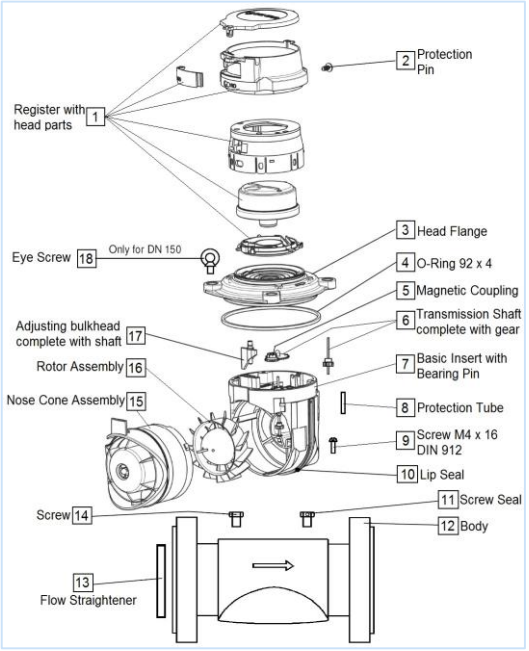
Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin

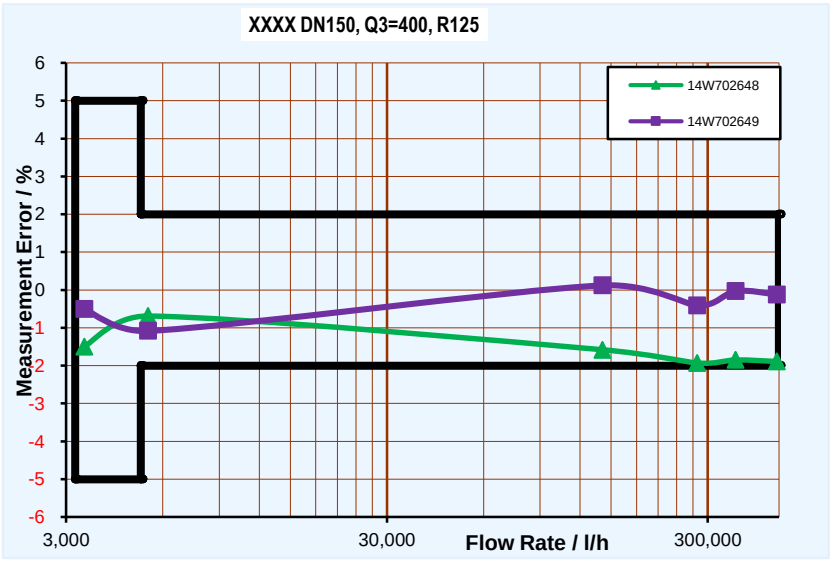
APLMF
Asia–Pacific
Legal Metrology Forum

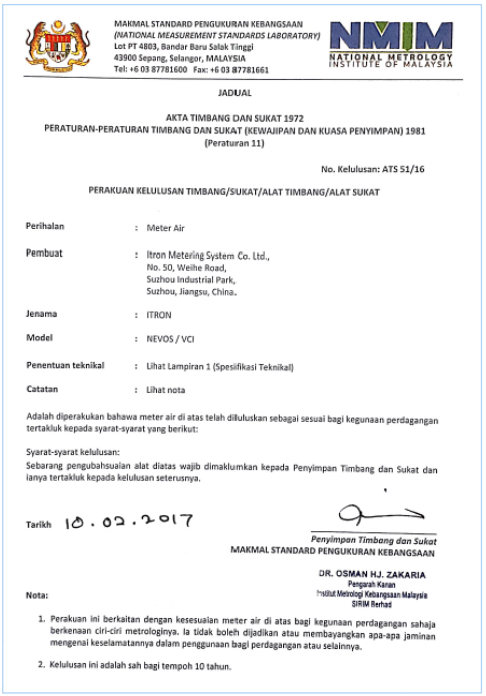
Pattern Approval and Verification and of Water Meters

Training Course on

Pattern Approval and Verification of Water Meters – OIML R49
15 – 18 October 2019 at NMIM, Sepang, Malaysia







MAKMAL STANDARD PENGUKURAN KEBANGSAAN
(NATIONAL MEASUREMENT STANDARDS LABORATORY)
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NMIM NATIONAL METROLOGY INSTITUTE OF MALAYSIA

JADUAL

AKTA TIMBANG DAN SUKAT 1972
PERATURAN-PERATURAN TIMBANG DAN SUKAT (KEWAJIPAN DAN KUASA PENYIMPAN) 1981
(Peraturan 11)

No. Kelulusan: ATS 51/16

PERAKUAN KELULUSAN TIMBANG/SUKAT/ALAT TIMBANG/ALAT SUKAT

Perihalan	:	Meter Air
Pembuat	:	Itron Metering System Co. Ltd., No. 50, Weihe Road, Suzhou Industrial Park, Suzhou, Jiangsu, China.
Jenama	:	ITRON
Model	:	NEVOS / VCI
Penentuan teknikal	:	Lihat Lampiran 1 (Spesifikasi Teknikal)
Catatan	:	Lihat nota

Adalah diperakukan bahawa meter air di atas telah diluluskan sebagai sesuai bagi kegunaan perdagangan tertakluk kepada syarat-syarat yang berikut:

Syarat-syarat kelulusan:
Sebarang pengubahsuaian alat diatas wajib dimaklumkan kepada Penyimpan Timbang dan Sukat dan lanya tertakluk kepada kelulusan seterusnya.

Tarikh 10.02.2017

Penyimpan Timbang dan Sukat
MAKMAL STANDARD PENGUKURAN KEBANGSAAN

DR. OSMAN HJ. ZAKARIA
Pengarah Kanan
Institut Metrologi Kebangsaan Malaysia
SIRIM Berhad

Nota:

1. Perakuan ini berkaitan dengan kesesuaian meter air di atas bagi kegunaan perdagangan sahaja berkenaan ciri-ciri metrologinya. Ia tidak boleh dijadikan atau membayangkan apa-apa jaminan mengenai keselamatannya dalam penggunaan bagi perdagangan atau selainnya.
2. Kelulusan ini adalah sah bagi tempoh 10 tahun.

STATUTORY REQUIREMENTS AND STANDARDS

Metering for water is an important aspect in water industry since these are the cash registers that measure the revenues of the resources delivered by water supply companies. Whilst the suppliers are interested in the monetary return for their investments, the users have to be ensured that they are getting what they paid for. A slight error in the measurement can resulted in huge gain or loss to either party.

That’s why in most countries, legislation are introduced to facilitate trade as well as ensuring the activities are conducted in a fair manner.

The measurement of fluid flow is required:

i. Process control

For example: to control the distribution of water or petroleum/gas within a supply system or internal allocation purposes within a building or a plant

Repeatability of measurement is more important than the accuracy. No money is directly involved.

ii. Custody transfer or fiscal metering

- A measure of the potential revenue for the liquid/gas supplier.

- The customers to know the volume/mass/energy of liquid/gas consumption.

As it involves a transferring of money, accuracy of the measurement is important. The meter used have to meet legal requirement

STATUTORY REQUIREMENTS AND CONTROL

Regulation that requires uniformity in the units of measurement within the country, reliability for the measurement instruments used where their errors have to be within prescribed limits, are commonly stated to be followed by the trading industries.

Steps that have been taken to control the measuring instruments, to ensure their ability in meeting the legislative requirements, includes the **pattern or type approvals, verification at the installation** and **in service inspection** on a periodic basis.

These are parts of the **metrological control system** developed to maintain public confidence in the instruments used.

METROLOGICAL CONTROL PROCESS

PATTERN APPROVAL

- PROTO-TYPE TESTING
- TECHNICAL DESCRIPTION
- CERTIFICATE OF APPROVAL

CUSTODIAN/NMIM-SIRIM

INITIAL VERIFICATION (factory)

QUALITLY ASSESSOR

MDTCA/ MCM

VERIFICATION (field)

INSPECTION

DEFINITIONS

"Type approval: *- decision of legal relevance, based on the evaluation report, that the type of a measuring instrument complies with the relevant statutory requirements and is suitable for use in the regulated area in such a way that it is expected to provide reliable measurement results over a defined period of time."*

METROLOGICAL CONTROL OF MEASURING INSTRUMENTS

Pattern approval is the process whereby an impartial body examines the pattern (design) of an instrument prototype against a set of national or international metrological specifications.

The sample instruments are subjected to comprehensive testing throughout their measuring ranges and at conditions which simulate the environment in which they are intended to operate.

This ensures the reliability of the instrument, that it will maintain its calibration accuracy over a range of environmental conditions and other influence factors, throughout their service lifetime.

Pattern approval also aimed to ensure the design of the instrument does not capable of facilitating fraud.

METROLOGICAL CONTROL OF MEASURING INSTRUMENTS

Requirements to be met by measuring instruments:

i. Correct measurement result

means with nominal operating conditions, the prescribed maximum permissible errors are complied with. Nominal operating condition is where the instrument is tested under influence conditions (e.g temperature, humidity, vibraton …

ii. Durable

means correct measuring results at least during the verification validity period

iii. Must be sufficiently protected from intended manipulation

Example of Pattern Approval certificate

- **Is a certificate which relates to the metrological and technical characteristics of the pattern of the instrument.**
- **Issued by the Custodian of Weights and Measures.**
- **The certificate certifies the suitability of the instrument to be used for trade.**
- **It contains description of the approved instrument as well as terms and conditions regarding the approval, if any.**

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SIRIM

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JADUAL

AKTA TIMBANG DAN SUKAT 1972
PERATURAN-PERATURAN TIMBANG DAN SUKAT (KEWAJIPAN DAN KUASA PENYIMPAN) 1981
(Peraturan 11)

No. Kelulusan: ATS-0031-19

PERAKUAN KELULUSAN TIMBANG/SUKAT/ALAT TIMBANG/ALAT SUKAT

Perihalan	:	Meter Air
Pembuat	:	Ningbo Water Meter Co. Ltd. 355 Hongxing Road, Jiangbei District, 315032 Ningbo, China.
Jenama	:	MINCH
Model	:	AF 50W, AF 80W, AF 100W, AF 150W, AF 200W
Penentuan teknikal	:	Lihat Lampiran 1 (Spesifikasi Teknikal)
Catatan	:	Lihat nota

Adalah diperakukan bahawa meter air di atas telah diluluskan sebagai sesuai bagi kegunaan perdagangan tertakluk kepada syarat yang berikut:

Sebarang pengubahsuaian alat di atas wajib dimaklumkan kepada Penyimpan Timbang dan Sukat dan ianya tertakluk kepada kelulusan seterusnya.

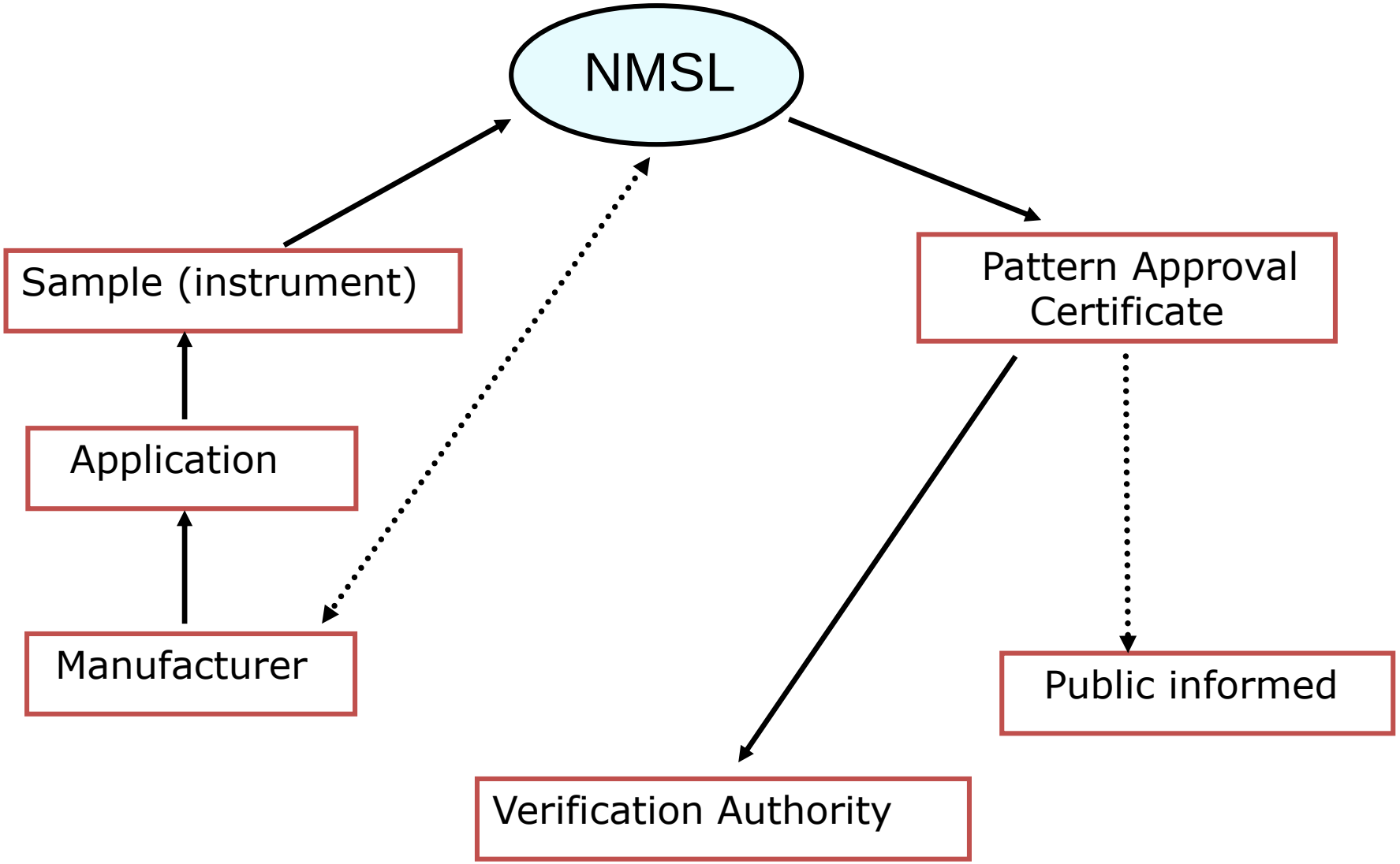
Tarikh: 10.10.2019

DR. OSMAN ZAKARIA
Pengarah Kanan
Makmal Standard Pengukuran Kebangsaan
(Institut Metrologi Kebangsaan Malaysia, NMIM)
SIRIM Berhad

Nota:

1. Perakuan ini berkaitan dengan kesesuaian alat di atas bagi kegunaan perdagangan sahaja berkenaan ciri-ciri metrologinya. Ia tidak boleh dijadikan atau membayangkan apa-apa jaminan mengenai keselamatannya dalam penggunaan bagi perdagangan atau selainnya.
2. Kelulusan ini adalah sah bagi tempoh 10 tahun dari tarikh kelulusan perakuan ini.

PATTERN APPROVAL PROCESS



METROLOGICAL CONTROL OF MEASURING INSTRUMENTS

WHY PATTERN APPROVAL SO IMPORTANT

- The pattern approval process determines whether an instrument is capable of retaining its calibration over a range of environmental and operating conditions while it is not capable of facilitating fraud.

- Pattern approval protects measuring instrument manufacturers and importers from substandard measuring instruments that would otherwise provide unfair competition.

- Pattern approval provides confidence that all measuring instruments will meet certain metrological standards of performance over a range of operating conditions and will not need to be excessively recalibrated.

As a result, the confidence in a measurement is increased and all parties involved in the measurement are protected. For example, the water service provider, the meter manufacturer and the consumer.

DEFINITIONS

*"**Verification of a measuring instrument**: - procedure (other than type approval) which includes the examination and marking and/or issuing of a verification certificate, that ascertains and confirms that the measuring instrument complies with the statutory requirements."*

METROLOGICAL CONTROL OF MEASURING INSTRUMENTS

Verification is the process whereby instruments are:

i. inspected to ensure that they comply with the approved pattern

ii. tested to ensure that they are operating within the maximum permissible errors

iii. certified by marking the instrument with a seal

Initial verification is the verification of new measuring instruments which have not been verified yet.

Subsequent verification is the periodical verification of measuring instruments which have already been verified.

Initial Verification

Initial verification is the process whereby new instruments are examined to determine whether they:

- Comply with the notice of type approval
- Comply with the applicable technical requirements
- Are operating and measuring within the required maximum permissible errors

Initial Verification

For initial verification, OIML R 49-1 requires water meters to be tested at flow rates of:

- Between Q_1 and 1.1 Q_1
- Between Q_2 and 1.1 Q_2
- Between 0.9 Q_3 and Q_3
- Between 1.05 Qx_1 and 1.15 Qx_2 (combination meters only)

No other requirements or testing are specified in OIML R 49-1 for initial verification .

Re -Verification

Sometimes referred to as subsequent verification.

"*Subsequent verification: - any verification of a measuring instrument after a previous verification and including:*

mandatory periodic verification
verification after repair"

NOTE: Subsequent verification of a measuring instrument may be carried out before expiry of the period of validity of a previous verification either at the request of the user (owner) or when its verification is declared to be no longer valid.

The purpose of the re-verification process is to ensure continuing and sustained confidence in the performance of a measuring instrument.