



# THE NATIONAL METROLOGY INSTITUTE

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**M. RANGANAI**  
Director

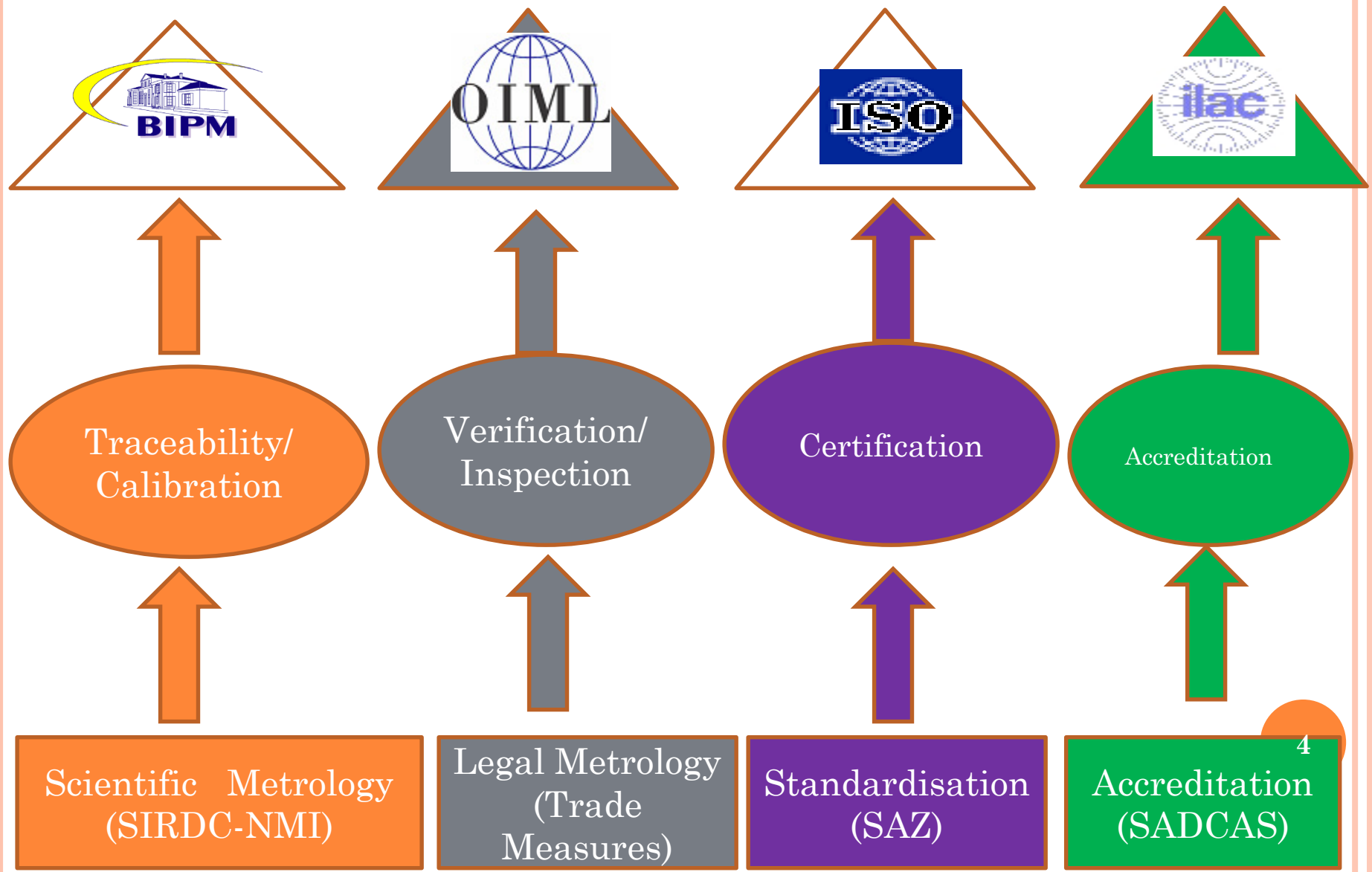
# OUTLINE

- ❖ Information on the national metrology system (National Quality Infrastructure)
- ❖ The quality policy.
- ❖ Detailed organogram of the NMI.
- ❖ QMS processes and steering mechanisms in the organisation
- ❖ Current accreditations/international recognition. List of updated calibration capabilities covered by the QMS
- ❖ Update on ISO/IEC 17025:2017 Transition Plan
- ❖ QMS procedure of continuous improvement
- ❖ Audits / external review
- ❖ Addressing weak and strong points
- ❖ Addressing (solutions found for) problems encountered (*Addressing e.g. the problems and findings from the peer review visits or accreditations and from participation in inter-laboratory comparisons.*)

# THE NATIONAL METROLOGY SYSTEM

- Zimbabwe through the National Metrology Institute (NMI) became an Associate of the CGPM, on 14 September 2010.
- On 4 January 2011, the National Metrology Institute (NMI) signed the CIPM-MRA
- 4 Labs(M,T, D & V) are accredited by SADCAS.
- Initial accreditation was on the 5<sup>th</sup> OCTOBER 2011
- Re-accreditation was done on 13 June 2017
- Second surveillance of NMI was done on 20 February 2019.

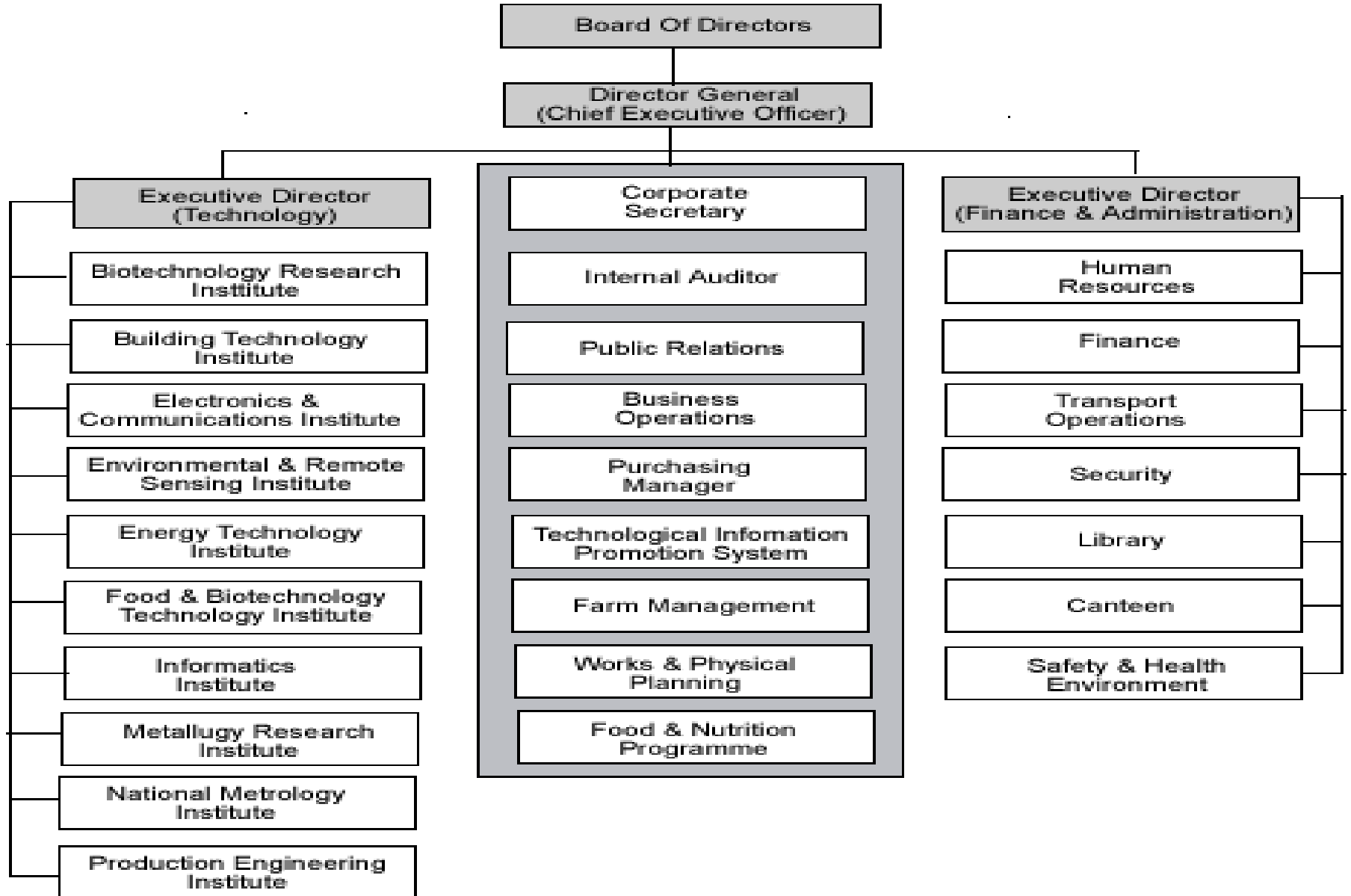
# NATIONAL STANDARDS BODIES (PILLARS OF QUALITY INFRASTRUCTURE)



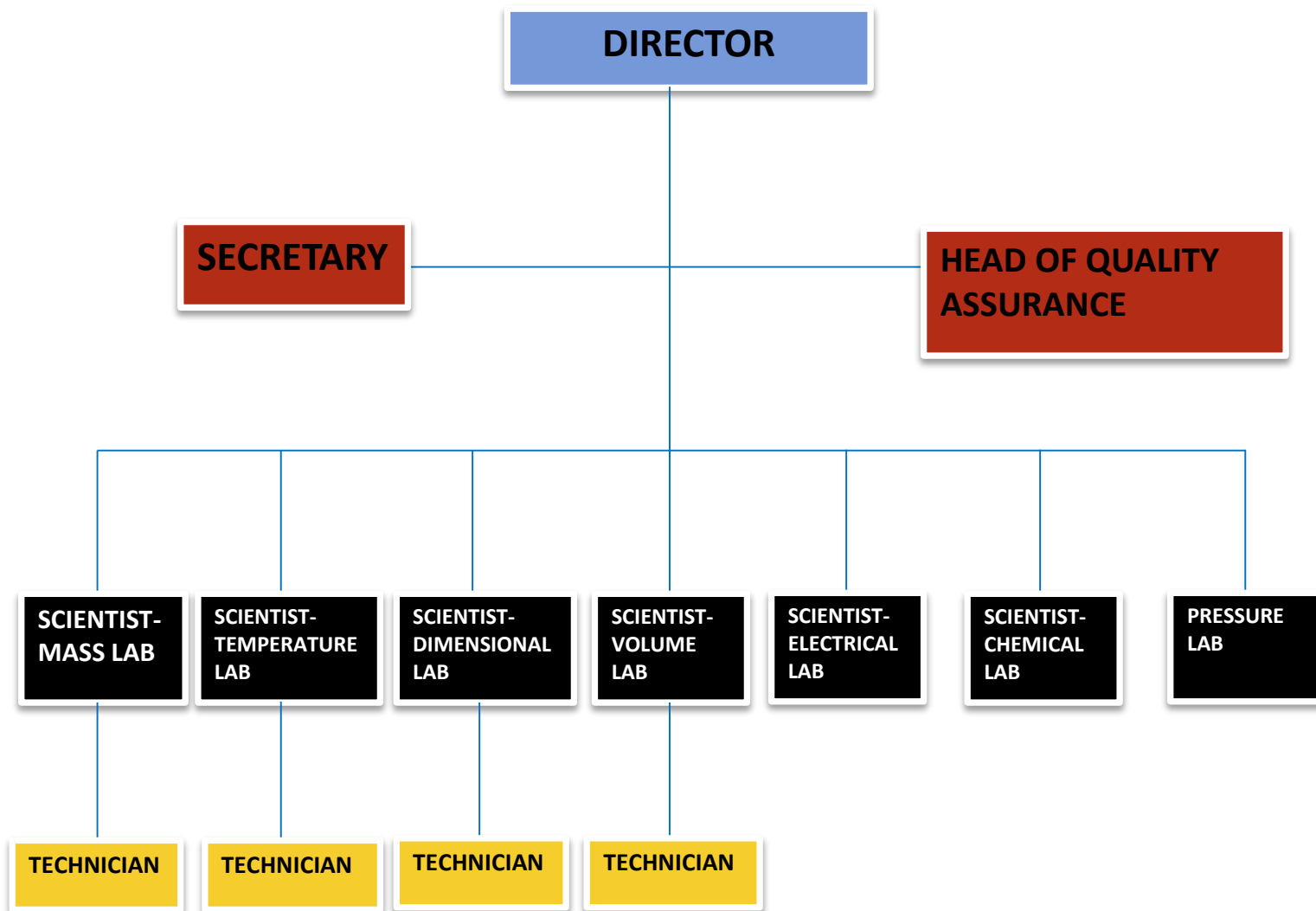
# QUALITY POLICY

- **SIRDC-NMI provide its clients and stakeholders with metrology services that meet international standards through:**
  - **Delivery of accurate and traceable results**
  - **ISO/IEC 17025 implementation**
  - **Ensuring that our policies and procedures are known, understood and implemented by our employees**
  - **Continuous improvement through formulation and review of objectives**
  - **Training of personnel and participation in inter-Laboratory comparisons**

# SIRDC



# SIRDC-NMI ORGANISATIONAL STRUCTURE



# TRACEABILITY OF MEASUREMENT STANDARDS

- **SIRDC-NMI Temperature, Mass, Volume, Electrical and Dimensional laboratories derive their traceability from NMISA, South Africa.**
- **Pressure and Chemical laboratories derive their traceability from NIST.**



# SIRDC-NMI MANDATE

- **Acquire, define, realise and maintain national measurement standards**
- **To establish the international equivalence of Zimbabwe national measurement standards with those of other countries**
- **To disseminate measurement traceability in Zimbabwe**
- **Research and development of measurement standards and equipment**

# QMS STEERING MECHANISMS

**The SIRDC-NMI is run based on:**

- The implementation of ISO/IEC 17025
- Afrimets peer review process
- Technical procedures guided by ISO/IEC 17025 and SADCAS/SANAS TR documents and international guides
- Use of well trained personnel and traceable equipment
- Management commitment to good laboratory practice

# INTERNATIONAL RECOGNITION

## The SIRDC-NMI Published CMCs in:

- Zimbabwe's first CMC in Temperature was published in the KCDB on 26 July 2018
- Zimbabwe's first CMC in Mass was published in the KCDB on 26 June 2019

# ACCREDITATION / INTERNATIONAL RECOGNITION

LABORATORY	ACCREDITATION STATUS	ACCREDITATION BODY
TEMPERATURE	RE-ACCREDITED 13 JUNE 2017 and second surveillance was done on 20 February 2019	SADCAS
MASS		SADCAS
VOLUME		SADCAS
DIMENSIONAL		SADCAS
PRESSURE	NOT YET	N/A
ELECTRICAL	NOT YET	N/A
CHEMICAL	NOT YET	N/A

# CALIBRATION CAPABILITIES COVERED BY THE QMS (TEMPERATURE)

ITEM	MEASURED QUANTITY OR TYPE OF GAUGE OR INSTRUMENT	RANGE	CMC /EXPRESSED AS AN UNCERTAINTY ( $\pm$ )
1	Base Metal Thermocouples	-50 to 660°C	0.4 to 1.2°C
2	Ice point Reference	0°C	0.05°C
3	Digital Thermometers	-50 to 660°C	0,13°C to 1,2°C
4	Digital Thermometers Electrical Simulation	-200°C to 1700°C	1,2°C
5	Platinum Resistance Thermometers	-50 to 660°C	0,13°C to 1,2°C
6	Liquid in Glass Thermometers	-50 to 300°C	0,25°C to 0,82°C

# CALIBRATION CAPABILITIES COVERED BY THE QMS (MASS)

ITEM	MEASURED QUANTITY OR TYPE OF GAUGE OR INSTRUMENT	RANGE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )
1	Mass Pieces	1 mg to 20000 g	0,00002 g to 0,3 g
2	Weighing Instruments Digital Self - indicating	0 g to 3000 g	0,001 g to 0,0003 % + 0,1 mg

# CALIBRATION CAPABILITIES COVERED BY THE QMS (VOLUME)

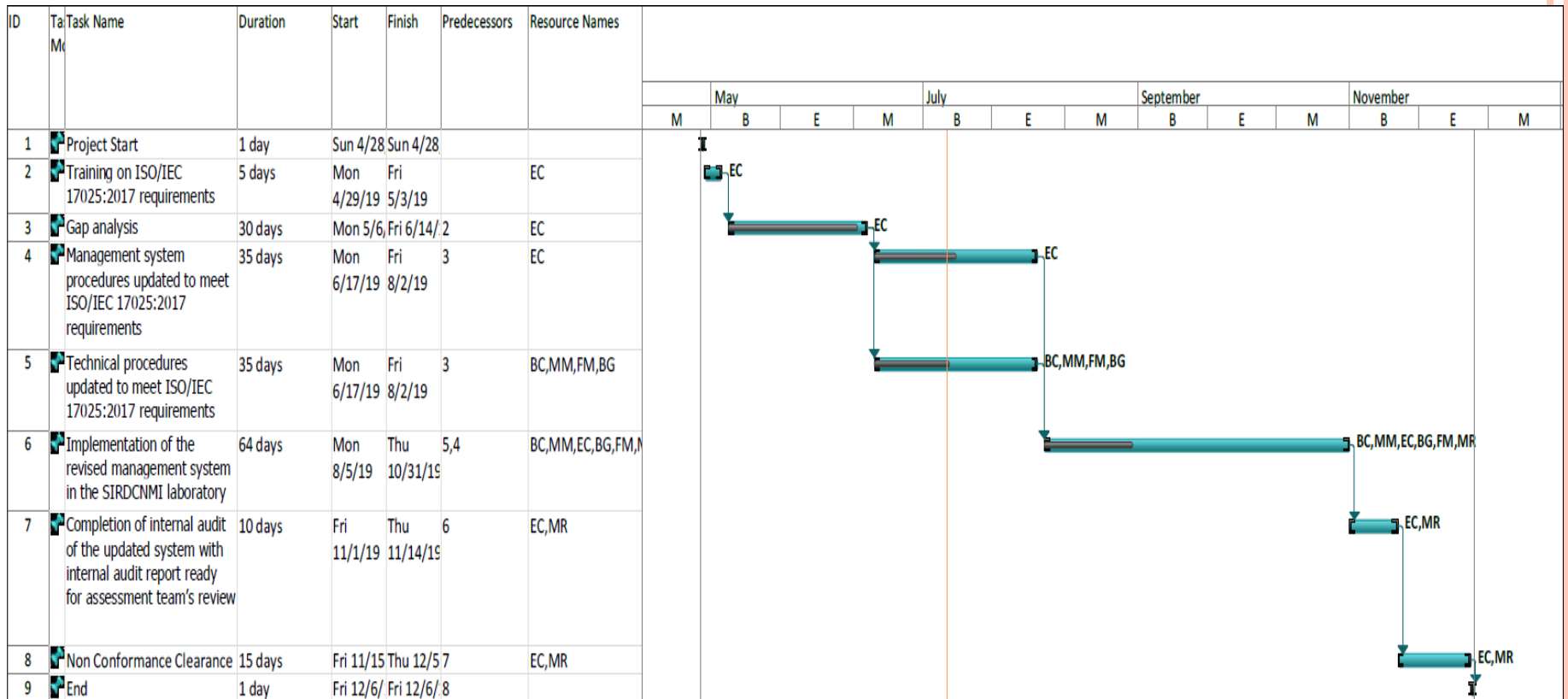
ITEM	MEASURED QUANTITY OR TYPE OF GAUGE OR INSTRUMENT	RANGE OF MEASURED QUANTITY	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )
1	<b>Laboratory Glass Ware</b> Flasks Measuring Cylinders Pyknometers	2 ml to 1 000 ml	0,015 % + 10 $\mu$ l
2	<b>Piston Pipette</b> Micropipettes	100 $\mu$ l to 10ml	0.7 $\mu$ l to 30 $\mu$ l

# CALIBRATION CAPABILITIES COVERED BY THE QMS (DIMENSIONAL)

ITEM	MEASURED QUANTITY OR TYPE OF GAUGE OR INSTRUMENT	RANGE OF MEASURED QUANTITY	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )
1	External Micrometers	0 to 100 mm	(1,2 + 0,021L) $\mu\text{m}$ L specified in mm i.e. 1,20 to 3,30 $\mu\text{m}$
2	Caliper -Vernier and Digital	0 to 150 mm	13 $\mu\text{m}$
4	Dial Gauge -Dial and Digital	0 to 10 mm	2 $\mu\text{m}$



# SIRDC-NMI ISO/IEC 17025: 2017 TRANSITION



# CONTINUOUS IMPROVEMENT

- The Use of the quality of the Quality policy and objectives
- Routine internal Audits.
- Identifying training needs and continuous training of its personnel.
- Annual Management review of the QMS
- Surveillance assessment from external assessors
- Regular participation in interlaboratory comparisons

# INFORMATION ABOUT INTERNAL AUDITS

- Internal Audits are carried according to NMI procedure by trained auditors
- The findings are investigated to establish the root cause and discussed with relevant personnel
- Corrective actions and preventive actions are enforced

# INFORMATION ABOUT MANAGEMENT REVIEW

- A procedure for conducting management review is available and implemented.
- The management review is conducted annually
- The management review is attended by top management and all laboratory staff
- Output from management review  
Idocumented and action plans followed up

# MANAGEMENT REVIEW AGENDA

- **Internal audits**
- **External assessments**
- **Customer complaints**
- **Non – conformances, corrective & preventive actions**
- **Progress on objectives and targets- reports from managerial and supervisory staff**
- **The results of inter laboratory comparisons or proficiency tests**
- **Customer feedback from customer surveys.**
- **Suitability of policies, procedures and objectives**
- **Changes that could affect the Quality Management System. E.g. changes in the type of work**
- **Resources**
- **Training Requirements**
- **Recommendations for continual improvement**
- **Other matters relevant to the Quality System may also be addressed.**

# EXTERNAL ASSESSMENT DETAILS

Date of Assessment	Subject Field Assessed	Name of Assessor	Function of Assessors	Institution from Assessor
2008	Mass Metrology	Ireen Field	Peer Review	NMISA
2010	All	Eddie Tarnow	Preparatory Assessment	NMISA
2011	QMS	Eben Smit	Lead Assessor	SANAS
2011	Mass	Ben Van der Merwe	Initial Assessment	SANAS/NMISA
2013	QMS	Eben Smit	Lead Assessor	SANAS
2013	Mass	Ben Van der Merwe	Surveillance Assessment	SANAS/NMISA
2013	Temperature	Hans Liedburg	Surveillance Assessment	SADCAS/SANAS/NMISA
2013	Volume	Alfred Moyo	Surveillance Assessment	SADCAS/SANAS/MBS
2013	DIMENSIONAL	Oelof Krueger	Surveillance Assessment	SADCAS/SANAS/NMISA
2014	Temperature	Hans Liedburg	Surveillance Assessment	SANAS/SADCAS/NMISA
2014	QMS	Eben Smit	Surveillance Assessment	SANAS/SADCAS
2014	Volume	Alfred Moyo	Surveillance Assessment	SANAS/SADC AS/MBS
2014	Dimensional	Oelof Krueger	Surveillance Assessment	SANAS/SADCAS/NMISA

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<b>Date of Assessment</b>	<b>Subject Field Assessed</b>	<b>Name of Assessor</b>	<b>Function of Assessors</b>	<b>Institution from Assessor</b>
<b>2015</b>	<b>QMS</b>	<b>Eben Smit</b>	<b>Lead Assessor</b>	<b>SANAS</b>
<b>2015</b>	<b>Mass</b>	<b>Ben Van der Merwe</b>	<b>Surveillance Assessment</b>	<b>SANAS/NMISA</b>
<b>2015</b>	<b>Temperature</b>	<b>Hans Liedburg</b>	<b>Surveillance Assessment</b>	<b>SADCAS/SANAS/NMISA</b>
<b>2015</b>	<b>Volume</b>	<b>Alfred Moyo</b>	<b>Surveillance Assessment</b>	<b>SADCAS/SANAS/MBS</b>
<b>2015</b>	<b>DIMENSIONAL</b>	<b>Oelof Krueger</b>	<b>Surveillance Assessment</b>	<b>SADCAS/SANAS/NMISA</b>
<b>2016</b>	<b>Temperature</b>	<b>Hans Liedburg</b>	<b>Afrimets Peer Review</b>	<b>AFRIMETS/NMISA</b>
<b>2016</b>	<b>Mass</b>	<b>Ben Van der Merwe</b>	<b>Afrimets Peer Review</b>	<b>AFRIMETS/NMISA</b>

# EXTERNAL ASSESSMENT DETAILS FOR REACCREDITATION OCTOBER 2016

<b>Date of Assessment</b>	<b>Subject Field Assessed</b>	<b>Name of Assessor</b>	<b>Function of Assessors</b>	<b>Institution from Assessor</b>
<b>2016</b>	<b>QMS</b>	<b>Monica Peart</b>	<b>Lead Assessor</b>	<b>SADCAS</b>
<b>2016</b>	<b>Mass</b>	<b>Thomas Mautjana</b>	<b>Surveillance Assessment</b>	<b>SADCAS/NMISA</b>
<b>2016</b>	<b>Temperature</b>	<b>Hans Liedburg</b>	<b>Surveillance Assessment</b>	<b>SADCAS/NMISA</b>
<b>2016</b>	<b>Volume</b>	<b>Thomas Mautjana</b>	<b>Surveillance Assessment</b>	<b>SADCAS/NMISA</b>
<b>2016</b>	<b>DIMENSIONAL</b>	<b>Barry Reynolds</b>	<b>Surveillance Assessment</b>	<b>SADCAS</b>



# EXTERNAL SURVEILLANCE ASSESSMENT DETAILS FOR FEBRUARY 2018

<b>Date of Assessment</b>	<b>Subject Field Assessed</b>	<b>Name of Assessor</b>	<b>Function of Assessors</b>	<b>Institution from Assessor</b>
<b>Feb 2018</b>	<b>QMS</b>	<b>Monica Peart</b>	<b>Lead Assessor</b>	<b>SADCAS</b>
<b>Feb 2018</b>	<b>Mass</b>	<b>Thomas Mautjana</b>	<b>Surveillance Assessment</b>	<b>SADCAS/ NMISA</b>
<b>Feb 2018</b>	<b>Temperature</b>	<b>Hans Liedburg</b>	<b>Surveillance Assessment</b>	<b>SADCAS/ NMISA</b>
<b>Feb 2018</b>	<b>Volume</b>	<b>Thomas Mautjana</b>	<b>Surveillance Assessment</b>	<b>SADCAS/ NMISA</b>
<b>Feb 2018</b>	<b>Dimensional</b>	<b>Barry Reynolds</b>	<b>Surveillance Assessment</b>	<b>SADCAS</b>

# EXTERNAL SURVEILLANCE ASSESSMENT DETAILS FOR FEBRUARY 2019

<b>Date of Assessment</b>	<b>Subject Field Assessed</b>	<b>Name of Assessor</b>	<b>Function of Assessors</b>	<b>Institution from Assessor</b>
<b>Feb 2019</b>	<b>QMS</b>	<b>Monica Peart</b>	<b>Lead Assessor</b>	<b>SADCAS</b>
<b>Feb 2019</b>	<b>Mass</b>	<b>Thomas Mautjana</b>	<b>Surveillance Assessment</b>	<b>SADCAS/NMISA</b>
<b>Feb 2019</b>	<b>Temperature</b>	<b>Hans Liedburg</b>	<b>Surveillance Assessment</b>	<b>SADCAS</b>
<b>Feb 2019</b>	<b>Volume</b>	<b>Thomas Mautjana</b>	<b>Surveillance Assessment</b>	<b>SADCAS/NMISA</b>
<b>Feb 2019</b>	<b>Dimensional</b>	<b>Dr Faith Hungwe</b>	<b>Surveillance Assessment</b>	<b>SADCAS/NMISA</b>

# WEAK AND STRONG POINTS

Description	Rating
Staff Turnover	Low
Competence and Experience	High (Minimum 6 years)
Funding	Support from Zimbabwe Government, SIRDC management commitment, Cooperating partners
Equipment	Limited Equipment to support more CMCs
Staff Training	Staff trained from world class institutions such as KRISS, NMISA, NIM, EURAMET, NPL, etc.



NATIONAL METROLOGY INSTITUTE

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**THANK YOU!**

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***TESTED ONCE, ACCEPTED EVERYWHERE!***

28