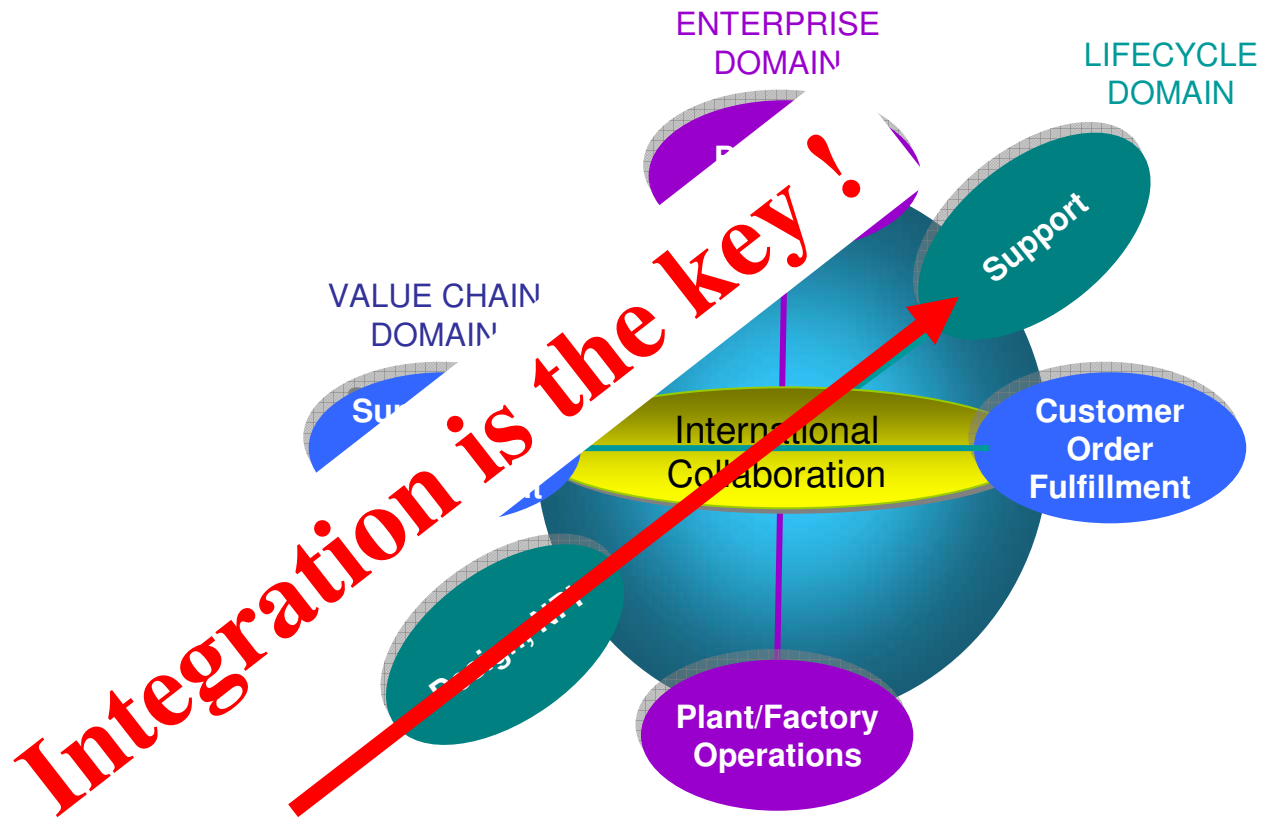


# Interoperability by standardized spec sheets

Presentation at ARC Conference  
Orlando 2006 Feb 24 - 26



Collaborative Manufacturing Management

# Speakers:



Dr. Hasso Drathen  
Bayer Technology Services  
D-51378 Leverkusen  
Building K9  
Tel +49-214-30-71034  
Fax +49-214-30-72774  
E-mail [office@NAMUR.de](mailto:office@NAMUR.de)  
[www.NAMUR.de](http://www.NAMUR.de)  
Namur managing director



Bayer Technology Services



Prof. Dr. Wolfgang Ahrens  
D-42799 Leichlingen  
Weißdornweg 21  
Phone: +49 (0) 2175 720250  
Email: [wolfgang.ahrens.wa@t-online.de](mailto:wolfgang.ahrens.wa@t-online.de)  
CAE-consultant, Intergraph representative,  
honorary professorship at University Aachen  
(RWTH Aachen)



Oskar Kroll  
Endress+Hauser Consult AG  
Kägebstrasse 7  
CH-4153 Reinach  
Phone: +41 (0) 61 715 77 81  
Email:  
[Oskar.kroll@holding.endress.com](mailto:Oskar.kroll@holding.endress.com)  
Leader of the international e-business unit  
of Endress + Hauser

**Endress+Hauser** 

People for Process Automation



Ahrens, Drathen, Kroll: Interoperability by standardized spec sheets

THOUGHT LEADERS FOR MANUFACTURING & SUPPLY CHAIN



# Interoperability by standardized spec sheets

## Contents

- Introduction
- Driving forces
- Workflow
- Benefits
- Pilot project
- Standardization process

# Interoperability by standardized spec sheets

## Contents

- Introduction – user issues
- Driving forces
- Workflow
- Benefits
- Pilot project
- Standardization process

# User issue: different media and forms

## Introduction

Driving forces

Workflow

Benefits

Pilot project

Standardization  
process

**Manufacturer A**



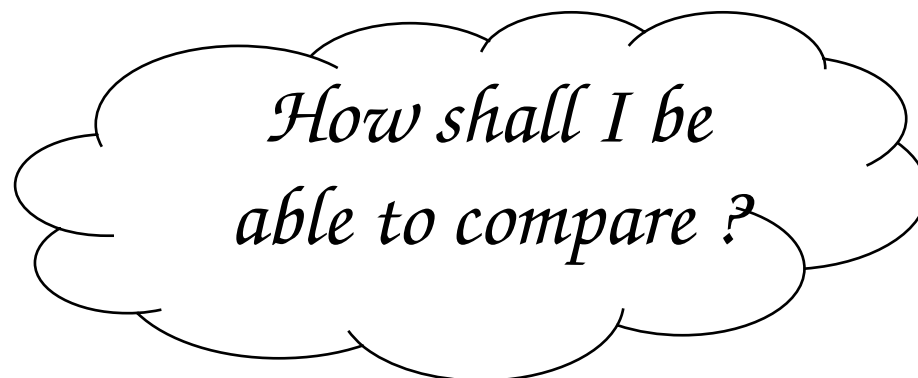
**Manufacturer B**



**Manufacturer C**



**Manufacturer D**



**Media ?**

**Characteristics ?**

**Forms ?**



# User issue: acceptance

## Introduction

Driving forces

Workflow

Benefits

Pilot project

Standardization  
process



*I do not find anything !!!*

*Because of:*

*different structures...*

*different terms...*

*different numbering systems...*

*different classifications...*

# User issue: different views

Introduction

Driving forces

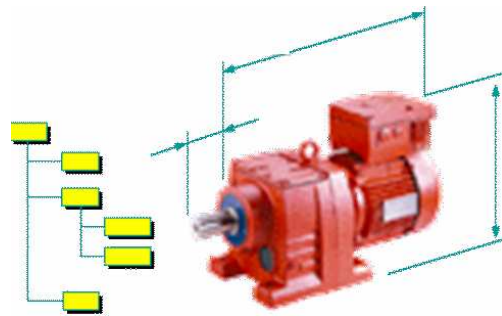
Workflow

Benefits

Pilot project

Standardization  
process

Classification according  
**mechanical** criteria



pcs-engineer

I need *CAE data*

electrician

I need *electrical characteristics*

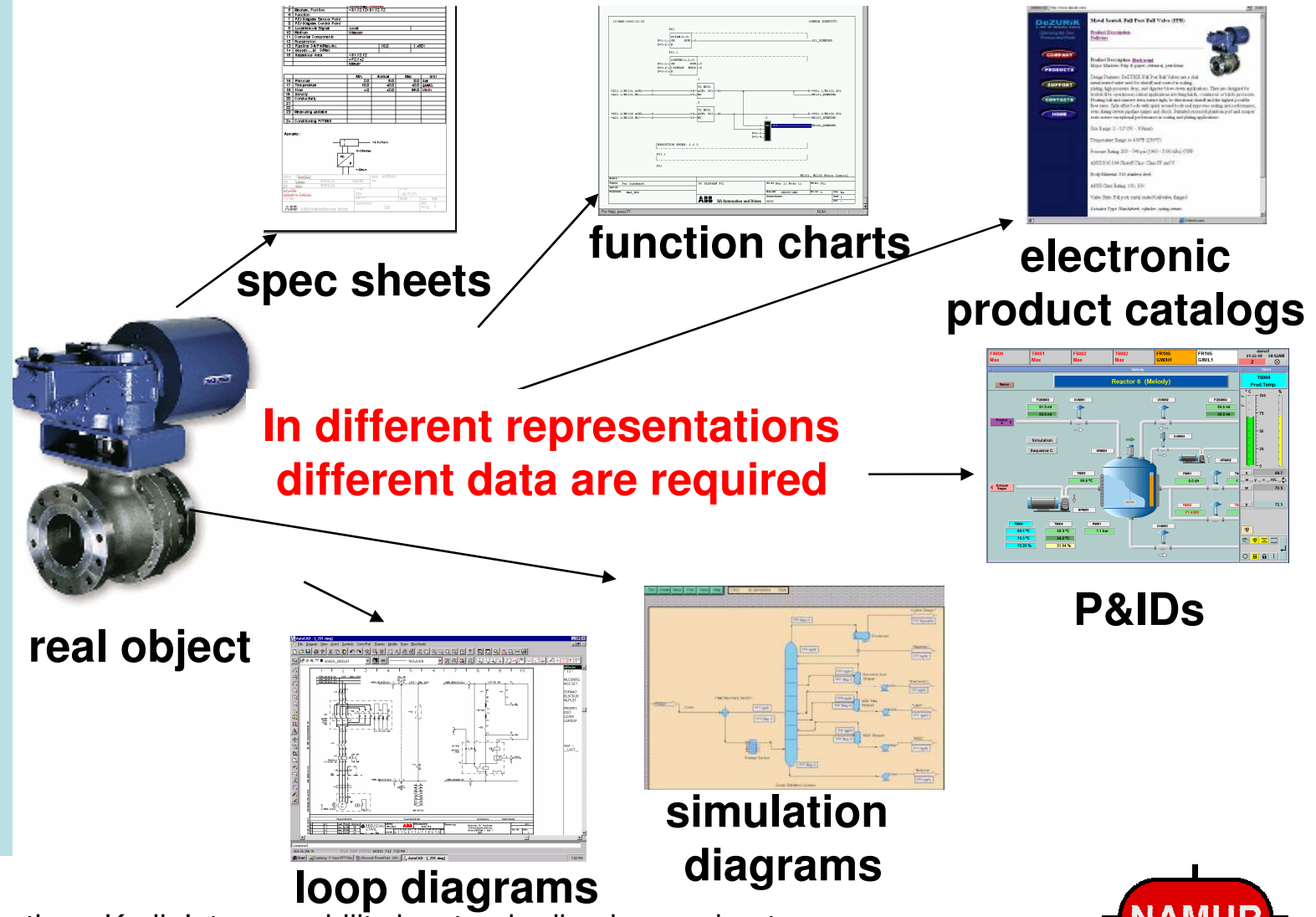
buyer

I need *commercial data*



# User issue: different forms of real objects

Introduction  
 Driving forces  
 Workflow  
 Benefits  
 Pilot project  
 Standardization  
 process



Ahrens, Drathen, Kroll: Interoperability by standardized spec sheets

THOUGHT LEADERS FOR MANUFACTURING & SUPPLY CHAIN





## Introduction

Driving forces

Workflow

Benefits

Pilot project

Standardization  
process

## Some questions to the equipment users:

- Do you still **enter your inquiry** data for process control equipment into your purchasing system manually and send it to your suppliers by fax or email?
- Do you still receive **non compatible quotations** from different manufacturers?
- Do you still enter the equipment data from the manufacturer's catalog into your CAE system **laboriously by hand**?

# Interoperability by standardized spec sheets

## Contents

- Introduction – supplier issues
- Driving forces
- Workflow
- Benefits
- Pilot project
- Standardization process

# Supplier issue: Inquiries in different media and forms

Introduction

Driving forces

Workflow

Benefits

Pilot project

Standardization  
process

**Customer A**



**Customer B**



**Customer C**



**Customer D**



*How can I reduce the complexity of my inquiry and quotation process?*

Media ?

Characteristics ?

Forms ?



## Introduction

Driving forces

Workflow

Benefits

Pilot project

Standardization  
process

## Some questions to the equipment manufacturers:

- Do you still receive inquiries in paper (letter or fax) and from each customer **in a different form?**
- Do you still have to **enter the inquiry data into your systems manually** to create a quotation?
- Do you still send your quotations **by fax, letter** or email?

## Introduction

Driving forces

Workflow

Benefits

Pilot project

Standardization  
process

## Some questions to the CAE-system vendors:

- Does your CAE-system support a standardized **electronic exchange-format** for device properties based on XML ?
- Are your CAE-systems **able** to handle standardized lists of properties for process control devices?
- Does your CAE-system **support** interfaces to procurement, material and plant maintenance systems ?

## Introduction

Driving forces

Workflow

Benefits

Pilot project

Standardization  
process

## Current situation:

**Customer and supplier processes are not standardized and most CAE systems are not able to fulfill the technical requirements.**

## To improve process quality and to save costs:

- **We need standardized exchange formats based on XML!**
- **We need standardized interfaces between customer and supplier systems!**

# Interoperability by standardized spec sheets

## Contents

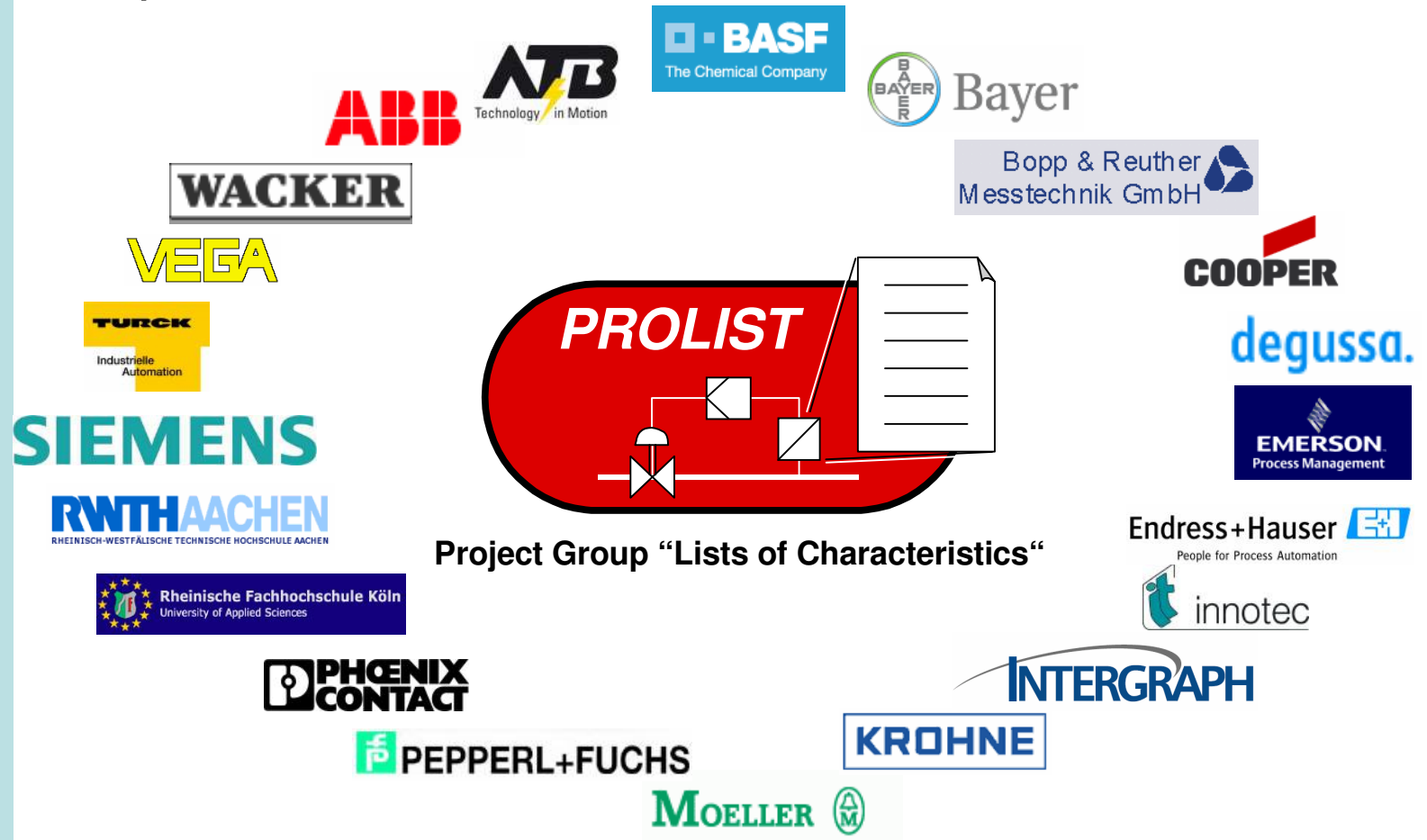
- Introduction
- Driving forces
- Workflow
- Benefits
- Pilot project
- Standardization process



# Who stands for NAMUR/PROLIST today?

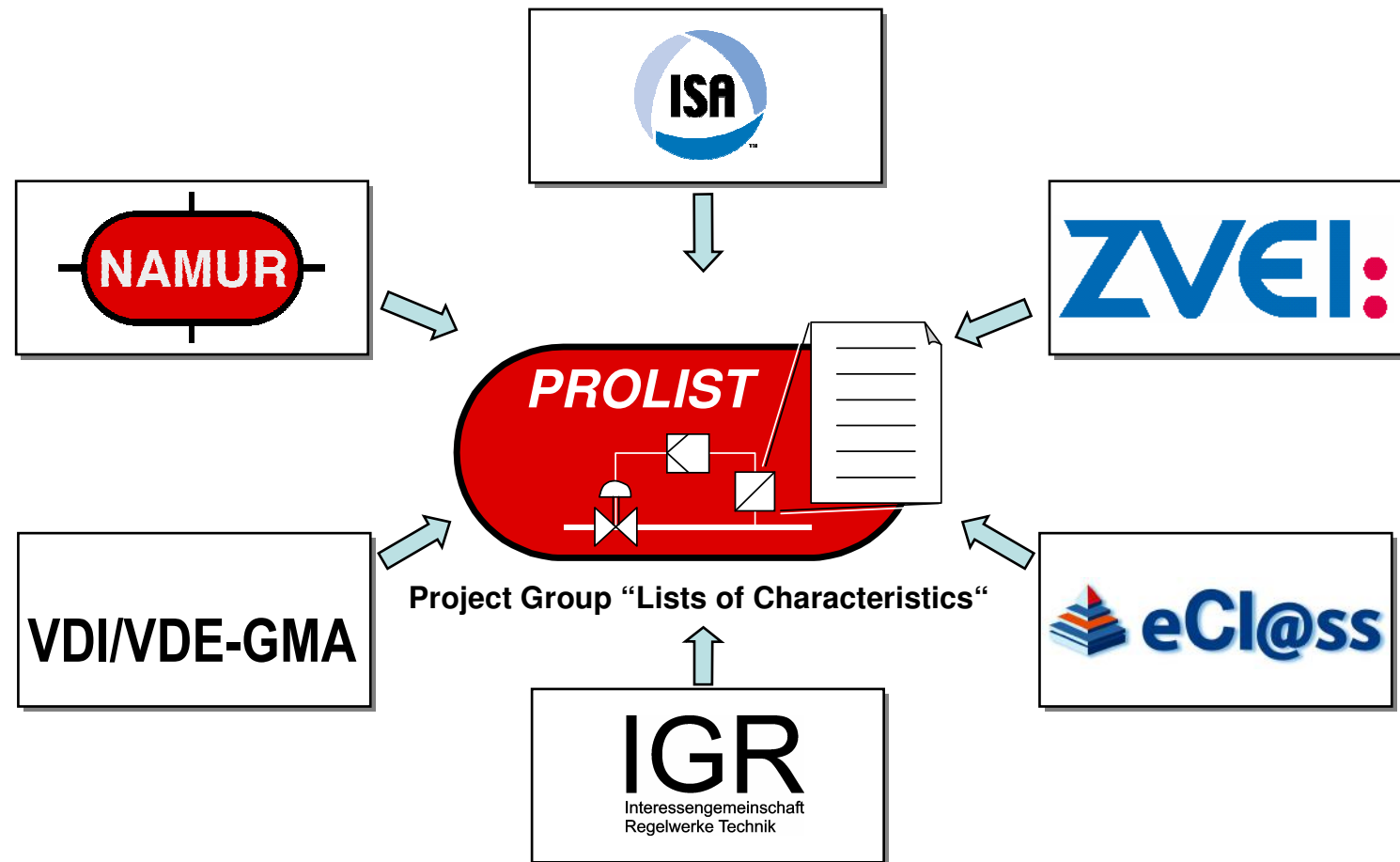
Companies:

- Introduction
- Driving forces
- Workflow
- Benefits
- Pilot project
- Standardization process



# Who stands for NAMUR/PROLIST today?

Associations:



- Introduction
- Driving forces
- Workflow
- Benefits
- Pilot project
- Standardization process

## Some fundamentals

Introduction

Driving forces

Workflow

Benefits

Pilot project

Standardization  
process

- ☑ It is our aim to help companies **saving transaction costs** by an electronic data exchange format which companies (vendors, owner/operators, EPC companies) can use for communications.
- ☑ It is the aim to create an **international standard** in cooperation with IEC and ISA
- ☑ It is **not** the purpose to create a new classification system for devices neither to prefer nor to reject one.

## What are the objectives of NAMUR/Prolist ?

Introduction

Driving forces

Workflow

Benefits

Pilot project

Standardization  
process

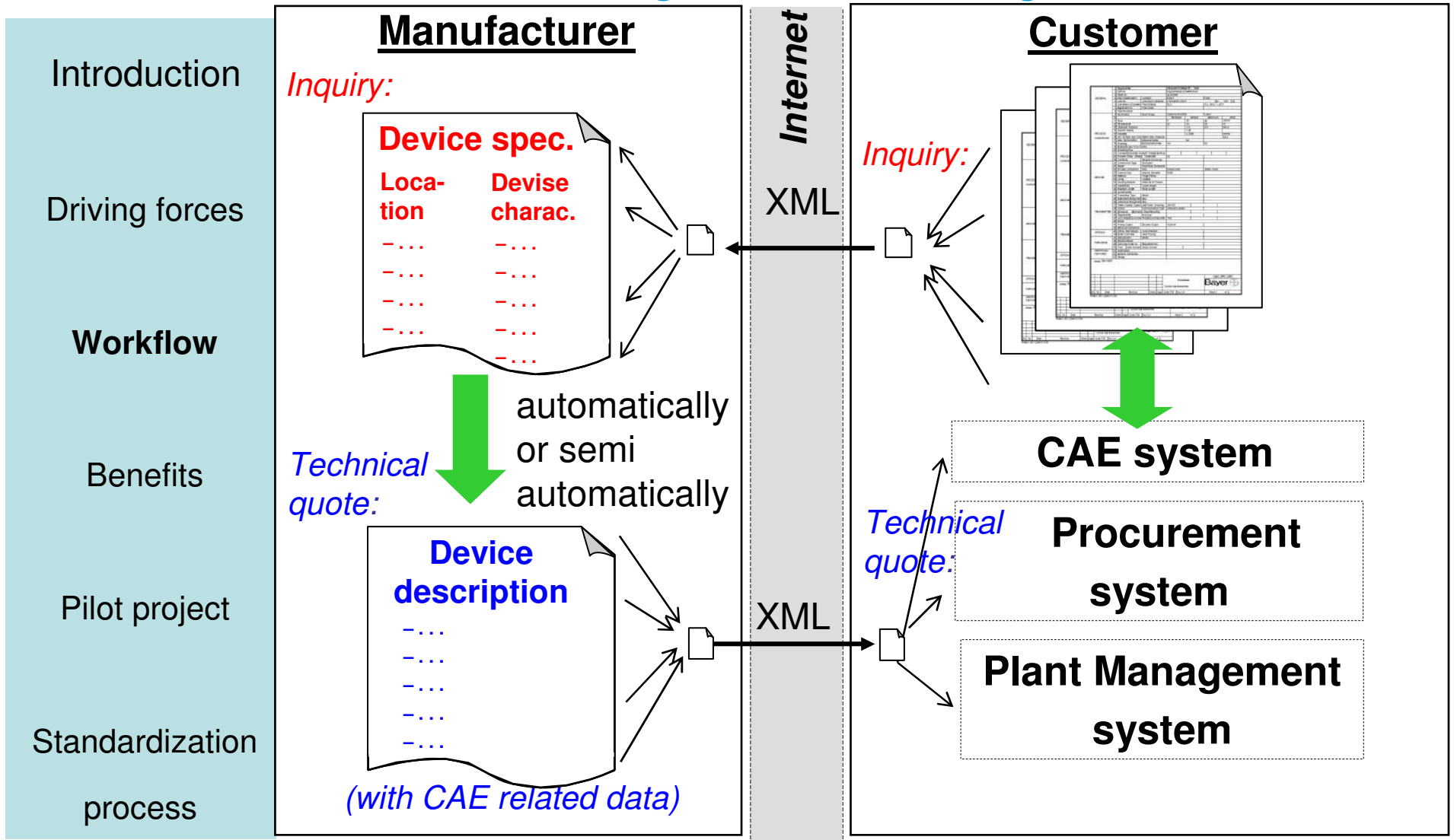
- ✓ Creation of **lists of properties** (eSpec Sheets) covering all classes of pc-devices.
- ✓ Creation of an **easy-to-use WEB server** for creating and maintaining eSpec Sheets familiar with IEC-server and for putting eSpec Sheets at companies proposal.
- ✓ Creation of **application tools** for handling files
- ✓ Creation of an **exchange format** based on XML and supported by SAP.

# Interoperability by standardized spec sheets

## Contents

- Introduction
- Driving forces
- Workflow
- Benefits
- Pilot project
- Standardization process

# Advantages when using LOC's

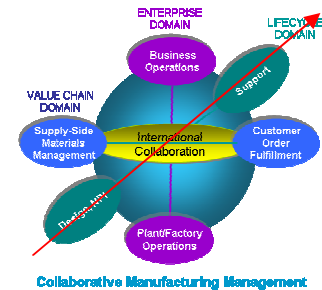


- Introduction
- Driving forces
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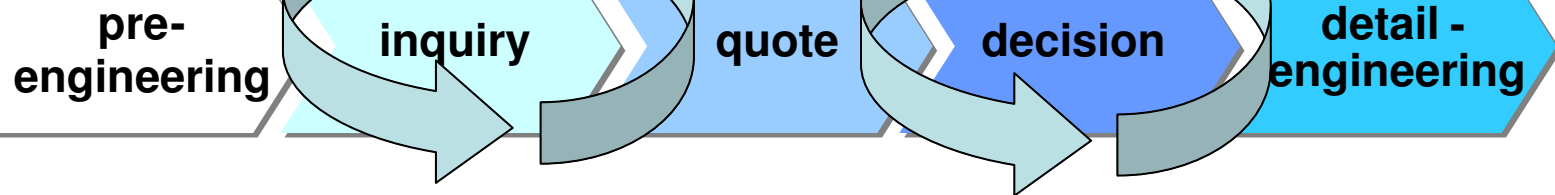
# The life cycle domain

## *Owner/operator's/EPC-company's side*

1. Definition of the automation task
2. Definition of the requirements
3. Definition of inquiries concerning pc-devices



### Workflow



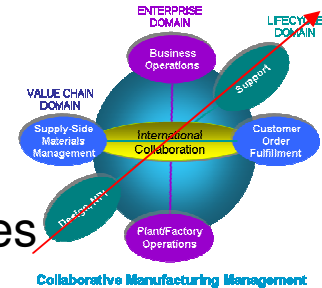
4. Understanding the inquiries
5. Clearing of misunderstood issues
6. Definition of a quote

## *Manufacturer's/Supplier's side*



# The life cycle domain

## *Owner/operator's/EPC-company's side*



- 7. Comparison of quotes
- 8. Clearing of misunderstood issues
- 9. Ordering devices



- 10. Comparison of orders
- 11. Clearing of misunderstood issues
- 12. Delivering devices

## *Manufacturer's/Supplier's side*

- Introduction
- Driving forces
- Workflow**
- Benefits
- Pilot project
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# Interoperability by standardized spec sheets

## Contents

- Introduction
- Driving forces
- Workflow
- Benefits
- Pilot project
- Standardization process

# Benefits for owners/operators or EPC-company side

Introduction

Driving forces

Workflow

**Benefits**

Pilot project

Standardization  
process

## Standardized electronic spec sheets:

### → Reduce costs

- 30 min/tag number time savings

### → Reduce the total engineering processing time

- Fast device data exchange

### → Improve the engineering process quality

- no mistakes like by manual data input

### → Improve the comparison of quotations

- based on defined properties

# Benefits for suppliers

Introduction

Driving forces

Workflow

**Benefits**

Pilot project

Standardization  
process

## Standardized electronic spec sheets:

### → Reduce the complexity of inquiry and quotation processes

- One standard used by different customers
- Reduce IT costs

### → Reduce operative costs

- 15 – 25 min/tag number time savings

### → Improve process quality

- no mistakes like by manual data input

# Benefits for suppliers

Introduction

Driving forces

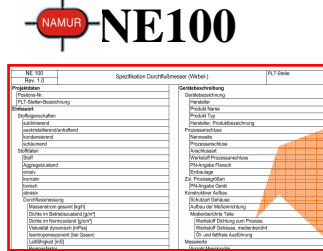
Workflow

Benefits

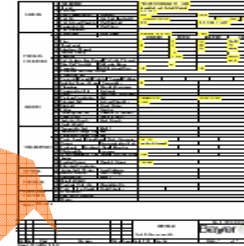
Pilot project

Standardization process

## electronic Spec Sheet



## Paper spec sheets



## SAP

	Process connection and material
GQ2	G3/4 BSP, 1.4435/316L
GQ5	G3/4 BSP, Alloy C4/2.4610
GM2	3/4" NPT, 1.4435/316L
GM5	3/4" NPT, Alloy C4/2.4610
GE2	R3/4 BSP DIN 2999, 1.4435/316L
GE5	R3/4 BSP DIN 2999, Alloy C4/2.4610

## Selection tools



## Documentation

For -10...+60°C (+14...+140°F): ± (0.1% x TD + 0.1%)
For -40...-10°C (-40...+14°F), +60...+85°C (+140...+185°F): ± (0.2% x TD + 0.2%)
TD = nominal value/set span
For -20...+85°C: ±(0.2% x TD + 0.4%): 0.1 bar

## Homepage



**Product data management based on product properties:**  
**→ Improvements of the data quality by maintaining only one source for different processes**

# Benefits for CAE-vendors

Introduction

Driving forces

Workflow

**Benefits**

Pilot project

Standardization  
process

## **Higher acceptance by**

- end users,
- solution providers,
- EPC companies

**The CAE-vendors increase their competitiveness.**

**Less interfaces to other systems especially  
ERP and catalog systems**

## WIN WIN situation for all

Introduction

Driving forces

Workflow

**Benefits**

Pilot project

Standardization  
process

**Interoperability by  
standardized electronic spec sheets  
improves process quality and saves  
costs**

**→ Increasing the competitiveness  
of all participants**





# Interoperability by standardized spec sheets

## Contents

- Introduction
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- Benefits
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- Standardization process

# Pilot project at Bayer Technology Services

## Introduction

Early in 2005 Bayer Technology Services started a pilot project with the following objectives:

## Driving forces

## Workflow

## Benefits

## Pilot project

## Standardization process

- to show that using the WEB server it is possible to create exchange files including XML, PDF and XLS files in an easy, user-friendly way.
- to show, that it is possible to send these files from Bayer Technology Services to certain manufacturers (inquiries) for creation of quotations.
- to show that the same business process works the other way round.
- to show that Intergraph is able to integrate the XML file into its Smart Plant Instrumentation planning tool.

# Companies involved

- Introduction
- Driving forces
- Workflow
- Benefits
- Pilot project**
- Standardization process

## Device suppliers involved in pilot project:

- Coriolis flowmeter/ Level transmitter      Endress+Hauser
- Pressure transmitter/ Positioner      Siemens
- Motor drive      ATB
- Remote IO      Pepperl+Fuchs



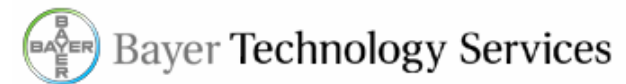
## CAE system used:

- SmartPlan Instrumentation Intergraph



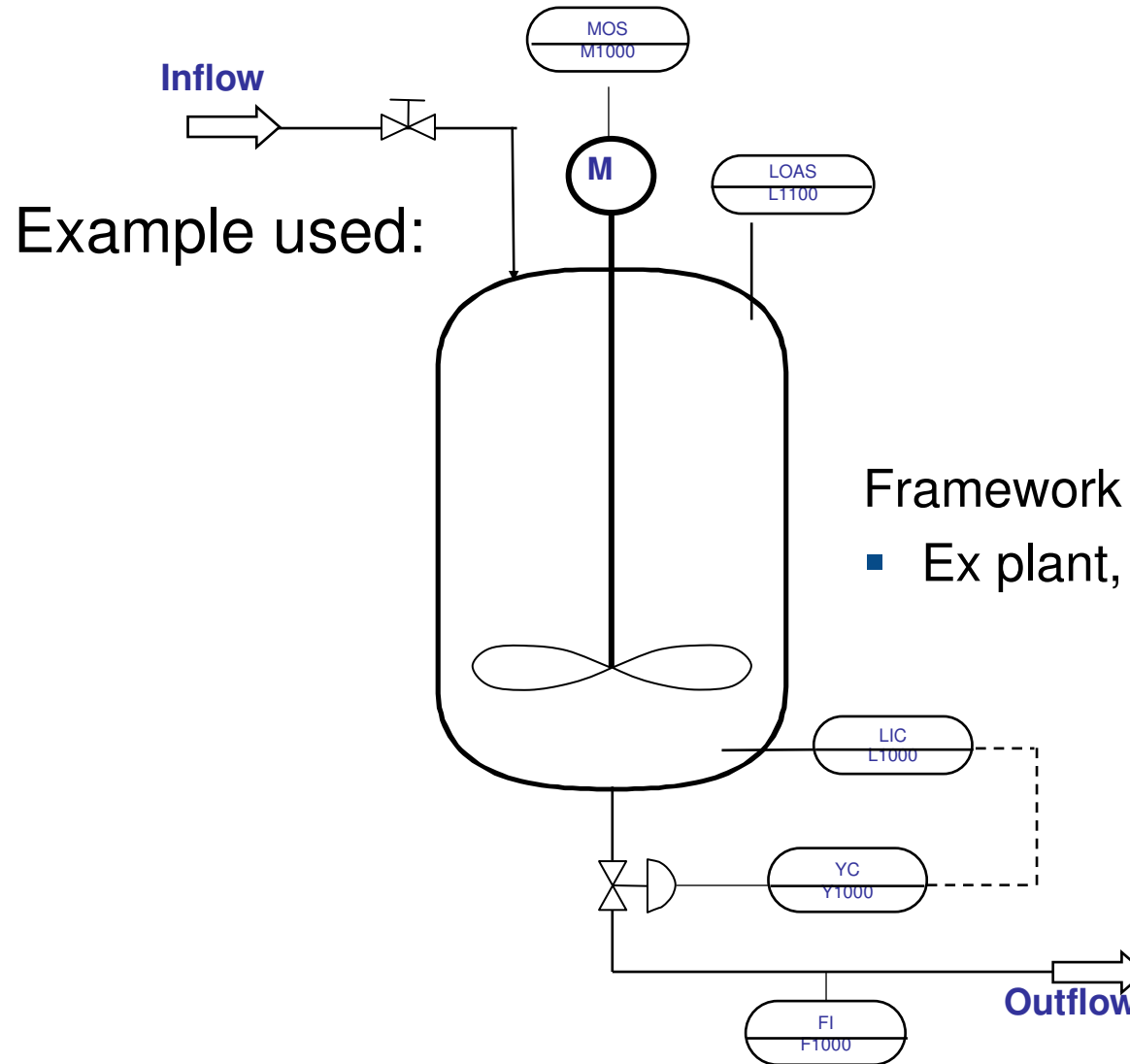
## Customer in project:

- Bayer Technology Services



# Pilot project at Bayer Technology Services

- Introduction
- Driving forces
- Workflow
- Benefits
- Pilot project**
- Standardization process



## Pilot project: lessons learned

Introduction

Driving forces

Workflow

Benefits

**Pilot project**

Standardization  
process

- The overall business process works properly.
- The manufacturers are lacking adapters for their inhouse catalog systems  
→ They are now on the way to realize adapters.
- First the server was a little bit slow  
→ Problem was solved to the greatest possible extent
- The adapter to SmartPlant Instrumentation was difficult to create, because the data models on both sides differ in detail.  
→ Problem solved

# Other pilot projects on the way within the NAMUR/Prolist context

	<b>User</b>	<b>CAE-Vendor</b>	<b>Manufacturer</b>
Introduction			
Driving forces			
Workflow	<ul style="list-style-type: none"> <li>• BASF 2006</li> </ul>	Intergraph + Rösberg	different manufacturers
Benefits	<ul style="list-style-type: none"> <li>• Degussa planned for 2006</li> </ul>	Rösberg	different manufacturers
<b>Pilot project</b>	<ul style="list-style-type: none"> <li>• Bayer planned for 2006</li> </ul>	Intergraph	different manufacturers
Standardization process			

# Interoperability by standardized spec sheets

## Contents

- Introduction
- Driving forces
- Workflow
- Benefits
- Pilot project
- Standardization process

# What comes next ?

Introduction

- NAMUR/Prolist is working on further electronically exchangeable spec sheets

Driving forces

- NAMUR and ISA are matching NAMUR NE 100 and ISA – 20.00.03 – 2001

Workflow

- Next version NE 100 is planned for 2006 as a harmonized recommendation with common property library

Benefits

Pilot project

- The standardization process in IEC will be accelerated
- Adaptors will be created by the manufacturers

**Standardization  
process**

- Some adaptations concerning the server and the tools will be made.



# IEC / ISO Standards

Introduction

Driving forces

Workflo

Benefi

Pilot project

Standardization  
process

International Electrotechnical Commission  
IEC 61360 - Component Data Dictionary

Welcome to the IEC Component Data Dictionary

The IEC 61360 database contains the IEC reference collection of classes and associated characteristic prop. electric/electronic components and materials used in electrotechnical equipment and systems.

Scope

The dictionary and database follow the methodology of Part 1 of IEC 61360 and the information model of Parts 2 and 5, and include:

**IEC 61360-2**

**Component Data Dictionary**

IEC 65B/555/NP  
NEW WORK ITEM PROPOSAL

Title of proposal  
Industrial-Process Measurement and Control - Data Structures and Elements in Process Equipment Catalogues - Part 2: Measuring equipment properties for electronic data exchange

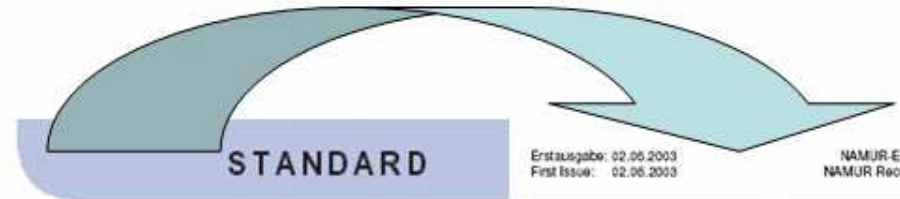
Standard  Technical Specification  Publicly Available Specification

**International Organization for Standardization**

**ISO 13584-42 Industrial automation systems and integration – Parts library**

# Matching NAMUR NE 100 and ISA - 20 - 1981

- Introduction
- Driving forces
- Workflow
- Benefits
- Pilot project
- Standardization process



STANDARD

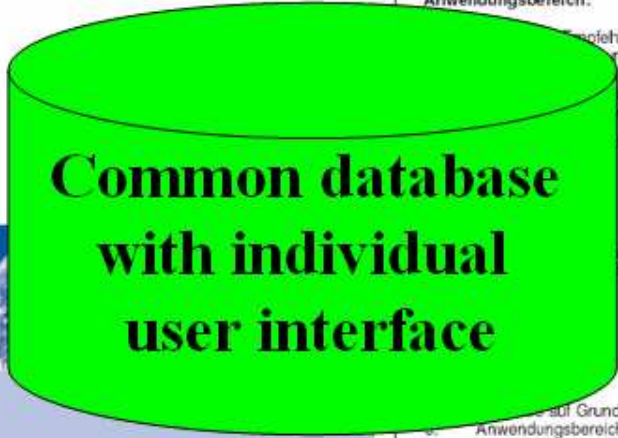
Erstausgabe: 02.05.2003  
First Issue: 02.05.2003

NAMUR-Empfehlung  
NAMUR Recommendation

Version: 02.05.2003

**New: Version 3.0 by April 2006**

	<b>Merkmalen zur Erstellung von PLT-Gerätespezifikationen</b> Lists of characteristics for creation of process control device specifications	<b>NE 100</b> Version 1.0
<b>Anwendungsbereich:</b> Anwendungsbereich: ... Empfehlungen und -Arbeits- ... im Erfahrungsberichte ... die NAMUR für ihre ... der Anwender zur ... arbeitet hat. ... als Normen oder ...		<b>Scope:</b> NAMUR® Recommendations and Worksheets are working documents and practical reports prepared by NAMUR for their members. Their application is optional.  These papers are neither normative standards nor guidelines.  The English version is a translation. In case of doubt you should follow the original German text.  * User Association of Process Control Technology in Chemical and Pharmaceutical Industries
<b>Specification Forms for Process Measurement and Control Instruments, Primary Elements, and Control Valves</b>		<b>Contents</b> Preamble 1. Introduction 2. References to basic principles 3. Scope 4. Benefits of standardized specifications for process control devices 5. Description of the underlying data model 6. Correlation with classification systems  7. Examples of use 8. Summary and outlook 9. References 10. Appendix 10.1 Basics 10.2 Device Specifications Version 1.0



**Common database with individual user interface**

**ISA-20-1981**  
Formerly ISA-S20-1981





# Co-operation Agreement NAMUR - ISA

Introduction

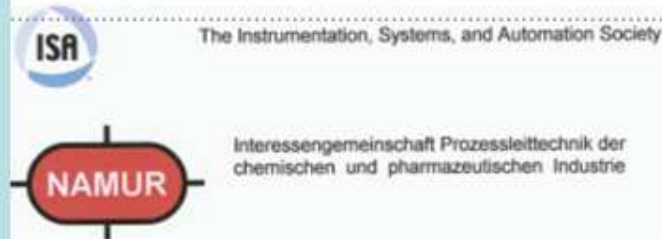
Driving forces

Workflow

Benefits

Pilot project

Standardization  
process



## NAMUR-ISA Co-operation Agreement

Both, users and manufacturers of process control equipment increasingly operate at an international level. New communication media have led to globalization of the world



The place of arbitration is Geneva, Switzerland. The language of the arbitral proceedings is English.

### 5. Declaration of agreement

With these signatures, ISA and NAMUR hereby declare their acceptance of the terms of this agreement.

Levenhaken, date 26 Oct 2005

Research Triangle Park, date 26 October 2005

NAMUR

*H. Joubert*

ISA

*Thierry Blassin*

Thank for your attention