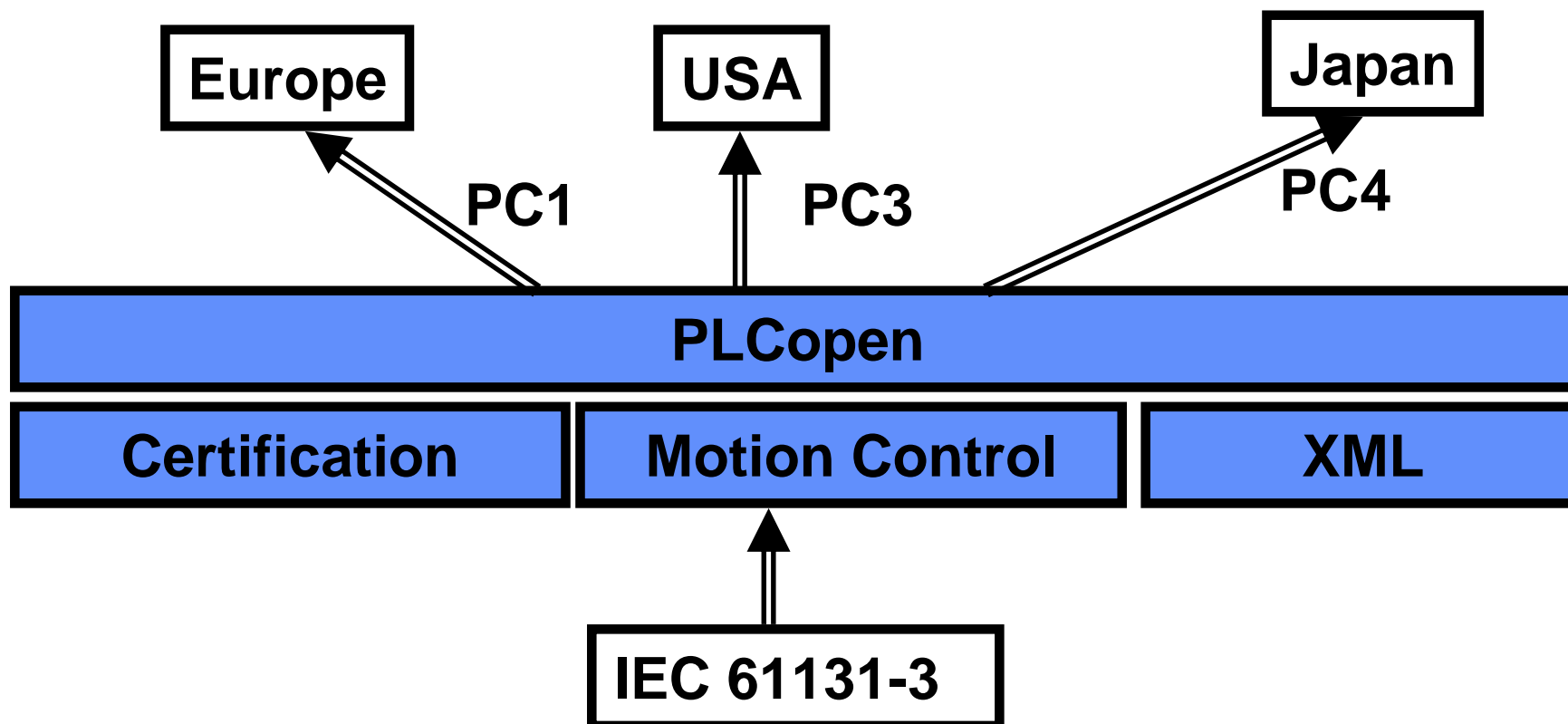
Third Step

- **PLCopen adds independent training guidelines (PC2)**

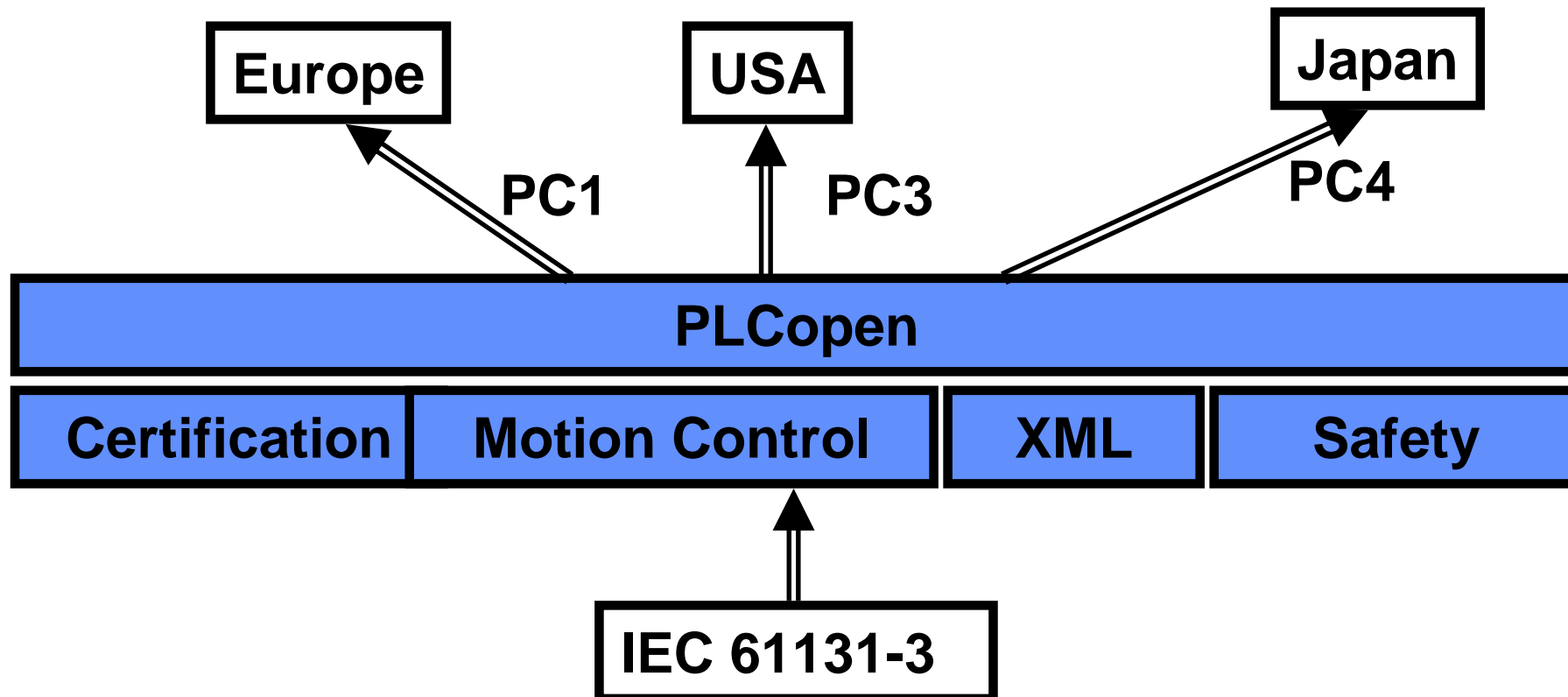
Fourth step – Motion Control



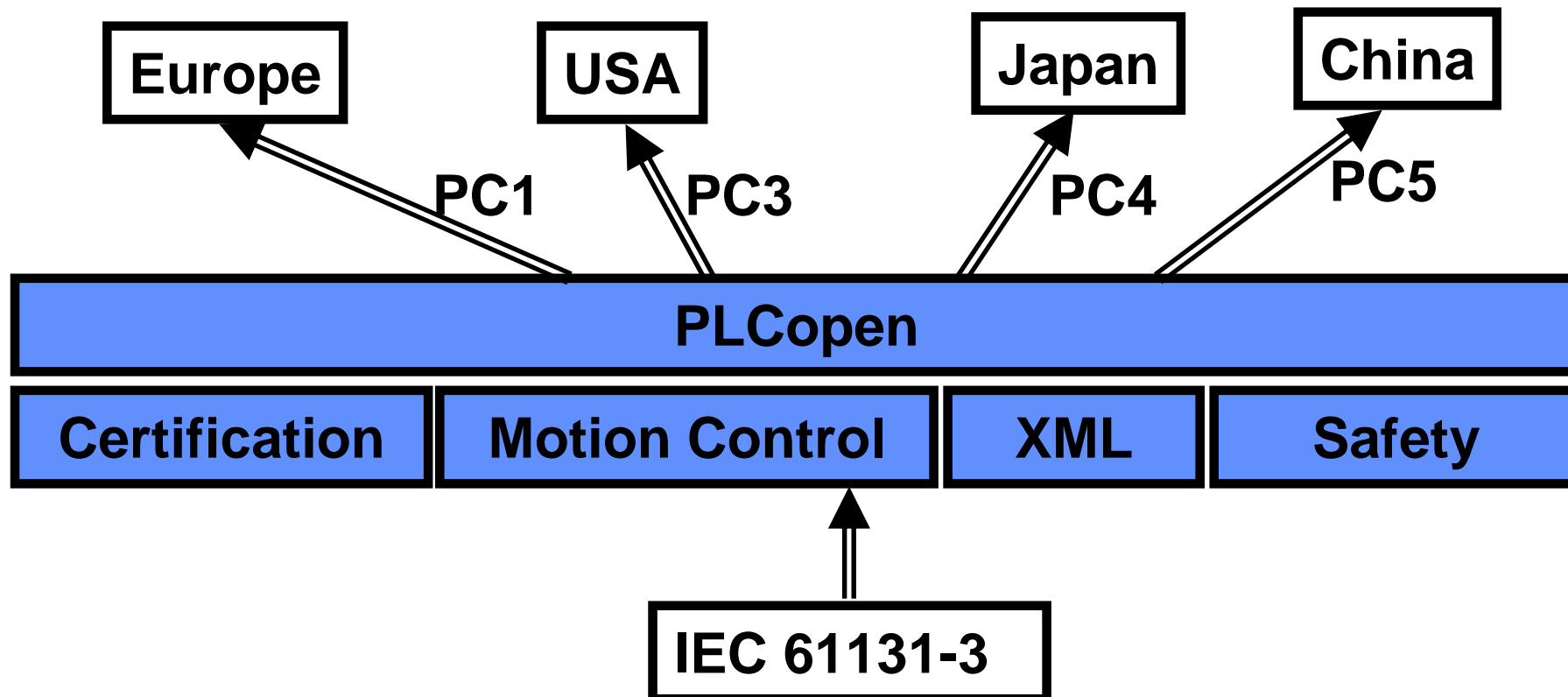
Fifth Step – PLCopen adds XML



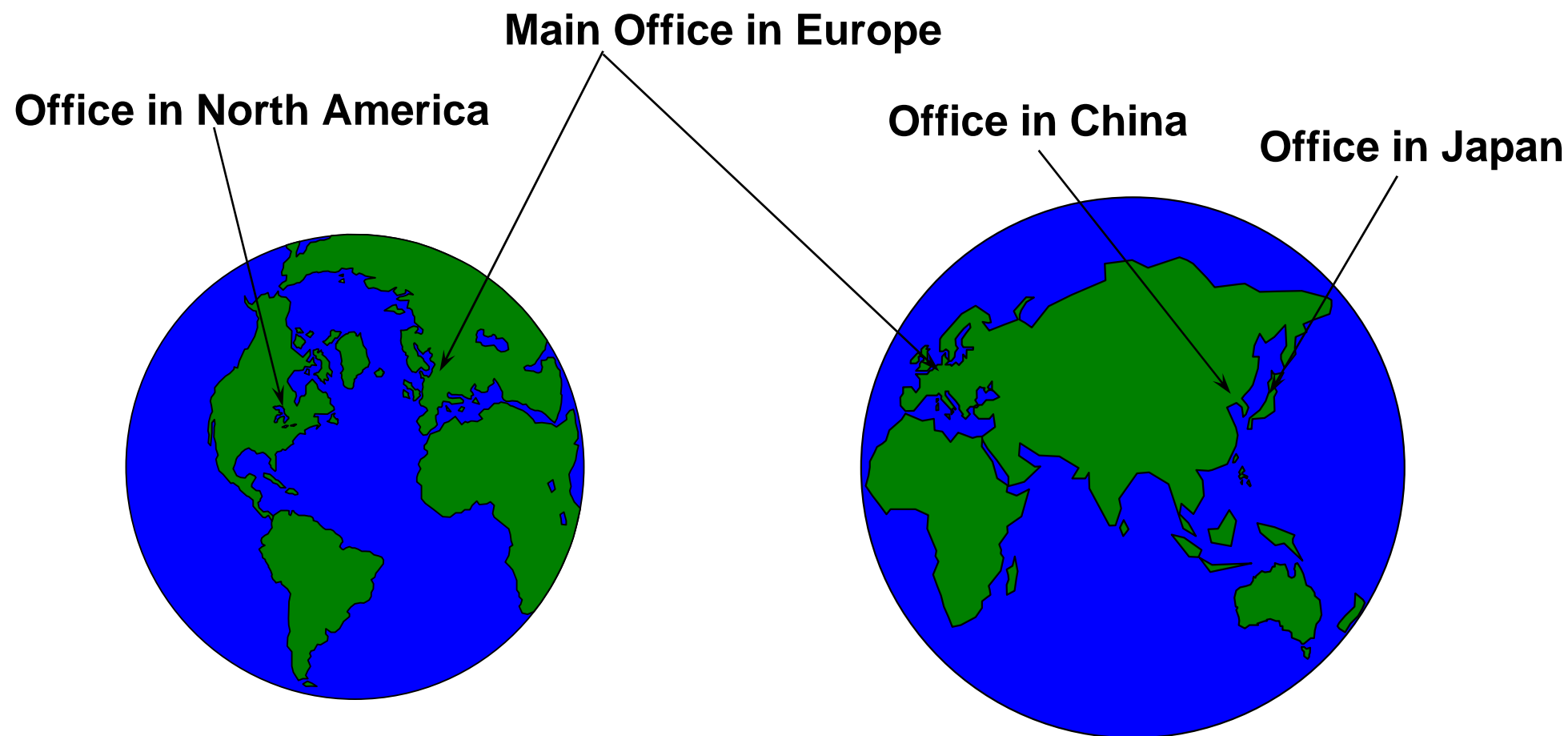
Sixth Step – PLCopen adds Safety



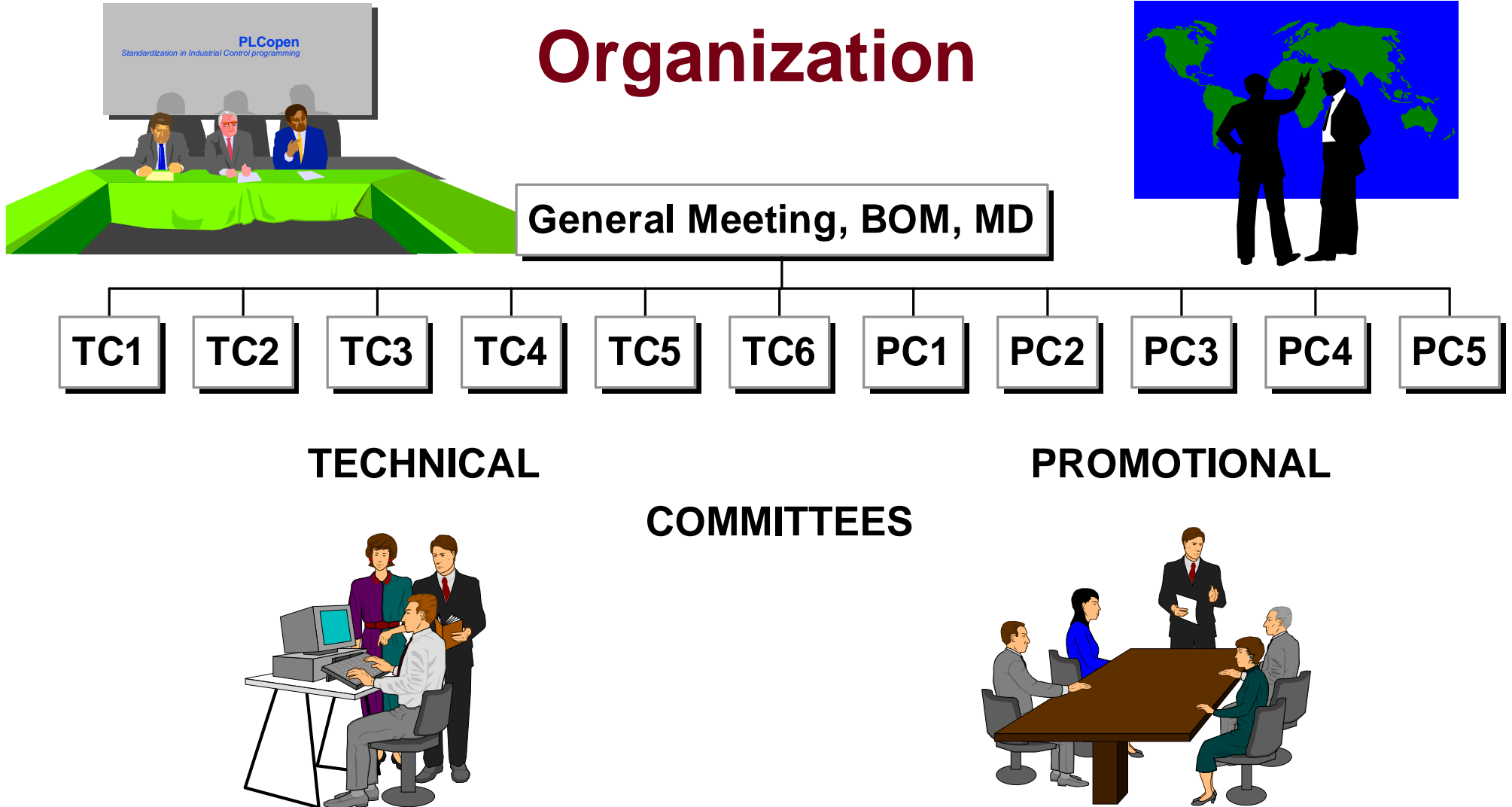
Seventh Step – PLCopen adds China



PLCopen as a World-wide association



Organization



Organizational issues

- **Non-profit association according to Dutch law**
- **All voting members are equal: one member = one vote**
- **PLCopen is focussed towards independent services, not products**
- **Focus towards users' awareness**
- **Commitment of users and suppliers members**

TC1: Standards

- **IEC 61131-3 is enhanced with Corrigendum & Amendments**
- **Development of joint PLCopen position for IEC**
- **Communication of information from IEC to PLCopen**
- **Improvement proposals**
- **Preparing for the 3d edition of the standard**

The 7 parts of the IEC 61131 Standard

- 1 General overview
- 2 Hardware
- 3 Programming Languages
- 4 User Guidelines
- 5 Communications
- 7 Fuzzy Logic
- 8 Application Guidelines

IS

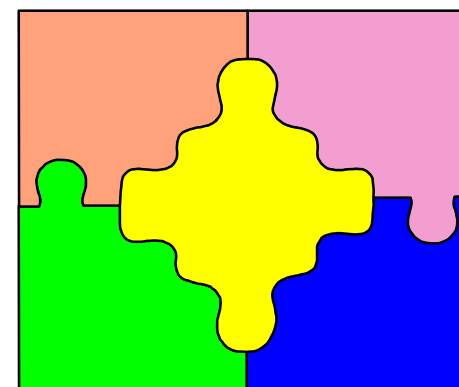
IS

IS

IS

IS

IS



IS = International Standard

IEC 61131-3

**Harmonizing the way people look to
control**

and PLCopen extending this basis

TC2: Functions

- **Definition of Function Block libraries & calling conventions**
- **... for example...**
- **Motion Control Library: the integration of different technologies: logic and motion**

TC2: PLCopen Task Force Motion Control

- Initiated by Users to fulfil their requirements

Goal :

***To harmonize the access for Motion Control
across different platforms
during development, installation and maintenance
based on the IEC 61131-3 environment***

TC2 – TF Motion Control

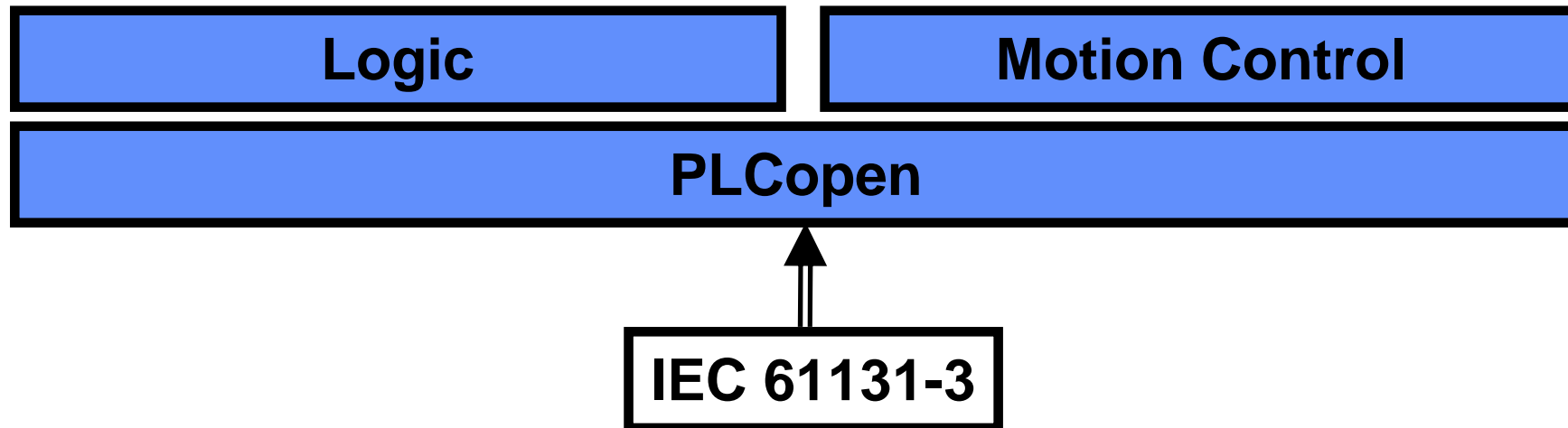
- Part 1 – FBs, version 1.0 - 2001, version 1.1 - 2005
- Part 2 – Extensions, released Sept 2005
- Merge of Part 1 and 2 , version 2.0 - released 2011
- Part 3 – User Guidelines, 2008 (ongoing)
- Part 4 – Coordinated Motion, released 2008
- Part 5 – Homing procedures – planned 2011
- Part 6 – Fluid Power – planned 2011
- 25 companies certified
- Check website for full list



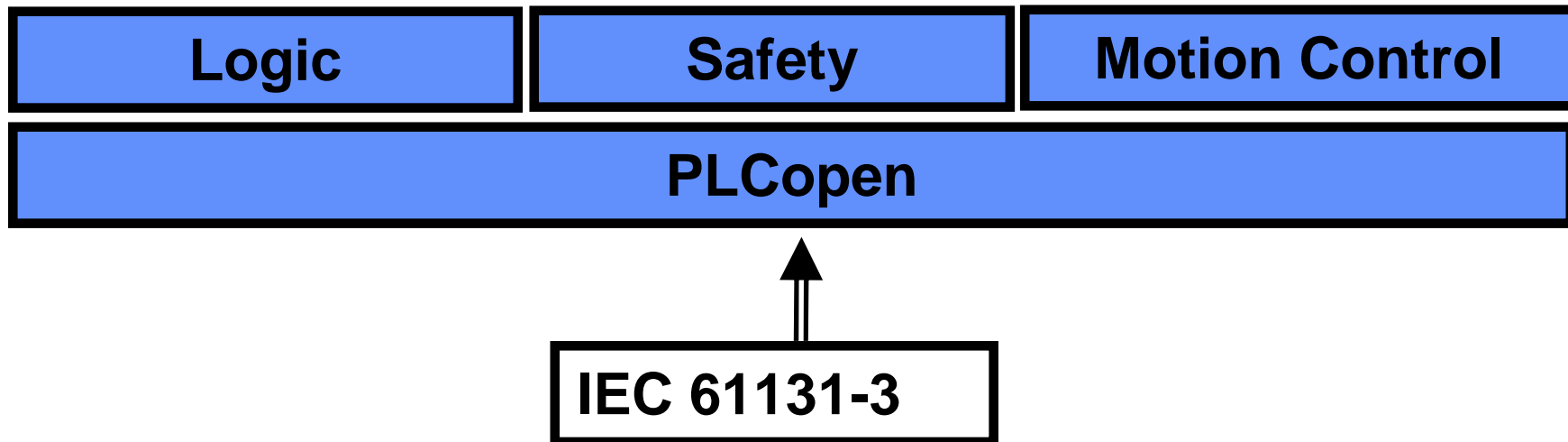
PLCopen Motion Control :



**The merge of
Logic and Motion**



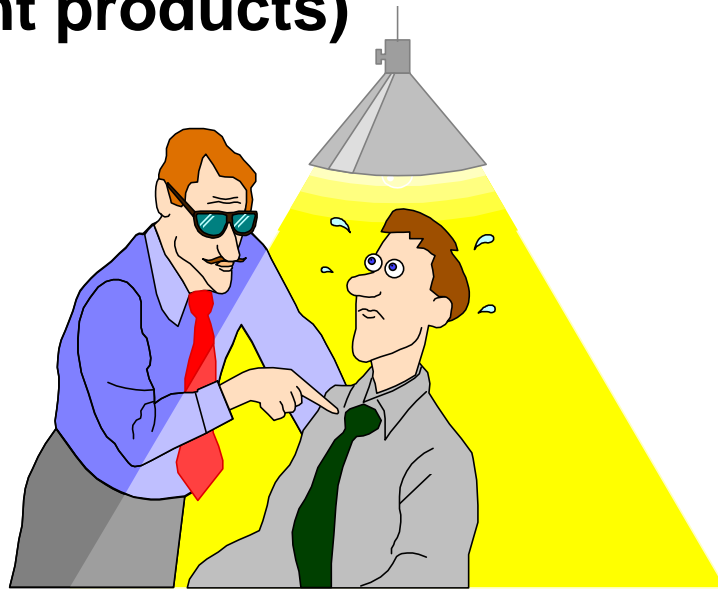
The next step: Adding Safety (at machine level)



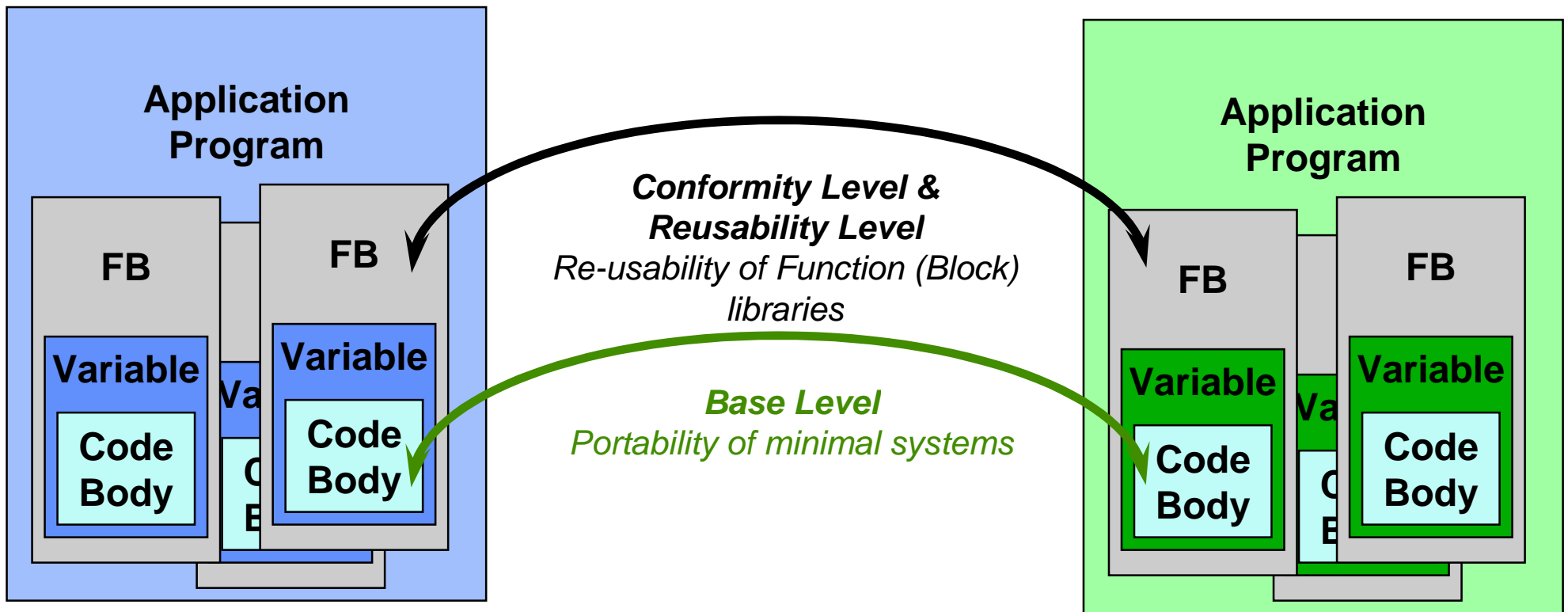
TC3 : Certification

...without testing there is no standard...

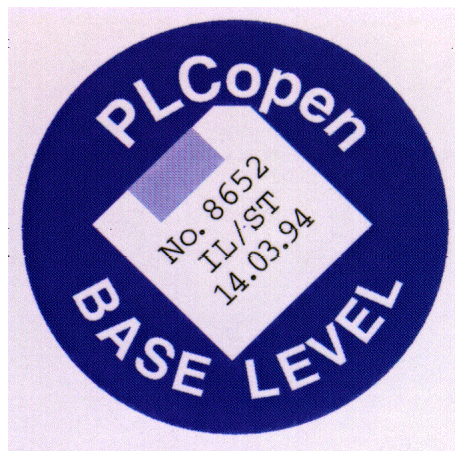
- **The IEC 61131 standard only gives basic rules for compliance**
- **Certification gives guidance for users towards real IEC 61131-3 programming systems (e.g. PLCopen certified list shows compliant products)**



TC3: PLCopen Compliance Levels



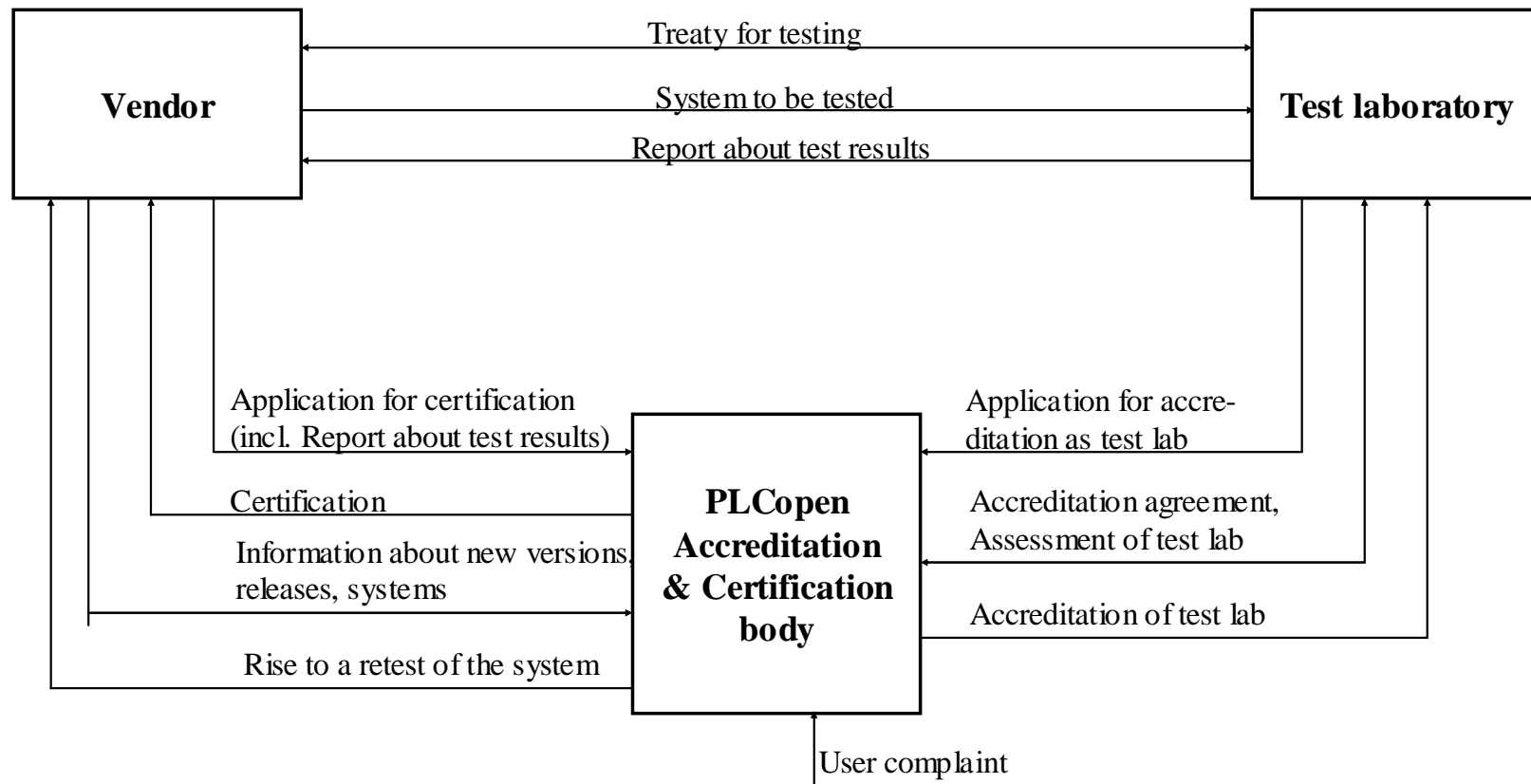
TC3: Compliance Results



TC3: Compliance Results and Status

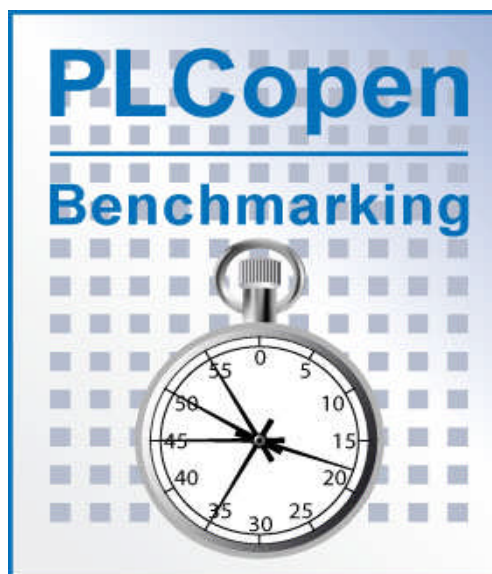
- **Guideline Compliance Testing & Certification version 2.0 released**
- **Test Laboratory Accreditation installed: 2 institutes accredited**
- **Base Level definition ready for IL, ST, FBD, LD and SFC**
- **Base Level Test software ready for IL, ST, FBD and SFC. LD in preparation**
- **Conformity Level and Reusability Level ready for ST**

TC3: Compliance Testing and Accreditation



TC3 - Benchmarking

A benchmark is a reproducible, portable test to measure the performance of a given system in comparison to other systems



TC3 - Benchmarking

There are two main objectives to use a benchmark:

- 1. To estimate the performance of the PLC in your own application**
- 2. To compare the performance of the PLC with other PLCs and find out the specific strength and weakness of a given system**

TC3 - Benchmarking

Two different sets of benchmarks defined:

- 1. 5 different types of applications, which are typical for the usage of a PLC.**
- 2. Measures each language feature of the IEC 61131-3 separately**

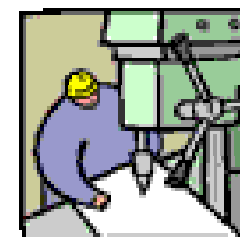
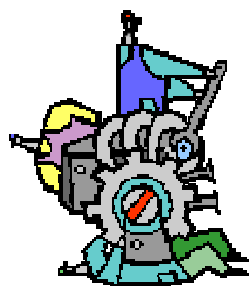
TC4: Communication

New: IEC 61131-3 information model in OPC UA

- **OPC Foundation developing new standards: Unified Architecture (UA)**
- **Joint working group of OPC Foundation and PLCopen developed new specification**
- **New specification defines OPC UA Information Model to represent IEC 61131-3 architectural models**

TC5 - Safety : Goal

**Allow the user to achieve the functional safety
at the plant and machine level**



TC5: Safety

- **Support for safe programming techniques**
- **Focus to IEC 61508 “Functional Safety of Safety Related systems”**
- **Guidelines for the use of the IEC standard**
- **Basis for easier commissioning**
- **In combination with the Function Blocks**

TC5: Safety

- **Part 1 - Concepts and Function Blocks, released Feb 2006**
- **Part 2 - User Guidelines, released March 2008**
- **Part 3 - Extensions, work started Jan 2009**
- **Part 4 - Extensions for presses work started April 2009**



TC6 : XML

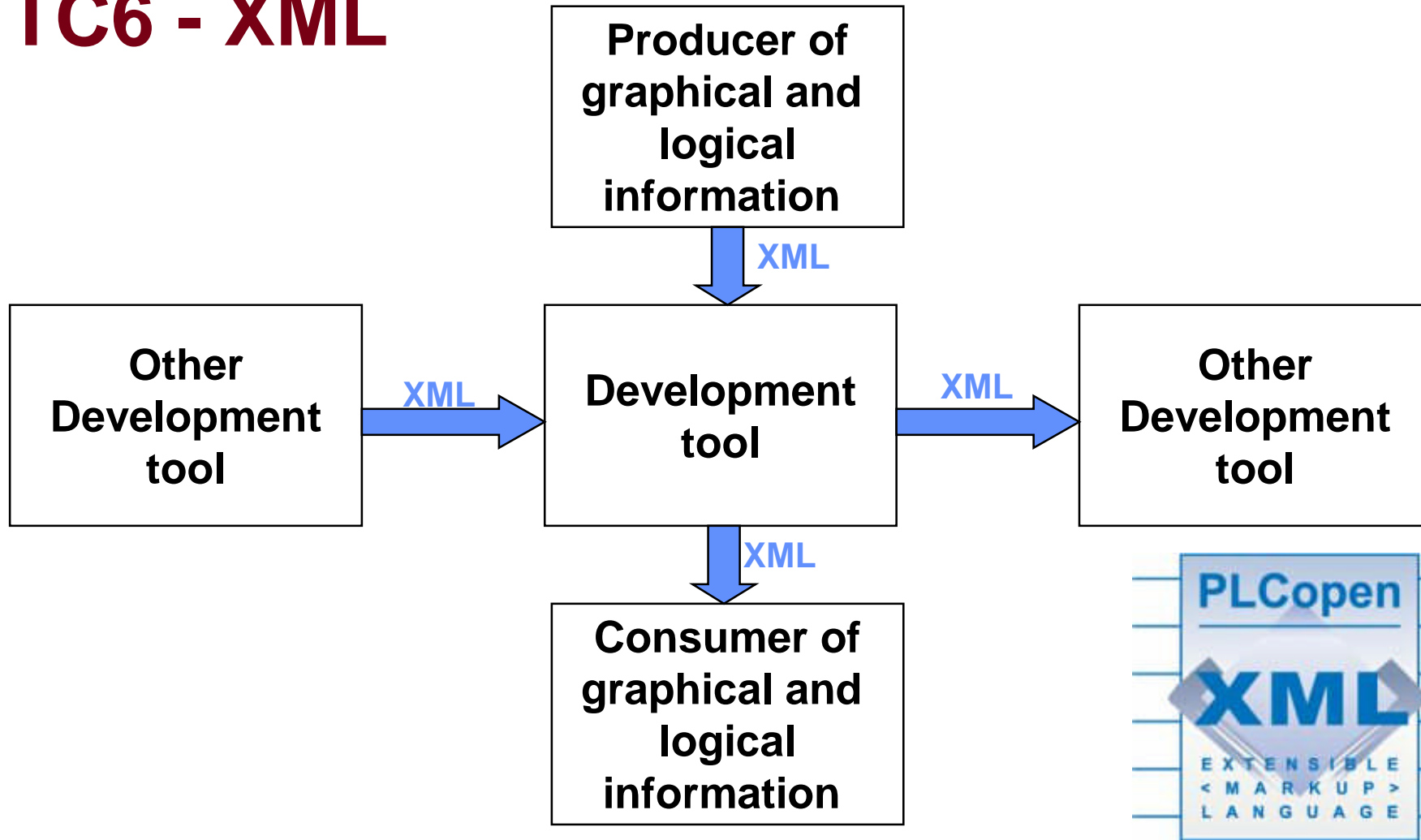
**Opening up the
development environments
by specifying XML formats for
IEC 61131-3**



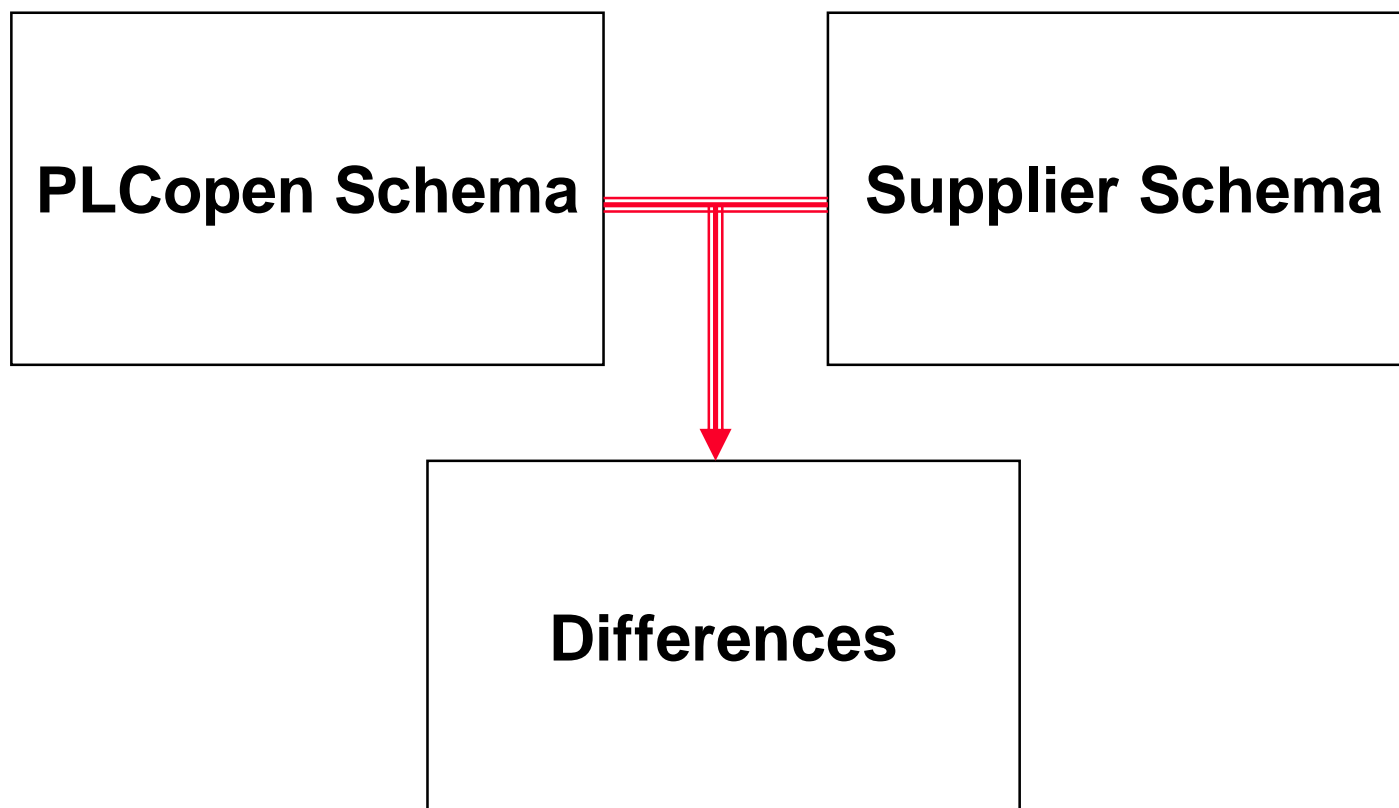
TC6: XML

- **Definition of XML schemes for all the IEC languages**
- **Representation of graphical information**
- **Interface to other tools**
- **Basis for distribution of Function Block libraries**
- **Version 2.0 – released December 2008**
- **Consists of a technical doc, the XML schema, and explanation.**

TC6 - XML



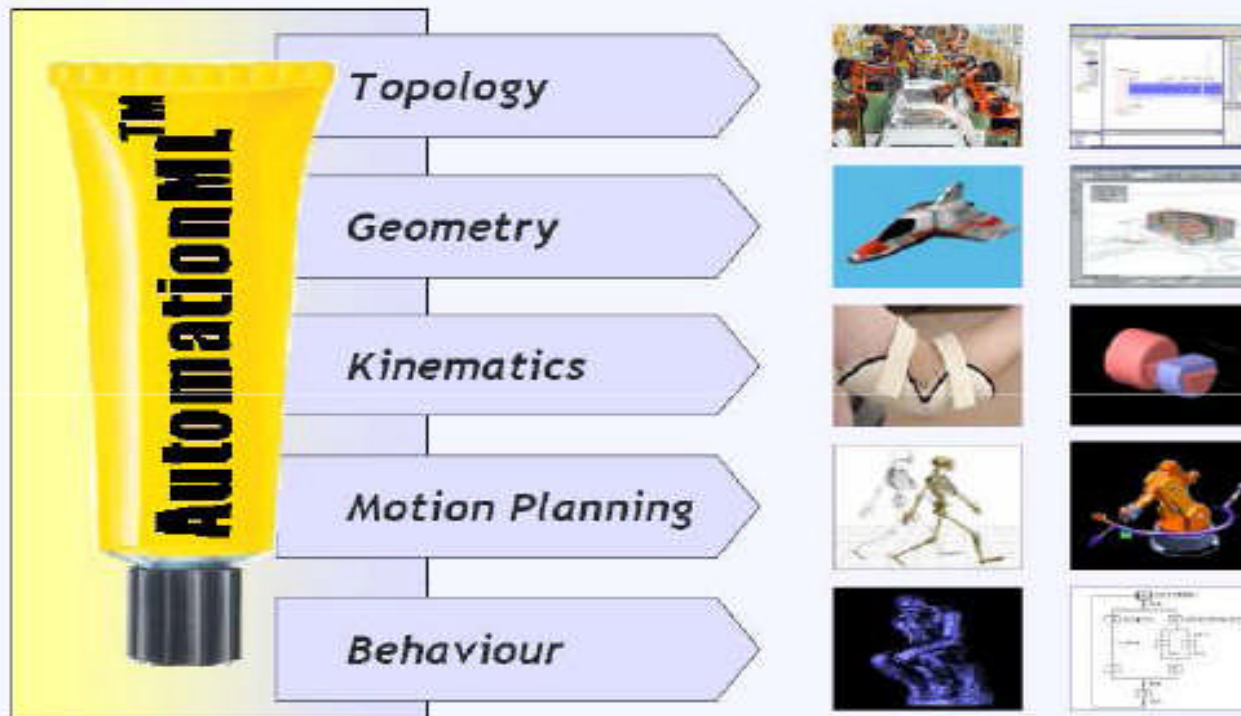
TC6 Coupling XML Schemes



TC6 – XML: Status

- **Automation Markup Language (AutomationML) initiated by group of companies (Daimler, ABB, KUKA, Rockwell, Siemens, netAllied and Zühlke) and universities of Karlsruhe and Magdeburg**
- **Interface PLCopen and AutomationML**
- **PLCopen XML scheme version 2.0 released December 2008**

AutomationML™ describes mechatronical objects



SPS/IPC/Drives Nürnberg, 27-29 Nov 2007

AutomationML - Overview

















8

AutomationML™ is
free and open



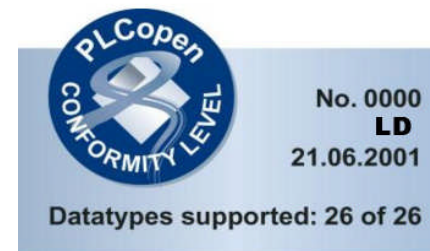
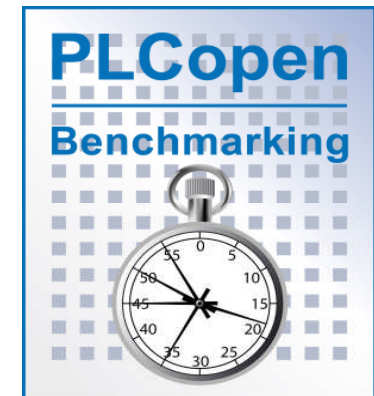
AutomationML™ incorporates successful standards



Aspect*	Format*	Organisation*
 Topology	CAEX (IEC 62424)	  VDE DIN
 Geometry		
 Kinematics		
 Motion Planning		
 Sequencing		 for efficiency in automation
 ...		

* Snapshot 11/2007

Wrap Up



General Promotion

- **PC1: General Promotion**
- **PC3: Promotion North America**
- **PC4: Promotion Japan**
- **PC5: Promotion China**

PC2: Common training program

- **The effect of training is often underestimated**
- **Standardization can be very useful and provide a better interface between study and reality**
- **PC2 defined common basics for training..**
- **.. for instance: a IEC 61131-3 training guideline is published**
- **Training facilities fulfilling basic requirements can be certified and listed / referenced to (see website for listing)**

The association PLCopen

Together we can make it happen:

efficiency in automation

WE NEED YOUR SUPPORT FOR THIS !

Join the organization PLCopen

More Information...

www.plcopen.org

- **Free-of-Charge electronic Newsletter 'PLCopening' (in English)**

email: evdwal@plcopen.org

Thanks !

End of this presentation