



# The UNECE Sectoral Initiative on Equipment for Explosive Environments

A **global legislative framework** for **Explosion Protection**

The comprehensive approach of the  
UNECE Model L Regulation

1. Introduction
2. Common Regulatory Objectives
3. Procedures
4. Summary

UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

A Common Regulatory Framework  
for Equipment Used in Environments  
with an Explosive Atmosphere





## Interest of the Industry using Ex-Products

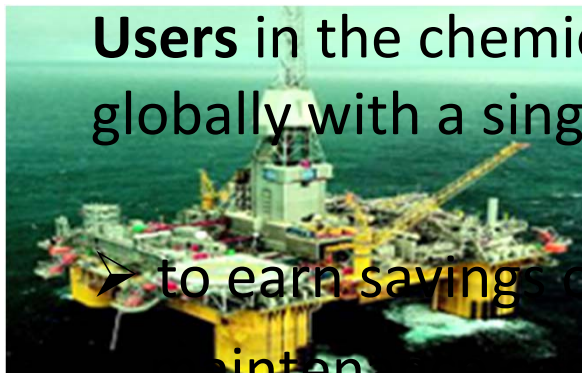
**Users** in the chemical and petroleum industry act more and more globally with a single engineering approach for their plants

➤ to earn savings of engineering, installation and maintenance costs

➤ to buy the equipment in a larger number and to get a better price per piece

➤ to have benefit from the global competition under manufacturers

Barriers against this tendency are domestic rules and regulations which require **special engineering for the plants** from country to country.





## Interest of the Industry manufacturing Ex-Products

**Manufacturers** want to sell and manufacture their products

- without additional national differences for the product and delays to the market
- in accordance to one global standard (IEC / ISO)
- without double-testing of their product
- without formal restrictions to place it on the market

Barriers against this tendency are domestic rules and regulations which require **special differences for the product** from country to country.

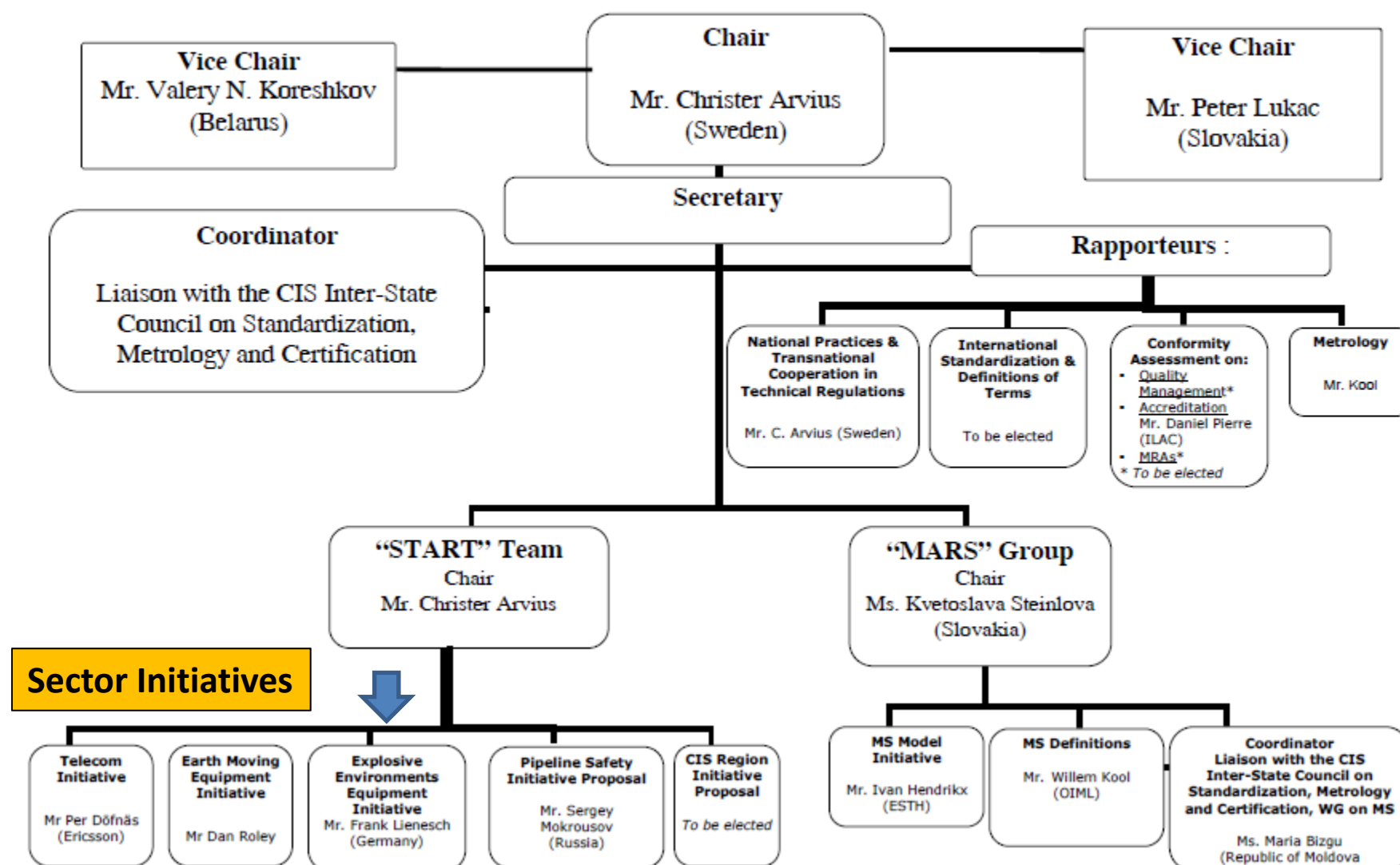






## 1. Introduction

### ORGANIZATIONAL CHART OF THE WORKING PARTY





## History/Structure

	National European International		
Regulation	Up to the seventies	“Old” Approach	“New”
Standardization	DIN DKE	CEN Cenelec	ISO IEC
Certification	Product	Product + Production	Product + Installation Maintenance Repair

Common Regulatory Objectives (CRO)?

## Some basics of Ex-Equipment

Levels	Very High risk Zone 0	High risk Zone 1	Normal risk Zone 2
Certification by Third Party	Yes	Yes	<u>Yes</u> /No



## Sector Initiative on Equipment for Explosive Environments (SIEEE) *Status Report:*

- ✓ Kick off meeting 2007 in Geneva  
Presentations of the various systems, **Questionnaire**
- ✓ 2008 Geneva  
Preparation of the **Terms of Reference**
- ✓ 2009 Geneva  
Presentation of the **Common Regulatory Objectives**
- ✓ 2010 Berlin  
Presentation of the **Workshop-Concept**
- ✓ 2011 Split  
Presentation of various Regulation Systems and Market Surveillance Aspects
- ✓ 2012 Dubai  
First Workshop
- ✓ 2013 **Fortaleza**  
Update of the Questionnaire (Translation to Spanish and Portuguese)



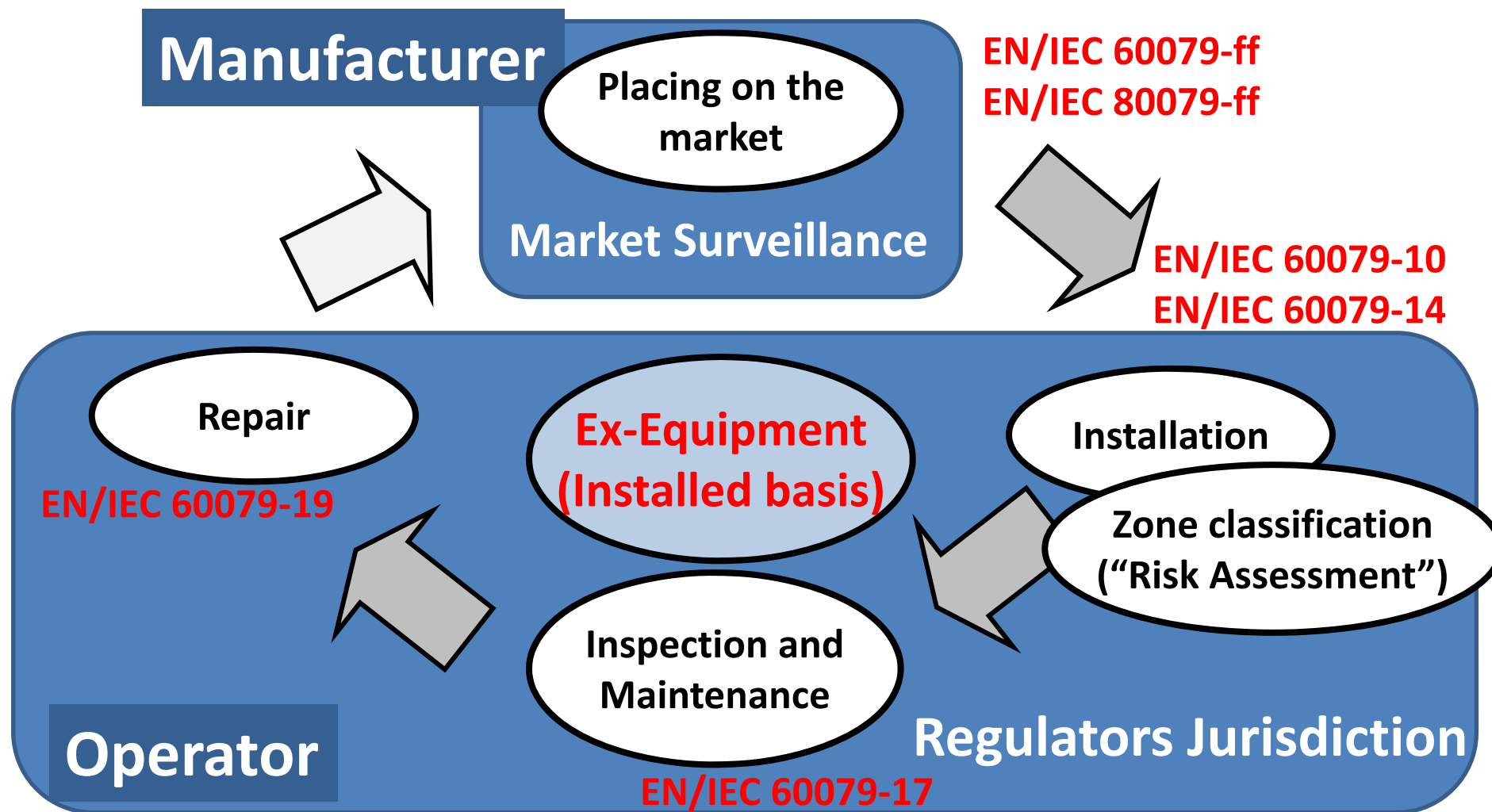
## Intention of the Common Regulatory Objectives (CRO)

### White paper approach

- to cover comprehensively all relevant issues  
in order to achieve a globally accepted safety level
- to provide a global „Best Practice“ model as template  
for national regulation
- Focus to the main objectives
  - Easy to understand
  - Open for national modifications
- Specify the distributed roles and related responsibilities of  
the involved parties:
  - Regulator
  - Market Surveillance
  - Certification Body
  - Manufacturer
  - End user/Operator
- Open for ongoing maintenance and modification



## Intention of the Common Regulatory Objectives (CRO)

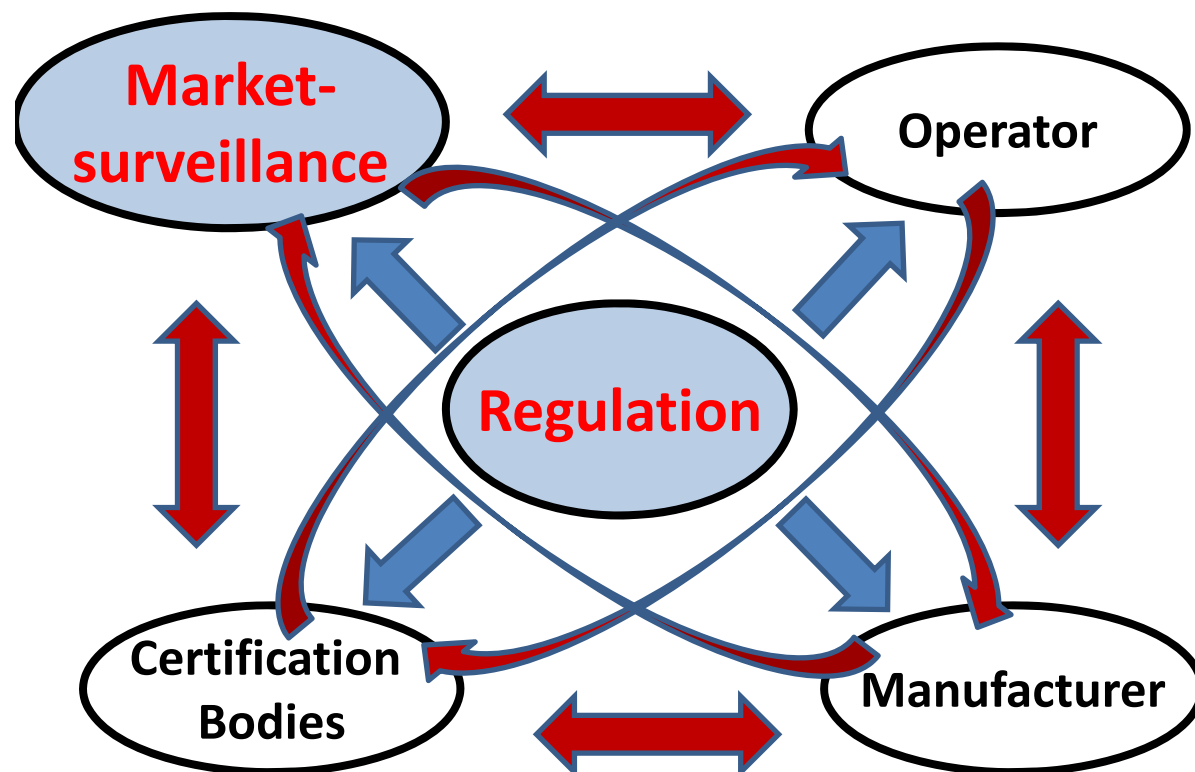


Life cycle approach





## Interaction/Relationship within the SIEEE-System



1. Definition/Jurisdiction
  - a) Market Surveillance
  - b) Certification Bodies
  - c) Manufacturer
  - d) Operator
2. Interaction
  - a. Cert. B.  $\leftrightarrow$  Manu.
  - b. Manu.  $\leftrightarrow$  Oper.
  - c. MS  $\leftrightarrow$  Oper.
  - d. MS  $\leftrightarrow$  Manu.
  - e. MS  $\leftrightarrow$  Insp. B.
  - f. Cert. B.  $\leftrightarrow$  Insp. B.



## CRO Part 1: Requirement for the equipment Placing on the market

- » Elimination of possible ignition sources in accordance to intended use of the equipment, typical ignition sources are:

- » Hot surfaces
- » Electrical sparks
- » Mechanical sparks
- » Electrostatic

EN 1127-1  
13 Ignition sources

- » Validated protection concepts ("Types of Protection") have to be applied

IEC/ISO 60079-"X" / 80079-"X"

- » Instructions (manual) about the intended use, installation and repair

IEC/ISO 60079-"X" / 80079-"X"

- » Conformity assessment procedure in accordance to an international certification scheme such as IECEx (IECEx procedure can be seen as a reference)

IECEx-02



## CRO Part 2: Safe use of the equipment

- » Classification of the explosive substances in accordance to:
  - » Ignition Temperature
  - » Explosions Groups (Ignition Energy)

Ex d e IIC T3 Gb
- » IEC-Zone Classification Concept (Zones for Gas and Dust) with the applicable Equipment Protection Levels

IEC 60079 -10
- » The equipment and its installation need to be inspected and maintained

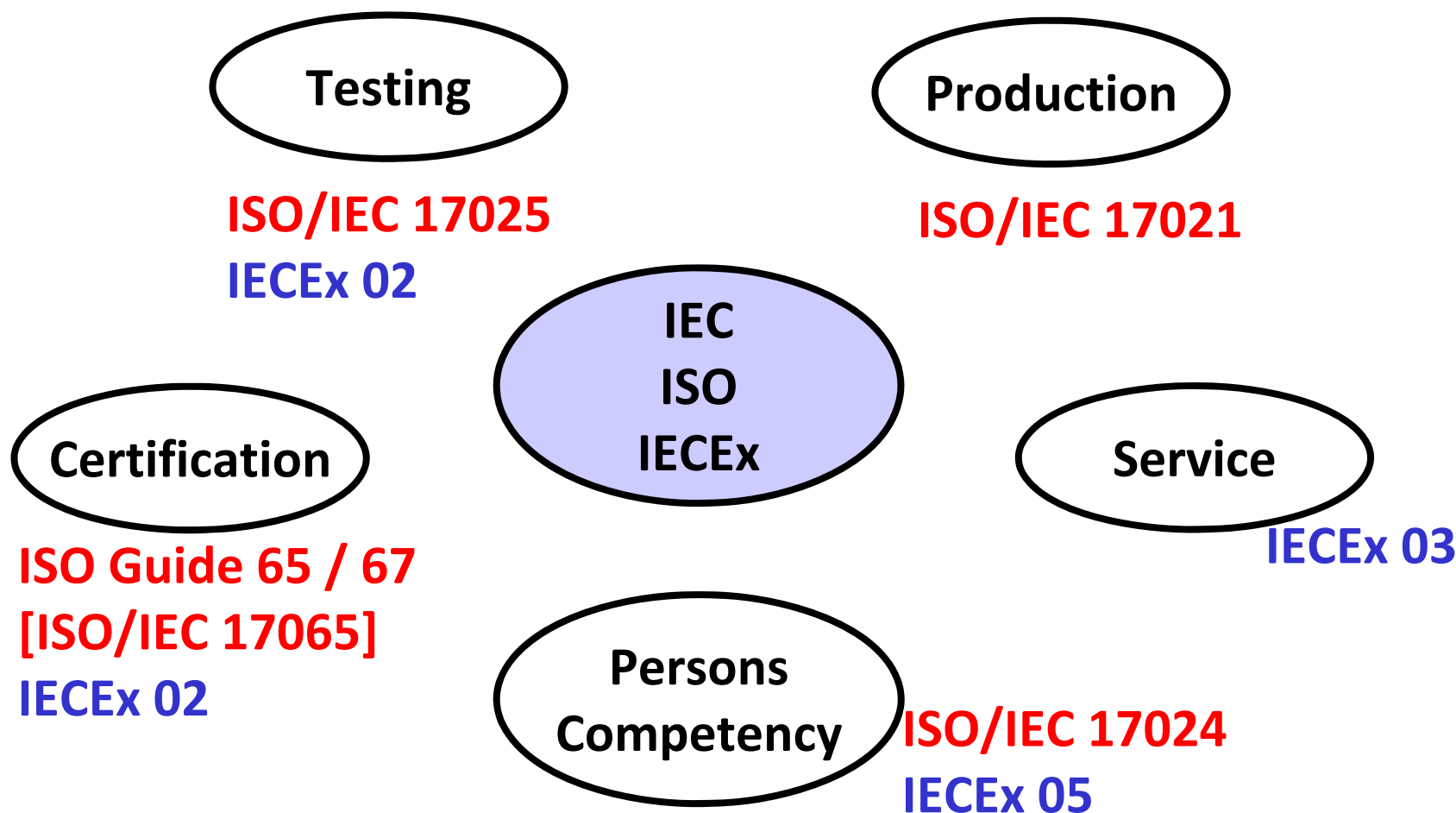
IEC 60079 -14, -17,-19
- » Requirements for the competency of persons (selection, installation, use of the equipment)

IECEX-05
- » Requirements for service facilities (e.g. repair workshops)

IECEX-03
- » The Explosion risk assessment of an individual plant needs to be documented in the “Explosion Protection Document”



CRO Part 1 and 2:







## CRO Part 3: Standards reference list

- » Accepted Standards (ISO/IEC) are listed in an annex to the regulation (State of the Art)
- » The standards has to be accepted by a Standard Acceptance Group
- » After the acceptance the Standards can be applied by manufacturers and end users to show compliance with the regulation
- » All countries which have implemented the Regulation enjoy the advantages like barrier free trade of explosion protected equipment and equal conditions for operating a plant bearing explosion risks



## CRO Part 4: Conformity assessment bodies

- » The accreditation body has to be a member of ILAC/IAF
- » The accreditation of
  - » Conformity Assessment Bodies
  - » Test Laboratorieshas to follow the applicable ISO/IEC-Standards
- » One member of the assessor team needs competence in the field of explosion protection (see e.g. the list of approved IECEx assessors).
- » Procedures and Rules of the IEC Conformity Assessment System IECEx is to take as a reference for conformity assessment



## CRO Part 5: Steering Committee

- » An Explosion Protection Steering Committee is to be formed and operated under the umbrella of UNECE WP.6 (ExSC) to monitor the application experiences
- » All member having implemented the CROs can participate in the Explosion Steering Committee (ExSC)
- » ExSC notifies the members of the Standard Acceptance Group
- » Observers like
  - » Standardization Organization (IEC/ISO)
  - » Market Surveillance
  - » IECEXare also invited to attend the meetings



## CRO Part 6: Market surveillance

- » A Market Surveillance network specialized in Ex-Equipment is to be formed and operated (UNECE-ExMars)
- » For critical non-conformance of Ex-Equipment an Alert-System is necessary

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Ex - Market Surveillance Concept based on the general concept of the „**MARS**“ Group

### Strategy:

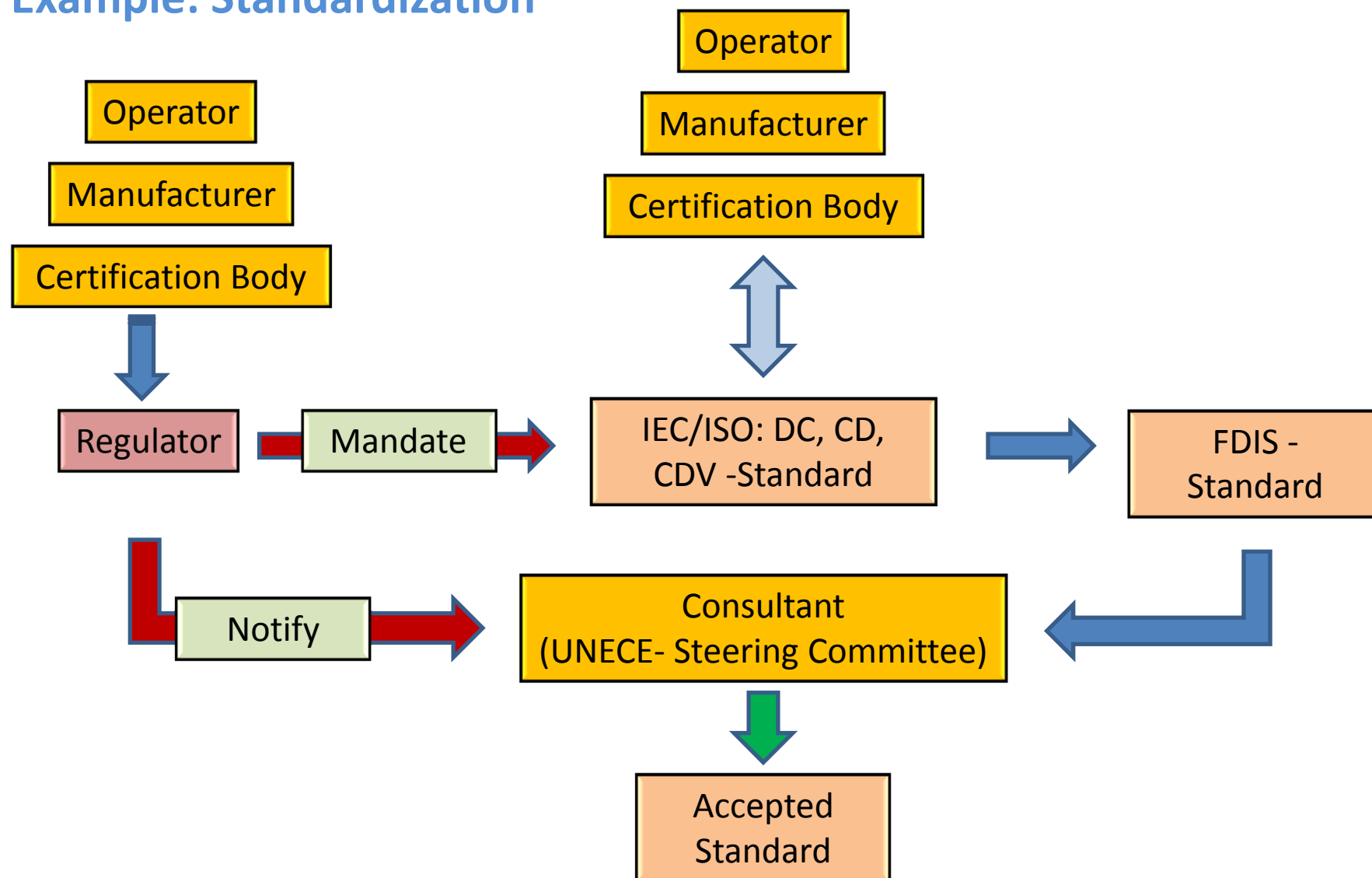
- Developing a general procedure for market surveillance (GMSP)
- Increasing cooperation with stakeholders and sharing the work of Market Surveillance internationally
- Increasing the visibility of Market Surveillance to the outside world





## Procedure for the Regulation

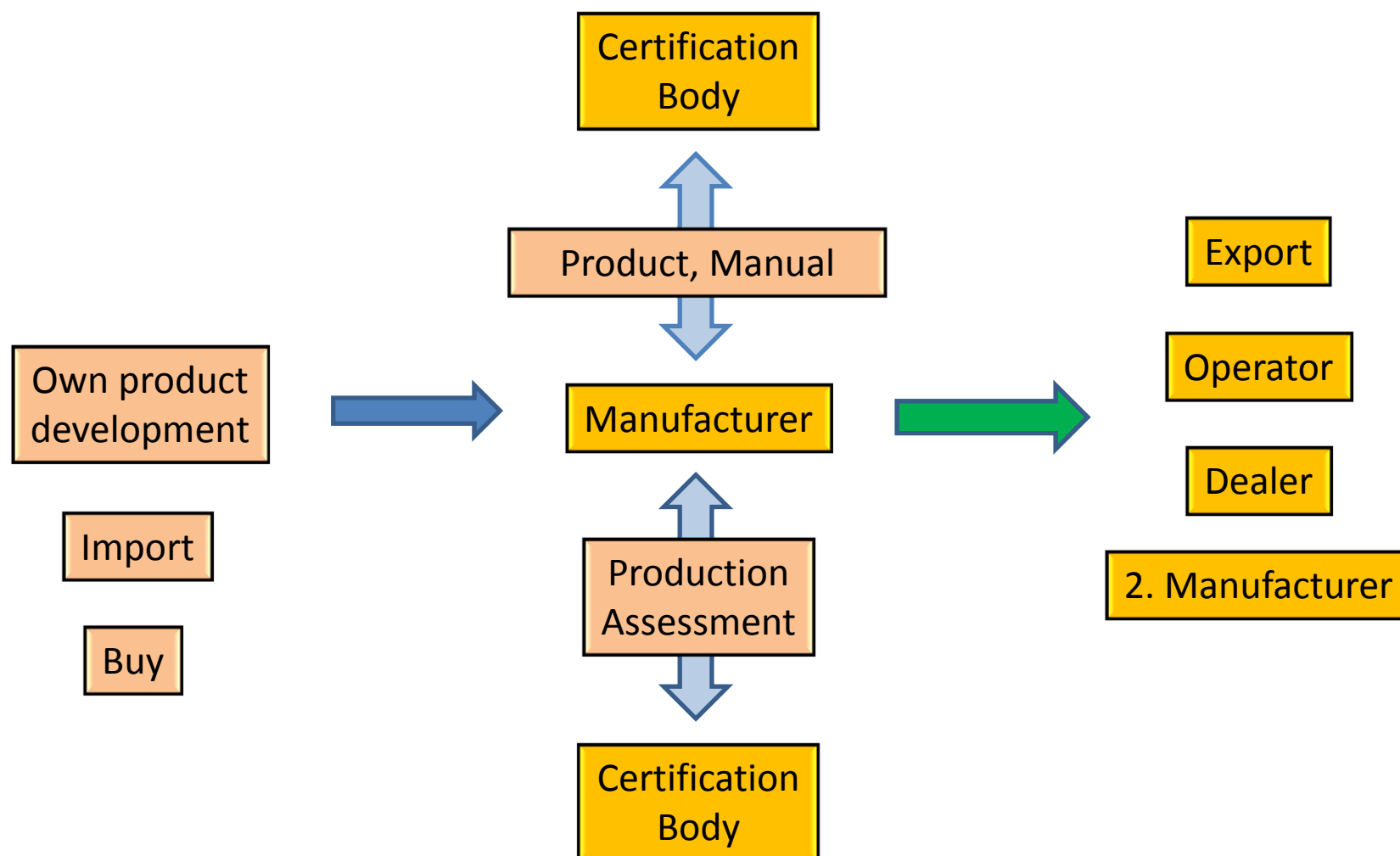
### Example: Standardization





## Procedure for Manufacturer

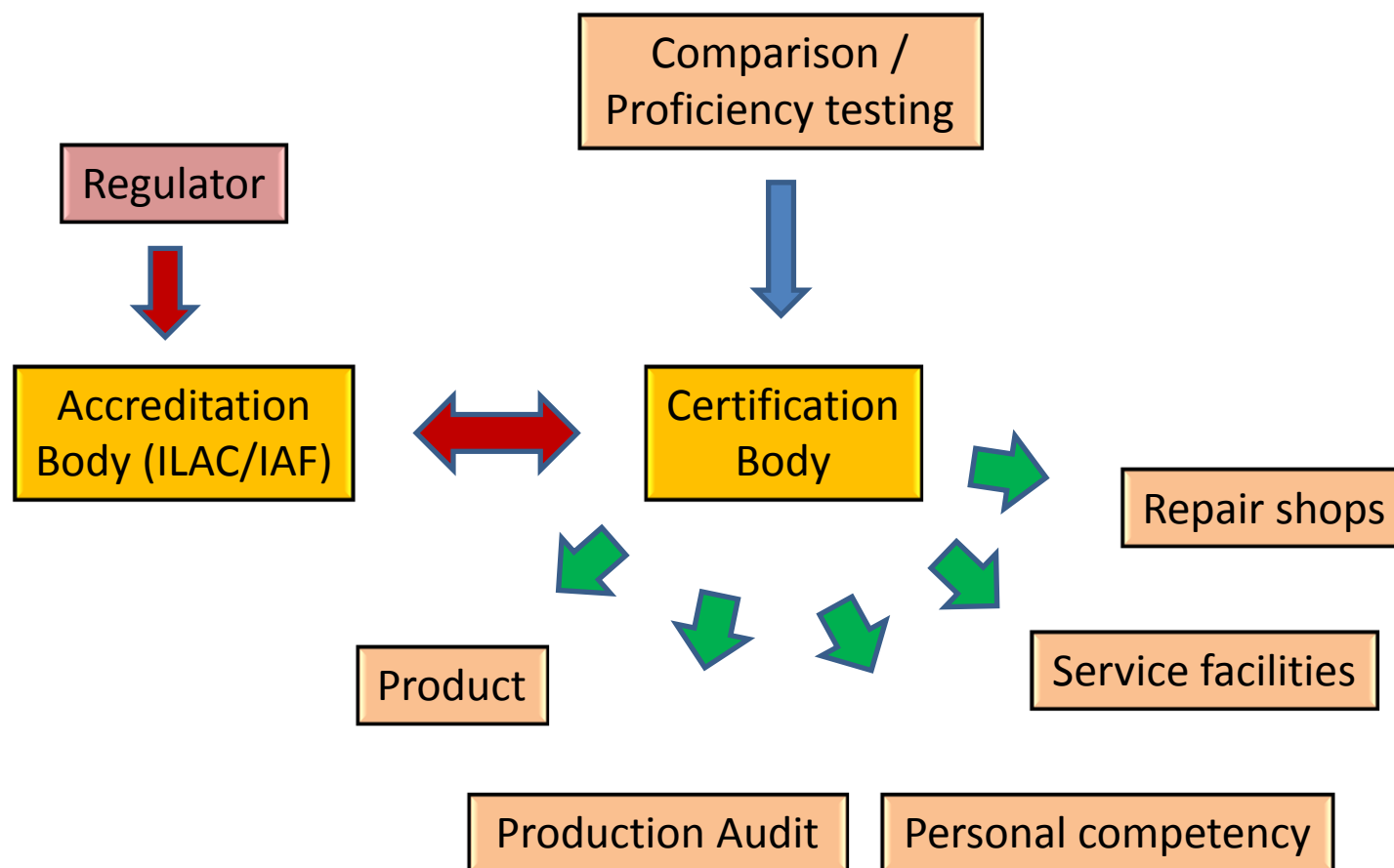
Example: placing on the market





## Procedure for Certification Bodies

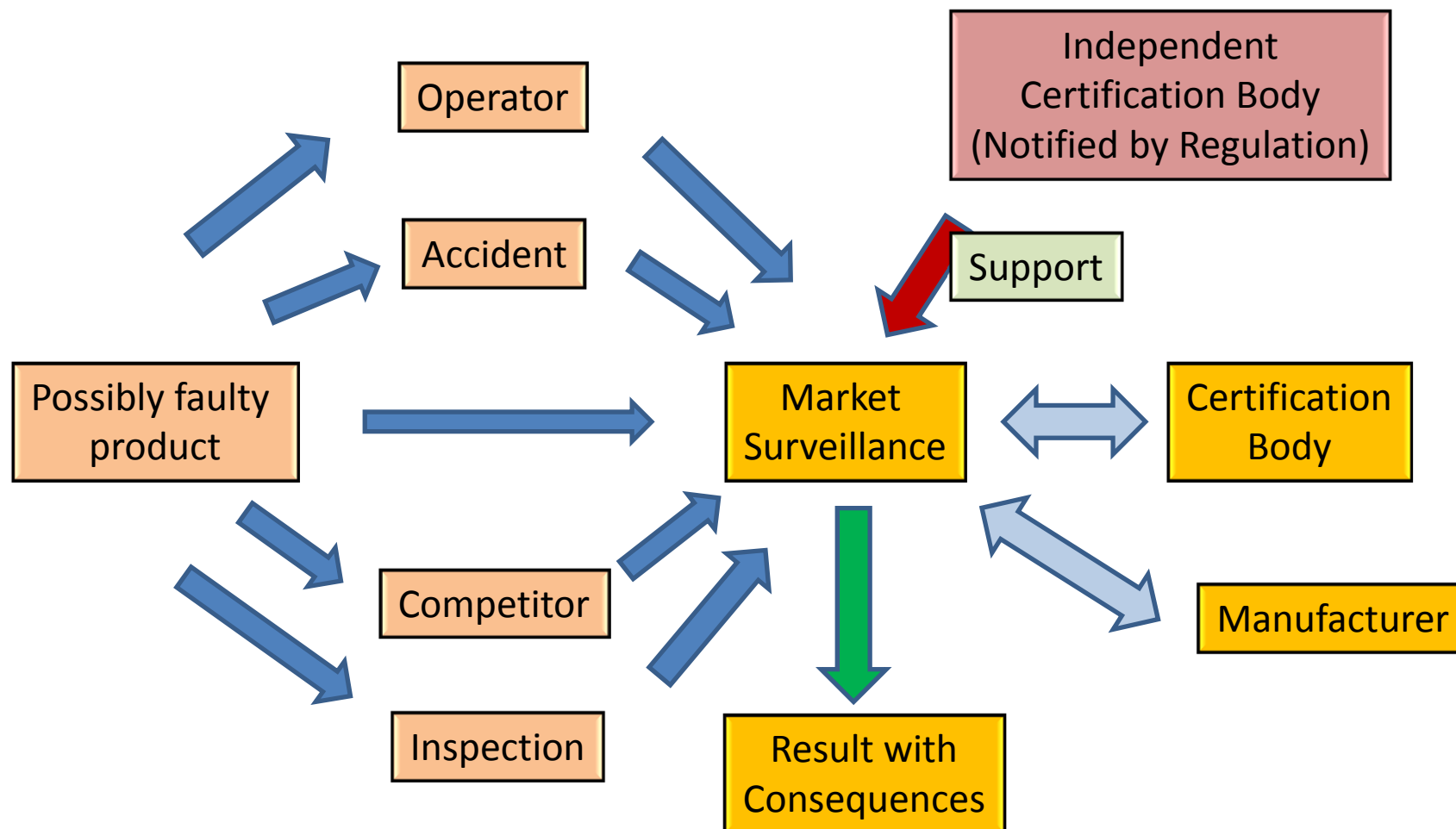
### Examples: Accreditation





## Procedure for Ex-market surveillance (Ex-GMSP)

### Example: Possibly faulty product

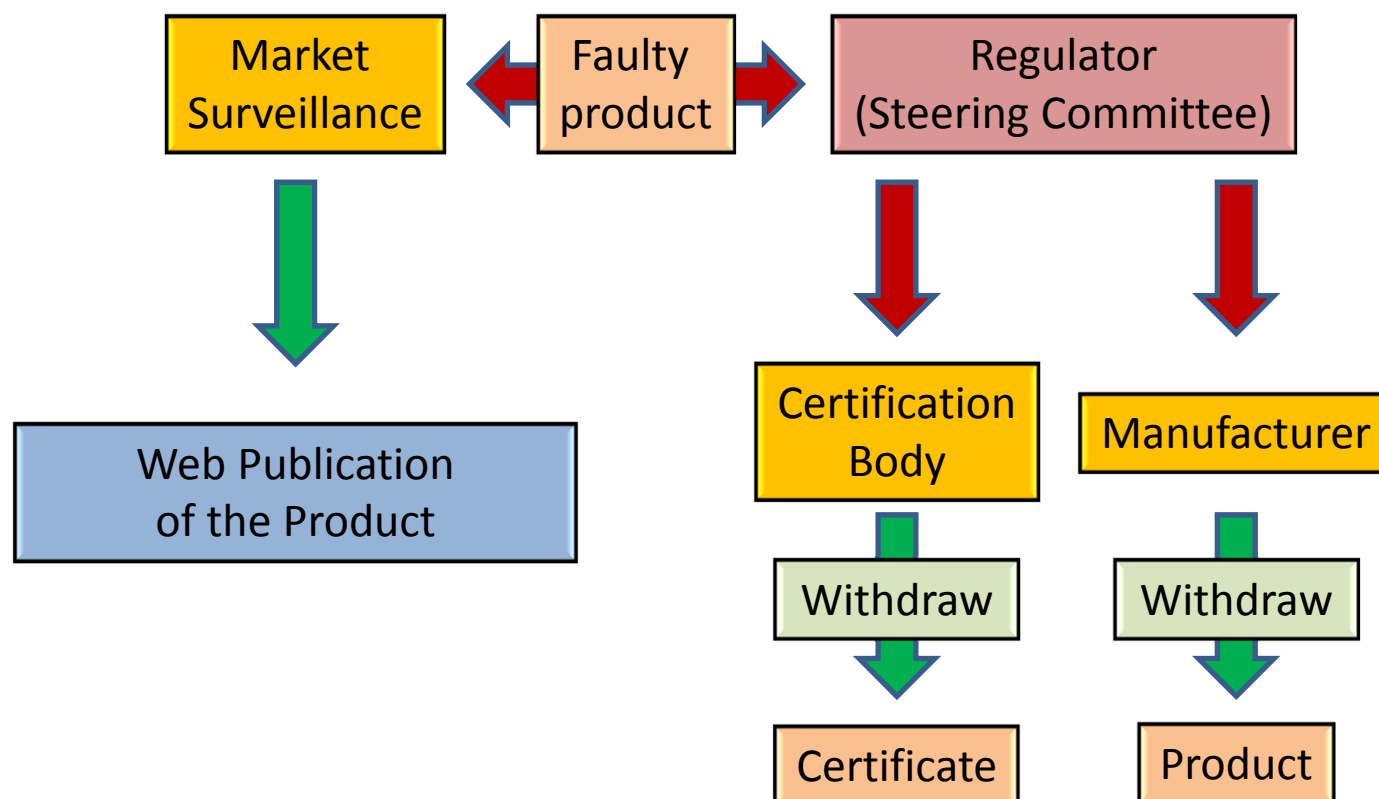






## Procedure for Ex-market surveillance (Ex-GMSP)

Example: Alert System, Arbitration board,...





## Guidelines for the Ex-Market Surveillance

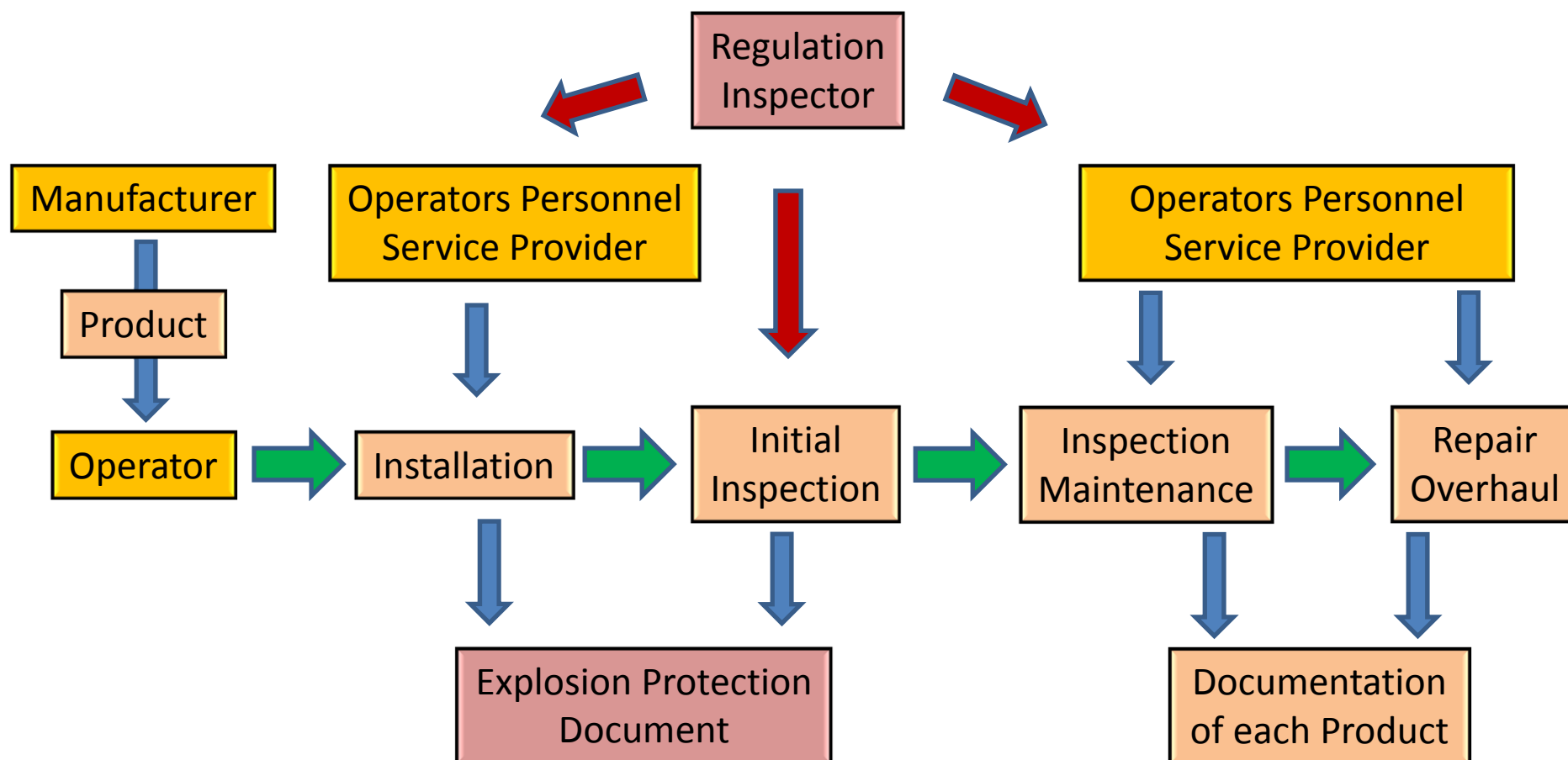
### Contents:

1. Introduction:
2. Actions of the MS
  - 2.1 Pro Active
  - 2.2 Reactive
3. Cooperation and Exchange of Experience (with other stakeholder)
  - 3.1 Internet-Platform
  - 3.2 Arbitration Board
  - 3.3 Alert-System
4. Definition of Ex-Products and the boundary conditions
  - 4.1 Zone Concept (Essential Requirements)
  - 4.2 Types of Protection (Applicable Standards)
5. Explanation of the objectives of the surveillance activities (Compliance Criteria)
  - 5.1 Labeling and Conformity Declaration
  - 5.2 Manual
  - 5.3 Technical Inspection
6. List of References



## Procedure for Operators

Examples: Operation of a plant, Maintenance, Repair, Training, ...





## The workshop idea: Regulators Dialogue Group



### Outputs:

- Comprehensive description of the methodology of the system
- Guidance documents for the various stakeholders (Regulators, Market Surveillance, Manufacturer, Operator, Inspection bodies)



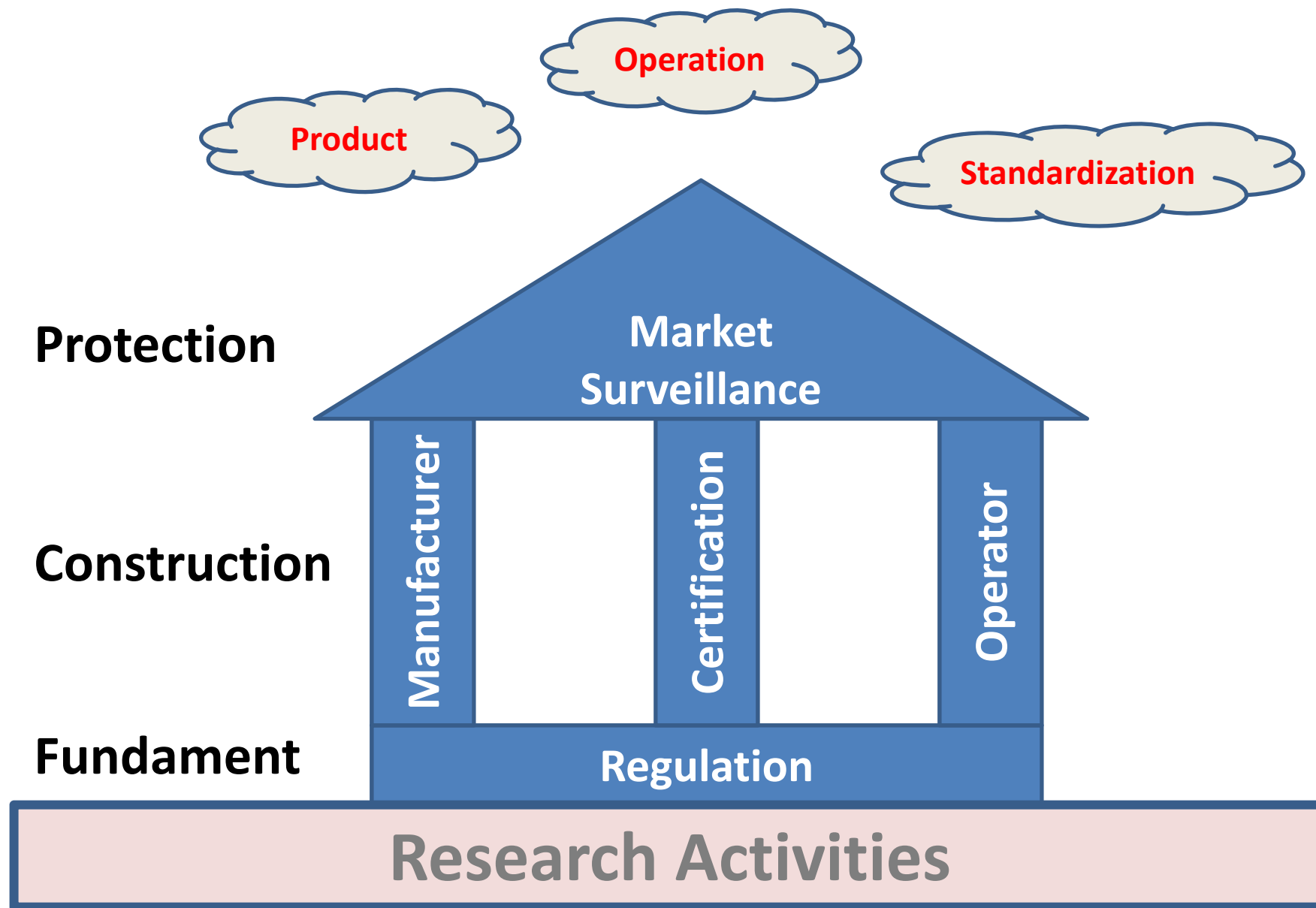


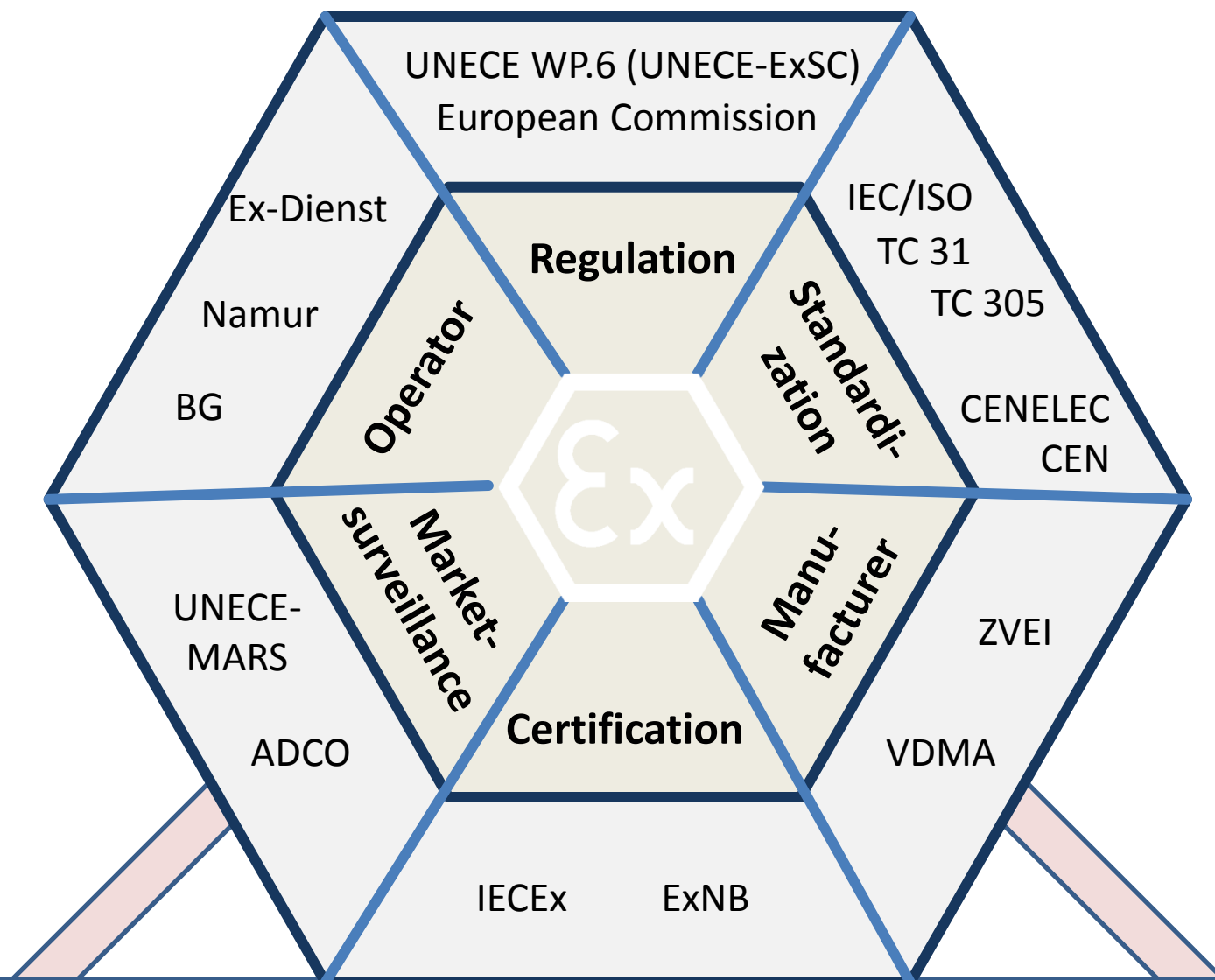
UNECE

United Nations Economic Commission for Europe

## 4. Summary

# Principal of Ex-Business





6 Common Regulatory Objectives