

# Management of Plant Maintenance (MPM)- Expl. of management methods to control plant inspections procedures

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# MPM - AGENDA

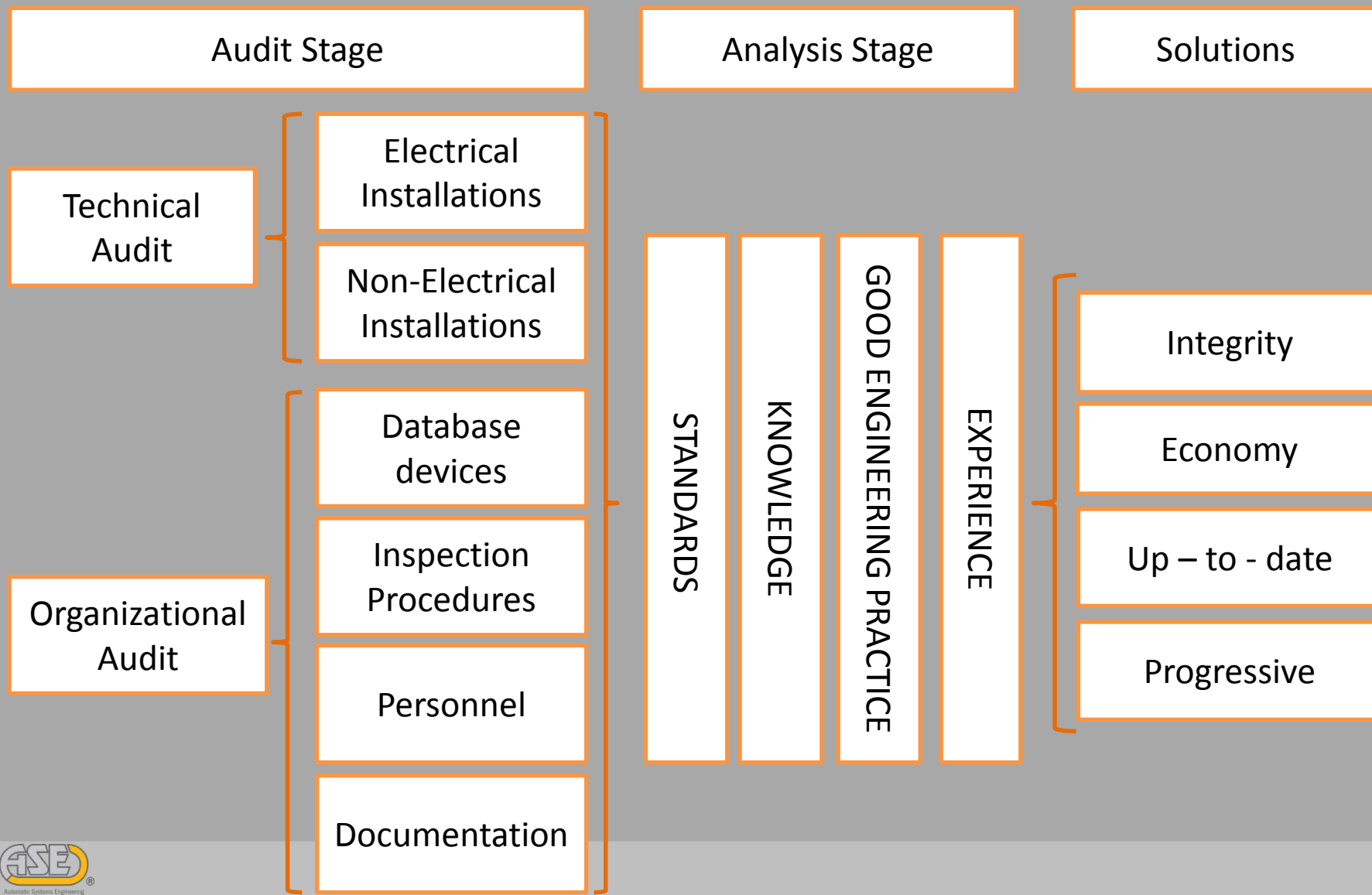
## AGENDA:

1. Technical and organizational Audit's
2. Analyses stage
3. Solution



Methods to control plant inspections

# MPM - Scheme of a comprehensive approach



# MPM - Audit stage

## Audit Stage

## Analysis Stage

## Solutions

- ✓ **Technical audit**
- ✓ technical state of electrical and non-electrical installations and devices,
- ✓ proper selection of the equipment,
- ✓ technical condition of the devices
- ✓ environmental conditions
  
- ✓ Non-electrical devices:
- ✓ Materials
- ✓ Surface temperature
- ✓ Protection against mechanical sparks
- ✓ Static electricity



# MPM - Audit stage

## Audit Stage

## Analysis Stage

## Solutions

- ✓ **Organizational audit**
- ✓ Data base of devices / installation's,
- ✓ Standards
- ✓ Procedures for inspection
- ✓ Documentations
- ✓ Personnel





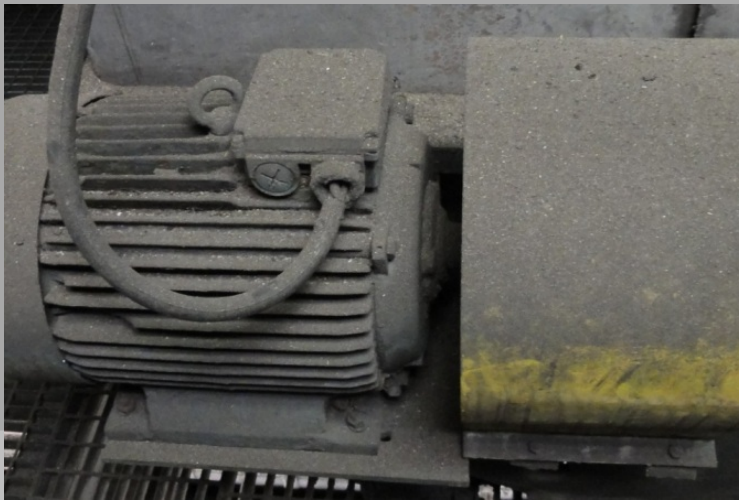
# MPM - Audit stage

**Audit Stage**

Analysis Stage

Solutions

- ✓ **Technical & Organizational audit**
- ✓ Overview of the situation on inspection and maintenance of electrical and non electrical devices.
- ✓ lot of input data's for analysis stage.



# MPM - Analysis stage

Audit Stage

**Analysis Stage**

Solutions

GOOD ENGINEERING PRACTICE

EXPERIENCE

KNOWLEDGE

STANDARDS

# MPM - Analysis stage

Audit Stage

**Analysis Stage**

Solutions

**STANDARDS**

## Electrical devices and installations:

EN-IEC 60079-0

EN-IEC 60079-14

EN-IEC 60079-17

EN-IEC 60079-19

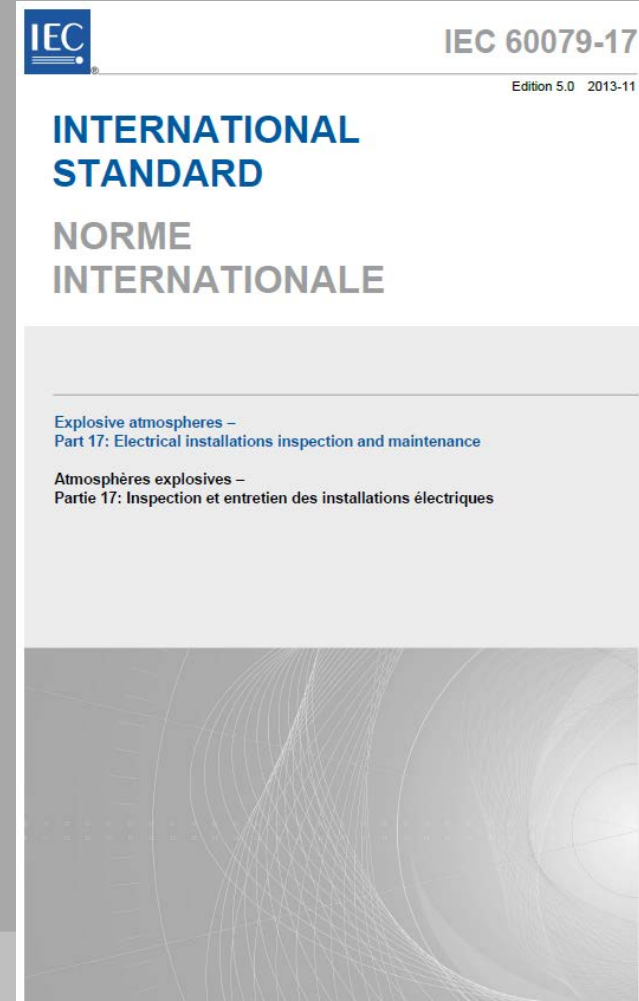
EN-IEC 60079-XX

## Non-electrical devices and installations:

EN-ISO/IEC 80079-34 Part 34

EN 13463 – 1

EN 13463 – X





# MPM - Analysis stage

Audit Stage

**Analysis Stage**

Solutions

## KNOWLEDGE

- ✓ More than 25 years associated with the O&G industry, chemical industry, gas industry.
- ✓ Knowledge of the process, technology,
- ✓ Identification of the problems,
- ✓ **Developed unique solutions for non-electrical equipment**



# MPM - Analysis stage

Audit Stage

**Analysis Stage**

Solutions

## EXPERIENCE

- ✓ Over 25 years experience,
- ✓ Lot of process safety and risk analyses,
- ✓ Verification of technical solutions
- ✓ Customer-specific analysis and reports,
- ✓ Verification of the mechanical and electrical equipment.
- ✓ Designing, construction

**EXPERIENCE**

**KNOWLEDGE**



# MPM - Analysis stage

Audit Stage

**Analysis Stage**

Solutions

## GOOD ENGINEERING PRACTICE

- ✓ IEC/EN standards contain only a certain amount of knowledge needed to make inspection and maintenance of the installation and devices.
- ✓ Lots of recommendations is described as black or white (allowed or forbidden).
- ✓ And what about the gray?

In the following several examples:

# MPM - Analysis stage

Audit Stage

**Analysis Stage**

Solutions

## GOOD ENGINEERING PRACTICE

What about inspection requirements for:  
“m”, “mD”, “o”, “op” and “q”  
types of explosion protection?



Transformer 100 kVA - oil immersion „o”

# MPM - Analysis stage

Audit Stage

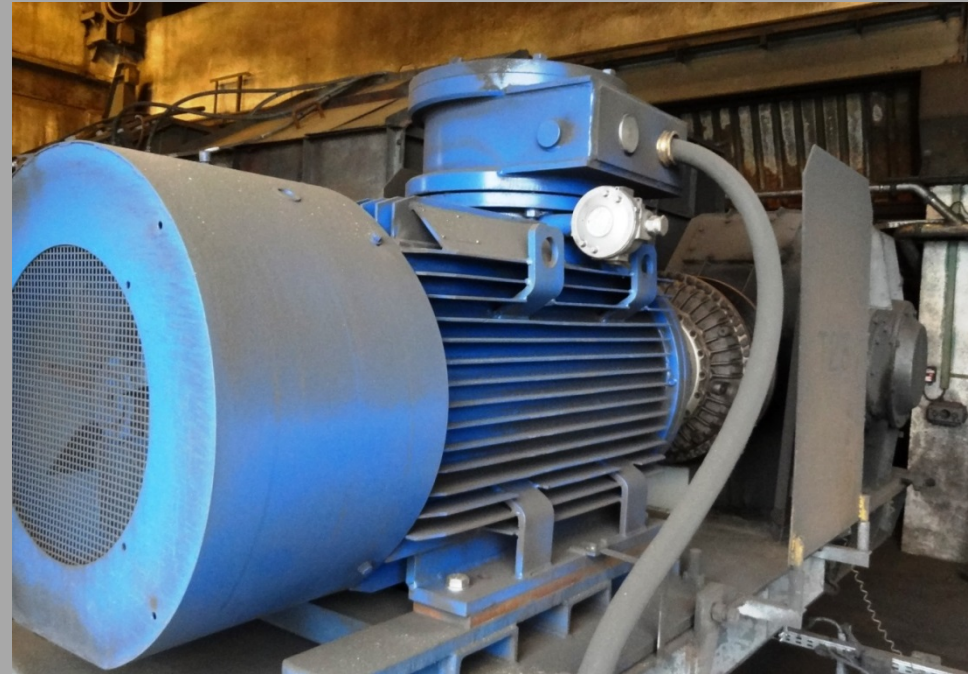
**Analysis Stage**

Solutions

## GOOD ENGINEERING PRACTICE

What about assemblies (electrical and non electrical equipment)?

How to make an inspection of the complete set?



Ex electrical motor and clutch / gear (as a set)



# MPM - Analysis stage

Audit Stage

**Analysis Stage**

Solutions

## GOOD ENGINEERING PRACTICE

- ✓ Old installations (Ex and non-Ex)
- ✓ The investment process is very long.
- ✓ Implement the Roadmap.
- ✓ What about the old equipment in the meantime?





# MPM - Analysis stage

Audit Stage

**Analysis Stage**

Solutions

**Analysis Stage**

- ✓ The analysis stage - right way to solution.
- ✓ Analysis and cooperation between engineering company and the users.
- ✓ Multibranch team



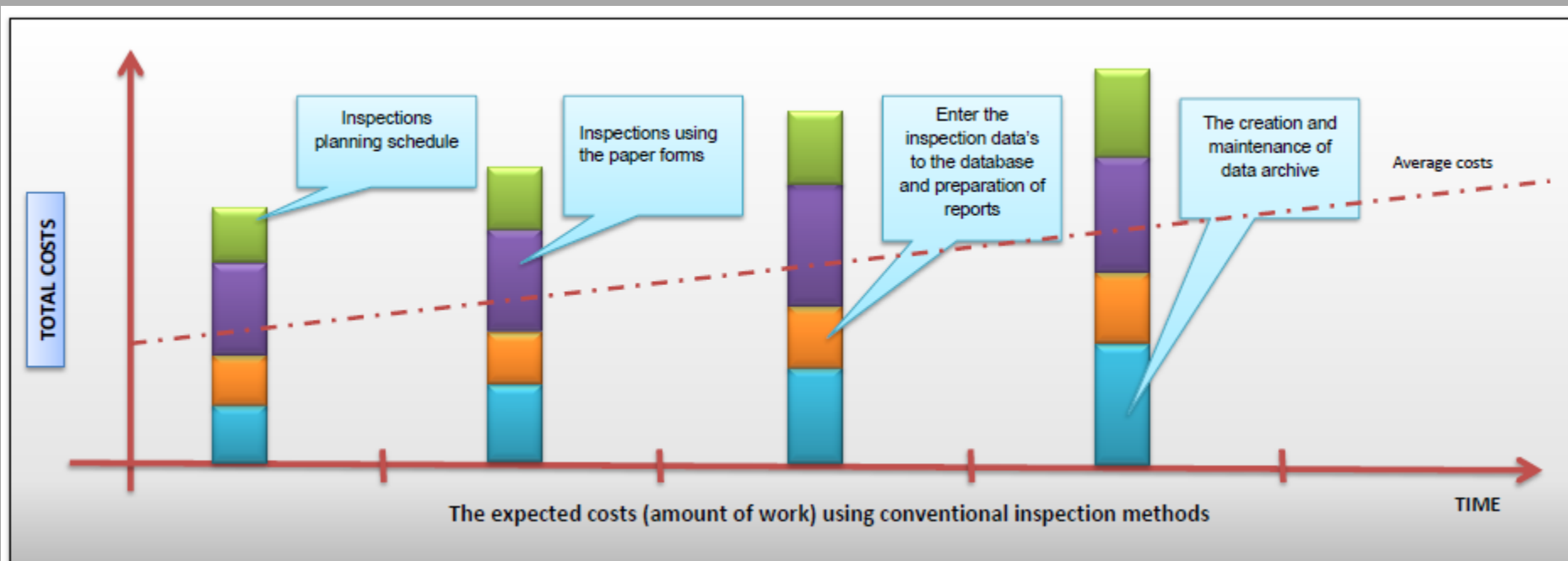
# MPM - Solutions

Audit Stage

Analysis Stage

Solutions

Analysis Stage



# MPM - Solutions

Audit Stage

Analysis Stage

**Solutions**

**Solution**

Due to:

- The variety and size of Ex installations,
- The number and type of devices  
(Electrical and Mechanical)
- Age of installation
- Database
- Documentation
- Personnel Competence

There is a need for modern system supporting the inspection and maintenance of Ex equipment (electrical and non-electrical).



# MPM - Solutions

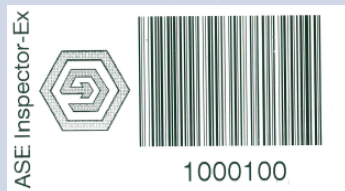
Audit Stage

Analysis Stage

**Solutions**

**Solution**

Passportisation  
(data base)

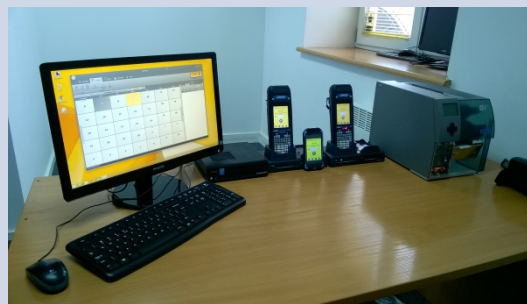


Barcode



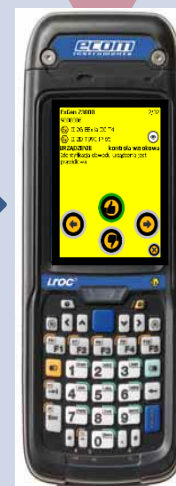
RFID tag

Planning and management  
of inspections



PC application kit

Devices inspection  
on the field



Mobile devices

Detailed and summary reports,  
technical documentation



WEB application kit

Audit Stage

Analysis Stage

Solutions

Solution

The key functions of the system:

1. **Passportisation**

- Identification tag / nameplate,
- The electronic passport of device

2. **Inspections** on the field

- PDA mobile technology
- Schedule
- Inspections for electrical, non-electrical and assemblies

3. **Reports**

- Electronic versions
- Direct access to up-to-date reports
- Access to technical documentations





Audit Stage

Analysis Stage

**Solutions**

### Solution

- ✓ Structured and unambiguous evidence of devices and installations
- ✓ Creating passports of devices
- ✓ System requires contact with controlled device
- ✓ Clear and unambiguous report
- ✓ Verification of the status of the equipment
- ✓ Elimination of faults and deficiencies
- ✓ Optimization of workload
- ✓ Increasing the level of safety





# Thank you



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