NMi international WIM standard

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Topics

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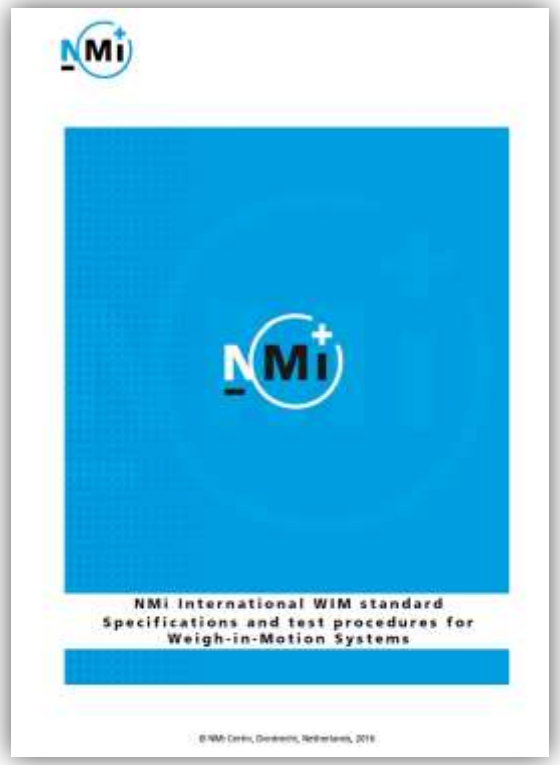


Introduction

Independent, Test, Inspection, Calibration and Certification Institute

- 1000 years of experience in Global Legal Metrology

Certification & Acceptance

- World wide Certification (OIML)
- European Approvals (CE)
- National Approvals (Enforcement)

Background

Legal Applications:	Direct Weight Enforcement and Tolling by Weight
Metrology:	The measurements of the Weigh-In-Motion systems are used directly as basis for fine/fee.
Benefits:	Most efficient way of weight enforcement and tolling by weight without any impact on the traffic flow
Guarantee:	All issued fines/fees must be justified, hence all measurements should always be within specification.

Background

- 3 International Standards
  - COST-323, ASTM-E1318, OIML-R134
  - Each with own purpose and (dis-)advantages
  - Parts used in tenders
  - None for legal applications at high speeds

- Many National Standards
  - All different
  - Often not practical
  - Limitation for new applications
  - Barrier for market access

Background

NMi WIM Initiative (2016)

- Scope:
  - Automatic WIM-systems.
  - High Speed and Low Speed
  - Performance Requirements
  - Minimum Testing Procedures
- Application:
  - Technology Independent
  - Legal and Statistic Applications
  - International use, free of charge

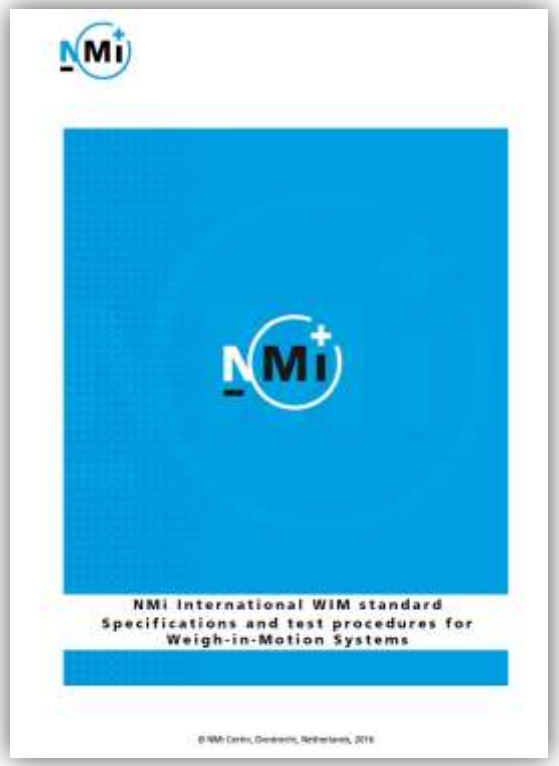
Background

NMi WIM Initiative

- International Expert Group:
  - Different Manufactures
  - Different Technologies
  - Legal Metrology
  - > 100 year experience
- Balance between:
  - Theoretical requirements
  - Practical conditions

Content of Standard

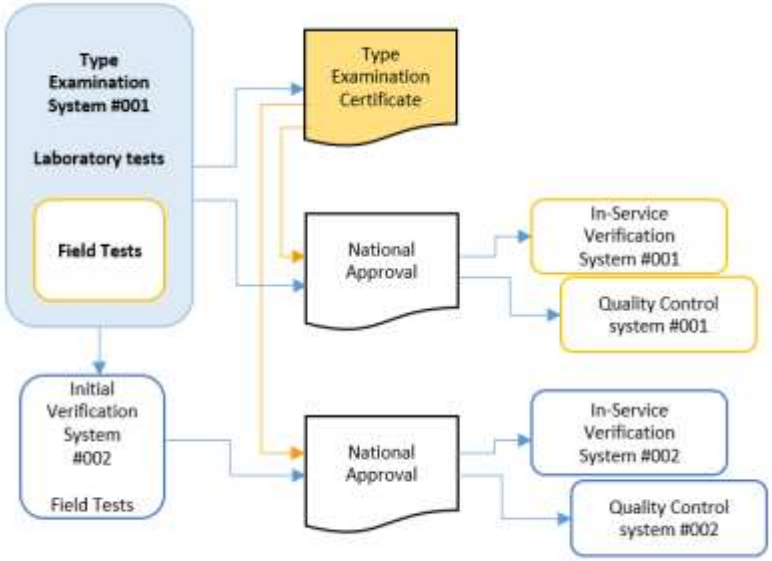
- Operating Conditions:
  - Ranges for: Speed, Temperature Humidity, EMC, Mains Variation
- Technical Requirements:
  - Vehicle Record, Completion Rate
  - Time + Speed Recording
  - Length Measurement
  - Vehicle Classification
- Weighing Requirements:
  - Accuracy Classes, eg. L(5) S(10)



Content of Standard

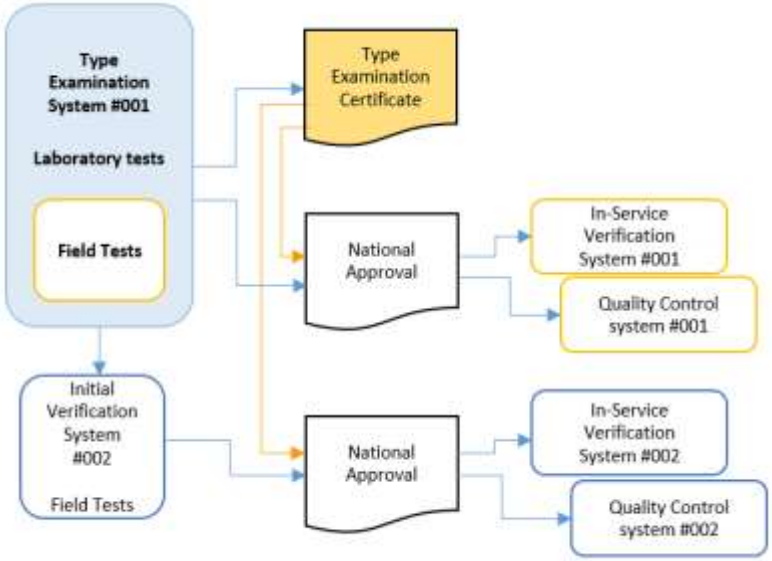
Test Procedures

- Legal Applications
  - 3 test levels
  - Independent Metrological Approval
  - Testing and Certification by NMi
    - or approved National Authority
- Statistical Applications
  - 2 Test levels
  - Relation between Buyer and Vendor



Content of Standard

- Type Approval:
  - New Type of System
    - Pre-approval
    - Laboratory Tests
    - Large Field Test (90 runs)
- Initial Verification:
  - After Installation
    - Medium Field Test (60 runs)
- In-service Verification:
  - After certain period
    - Small Field Test (30 runs)



Implementation

System Approval

- Provides metrological reference
- Formal system testing & certification
  - Type Approval,
  - Initial Verification
  - In-Service Verification
- Based on international NMi standard

Implementation

Legal Acceptance

- Provides legal basis for use of WIM
- Requirements for:
  - System Accuracy & Reliability
  - System Operation & Maintenance (Data Quality Management)
- Included in National Legislation
  - Based on NMi Standard

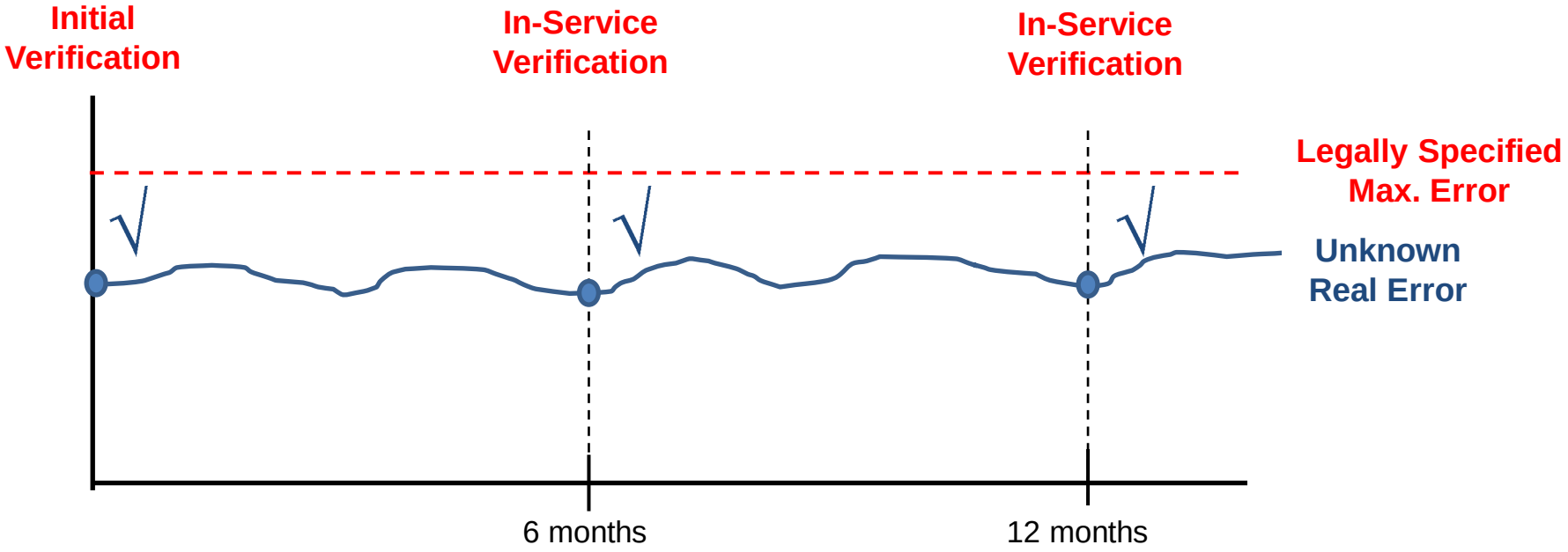
Implementation

Data Quality Management

- Proof of operational stability
- Through combination of:
  - Continuous Checks
  - Maintenance
  - Calibration
- Included in the Quality System for the operation of the WIM system

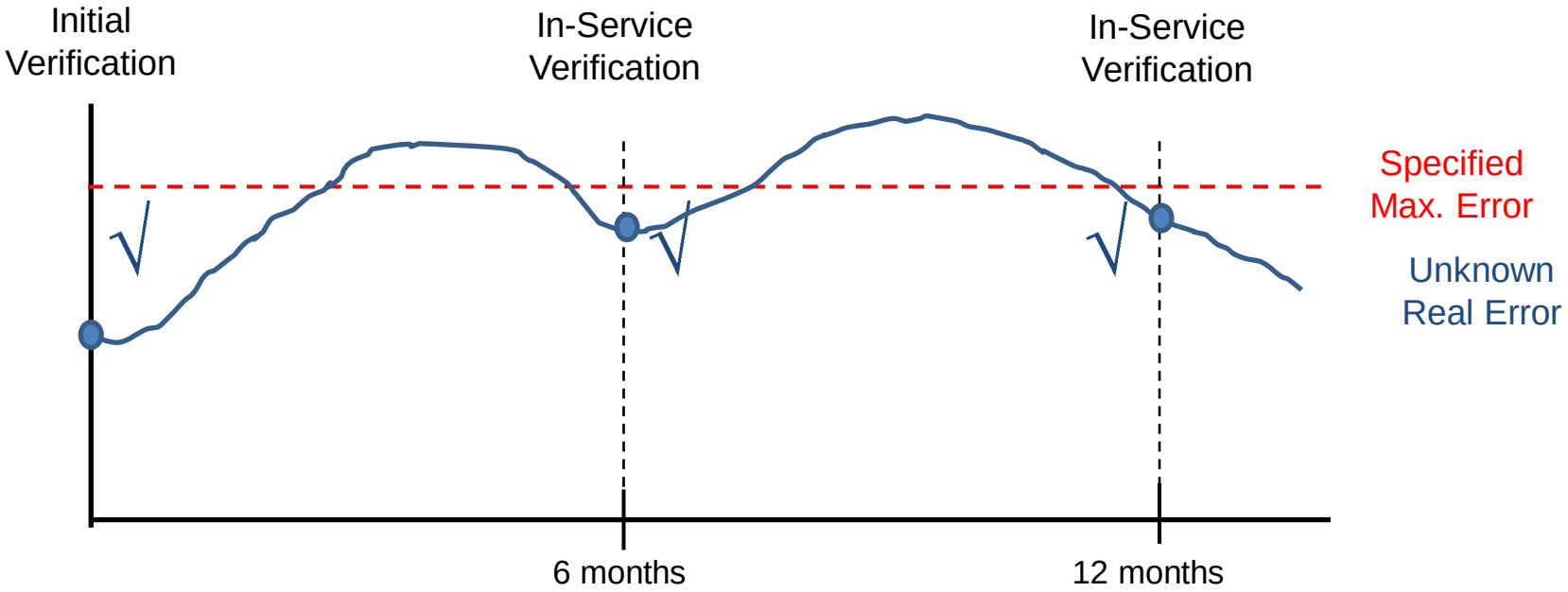
Data Quality Management

- Legal Acceptance and System Approval



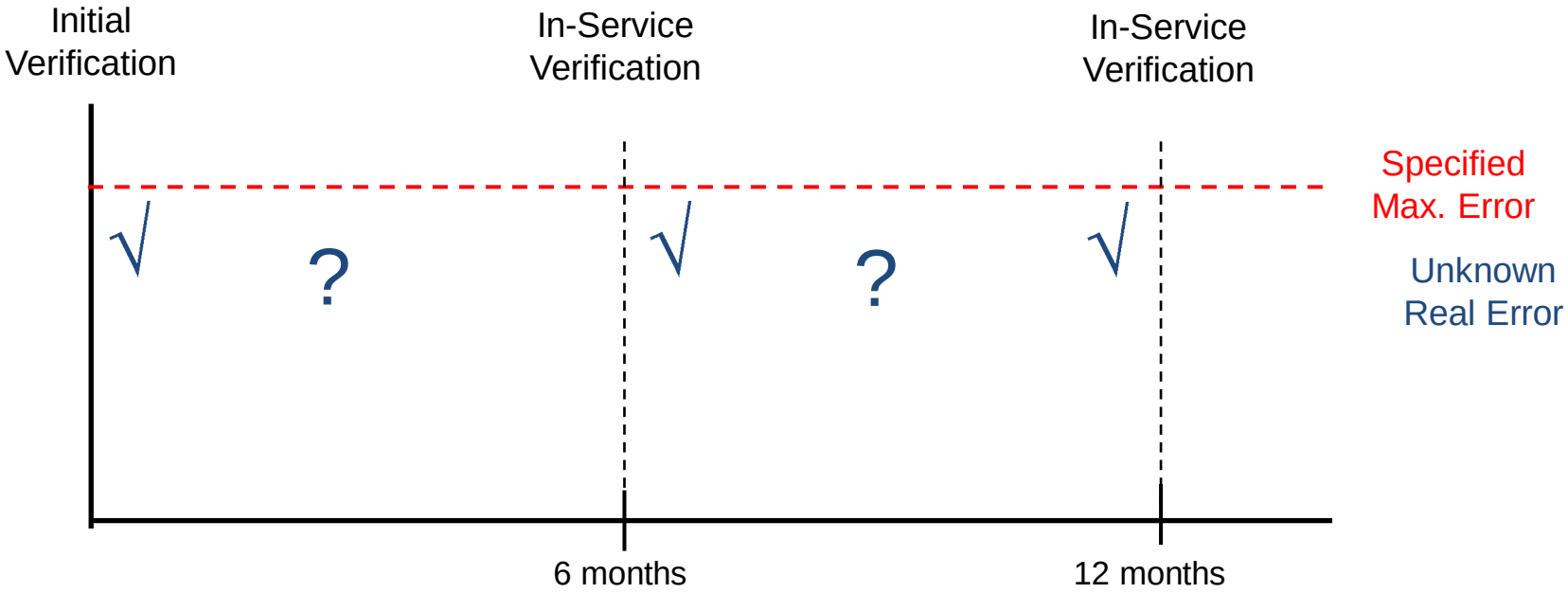
Data Quality Management

- Not always enough!



Data Quality Management

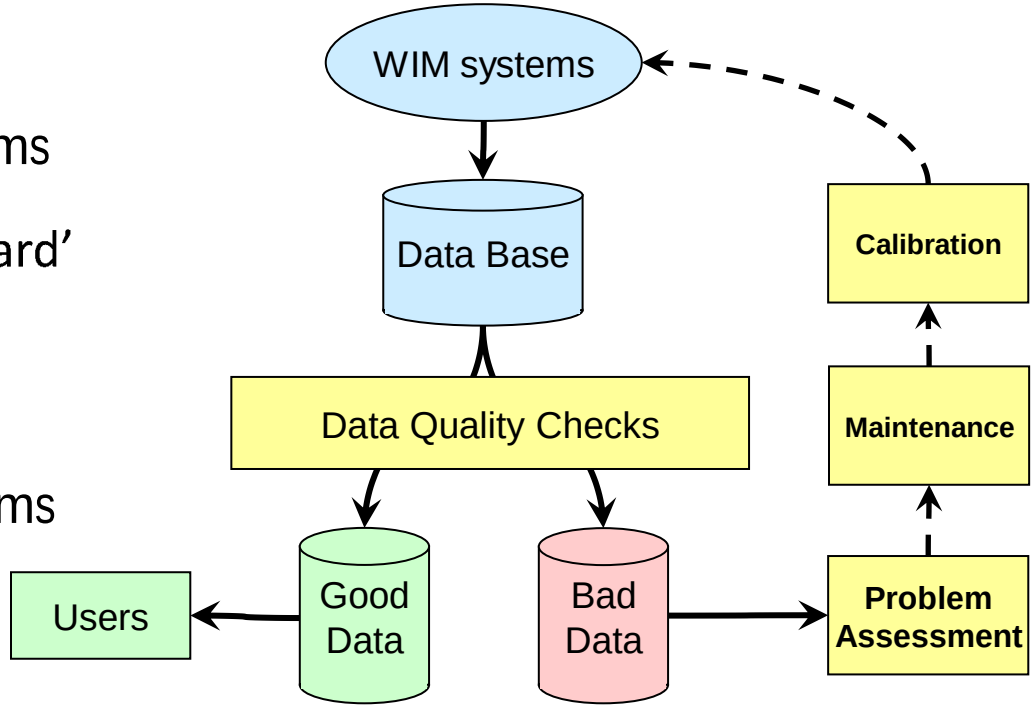
- What happens in between?



Data Quality Management

Purposes of DQM:

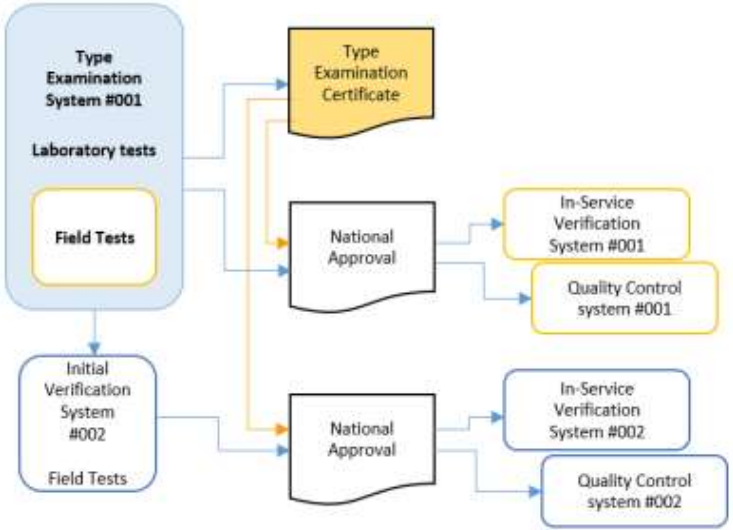
- to make sure the WIM systems continue to operate within specifications in between 'hard' system verifications.
- to provide input for maintenance, trouble shooting and calibration of the WIM systems



Type Approval Procedure

1. Pre-approval Fase

- Assessment of:
  - All existing documentation
  - Previous test results
- Determination of
  - Possible missing documentation
  - Acceptance of previous test results
  - Description of required Tests procedu
  - Planning of next Fases
  - Overview of Costs



Type Approval Procedure

1. Pre-approval Fase

2. Laboratory Tests
   - At NMi Lab in Dordrecht or
   - Approved National Lab

- Testing of:
  - Temperature + Humidity
  - Immunity to EMC, Mains variations
  - Hard- and Software Security

Type Approval Procedure

1. Pre-approval Assessment
2. Laboratory Tests
3. Field Tests
   - At customer location
     - Organization by Customer
     - Supervision by NMi (or CSI)
   - Testing :
     - 3 different test-trucks, fully loaded*
     - 30 runs each spread over speed range
     - Accepted if: No error > 0.5 * MPE

Application\Test	Type Approval	Initial Verification	In-Service Verification
Statistics	n.a.	2 Vehicles, 10 runs each Total: 20 runs	1 Vehicle, 10 runs Total: 10 runs
Legal	3 Vehicles, 30 runs each Total: 90 runs	2 Vehicles, 30 runs each Total 60 runs	2 Vehicles, 15 runs each, Total 30 runs

* For Weight Enforcement

More Information

Download at NMi website:

Free to use!

http://www.nmi.nl/nmi-wim-standard/

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