Final Report

APMP. EM-S8
Supplementary Comparison on Digital Multimeter

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Abstract

A measurement comparison of DC voltage, DC current, DC resistance, AC voltage and AC current has been carried out among seventeen national metrology laboratories with the travelling standards 6½ digit multimeter (Fluke model 8846A) as Loop A, Loop B and Loop C for the nominal values of the measured parameters DC Voltage (100 mV, 1 V, 10 V, –10 V, 100 V and 1000 V), DC Current(10 mA and 1 A), DC Resistance(100 Ω, 1 kΩ and 10 kΩ (using 4-wire), AC Voltage(100 mV, 1 V, 10 V, 100 V and 700 V at 40 Hz and 1 kHz) and AC Current (10 mA and 1 A at 40 Hz and 1 kHz) for establishing the degrees of equivalence among the participating NMIs. This is the final report on the comparison. The report presents the combined results (Loop A, Loop B and Loop C), represented by corrections in measured parameters and the corresponding expanded uncertainties. The combined results from the three loops have been used to calculate the Supplementary Comparison Reference Values, degrees of equivalence d_i and corresponding uncertainties $u(d_i)$ of each laboratory participated in the comparison.

Contents

1 Introduction

At the 8th Meeting of APMP Developing Economies' Committee (DEC) on 12 April 2004 in Kuala Lumpur, Malaysia, it was decided to initiate an international comparison of digital multimeter calibration. The measurement comparison of DC voltage, DC current, DC resistance, AC voltage and AC current has been carried out among seventeen national metrology laboratories with the travelling standards 6½ digit multimeters (Fluke model 8846A) as Loop A, Loop B and Loop C for the nominal values of the measured parameters DC Voltage(100 mV, 1 V, 10 V, –10 V, 100 V and 1000 V), DC Current(10 mA and 1 A), DC Resistance(100 Ω, 1 kΩ and 10 kΩ (using 4-wire), AC Voltage(100 mV, 1 V, 10 V, 100 V and 700 V at 40 Hz and 1 kHz) and AC Current(10 mA and 1 A at 40 Hz and 1 kHz) for establishing the degree of equivalence among the participating NMIs. The seventeen laboratories participated are CSIR-NPL India (NPLI), NMI Australia, CSIR-NML South Africa, ESLMASM Mongolia, NIM Thailand, SCL Hong Kong, NMI Malaysia, MUSSD Sri Lanka, VMI Vietnam, NML Philippines, NISIT Papua New Guinea, KIM-LIPI Indonesia, KIM Kazakhstan, NIS Egypt, NSCL Syria, JNMI Jordan and NMC Singapore. The CSIR National Physical Laboratory (India) acted as the pilot laboratory for the comparison with full support from NMIA. The comparison results received for the three Loops as correction in measured parameters and the corresponding expanded uncertainties have been graphically represented. The Supplementary Comparison Reference Values (SCRVs) for five selected measurements (Loop C) were presented for discussion in the Concluding Workshop for International Supplementary Comparison on Digital Multimeter (APMP.EM-S8) 5th to 7th-Nov-15 in Beijing, People's Republic of China to prepare Draft B report.

1.1 The assistance of the support group

The protocol was drafted with the help of Dr. Ilya Budovsky (NMIA), TCEM chair at that time, Louis Marais (NMIA) and Dr. VN Ojha, Mr. A K Saxena, Mr. A K Govil, and Mr. PS Negi (NPLI). A support group was established to work with comparison coordinators and took active role in completing the final report. The support group included Manuel Ruiz and Sabino Paulo B Leones, Jr. (ITDI the Philippines) and Nor Azrin Hassan (NMIM Malaysia). The support group, especially Mr. Nor Azrin Hassan, also reviewed the Draft A and made critical contributions to the Draft B of this report.

2 Participants and organization of the comparison

2.1 List of participants

The list of participating institutes with details of contact persons are given in Table 2-1.

No.	Participating NMI	Contact Person	Email ID
1	CSIR-NPL, India	Thomas John/ PS Negi/ Saood Ahmad	tjohn@nplindia.org psnegi198792@gmail.com ahmads@nplindia.org
2	NMI, Australia	Louis Marais	louis.marais@measurement.gov.au
3	NMI, South Africa	Flippie Prinsloo, Alexander Matlejoane	fprinsloo@nmisa.org, amatlejoane@nmisa.org
4	MASM, Mongolia	Ariuntungalag Jargal	r_aagii@yahoo.com, jariuntungalag@gmail.com
5	NIM, Thailand	Ms. Jutarat Tanarom, Narat Rujirat	jutarat@nimt.or.th, narat@nimt.or.th
6	SCL, Hong Kong	Steven Yang	steven.yang@itc.gov.hk
7	NMI, Malaysia	Nor Azrin Hassan	norazrin@sirim.my
8	MUSSD, Sri Lanka	R.D.M. Alanka	metrolg@sltnet.lk
9	VMI, Vietnam	Phung Thi KieuLinh	linhptk@vmi.gov.vn
10	NML, Philippines	Sabino Paulo B. Leones, Jr.	paulo_leones@yahoo.com
11	NISIT, Papua New Guinea	Joe Panga, Victor Gabi	Joe.Panga@nisit.gov.pg, Victor.Gabi@nisit.gov.pg
12	KIM-LIPI, Indonesia	Ahnan Maruf	ahnan@kim.lipi.go.id
13	KIM, Kazakhstan	Marat Konkanov Seksembaev Nurlan	marconzenti@bk.ru nurlan_ast_76@mail.ru
14	NIS, Egypt	Nadia N. Tadros Dr. Rasha Sayed	nntadros@yahoo.com, halaabdelmegeed@yahoo.com/rasha_sama79@hotmail.com
15	NSCL, Syria	Naser Harba	nscl@nscl.sy
16	JNMI, Jordan	Mustafa Flaifel	mustafa.flaifel@rss.jo, jnmi-emd@rss.jo
17	NMC, Singapore	Tay Siew Choon	tay_siew_choon@nmc.a-star.edu.sg

Table2.1. Details of participating NMIs.

2.2 Comparison schedule

The circulation of the travelling standards has been eventually organized in loops A, B and C in order to allow smooth travel of the standard. Each laboratory had at least four weeks for measurement and transportation.

Circulation Scheme for Participants covered under ATA Carnet

Laboratory	Receipt of Travelling Standard (DD-MM-YY)	Departure of Travelling standard (DD-MM-YY)	Report Dispatch (DD-MM-YY)
Loop 1			
CSIR-NPL, India	---	27-05-11	---
NMI, Australia	15-06-11	15-07-11	17-08-11
NMI, South Africa	01-08-11	02-09-11	02-10-11
ESLMASM, Mongolia	12-09-11	30-09-11	30-10-11
CSIR-NPL, India	31-10-11	---	---
Loop 2			
CSIR-NPL, India	---	02-12-11	---
NIM, Thailand	16-01-12	13-02-12	13-03-12
SCL, Hong Kong	02-03-12	02-04-12	02-05-12
NML, Malaysia	20-04--12	18-05-12	18-06-12
MUSSD, Sri Lanka	04-06-12	06-07-12	06-08-12
NMI, Australia	20-07-12	24-08-12	24-09-12
CSIR-NPL, India	24-09-12	---	---

Table2.2a. Comparison schedule Travelling standard: Fluke model 8846AS/N9481013 Loop A.

Laboratory	Receipt of Travelling Standard (DD-MM-YY)	Departure of Travelling standard (DD-MM-YY)	Report Dispatch (DD-MM-YY)
Loop 1			
NMI, Australia	---	11-06-11	11-07-11
CSIR-NPL ,India	11-07-11	29-08-11	---
VMI, Vietnam	08-09-11	10-10-11	09-11-11
NML, Philippines	26-10-11	28-11-11	28-12-11
NISIT, Papua New Guinea	07-12-11	26-12-11	25-01-12
KIM-LIPI, Indonesia	27-01-12	17-02-12	17-03-12
CSIR-NPL, India	17-03-12	---	---
Loop 2			
CSIR-NPL, India	---	18-04-12	---
KIM, Kazakhstan	18-05-12	13-06-12	13-07-12
NIS, Egypt	27-06-12	27-07-12	28-08-12
NSCL, Syria	10-08-12	10-09-12	10-10-12
JNMI, Jordan	02-10-12	17-10-12	17-11-12

Circulation Scheme for Participants not covered under ATACarnet

Table2.2b. Comparison schedule Travelling standard: Fluke model 8846AS/N9273015 Loop B.

Circulation Scheme for Participants of Loop 3

Laboratory	Receipt of Travelling Standard (DD-MM-YY)	Departure of Travelling standard (DD-MM-YY)	Report Dispatch (DD-MM-YY)
Loop 3			
NMI, Australia	---	16-06-14	---
CSIR-NPL, India	11-07-14	11-09-14	---
SCL, Hong Kong	19-09-14	20-10-14	20-11-14
Singapore	29-10-14	21-11-14	21-12-14
MUSSD, Sri Lanka	28-11-14	29-12-14	29-01-15
JNMI, Jordon	22-01-15	06-02-15	06-03-15
NMI, Australia	13-02-15	---	16-3-15

Table2.2c. Comparison schedule Travelling standard: Fluke model 8846AS/N2608004 Loop C.

2.3 Organization of the comparison

The comparison schedule was initially organized in two consecutive loops (Loops A and Loop B) for participant covered and not covered under ATA Carnet. The artefacts returned to the pilot laboratory, NPLI for re-checking at the end of each loop.

A period of four weeks was scheduled for each participant. Generally, participants had at least two weeks and usually three weeks in which to make their measurements, depending on the time taken to receive the artefacts through the customs service in their country and allow the artefacts to be stabilized with the environment in their laboratory.

The traveling standards, three Digital Multimeter (provided by NPLI & NMIA), each of which was enclosed in separate travel case were transported in a case by air cargo using an ATA Carnet for customs clearance where possible. A small thermo-hygrometer (provided by NPLI) was also enclosed in the transport case to monitor the environmental change during transportation.

2.4 Unexpected events

2.4.1 Addition of new loop to support Loop A and B results

In Loop A of the Circulation Scheme, the travelling standard was found to be out of order at NMI Australia. In Loop B of the Circulation Scheme, the travelling standard was destroyed in a warehouse fire after coming back to India. Therefore, Loop C was initiated with a new artifact from NMI Australia and a few selected participants from both Loop A and B in order to support the results of loops A and B.

The comparison schedule of Table 2-2 a, b and c is the result of several modifications from the original schedule. NMC A-Star Singapore was added in 2014 in Loop C. The circulation was completed with the final measurement at NMIA in Mar-15.

2.4.2 Application of correction coefficients

NMIA resistance measurement in Loop A and B, was done at a different temperature setting which was at 20 °C compared to the recommended 23 ° C. The NMIA results for Loop A and B have a large difference compared to other laboratories and the pilot due to uncorrected systematic errors due to the temperature coefficients of the digital multimeters used in the comparison. The NMIA, who provided the travelling standards for Loop C, recalculated the data and applied corrections for the effect of temperature coefficients measured for the Digital Multimeter. The new correction for temperature coefficients of 100 Ω, 1 kΩ and 10 kΩ outputs are shown in Table 2.4.2 and Figure 2.4.2 a, b and c respectively with their standard uncertainties. The values were finally adopted, so the revised protocol was redistributed quickly. For all the reports, which were already submitted, the new correction values were recalculated with the support of Dr. Ilya Budovsky and Mr. Louis Marais.

Name		Correction	Uncertainty	unit
NMI, Australia RN141297	NMIA	2.3	0.4	mΩ
CSIR-NPL, India	NPLI	8.6	5.84	mΩ
SCL, Hong Kong	SCL, HK	3.2	0.2	mΩ
NMC, Singapore	NMC, SG	3.1	0.3	mΩ
MUSSD, Sri Lanka	MUSSD, SL	2.6	13.9	mΩ
JNMI, Jordon	JNMI	2.72	2.8	mΩ
NMI, Australia RN150814	NMIA	2.9	0.3	mΩ

Table 2.4.2.a Correction and uncertainties for 100 Ω

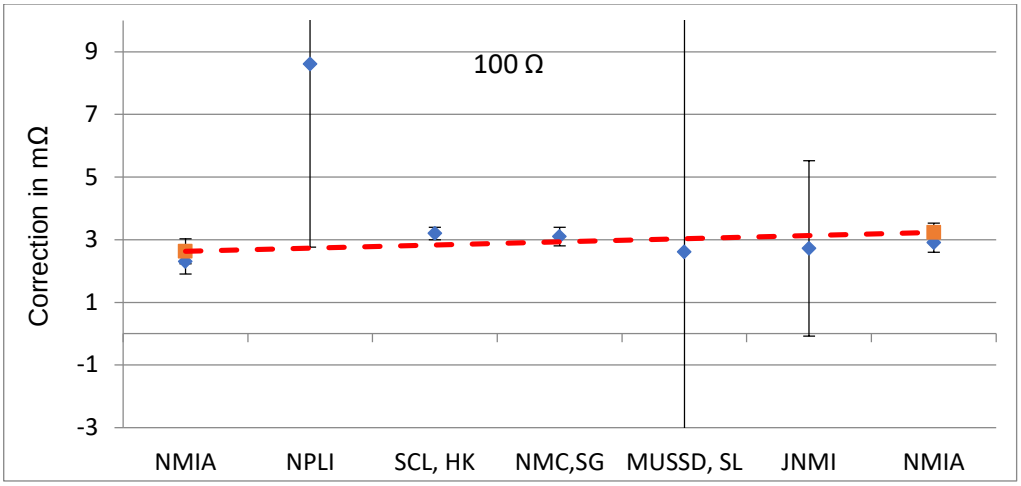

Figure 2.4.2.a Correction and uncertainties for 100 Ω

Name		Correction	Uncertainty	Unit
NMI, Australia RN141297	NMIA	6	2	mΩ
CSIR-NPL, India	NPLI	27.6	15.2	mΩ
SCL, Hong Kong	SCL, HK	14.00	1	mΩ
NMC, Singapore	NMC, SG	14	2	mΩ
MUSSD, Sri Lanka	MUSSD, SL	8.5	104.3	mΩ
JNMI, Jordon	JNMI	9.3	15	mΩ
NMI, Australia RN150814	NMIA	14	2	mΩ

Table 2.4.2.b Correction and uncertainties for 1 kΩ

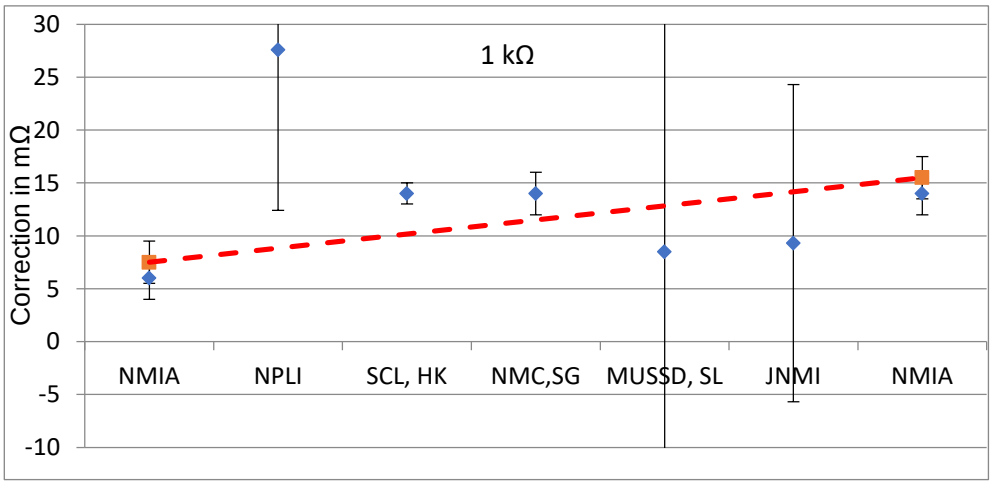

Figure 2.4.2.b Correction and uncertainties for 1 kΩ

Name		Correction	Uncertainty	Unit
NMI, Australia RN141297	NMIA	40	20	mΩ
CSIR-NPL, India	NPLI	0.414	121	mΩ
SCL, Hong Kong	SCL, HK	120	20	mΩ
NMC, Singapore	NMC, SG	120	20	mΩ
MUSSD, Sri Lanka	MUSSD, SL	102	1042.8	mΩ
JNMI, Jordon	JNMI	93	98	mΩ
NMI, Australia RN150814	NMIA	110	20	mΩ

Table 2.4.2.c Correction and uncertainties for 10 kΩ

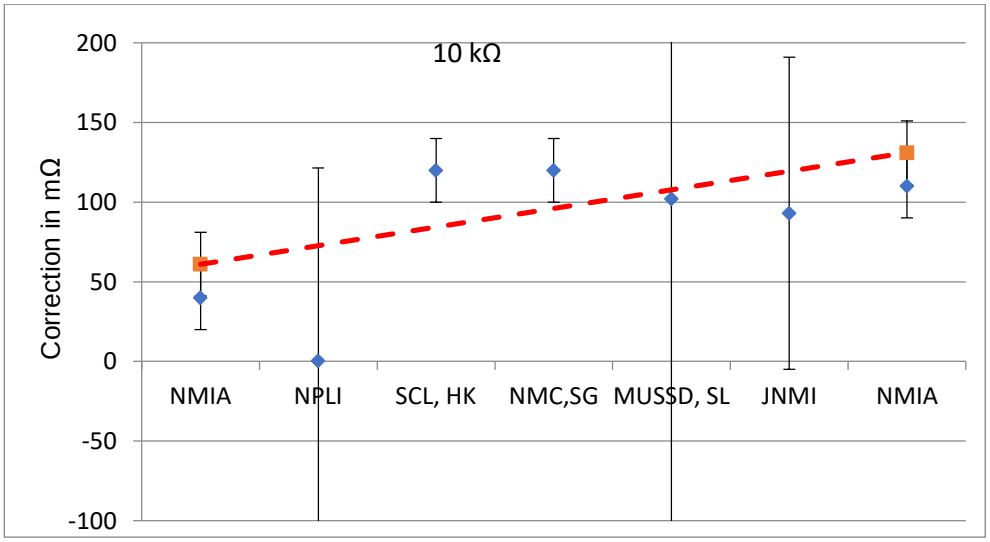

Figure 2.4.2.c Correction and uncertainties for 10 kΩ

2.4.3 Drift of the traveling standards

It was found that the travelling standard in Loop B rapidly drifted around the time it was in Egypt in Aug 12. Loop B result compared to Loop C result supports the suspicion that in Loop B the travelling standard suffered damage between Kazakhstan and Egypt. The Loop C results from Jordan have been used to correct the results of Egypt and Syria.

For loop A, 10 mA results show that the multimeter drifted significantly. For this reason, the 10mA loop A results have been excluded from the comparison report.

3 Withdrawn results

The NMIA resistance measurement results for Loop A and B have a large difference compared to other laboratories and the pilot due to making the resistance measurement sat a different temperature setting. For this reason, NMIA resistance results were not used to calculate the reference values for the loops A and B.

The measurements made in Jordan for loop B were done after the instrument changed its values, so these measurements have been discarded. As JNMI made measurements in Loop C also, the support group recommended using only the Loop C results for JNMI in the comparison. The support group also decided to apply corrections in the NIS and NSCL (Loop B) measurements by using the JNMI measurements so that both NSCL and NIS could be retained in the comparison.

Due to abnormal change of the travelling standard in the 10 mA current measurement for loop A, it was decided not to include the 10 mA, loop A measurements in the final results.

4 Travelling standard and measurement instructions

4.1 Description of the standards

The travelling standards selected for the comparison were three 6½ digit multimeters (Fluke model 8846A). This instrument can measure DC voltage up to 1000 V, DC current up to 10 A, resistance up to 1 GΩ, AC voltage up to 1000 V, and AC current up to 10 A. The details of the digital multimeter are given as follows:

General Information	
Power supply requirement	100V / 120V / 220V/240V ± 10%
Power line frequency	50Hz to 60 Hz
Power consumption	28VA peak(12W average)
Warm-up time	1Hour
Operating temperature range	0 °C to 50°C
Operating humidity range	0% to 80% relative humidity
Temperature coefficient(18 °C -28°C)	Not specified
Transport Information	
Storage temperature range	–40°C to70°C
Dimension(H x W x D)	89mm(H) x 217mm(W) x 297mm(D)
Shipping container(H x W x D)	167mm(H) x 470mm(W) x 360mm(D)
Weight	3.6kg
Shipping Weight	6.0kg

Table 4.1 the details of the digital multimeter

4.2 Quantities measured and conditions of measurements

The quantities measured were DC voltage, DC current, DC resistance, AC voltage and AC current. The details of the measured points are given in Table4.2.

Parameter	**Nominal value**
DC Voltage	100mV, 1V, 10V,–10V,100V and 1000V
DC Current	10mA and 1A
DC Resistance	100Ω, 1kΩ and 10kΩ(using4-wire)
AC Voltage	100mV, 1V, 10V,100V and 700V at 40Hz and 1kHz
AC Current	10mA and 1A at 40Hz and 1kHz

Table4.2 Measurement points in comparison on DMM

4.3 Measurement instructions

After arrival in the participant's laboratory, it must be checked if the main voltage setting is applicable to the local supply, any physical damage and if the instrument is functioning correctly. Then it should be allowed to stabilize in temperature and humidity controlled environment for at least before 24 hours before commencing measurements.

4.3.1.1 Tests before measurements

After arrival of the travelling standard, it should be checked for any physical damage. Ensure that the mains voltage setting is applicable to the local supply, and check that the instrument is functioning correctly. It should be allowed to stabilize in a temperature and possibly, humidity controlled environment for at least 24 hours before commencing measurements.

4.3.1.2 Measurement conditions

1. The digital multimeter should be used in the configurations given in Annexure 3 of Technical Protocol.
2. The instrument will be supplied without input leads. The input voltage, current and resistance are defined at the input terminals of the instrument.
3. A single earth connection must be used in the measurement setup to avoid ground loops.
4. The minimum settling time given in the table should be used after first application of the test signal.
5. The standard ambient conditions for measurement are
   Temperature: (23 ± 1) °C
   Relative humidity: 50% ± 10%
6. Before making DC measurements, for each point, a zero value should be applied and Auto Zero (check function) should be executed.
7. The measurement result is the correction for the Digital Multimeter calculated as: DMM correction = True (Applied) value – DMM reading.

Any standard method may be used for calibrating the digital multimeter. For example, the participant laboratories may use the following techniques:

- Direct comparison with a multifunction calibrator;
- Direct comparison with DC reference voltage standard and standard resistors; and
- Indirect comparison using voltage drop method for currents.

The calibration method must be presented in detail in the comparison report.

5 Methods of measurement and traceability

All the participants were using different standard for the measurements. Some participants' measurement results are traceable to their own standards, while some are traceable to other laboratories.

6 Measurements by the pilot laboratory and the NMIA

Measurements made by the pilot laboratory together with those by the NMIA were used to estimate the stability of the travelling standards during the course of the comparison. The protocol states that only laboratories that have independent realizations of primary standards contribute to the reference value. For dc voltage, these would be laboratories that obtain traceability from their own Josephson voltage standards. For resistance, these would be laboratories that obtain traceability from their own Quantum Hall Resistance standards or Calculable Capacitor. For ac parameters, laboratories must have calculable ac-dc transfer standards to contribute to the reference value.

6.1 Stability of the travelling standards

Measurements were made by the pilot laboratory and NMIA for each travelling standard for all parameters. The drift uncertainty is usually calculated using values that come from linear regression, in this comparison, as there are only two points, applying linear regressi~~o~~n is not possible. The working group has decided to use the total drift divided by the square root of 3 as the standard uncertainty for drift. In most cases the drift of the multimeter is very small, which means that the drift uncertainty components are negligible.

6.2 Calculation of reference values

To calculate a Comparison Reference Value, CRV, we made some assumptions.

Firstly, we assumed that, there was no trend in time. Based on plots of {di}, we accept the assumption. Secondly, to use a weighted mean to calculate the CRV of the {di}, we assumed that {di} are independently Gaussian distributed with the same mean and possible different variances. By that, the weighted mean estimator has some optimal property.

The protocol states that only laboratories that have independent realisations of primary standards contribute to the reference value.

7 Measurement results

The participants were requested to report both the original result and the corrected result to allow the pilot to double-check the calculation. The corrected results were taken as the measurement results for the comparison. Participants' measurement result for i-th Digital Multimeter at the time of the k-th participant, $x_{i,k}$ is normalized by subtracting the reference value for the travelling standard, $q_{i,k}$, which is given by the pilot's measurements result,

$$d_{i,k} = x_{i,k} - q_{i,k}$$

All the $d_{i,k}$ are averaged over all Digital Multimeter by weighted mean to obtain the averaged normalized result of the k-th participant, dk,

$$d_k = (\sum w_i \, . \, d_{i,k}) / \sum w_i$$

As for the weighting factor, we used w_i as given by;

$$w_i = 1/\{u^2(d_{i,k}) - u_{s,k}^2\}$$

where the standard uncertainty, $u(d_{i,k})$ is the combined uncertainty of all uncertainties relevant to the $d_{i,k}$ and the $u_{s,k}$ is the combined uncertainty of the k-th participant's system and pilot system, which is common for all Digital Multimeter indices, i. Then the uncertainty of d_k, is calculated by

$$u^2(d_k) = 1/\{\sum w_i\} + u^2_{s,k}$$

7.1 Results of the participating institutes

Participants' final results are shown in the following tables. It should be noted that NPLI, NMIA and MUSSD have multiple participation data. For those laboratories, the average results are taken as their representing results.

7.2 Calculation of the Supplementary Comparison Reference Value and its uncertainty

We can assume that the DMMs are equivalent. Thus, we accept the assumption of the same contribution to the mean. We use a weighted mean to obtain the CRV. The weights are determined by the expanded uncertainty (Exp. Unc.) of only laboratories that have independent realizations of primary standards. The corresponding uncertainty of CRV is calculated.

We used the weighted mean to calculate the CRV. Namely

CRV $= \sum w * d,$

Where the weights {w} are based on the reciprocals of the variances (squares of the standard uncertainties) of {di}.

To calculate the standard uncertainty of the CRV, U_{CRV}, we may use two approaches:

1. Ignore the covariance for all the pairs of {di}
2. Calculate the covariance's for all the pairs.

For simplicity, we ignored the covariance terms in the calculations.

7.3 Degrees of equivalence

Once for each function, a CRV is determined, we calculated the degrees of equivalence, which include two parts: (1) D.O.E of each NMI (in terms of di's) w.r.t. the CRV; (2) D.O.E. of each pair of NMIs. The uncertainties of these values can be obtained too. Based on the agreements, we did not calculate the pair-wise D.O.E.

The D.O.E. of each NMI with respect to CRV is given by

$$\text{di , DOE=di}-\text{CRV},$$

where di is the d value of Lab i (i=1,2…n). The uncertainties of D.O.E. are calculated correspondingly. For the corresponding standard uncertainties of di, DOE, based on the assumption that all di's are independent from each other, they are given by

$$U^2 d_{i,DOE} = U^2 d_i - U^2_{CRV}$$

DC VOLTAGE: 100mV - LOOP A results

Name		Correction	Uncertainty	unit	Date	Day
NPL, India	NPLI	-1.123	0.460	µV	27-May-11	0
NMI, Australia	NMIA	-1.000	1.100	µV	22-Jun-11	26
NMI, South Africa	NMISA	-1.800	3.000	µV	07-Aug-11	72
MASM, Mongolia	MASM	-0.800	1.000	µV	18-Sep-11	114
NPL, India	NPLI	-0.441	0.632	µV	20-Nov-11	177
NIM, Thailand	NIMT	-0.743	0.480	µV	27-Jan-12	245
SCL, Hong Kong	SCLHK	-0.900	0.500	µV	19-Mar-12	297
NMI, Malaysia	NMLMY	-0.600	2.400	µV	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	7.200	7.100	µV	30-Jun-12	400

Table 7.1.1.a.i Loop A DC Voltage 100mV results uncorrected

Drift of reference

NPLI	-1.12	0.460	27-May-11
NPLI	-0.44	0.632	20-Nov-11

Least squares can be used to perform the calculation if you have enough data. For linear least squares you need at least three points. We only have two, so we can only calculate the slope and intercept.

Slope = (Correction 2 – Correction 1) / (Day 2 – Day 1)

Intercept = Correction 2 – Slope * Day 2

Slope:	+0.003 853	µV	/ day
Intercept:	– 1.12	µV	

Average value for laboratories that performed more than one measurement

Average Correction = (Correction $_{NPLI1}$ + Correction $_{NPLI2}$) / 2

Combined Uncertainty = √[(U_{NPLI1}^2 + U_{NPLI2}^2)/2]

Mean measurement date = (day 2 - day 1) / 2

Name		Correction	Uncertainty	unit	Mean measurement date
^{R}NPL, India	NPLI	-0.782	0.553	µV	23-Aug-11

* Note: A laboratory can only appear once in each loop.

Correcting for the drift.

We calculated the new values with drift removed. Because we only have two measurements, we assumed that the drift was linear.

Drift Correction = Correction - Day * Slope

Name		Correction	Uncertainty	unit
[R]NPL, India	NPLI	-1.123	0.460	µV
[R]NMI, Australia	NMIA	-1.100	1.100	µV
[R]NMI, South Africa	NMISA	-2.077	3.000	µV
ESLMASM, Mongolia	MASM	-1.239	1.000	µV
[R]NPL, India	NPLI	-1.123	0.632	µV
[R]NIM, Thailand	NIMT	-1.687	0.480	µV
SCL, Hong Kong	SCLHK	-2.044	0.500	µV
[R]NML, Malaysia	NMLMY	-1.964	2.400	µV
MUSSD, Sri Lanka	MUSSDSL	5.659	7.100	µV

As a check, you can see that the two NPLI measurements are the same.

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift = Correction $_{NPLI1}$ - Correction $_{NPLI2}$)

Artefact Drift	-0.7	**Uncertainty of Drift**	0.4

Table 7.1.1.a.ii Loop A DC Voltage 100 mV Artefact Drift

Also perform drift correction on laboratories with more than one measurement in the loop.

Drift correction > 1 in loop = Average Correction – Slope *(Mean Measurement Date - First Date)

Combined Uncertainty = √ {(U_{NPLI1}^2 + U_{NPLI2}^2)/2}

Name		Correction	Uncertainty	unit	Mean measurement date
[R]NPL, India	NPLI	-1.123	0.553	µV	23-Aug-11

As a check, this value agrees with the NPLI values above.

Loop Reference Value (RV)

Weighted Mean, wi = $1 / u_i^2$

Uncertainty of Weighted Mean, u_w = covariance for all the pairs = $\sum \sigma = 1/\sqrt{(\sum (1/u_i^2))}$

Loop Reference Value (RV), $x_{RV} = x_w = \sum(x_i / u_i^2) / \sum (1 / u_i^2)$

Loop Reference Value Uncertainty, $u_{RV} = \sqrt{(u_w^2 + u_{drift}^2)}$

Name		**Correction, x_i**	**Exp. Unc., u_i**	**unit**	**Date**	x_i / u_i^2	$1 / u_i^2$
Loop A 100 mV RV	*Ref Val*	-1.4	0.9	µV			
[R]NMI, Australia	NMIA	-1.1	1.1	µV	22-Jun-11	-0.9092	0.8264
[R]NMI, South Africa	NMISA	-2.1	3.0	µV	07-Aug-11	-0.2308	0.1111
[R]NPL, India	NPLI	-1.1	0.6	µV	23-Aug-11	-3.6758	3.2732
MASM, Mongolia	MASM	-1.2	1.0	µV	18-Sep-11		
[R]NIM, Thailand	NIMT	-1.7	0.5	µV	27-Jan-12	-7.3221	4.3403
SCL, Hong Kong	SCLHK	-2.0	0.5	µV	19-Mar-12		
[R]NMI, Malaysia	NMLMY	-2.0	2.4	µV	15-May-12	-0.3410	0.1736
MUSSD, Sri Lanka	MUSSDSL	5.7	7.1	µV	30-Jun-12		
					Σ	-12.4789	8.7246
	x_w (µV)	-1.4				u_w (µV)	0.3

Table 7.1.1.a.iii Loop A Reference Value for DC Voltage 100mV with drift corrected

[R] Contributing Reference Laboratory

DC VOLTAGE: 100mV – LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	0.000	1.200	µV	22-May-11	-76
NPL, India	NPLI	-0.567	0.357	µV	06-Aug-11	0
VMI, Vietnam	VMI	0.400	1.300	µV	20-Oct-11	75
NML, Philippines	NMLPH	-0.400	1.400	µV	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	0.200	0.600	µV	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	0.500	1.200	µV	15-Mar-12	222
NPL, India	NPLI	-0.400	0.298	µV	25-May-12	293
KIM, Kazakhstan	KIM	1.700	91.000	µV	06-Aug-12	366
NIS, Egypt	NIS	2.310	6.200	µV	27-Oct-12	448
NSCL, Syria	NSCL	1.030	1.160	µV	05-Jan-13	518
JNMI, Jordan	JNMI	-0.700	6.120	µV	24-Feb-13	568

Table 7.1.1.b.i Loop B DC Voltage 100mV results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-0.167	**Uncertainty of Drift**	0.1

Table 7.1.1.b.ii Loop B DC Voltage 100mV Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 100 mV RV	*Ref Val*	-0.5	0.4	µV			
[R]NMI, Australia	NMIA	0.0	1.2	µV	22-May-11	0.0301	0.6944
VMI, Vietnam	VMI	0.4	1.3	µV	20-Oct-11		
NML, Philippines	NMLPH	-0.5	1.4	µV	16-Nov-11		
[R]NPL, India	NPLI	-0.6	0.3	µV	30-Dec-11	-5.2439	9.2484
NISIT, Papua New Guinea	NISIT	0.1	0.6	µV	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	0.4	1.2	µV	15-Mar-12		
KIM, Kazakhstan	KIM	1.5	91.0	µV	25-May-12		
NIS, Egypt	NIS	2.1	6.2	µV	06-Aug-12		
NSCL, Syria	NSCL	0.7	1.2	µV	27-Oct-12		
JNMI, Jordan	JNMI	-1.0	6.1	µV	05-Jan-13		
			Σ			-5.2138	9.9429
	x_w (µV)	-0.5				u_w (µV)	0.3

Table 7.1.1.b.iii Loop B Reference Value for DC Voltage 100mV with drift corrected

DC VOLTAGE: 100mV – LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NMI, Australia	NMIA	-1.1000	1.3000	µV	25-May-14	0
[R]NPL, India	NPLI	-0.0975	2.1625	µV	11-Aug-14	78
[R]NMC, Singapore	NMC,SG	-1.3000	0.8000	µV	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	6.7200	7.0800	µV	13-Dec-14	202
JNMI, Jordan	JNMI	-2.2000	7.0000	µV	30-Jan-15	250
SCL, Hong Kong	SCL, HK	-0.6000	0.7000	µV	08-Mar-15	287
[R]NMI, Australia	NMIA	-1.2000	1.2000	µV	15-Apr-15	325

Table 7.1.1.c.i Loop C DC Voltage 100mV results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	0.1	Uncertainty of Drift	0.1

Table 7.1.1.c.ii Loop C DC Voltage 100 mV Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 100 mV RV	*Ref Val*	-1.1	0.7	µV			
[R]NPL, India	NPLI	-0.1	2.2	µV	11-Aug-14	-0.0157	0.2138
[R]NMI, Australia	NMIA	-1.1	1.3	µV	03-Nov-14	-0.7029	0.6390
[R]NMC, Singapore	NMC, SG	-1.2	0.8	µV	10-Nov-14	-1.9500	1.5625
MUSSD, Sri Lanka	MUSSD, SL	6.8	7.1	µV	13-Dec-14		
JNMI, Jordan	JNMI	-2.1	7.0	µV	30-Jan-15		
SCL, Hong Kong	SCL, HK	-0.5	0.7	µV	08-Mar-15		
			Σ			-2.6686	2.4153
	x_w	-1.1				u_w	0.6

Table 7.1.1.c.iii Loop C Reference Value for DC Voltage 100mV with drift corrected

DC VOLTAGE: 1V – LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	4.700	2.414	µV	27-May-11	0
NMI, Australia	NMIA	-1.000	2.400	µV	22-Jun-11	26
NMI, South Africa	NMISA	-3.000	2.000	µV	07-Aug-11	72
ESLMASM, Mongolia	MASM	-1.000	5.000	µV	18-Sep-11	114
NPL, India	NPLI	9.394	6.600	µV	20-Nov-11	177
NIM, Thailand	NIMT	-0.150	1.700	µV	27-Jan-12	245
SCL, Hong Kong	SCLHK	-1.000	3.000	µV	19-Mar-12	297
NML, Malaysia	NMLMY	2.000	8.000	µV	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	19.000	29.000	µV	30-Jun-12	400

Table 7.1.2.a.i Loop A DC Voltage 1V results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-4.694	Uncertainty of Drift	2.7

Table 7.1.2.a.ii Loop A DC Voltage 1V Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 1 V RV	*Ref Val*	-4.5	5.5	µV			
[R]NMI, Australia	NMIA	-1.7	2.4	µV	22-Jun-11	-0.2933	0.1736
[R]NMI, South Africa	NMISA	-4.9	2.0	µV	07-Aug-11	-1.2274	0.2500
[R]NPL, India	NPLI	4.7	5.0	µV	23-Aug-11	0.1903	0.0405
ESLMASM, Mongolia	MASM	-4.0	5.0	µV	18-Sep-11		
[R]NIM, Thailand	NIMT	-6.6	1.7	µV	27-Jan-12	-2.3001	0.3460
SCL, Hong Kong	SCLHK	-8.9	3.0	µV	19-Mar-12		
[R]NML, Malaysia	NMLMY	-7.4	8.0	µV	15-May-12	-0.1154	0.0156
MUSSD, Sri Lanka	MUSSDSL	8.4	29.0	µV	30-Jun-12		
			Σ			-3.7459	0.8258
	x_w (µV)	-4.5				u_w (µV)	1.1

Table 7.1.2.a.iii Loop A Reference Value for DC Voltage 1V with drift corrected

DC VOLTAGE: 1V – LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	2.000	4.500	µV	22-May-11	-76
NPL, India	NPLI	6.920	3.000	µV	06-Aug-11	0
VMI, Vietnam	VMI	-0.100	4.890	µV	20-Oct-11	75
NML, Philippines	NMLPH	2.000	7.300	µV	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	0.000	3.000	µV	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	4.000	7.000	µV	15-Mar-12	222
NPL, India	NPLI	5.020	2.470	µV	25-May-12	293
KIM, Kazakhstan	KIM	3.000	10.000	µV	06-Aug-12	366
NIS, Egypt	NIS	-0.400	26.000	µV	27-Oct-12	448
NSCL, Syria	NSCL	1.200	2.400	µV	05-Jan-13	518
JNMI, Jordan	JNMI	-1.000	10.000	µV	24-Feb-13	568

Table 7.1.2.b.i Loop B DC Voltage 1V results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	1.900	Uncertainty of Drift	1.1

Table 7.1.2.b.ii Loop B DC Voltage 1V Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 1 V RV	*Ref Val*	5.4	3.2	µV			
[R]NMI, Australia	NMIA	1.5	4.5	µV	22-May-11	0.0744	0.0494
VMI, Vietnam	VMI	0.4	4.9	µV	20-Oct-11		
NML, Philippines	NMLPH	2.7	7.3	µV	16-Nov-11		
[R]NPL, India	NPLI	6.9	2.7	µV	30-Dec-11	0.9165	0.1324
NISIT, Papua New Guinea	NISIT	1.2	3.0	µV	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	5.4	7.0	µV	15-Mar-12		
KIM, Kazakhstan	KIM	5.4	10.0	µV	06-Aug-12		
NIS, Egypt	NIS	2.5	26.0	µV	27-Oct-12		
NSCL, Syria	NSCL	4.6	2.4	µV	05-Jan-13		
JNMI, Jordan	JNMI	2.7	10.0	µV	24-Feb-13		
			Σ			0.9909	0.1818
	x_w (µV)	5.4				u_w (µV)	2.3

Table 7.1.2.b.iii Loop B Reference Value for DC Voltage 1V with drift corrected

DC VOLTAGE: 1V – LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NMI, Australia	NMIA	-6.000	4.900	µV	25-May-14	0
NPL, India	NPLI	-5.100	1.437	µV	11-Aug-14	78
NMC, Singapore	NMC, SG	-6.000	3.000	µV	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	21.100	29.460	µV	13-Dec-14	202
JNMI, Jordan	JNMI	-7.000	15.000	µV	30-Jan-15	250
SCL, Hong Kong	SCL, HK	-4.000	1.000	µV	08-Mar-15	287
[R]NMI, Australia	NMIA	-7.000	4.900	µV	15-Apr-15	325

Table 7.1.2.c.i Loop C DC Voltage 1V results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	1.0	Uncertainty of Drift	0.6

Table 7.1.2.c.ii Loop C DC Voltage 1V Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 1 V RV	*Ref Val*	-5.0	1.7	µV			
[R]NPL, India	NPLI	-4.9	1.4	µV	11-Aug-14	-2.3528	0.4841
[R]NMI, Australia	NMIA	-6.0	4.9	µV	03-Nov-14	-0.2499	0.0416
[R]NMC, Singapore	NMC, SG	-5.5	3.0	µV	10-Nov-14	-0.6089	0.1111
MUSSD, Sri Lanka	MUSSD, SL	21.7	29.5	µV	13-Dec-14		
JNMI, Jordan	JNMI	-6.2	15.0	µV	30-Jan-15		
SCL, Hong Kong	SCL, HK	-3.1	1.0	µV	08-Mar-15		
			Σ			-3.2116	0.6369
	x_w	-5.0				u_w	1.3

Table 7.1.2.c.iii Loop C Reference Value for DC Voltage 1V with drift corrected

DC VOLTAGE: 10V – LOOP A results

Name		Correction	Uncertainty	Unit	Date	Days
[R]NPL, India	NPLI	-5.180	25.000	µV	27-May-11	0
[R]NMI, Australia	NMIA	-20.000	20.000	µV	22-Jun-11	26
[R]NMI, South Africa	NMISA	-10.000	20.000	µV	07-Aug-11	72
ESLMASM, Mongolia	MASM	-20.000	32.000	µV	18-Sep-11	114
[R]NPL, India	NPLI	-7.000	31.000	µV	20-Nov-11	177
[R]NIM, Thailand	NIMT	-5.600	14.000	µV	27-Jan-12	245
SCL, Hong Kong	SCLHK	-10.000	30.000	µV	19-Mar-12	297
[R]NML, Malaysia	NMLMY	20.000	60.000	µV	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	90.000	270.000	µV	30-Jun-12	400

Table 7.1.3.a.i Loop A DC Voltage 10V results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	1.820	Uncertainty of Drift	1.1

Table 7.1.3.a.ii Loop A DC Voltage 10V Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 10 V RV	*Ref Val*	-7.6	9.5	µV			
[R]NMI, Australia	NMIA	-19.7	20.0	µV	22-Jun-11	-0.04933	0.00250
[R]NMI, South Africa	NMISA	-9.3	20.0	µV	07-Aug-11	-0.02315	0.00250
[R]NPL, India	NPLI	-5.2	28.2	µV	23-Aug-11	-0.00653	0.00126
ESLMASM, Mongolia	MASM	-18.8	32.0	µV	18-Sep-11		
[R]NIM, Thailand	NIMT	-3.1	14.0	µV	27-Jan-12	-0.01572	0.00510
SCL, Hong Kong	SCLHK	-6.9	30.0	µV	19-Mar-12		
[R]NML, Malaysia	NMLMY	23.6	60.0	µV	15-May-12	0.00657	0.00028
MUSSD, Sri Lanka	MUSSDSL	94.1	270.0	µV	30-Jun-12		
			Σ			-0.0882	0.0116
	x_w (µV)	-7.6				u_w (µV)	9.3

Table 7.1.3.a.iii Loop A Reference Value for DC Voltage 10V with drift corrected

DC VOLTAGE: 10V – LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	0.000	22.000	µV	22-May-11	-76
NPL, India	NPLI	2.000	24.000	µV	06-Aug-11	0
VMI, Vietnam	VMI	-2.000	34.000	µV	20-Oct-11	75
NML, Philippines	NMLPH	10.000	54.000	µV	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	-30.000	30.000	µV	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	10.000	40.000	µV	15-Mar-12	222
NPL, India	NPLI	23.000	69.000	µV	25-May-12	293
KIM, Kazakhstan	KIM	50.000	84.000	µV	06-Aug-12	366
NIS, Egypt	NIS	-28.000	230.000	µV	27-Oct-12	448
NSCL, Syria	NSCL	-23.000	22.000	µV	05-Jan-13	518
JNMI, Jordan	JNMI	-20.000	60.000	µV	24-Feb-13	568

Table 7.1.3.b.i Loop B DC Voltage 10V results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-21.00	Uncertainty of Drift	12.1

Table 7.1.3.b.ii Loop B DC Voltage 10V Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 10 V RV	*Ref Val*	4.9	31.6	µV			
[R]NMI, Australia	NMIA	5.4	22.0	µV	22-May-11	0.0113	0.0021
VMI, Vietnam	VMI	-7.4	34.0	µV	20-Oct-11		
NML, Philippines	NMLPH	2.7	54.0	µV	16-Nov-11		
[R]NPL, India	NPLI	2.0	51.7	µV	30-Dec-11	0.0007	0.0004
NISIT, Papua New Guinea	NISIT	-43.3	30.0	µV	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	-5.9	40.0	µV	15-Mar-12		
KIM, Kazakhstan	KIM	23.8	84.0	µV	06-Aug-12		
NIS, Egypt	NIS	-60.1	230.0	µV	27-Oct-12		
NSCL, Syria	NSCL	-60.1	22.0	µV	05-Jan-13		
JNMI, Jordan	JNMI	-60.7	60.0	µV	24-Feb-13		
			Σ			0.0120	0.0024
	x_w (µV)	4.9				u_w (µV)	20.2

Table 7.1.3.b.iiiLoop B Reference Value for DC Voltage 10V with drift corrected

DC VOLTAGE: 10V - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NMI, Australia	NMIA	-70.000	55.000	µV	25-May-14	0
[R]NPL, India	NPLI	-74.000	6.440	µV	11-Aug-14	78
[R]NMC, Singapore	NMC, SG	-80.000	20.000	µV	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	70.000	268.000	µV	13-Dec-14	202
JNMI, Jordan	JNMI	-80.000	70.000	µV	30-Jan-15	250
SCL, Hong Kong	SCL, HK	-60.000	20.000	µV	08-Mar-15	287
[R]NMI, Australia	NMIA	-80.000	56.000	µV	15-Apr-15	325

Table 7.1.3.c.i Loop C DC Voltage 10V results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	10.0	Drift Uncertainty	5.8

Table 7.1.3.c.iiLoop C DC Voltage 10V Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 10 V RV	*Ref Val*	-71.9	13.1	µV			
[R]NPL, India	NPLI	-71.6	6.4	µV	11-Aug-14	-1.7264	0.0241
[R]NMI, Australia	NMIA	-70.0	55.5	µV	03-Nov-14	-0.0227	0.0003
[R]NMC, Singapore	NMC, SG	-74.8	20.0	µV	10-Nov-14	-0.1870	0.0025
MUSSD, Sri Lanka	MUSSD, SL	76.2	268.0	µV	13-Dec-14		
JNMI, Jordan	JNMI	-72.3	70.0	µV	30-Jan-15		
SCL, Hong Kong	SCL, HK	-51.2	20.0	µV	08-Mar-15		
			Σ			-1.9361	0.0269
	x_w	-71.9				u_w	6.1

Table 7.1.3.c.iii Loop C Reference Value for DC Voltage 10V with drift corrected

DC VOLTAGE: -10 V – LOOP A results

Name		Correction	Uncertainty	Unit	Date	Days
[R]NPL, India	NPLI	22.500	24.000	µV	27-May-11	0
[R]NMI, Australia	NMIA	20.000	20.000	µV	22-Jun-11	26
[R]NMI, South Africa	NMISA	20.000	10.000	µV	07-Aug-11	72
ESLMASM, Mongolia	MASM	-20.000	29.000	µV	18-Sep-11	114
[R]NPL, India	NPLI	16.000	35.000	µV	20-Nov-11	177
[R]NIM, Thailand	NIMT	7.500	14.000	µV	27-Jan-12	245
SCL, Hong Kong	SCLHK	20.000	30.000	µV	19-Mar-12	297
[R]NML, Malaysia	NMLMY	0.000	60.000	µV	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	-90.000	270.000	µV	30-Jun-12	400

Table 7.1.4.a.i Loop A DC Voltage - 10V results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	6.500	Uncertainty of Drift	3.8

Table 7.1.4.a.ii Loop A DC Voltage -10V Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A -10 V RV	*Ref Val*	20.6	10.4	µV			
[R]NMI, Australia	NMIA	21.0	20.0	µV	27-May-11	0.0524	0.0025
[R]NMI, South Africa	NMISA	22.6	10.0	µV	22-Jun-11	0.2264	0.0100
[R]NPL, India	NPLI	22.5	30.0	µV	23-Aug-11	0.0250	0.0011
ESLMASM, Mongolia	MASM	-15.8	29.0	µV	18-Sep-11		
[R]NIM, Thailand	NIMT	16.5	14.0	µV	27-Jan-12	0.0842	0.0051
SCL, Hong Kong	SCLHK	30.9	30.0	µV	19-Mar-12		
[R]NML, Malaysia	NMLMY	13.0	60.0	µV	15-May-12	0.0036	0.0003
MUSSD, Sri Lanka	MUSSDSL	-75.3	270.0	µV	30-Jun-12		
			Σ			0.3916	0.0190
	x_w (µV)	20.6				u_w (µV)	7.3

Table 7.1.4.a.iii Loop A Reference Value for DC Voltage -10V with drift corrected

DC VOLTAGE: -10V – LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	0.000	22.000	µV	22-May-11	-76
NPL, India	NPLI	7.000	24.000	µV	06-Aug-11	0
VMI, Vietnam	VMI	2.000	35.000	µV	20-Oct-11	75
NML, Philippines	NMLPH	10.000	42.000	µV	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	30.000	30.000	µV	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	-10.000	40.000	µV	15-Mar-12	222
NPL, India	NPLI	12.000	24.000	µV	25-May-12	293
KIM, Kazakhstan	KIM	-50.000	84.000	µV	06-Aug-12	366
NIS, Egypt	NIS	26.000	230.000	µV	27-Oct-12	448
NSCL, Syria	NSCL	23.000	22.000	µV	05-Jan-13	518
JNMI, Jordan	JNMI	20.000	50.000	µV	24-Feb-13	568

Table 7.1.4.b.i Loop B DC Voltage -10V results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-5.000	Uncertainty of Drift	2.9

Table 7.1.4.b.ii Loop B DC Voltage -10V Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B -10 V RV	*Ref Val*	3.9	17.2	µV			
[R]NMI, Australia	NMIA	1.3	22.0	µV	22-May-11	0.0027	0.0021
VMI, Vietnam	VMI	0.7	35.0	µV	06-Aug-11		
NML, Philippines	NMLPH	8.3	42.0	µV	20-Oct-11		
[R]NPL, India	NPLI	7.0	24.0	µV	30-Dec-11	0.0122	0.0017
NISIT, Papua New Guinea	NISIT	26.8	30.0	µV	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	-13.8	40.0	µV	15-Mar-12		
KIM, Kazakhstan	KIM	-56.2	84.0	µV	06-Aug-12		
NIS, Egypt	NIS	18.4	230.0	µV	27-Oct-12		
NSCL, Syria	NSCL	14.2	22.0	µV	05-Jan-13		
JNMI, Jordan	JNMI	10.3	50.0	µV	24-Feb-13		
			Σ			0.0148	0.0038
	x_w (µV)	3.9				u_w (µV)	16.2

Table 7.1.4.b.iii Loop B Reference Value for DC Voltage -10V with drift corrected

DC VOLTAGE: 10V - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NMI, Australia	NMIA	50.00	55.000	µV	25-May-14	0
[R]NPL, India	NPLI	70.00	7.530	µV	11-Aug-14	78
[R]NMC, Singapore	NMC, SG	70.00	20.000	µV	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	-70.00	154.000	µV	13-Dec-14	202
JNMI, Jordan	JNMI	70.00	70.000	µV	30-Jan-15	250
SCL, Hong Kong	SCL, HK	50.00	20.000	µV	08-Mar-15	287
[R]NMI, Australia	NMIA	70.00	56.000	µV	15-Apr-15	325

Table 7.1.4.c.i Loop C DC Voltage -10V results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-20	Drift Uncertainty	11.5

Table 7.1.4.c.ii Loop C DC Voltage -10V Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 10 V RV	*Ref Val*	64.3	24.1	µV			
[R]NPL, India	NPLI	65.2	7.5	µV	11-Aug-14	1.1499	0.0176
[R]NMI, Australia	NMIA	50.0	55.5	µV	03-Nov-14	0.0162	0.0003
[R]NMC, Singapore	NMC, SG	59.6	20.0	µV	10-Nov-14	0.1490	0.0025
MUSSD, Sri Lanka	MUSSD, SL	-82.4	154.0	µV	13-Dec-14		
JNMI, Jordan	JNMI	54.6	70.0	µV	30-Jan-15		
SCL, Hong Kong	SCL, HK	32.3	20.0	µV	08-Mar-15		
			Σ			1.3151	0.0205
	x_w	64.3				u_w	7.0

Table 7.1.4.c.iii Loop C Reference Value for DC Voltage -10V with drift corrected

DC VOLTAGE: 100V - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Days
NPL, India	NPLI	0.786	0.296	mV	27-May-11	0
NMI, Australia	NMIA	0.500	0.340	mV	22-Jun-11	26
NMI, South Africa	NMISA	0.500	0.600	mV	07-Aug-11	72
ESLMASM, Mongolia	MASM	0.400	0.500	mV	18-Sep-11	114
NPL, India	NPLI	1.144	0.252	mV	20-Nov-11	177
NIM, Thailand	NIMT	0.790	0.170	mV	27-Jan-12	245
SCL, Hong Kong	SCLHK	0.100	1.000	mV	19-Mar-12	297
NML, Malaysia	NMLMY	1.200	0.800	mV	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	1.400	3.900	mV	30-Jun-12	400

Table 7.1.5.a.i Loop A DC Voltage 100V results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-0.358	Uncertainty of Drift	0.2

Table 7.1.5.a.ii Loop A DC Voltage 100V Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 100 V RV	*Ref Val*	0.4	0.4	mV			
[R]NMI, Australia	NMIA	0.4	0.3	mV	22-Jun-11	3.8703	8.6505
[R]NMI, South Africa	NMISA	0.4	0.6	mV	07-Aug-11	0.9844	2.7778
[R]NPL, India	NPLI	0.8	0.3	mV	23-Aug-11	10.4023	13.2345
ESLMASM, Mongolia	MASM	0.2	0.5	mV	18-Sep-11		
[R]NIM, Thailand	NIMT	0.3	0.2	mV	27-Jan-12	10.1890	34.6021
SCL, Hong Kong	SCLHK	-0.5	1.0	mV	19-Mar-12		
[R]NML, Malaysia	NMLMY	0.5	0.8	mV	15-May-12	0.7563	1.5625
MUSSD, Sri Lanka	MUSSDSL	0.6	3.9	mV	30-Jun-12		
			Σ			26.2023	60.8274
	x_w (µV)	0.4				u_w (µV)	0.1

Table 7.1.5.a.iii Loop A Reference Value for DC Voltage 100V with drift corrected

DC VOLTAGE: 100V - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NMI, Australia	NMIA	0.700	0.240	mV	22-May-11	-76
[R]NPL, India	NPLI	1.412	0.242	mV	06-Aug-11	0
VMI, Vietnam	VMI	0.811	0.460	mV	20-Oct-11	75
NML, Philippines	NMLPH	0.800	0.400	mV	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	0.000	0.300	mV	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	1.100	0.600	mV	15-Mar-12	222
[R]NPL, India	NPLI	1.198	0.263	mV	25-May-12	293
KIM, Kazakhstan	KIM	0.400	1.242	mV	06-Aug-12	366
NIS, Egypt	NIS	0.680	3.400	mV	27-Oct-12	448
NSCL, Syria	NSCL	-0.560	1.000	mV	05-Jan-13	518
JNMI, Jordan	JNMI	-0.200	0.800	mV	24-Feb-13	568

Table 7.1.5.b.i Loop B DC Voltage 100V results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	0.214	Uncertainty of Drift	0.1

Table 7.1.5.b.i Loop B DC Voltage 100 V Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 100 V RV	*Ref Val*	1.0	0.3	mV			
[R]NMI, Australia	NMIA	0.6	0.2	mV	22-May-11	11.1891	17.3611
VMI, Vietnam	VMI	0.9	0.5	mV	20-Oct-11		
NML, Philippines	NMLPH	0.9	0.4	mV	16-Nov-11		
[R]NPL, India	NPLI	1.4	0.3	mV	30-Dec-11	22.1086	15.6577
NISIT, Papua New Guinea	NISIT	0.1	0.3	mV	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	1.3	0.6	mV	15-Mar-12		
KIM, Kazakhstan	KIM	0.7	1.2	mV	06-Aug-12		
NIS, Egypt	NIS	1.0	3.4	mV	27-Oct-12		
NSCL, Syria	NSCL	-0.2	1.0	mV	05-Jan-13		
JNMI, Jordan	JNMI	0.2	0.8	mV	24-Feb-13		
			Σ			33.2977	33.0188
	x_w (µV)	1.0				u_w (µV)	0.2

Table 7.1.5.b.i Loop B DC Voltage 100V with drift corrected

DC VOLTAGE: 100V - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NMI, Australia	NMIA	-0.50	0.630	mV	25-May-14	0
[R]NPL, India	NPLI	1.327	1.903	mV	11-Aug-14	78
NMC, Singapore	NMC,SG	-0.80	0.300	mV	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	1.79	3.850	mV	13-Dec-14	202
JNMI, Jordan	JNMI	-0.50	0.900	mV	30-Jan-15	250
SCL, Hong Kong	SCL, HK	-0.60	0.200	mV	08-Mar-15	287
[R]NMI, Australia	NMIA	-0.80	0.560	mV	15-Apr-15	325

Table 7.1.5.c.i Loop C DC Voltage 100V results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	0.3	Drift Uncertainty	0.2

Table 7.1.5.c.ii Loop C DC Voltage 100V Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 100 V RV	*Ref Val*	-0.6	0.4	mV			
[R]NPL, India	NPLI	1.4	1.9	mV	11-Aug-14	0.3863	0.2761
[R]NMI, Australia	NMIA	-0.5	0.6	mV	03-Nov-14	-1.4075	2.8149
[R]NMC, Singapore	NMC,SG	-0.6	0.3	mV	10-Nov-14	-7.1556	11.1111
MUSSD, Sri Lanka	MUSSD, SL	2.0	3.9	mV	13-Dec-14		
JNMI, Jordan	JNMI	-0.3	0.9	mV	30-Jan-15		
SCL, Hong Kong	SCL, HK	-0.3	0.2	mV	08-Mar-15		
			Σ			-8.1767	14.2022
	x_w	-0.6				u_w	0.3

Table 7.1.5.c.ii Loop C Reference Value for DC Voltage 100V with drift corrected

DC VOLTAGE: 1000V – LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	-2.480	3.000	mV	27-May-11	0
NMI, Australia	NMIA	-2.000	3.800	mV	22-Jun-11	26
NMI, South Africa	NMISA	-9.000	6.000	mV	07-Aug-11	72
ESLMASM, Mongolia	MASM	-3.000	6.000	mV	18-Sep-11	114
NPL, India	NPLI	1.850	2.340	mV	20-Nov-11	177
NIM, Thailand	NIMT	-0.270	2.000	mV	27-Jan-12	245
SCL, Hong Kong	SCLHK	-10.000	11.000	mV	19-Mar-12	297
NML, Malaysia	NMLMY	1.000	8.000	mV	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	5.000	48.000	mV	30-Jun-12	400

Table 7.1.6.a.i Loop A DC Voltage 1000V results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-4.330	Uncertainty of Drift	2.5

Table 7.1.6.a.ii Loop A DC Voltage 1000 V Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 1000 V RV	*Ref Val*	-5.0	5.2	mV			
[R]NMI, Australia	NMIA	-2.6	3.8	mV	22-Jun-11	-0.1826	0.0693
[R]NMI, South Africa	NMISA	-10.8	6.0	mV	07-Aug-11	-0.2989	0.0278
[R]NPL, India	NPLI	-2.5	2.7	mV	23-Aug-11	-0.3426	0.1382
ESLMASM, Mongolia	MASM	-5.8	6.0	mV	18-Sep-11		
[R]NIM, Thailand	NIMT	-6.3	2.0	mV	27-Jan-12	-1.5659	0.2500
SCL, Hong Kong	SCLHK	-17.3	11.0	mV	19-Mar-12		
[R]NML, Malaysia	NMLMY	-7.7	8.0	mV	15-May-12	-0.1197	0.0156
MUSSD, Sri Lanka	MUSSDSL	-4.8	48.0	mV	30-Jun-12		
			Σ			-2.5097	0.5008
	x_w (µV)	-5.0				u_w (µV)	1.4

Table 7.1.6.a.iii Loop A Reference Value for DC Voltage 1000V with drift corrected

DC VOLTAGE: 1000V - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	0.000	3.900	mV	22-May-11	-76
NPL, India	NPLI	2.540	2.407	mV	06-Aug-11	0
VMI, Vietnam	VMI	-3.200	5.800	mV	20-Oct-11	75
NML, Philippines	NMLPH	2.000	3.800	mV	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	7.000	2.000	mV	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	-2.320	9.000	mV	15-Mar-12	222
NPL, India	NPLI	3.700	2.377	mV	25-May-12	293
KIM, Kazakhstan	KIM	14.000	12.646	mV	06-Aug-12	366
NIS, Egypt	NIS	-3.300	42.000	mV	27-Oct-12	448
NSCL, Syria	NSCL	-17.000	12.000	mV	05-Jan-13	518
JNMI, Jordan	JNMI	-10.000	10.000	mV	24-Feb-13	568

Table 7.1.6.b.i Loop B DC Voltage 1000V results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-1.160	Uncertainty of Drift	0.7

Table 7.1.6.b.ii Loop B DC Voltage 1000V Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 1000 V RV	*Ref Val*	1.9	2.4	mV			
[R]NMI, Australia	NMIA	0.3	3.9	mV	22-May-11	0.0198	0.0657
VMI, Vietnam	VMI	-3.5	5.8	mV	20-Oct-11		
NML, Philippines	NMLPH	1.6	3.8	mV	16-Nov-11		
[R]NPL, India	NPLI	2.5	2.4	mV	30-Dec-11	0.4439	0.1748
NISIT, Papua New Guinea	NISIT	6.3	2.0	mV	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	-3.2	9.0	mV	15-Mar-12		
KIM, Kazakhstan	KIM	12.6	12.6	mV	06-Aug-12		
NIS, Egypt	NIS	-5.1	42.0	mV	27-Oct-12		
NSCL, Syria	NSCL	-19.1	12.0	mV	05-Jan-13		
JNMI, Jordan	JNMI	-12.2	10.0	mV	24-Feb-13		
			Σ			0.4637	0.2405
	x_w (μV)	1.9				u_w (μV)	2.0

Table 7.1.6.b.iii Loop B Reference Value for DC Voltage 1000V with drift corrected

DC VOLTAGE: 1000V - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NMI, Australia	NMIA	-9.00	6.700	mV	25-May-14	0
[R]NPL, India	NPLI	2.325	0.853	mV	11-Aug-14	78
[R]NMC, Singapore	NMC,SG	-11.00	4.000	mV	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	3.30	47.897	mV	13-Dec-14	202
JNMI, Jordan	JNMI	-6.00	12.000	mV	30-Jan-15	250
SCL, Hong Kong	SCL, HK	-9.00	2.000	mV	08-Mar-15	287
[R]NMI, Australia	NMIA	-8.00	6.800	mV	15-Apr-15	325

Table 7.1.6.c.i Loop C DC Voltage 1000V results uncorrected

Artefact Drift and Uncertainty of Drift, udrift

Artefact Drift	-1.0	Uncertainty of Drift	0.6

Table 7.1.6.c.ii Loop C DC Voltage 1000V Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 1000 V RV	*Ref Val*	1.3	1.4	mV			
[R]NPL, India	NPLI	2.1	0.9	mV	11-Aug-14	2.8656	1.3744
[R]NMI, Australia	NMIA	-9.0	6.8	mV	03-Nov-14	-0.1975	0.0219
[R]NMC, Singapore	NMC,SG	-11.5	4.0	mV	10-Nov-14	-0.7200	0.0625
MUSSD, Sri Lanka	MUSSD, SL	2.7	47.9	mV	13-Dec-14		
JNMI, Jordan	JNMI	-6.8	12.0	mV	30-Jan-15		
SCL, Hong Kong	SCL, HK	-9.9	2.0	mV	08-Mar-15		
			Σ			1.9480	1.4588
	x_w	1.3				u_w	0.8

Table 7.1.6.c.iii Loop C Reference Value for DC Voltage 1000V with drift corrected

DC CURRENT: 10mA - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NPL, India	NPLI	22.4	0.5	µA	27-May-11	0
[R]NMI, Australia	NMIA	15.7	0.5	µA	22-Jun-11	26
NMI, South Africa	NMISA	14.6	0.5	µA	07-Aug-11	72
ESLMASM, Mongolia	MASM	15.0	0.4	µA	18-Sep-11	114
[R]NPL, India	NPLI	11.3	0.6	µA	20-Nov-11	177
NIM, Thailand	NIMT	9.8	0.2	µA	27-Jan-12	245
SCL, Hong Kong	SCLHK	9.6	0.2	µA	19-Mar-12	297
NML, Malaysia	NMLMY	9.3	1.1	µA	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	7.9	5.9	µA	30-Jun-12	400

Table 7.1.7.a.i Loop A DC Current 10mA results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	11.0	Uncertainty of Drift	6.4

Table 7.1.7.a.ii Loop A DC Current 10mA Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 10 mA RV	*Ref Val*	24.0	12.7	µA			
[R]NMI, Australia	NMIA	17.3	0.5	µA	22-Jun-11	61.7006	3.5600
[R]NMI, South Africa	NMISA	19.1	0.5	µA	07-Aug-11	76.3634	4.0000
[R]NPL, India	NPLI	22.4	0.5	µA	23-Aug-11	77.1026	3.4467
ESLMASM, Mongolia	MASM	22.1	0.4	µA	18-Sep-11		
[R]NIM, Thailand	NIMT	25.1	0.2	µA	27-Jan-12	1116.2825	44.4444
SCL, Hong Kong	SCLHK	28.1	0.2	µA	19-Mar-12		
[R]NML, Malaysia	NMLMY	31.4	1.1	µA	15-May-12		
MUSSD, Sri Lanka	MUSSDSL	32.9	5.9	µA	30-Jun-12		
			Σ			1331.4490	55.4511
	x_w (µV)	24.0				u_w (µV)	0.1

Table 7.1.7.a.iii Loop A Reference Value for DC Current 10mA with drift corrected

DC CURRENT: 10mA - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	-0.4	0.7	µA	22-May-11	-76
NPL, India	NPLI	1.5	0.2	µA	06-Aug-11	0
VMI, Vietnam	VMI	0.5	0.6	µA	20-Oct-11	75
NML, Philippines	NMLPH	0.7	0.3	µA	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	1.0	0.5	µA	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	0.4	0.8	µA	15-Mar-12	222
NPL, India	NPLI	0.9	0.7	µA	25-May-12	293
KIM, Kazakhstan	KIM	0.0	1.0	µA	06-Aug-12	366
NIS, Egypt	NIS	0.8	5.0	µA	27-Oct-12	448
NSCL, Syria	NSCL	0.3	0.2	µA	05-Jan-13	518
JNMI, Jordan	JNMI	-0.1	0.5	µA	24-Feb-13	568

Table 7.1.7.b.i Loop B DC Current 10mA results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	0.6	Uncertainty of Drift	0.4

Table 7.1.7.b.ii Loop B DC Current 10mA Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 10 mA RV	*Ref Val*	0.8	0.8	µA			
[R]NMI, Australia	NMIA	-0.5	0.7	µA	22-May-11	-1.0310	1.9290
VMI, Vietnam	VMI	0.7	0.6	µA	20-Oct-11		
NML, Philippines	NMLPH	0.9	0.3	µA	16-Nov-11		
[R]NPL, India	NPLI	1.5	0.5	µA	30-Dec-11	5.2400	3.4980
NISIT, Papua New Guinea	NISIT	1.4	0.5	µA	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	0.8	0.8	µA	15-Mar-12		
KIM, Kazakhstan	KIM	0.8	1.0	µA	06-Aug-12		
NIS, Egypt	NIS	1.8	5.0	µA	27-Oct-12		
NSCL, Syria	NSCL	1.4	0.2	µA	05-Jan-13		
JNMI, Jordan	JNMI	1.2	0.5	µA	24-Feb-13		
			Σ			4.2090	5.4270
	x_w (µV)	0.8				u_w (µV)	0.4

Table 7.1.7.b.iii Loop B Reference Value for DC Current 10mA with drift corrected

DC CURRENT: 10mA - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NMI, Australia	NMIA	0.5	0.2	µA	25-May-14	0
[R]NPL, India	NPLI	1.7	0.2	µA	11-Aug-14	78
[R]NMC, Singapore	NMC,SG	1.0	0.3	µA	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	1.0	5.9	µA	13-Dec-14	202
JNMI, Jordan	JNMI	0.0	0.5	µA	30-Jan-15	250
SCL, Hong Kong	SCL, HK	1.0	0.2	µA	08-Mar-15	287
[R]NMI, Australia	NMIA	0.3	0.6	µA	15-Apr-15	325

Table 7.1.7.c.i Loop C DC Current 10 mA results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	0.2	Uncertainty of Drift	0.1

Table 7.1.7.c.ii Loop C DC Current 10mA Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 10 mA RV	*Ref Val*	1.5	0.2	µA			
[R]NPL, India	NPLI	1.7	0.2	µA	11-Aug-14	69.4520	40.0577
[R]NMI, Australia	NMIA	0.5	0.4	µA	03-Nov-14	2.6144	5.2288
[R]NMC, Singapore	NMC,SG	1.1	0.3	µA	10-Nov-14	12.7039	11.8906
MUSSD, Sri Lanka	MUSSD, SL	1.1	5.9	µA	13-Dec-14		
JNMI, Jordan	JNMI	0.2	0.5	µA	30-Jan-15		
SCL, Hong Kong	SCL, HK	1.1	0.2	µA	08-Mar-15		
			Σ			84.7703	57.1770
	x_w	1.5				u_w	0.1

Table 7.1.7.c.iii Loop C Reference Value for DC Current 10mA with drift corrected

DC CURRENT: 1A - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	22.190	14.670	µA	27-May-11	0
NMI, Australia	NMIA	-37.000	17.000	µA	22-Jun-11	26
NMI, South Africa	NMISA	-101.000	30.000	µA	07-Aug-11	72
ESLMASM, Mongolia	MASM	-15.000	92.000	µA	18-Sep-11	114
NPL, India	NPLI	-20.950	13.200	µA	20-Nov-11	177
NIM, Thailand	NIMT	-49.040	27.000	µA	27-Jan-12	245
SCL, Hong Kong	SCLHK	-140.000	100.000	µA	19-Mar-12	297
NML, Malaysia	NMLMY	-164.000	64.000	µA	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	225.000	699.000	µA	30-Jun-12	400

Table 7.1.8.a.i Loop A DC Current 1A results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	43.140	Uncertainty of Drift	24.9

Table 7.1.8.a.ii Loop A DC Current 1A Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 1A RV	*Ref Val*	-6.3	50.7	µA			
[R]NMI, Australia	NMIA	-30.7	17.0	µA	22-Jun-11	-0.1061	0.0035
[R]NMI, South Africa	NMISA	-83.5	30.0	µA	07-Aug-11	-0.0927	0.0011
[R]NPL, India	NPLI	22.2	14.0	µA	23-Aug-11	0.1140	0.0051
ESLMASM, Mongolia	MASM	12.8	92.0	µA	18-Sep-11		
[R]NIM, Thailand	NIMT	10.7	27.0	µA	27-Jan-12	0.0146	0.0014
SCL, Hong Kong	SCLHK	-67.6	100.0	µA	19-Mar-12		
[R]NML, Malaysia	NMLMY	-77.7	64.0	µA	15-May-12		
MUSSD, Sri Lanka	MUSSDSL	322.5	699.0	µA	30-Jun-12		
			Σ			-0.0702	0.0111
	x_w (µV)	-6.3				u_w (µV)	9.5

Table 7.1.8.a.iii Loop A Reference Value for DC Current 1A with drift corrected

DC CURRENT: 1A - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	-44.000	19.000	µA	22-May-11	-76
NPL, India	NPLI	-68.295	16.720	µA	06-Aug-11	0
VMI, Vietnam	VMI	-89.100	91.000	µA	20-Oct-11	75
NML, Philippines	NMLPH	-102.000	24.000	µA	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	-58.000	28.000	µA	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	-26.000	160.000	µA	15-Mar-12	222
NPL, India	NPLI	-57.000	20.408	µA	25-May-12	293
KIM, Kazakhstan	KIM	102.000	95.000	µA	06-Aug-12	366
NIS, Egypt	NIS	-19.000	610.000	µA	27-Oct-12	448
NSCL, Syria	NSCL	-125.500	21.400	µA	05-Jan-13	518
JNMI, Jordan	JNMI	-176.000	110.000	µA	24-Feb-13	568

Table 7.1.8.b.i Loop B DC Current 1A results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-11.295	Uncertainty of Drift	6.5

Table 7.1.8.b.ii Loop B DC Current 1A Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 1A RV	*Ref Val*	-54.9	18.6	µA			
[R]NMI, Australia	NMIA	-41.1	19.0	µA	22-May-11	-0.1138	0.0028
VMI, Vietnam	VMI	-92.0	91.0	µA	20-Oct-11		
NML, Philippines	NMLPH	-105.9	24.0	µA	16-Nov-11		
[R]NPL, India	NPLI	-68.3	18.7	µA	30-Dec-11	-0.1962	0.0029
NISIT, Papua New Guinea	NISIT	-65.2	28.0	µA	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	-34.6	160.0	µA	15-Mar-12		
KIM, Kazakhstan	KIM	87.9	95.0	µA	06-Aug-12		
NIS, Egypt	NIS	-36.3	610.0	µA	27-Oct-12		
NSCL, Syria	NSCL	-145.5	21.4	µA	05-Jan-13		
JNMI, Jordan	JNMI	-197.9	110.0	µA	24-Feb-13		
			Σ			-0.3100	0.0056
	x_w (µV)	-54.9				u_w (µV)	13.3

Table 7.1.8.b.iii Loop B Reference Value for DC Current 1A with drift corrected

DC CURRENT: 1A - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NMI, Australia	NMIA	-28.00	24.000	µA	25-May-14	0
[R]NPL, India	NPLI	428.000	72.140	µA	11-Aug-14	78
[R]NMC, Singapore	NMC,SG	-21.00	53.000	µA	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	-2.85	698.930	µA	13-Dec-14	202
JNMI, Jordan	JNMI	-80.00	150.000	µA	30-Jan-15	250
SCL, Hong Kong	SCL, HK	-40.00	20.000	µA	08-Mar-15	287
[R]NMI, Australia	NMIA	-71.00	14.000	µA	15-Apr-15	325

Table 7.1.8.c.i Loop C DC Current 1A results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	43.0	Uncertainty of Drift	24.8

Table 7.1.8.c.ii Loop C DC Current 1A Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 1A RV	*Ref Val*	3.9	52.8	µA			
[R]NPL, India	NPLI	438.3	72.1	µA	11-Aug-14	0.0842	0.0002
[R]NMI, Australia	NMIA	-28.0	19.6	µA	03-Nov-14	-0.0725	0.0026
[R]NMC, Singapore	NMC,SG	1.4	53.0	µA	10-Nov-14	0.0005	0.0004
MUSSD, Sri Lanka	MUSSD, SL	23.9	698.9	µA	13-Dec-14		
JNMI, Jordan	JNMI	-46.9	150.0	µA	30-Jan-15		
SCL, Hong Kong	SCL, HK	-2.0	20.0	µA	08-Mar-15		
			Σ			0.0122	0.0031
	x_w	3.9				u_w	17.8

Table 7.1.8.c.iii Loop C Reference Value for DC Current 1A with drift corrected

AC VOLTAGE: 100mV 40Hz - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	6.900	7.000	µV	27-May-11	0
NMI, Australia	NMIA	7.700	5.500	µV	22-Jun-11	26
NMI, South Africa	NMISA	6.400	11.100	µV	07-Aug-11	72
ESLMASM, Mongolia	MASM	7.000	8.600	µV	18-Sep-11	114
NPL, India	NPLI	5.800	7.100	µV	20-Nov-11	177
NIM, Thailand	NIMT	3.380	4.700	µV	27-Jan-12	245
SCL, Hong Kong	SCLHK	-0.700	6.000	µV	19-Mar-12	297
NML, Malaysia	NMLMY	3.000	14.800	µV	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	8.200	105.200	µV	30-Jun-12	400

Table 7.1.9.a.i Loop A AC Voltage 100mV, 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	1.1	Uncertainty of Drift	0.6

Table 7.1.9.a.ii Loop A AC Voltage 100 mV, 40 Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 100mV 40Hz RV	*Ref Val*	6.3	3.3	µV			
[R]NMI, Australia	NMIA	7.9	5.5	µV	22-Jun-11	0.2599	0.0331
[R]NMI, South Africa	NMISA	6.8	11.1	µV	07-Aug-11	0.0556	0.0081
[R]NPL, India	NPLI	6.9	7.1	µV	23-Aug-11	0.1388	0.0201
ESLMASM, Mongolia	MASM	7.7	8.6	µV	18-Sep-11		
[R]NIM, Thailand	NIMT	4.9	4.7	µV	27-Jan-12	0.2219	0.0453
SCL, Hong Kong	SCLHK	1.1	6.0	µV	19-Mar-12		
[R]NML, Malaysia	NMLMY	5.2	14.8	µV	15-May-12	0.0237	0.0046
MUSSD, Sri Lanka	MUSSDSL	10.7	105.2	µV	30-Jun-12		
			Σ			0.7000	0.1111
	x_w (µV)	6.3				u_w (µV)	3.0

Table 7.1.9.a.iii Loop A Reference Value for AC Voltage 100 mV, 40 Hz with drift corrected

AC VOLTAGE: 100mV 40Hz - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	0.300	5.200	µV	22-May-11	-76
NPL, India	NPLI	1.500	6.600	µV	06-Aug-11	0
VMI, Vietnam	VMI	4.000	20.600	µV	20-Oct-11	75
NML, Philippines	NMLPH	4.500	9.700	µV	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	9.600	9.900	µV	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	3.800	29.300	µV	15-Mar-12	222
NPL, India	NPLI	2.100	5.700	µV	25-May-12	293
KIM, Kazakhstan	KIM	4.700	1569.000	µV	06-Aug-12	366
NIS, Egypt	NIS	-1.700	92.000	µV	27-Oct-12	448
NSCL, Syria	NSCL	1.800	10.100	µV	05-Jan-13	518
JNMI, Jordan	JNMI	2.300	19.700	µV	24-Feb-13	568

Table 7.1.9.b.i Loop B AC Voltage 100mV 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-0.6	Uncertainty of Drift	0.3

Table 7.1.9.b.ii Loop B AC Voltage 100mV, 40Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 100mV 40Hz RV	*Ref Val*	0.9	4.0	µV			
[R]NMI, Australia	NMIA	0.5	5.2	µV	22-May-11	0.0169	0.0370
VMI, Vietnam	VMI	3.8	20.6	µV	20-Oct-11		
NML, Philippines	NMLPH	4.3	9.7	µV	16-Nov-11		
[R]NPL, India	NPLI	1.5	6.2	µV	30-Dec-11	0.0394	0.0263
NISIT, Papua New Guinea	NISIT	9.2	9.9	µV	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	3.3	29.3	µV	15-Mar-12		
KIM, Kazakhstan	KIM	4.0	1569.0	µV	06-Aug-12		
NIS, Egypt	NIS	-2.6	92.0	µV	27-Oct-12		
NSCL, Syria	NSCL	0.7	10.1	µV	05-Jan-13		
JNMI, Jordan	JNMI	1.1	19.7	µV	24-Feb-13		
			Σ			0.0563	0.0633
	x_w (µV)	0.9				u_w (µV)	4.0

Table 7.1.9.b.iii Loop B Reference Value for AC Voltage 100mV, 40Hz with drift corrected

AC VOLTAGE: 100mV 40Hz - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NMI, Australia	NMIA	11.60	12.200	µV	25-May-14	0
[R]NPL, India	NPLI	25.400	14.300	µV	11-Aug-14	78
[R]NMC, Singapore	NMC,SG	21.50	5.600	µV	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	25.30	105.200	µV	13-Dec-14	202
JNMI, Jordan	JNMI	13.00	30.000	µV	30-Jan-15	250
SCL, Hong Kong	SCL, HK	15.50	6.000	µV	08-Mar-15	287
[R]NMI, Australia	NMIA	15.60	7.600	µV	15-Apr-15	325

Table 7.1.9.c.i Loop C AC Voltage 100mV 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, udrift

Artefact Drift	-4.0	Drift Uncertainty	2.3

Table 7.1.9.c.ii Loop C AC Voltage 100mV, 40Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 100mV 40Hz RV	*Ref Val*	18.3	6.5	µV			
[R]NPL, India	NPLI	24.4	14.3	µV	11-Aug-14	0.1195	0.0049
[R]NMI, Australia	NMIA	11.6	10.2	µV	03-Nov-14	0.1123	0.0097
[R]NMC, Singapore	NMC, SG	19.4	5.6	µV	10-Nov-14	0.6193	0.0319
MUSSD, Sri Lanka	MUSSD, SL	22.8	105.2	µV	13-Dec-14		
JNMI, Jordan	JNMI	9.9	30.0	µV	30-Jan-15		
SCL, Hong Kong	SCL, HK	12.0	6.0	µV	08-Mar-15		
			Σ			0.8511	0.0465
	x_w	18.3				u_w	4.6

Table 7.1.9.c.iii Loop C Reference Value for AC Voltage 100mV, 40Hz with drift corrected

AC VOLTAGE: 100mV 1kHz – LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	1.900	5.200	µV	27-May-11	0
NMI, Australia	NMIA	1.600	4.600	µV	22-Jun-11	26
NMI, South Africa	NMISA	0.400	6.900	µV	07-Aug-11	72
ESLMASM, Mongolia	MASM	-0.400	7.900	µV	18-Sep-11	114
NPL, India	NPLI	1.700	5.100	µV	20-Nov-11	177
NIM, Thailand	NIMT	0.840	4.700	µV	27-Jan-12	245
SCL, Hong Kong	SCLHK	-4.500	6.000	µV	19-Mar-12	297
NML, Malaysia	NMLMY	-0.500	14.600	µV	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	0.050	105.100	µV	30-Jun-12	400

Table 7.1.10.a.i Loop A AC Voltage 100mV, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	0.2	Uncertainty of Drift	0.1

Table 7.1.10.a.iiLoop A AC Voltage 100mV, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 100mV 1kHz RV	*Ref Val*	1.3	2.5	µV			
[R]NMI, Australia	NMIA	1.6	4.6	µV	22-Jun-11	0.0770	0.0473
[R]NMI, South Africa	NMISA	0.5	6.9	µV	07-Aug-11	0.0101	0.0210
[R]NPL, India	NPLI	1.9	5.2	µV	23-Aug-11	0.0716	0.0377
ESLMASM, Mongolia	MASM	-0.3	7.9	µV	18-Sep-11		
[R]NIM, Thailand	NIMT	1.1	4.7	µV	27-Jan-12	0.0506	0.0453
SCL, Hong Kong	SCLHK	-4.2	6.0	µV	19-Mar-12		
[R]NML, Malaysia	NMLMY	-0.1	14.6	µV	15-May-12	-0.0005	0.0047
MUSSD, Sri Lanka	MUSSDSL	0.5	105.1	µV	30-Jun-12		
			Σ			0.2088	0.1559
	x_w (µV)	1.3				u_w (µV)	2.5

Table 7.1.10.a.iii Loop A Reference Value for AC Voltage 100mV, 1 kHz with drift corrected

AC VOLTAGE: 100mV 1kHz - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	-6.100	4.700	µV	22-May-11	-76
NPL, India	NPLI	-7.800	5.500	µV	06-Aug-11	0
VMI, Vietnam	VMI	-2.100	19.800	µV	20-Oct-11	75
NML, Philippines	NMLPH	1.700	8.700	µV	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	3.700	9.900	µV	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	-1.434	14.100	µV	15-Mar-12	222
NPL, India	NPLI	-8.100	5.400	µV	25-May-12	293
KIM, Kazakhstan	KIM	11.900	1321.000	µV	06-Aug-12	366
NIS, Egypt	NIS	-8.400	92.000	µV	27-Oct-12	448
NSCL, Syria	NSCL	-2.800	9.300	µV	05-Jan-13	518
JNMI, Jordan	JNMI	-3.100	19.700	µV	24-Feb-13	568

Table 7.1.10.b.i Loop B AC Voltage 100mV, 1 kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	0.3	Uncertainty of Drift	0.2

Table 7.1.10.b.ii Loop B AC Voltage 100mV, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 100mV 1kHz RV	*Ref Val*	-6.9	3.6	µV			
[R]NMI, Australia	NMIA	-6.2	4.7	µV	22-May-11	-0.2797	0.0453
VMI, Vietnam	VMI	-2.0	19.8	µV	20-Oct-11		
NML, Philippines	NMLPH	1.8	8.7	µV	16-Nov-11		
[R]NPL, India	NPLI	-7.8	5.5	µV	30-Dec-11	-0.2626	0.0337
NISIT, Papua New Guinea	NISIT	3.9	9.9	µV	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	-1.2	14.1	µV	15-Mar-12		
KIM, Kazakhstan	KIM	12.3	1321.0	µV	06-Aug-12		
NIS, Egypt	NIS	-7.9	92.0	µV	27-Oct-12		
NSCL, Syria	NSCL	-2.3	9.3	µV	05-Jan-13		
JNMI, Jordan	JNMI	-2.5	19.7	µV	24-Feb-13		
			Σ			-0.5422	0.0789
	x_w (µV)	-6.9				u_w (µV)	3.6

Table 7.1.10.b.iii Loop B Reference Value for AC Voltage 100mV,1kHz with drift corrected

AC VOLTAGE: 100mV 1kHz - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NMI, Australia	NMIA	9.10	7.500	µV	25-May-14	0
[R]NPL, India	NPLI	17.200	7.400	µV	11-Aug-14	78
[R]NMC, Singapore	NMC,SG	16.20	5.600	µV	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	20.10	105.100	µV	13-Dec-14	202
JNMI, Jordan	JNMI	8.00	30.000	µV	30-Jan-15	250
SCL, Hong Kong	SCL, HK	10.90	6.000	µV	08-Mar-15	287
[R]NMI, Australia	NMIA	10.10	4.700	µV	15-Apr-15	325

Table 7.1.10.c.i Loop C AC Voltage 100mV, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-1.0	Uncertainty of Drift	0.6

Table 7.1.10.c.ii Loop C AC Voltage 100mV, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 100mV 1kHz RV	*Ref Val*	13.8	3.8	µV			
[R]NPL, India	NPLI	17.0	7.4	µV	11-Aug-14	0.3097	0.0183
[R]NMI, Australia	NMIA	9.1	6.3	µV	03-Nov-14	0.2323	0.0255
[R]NMC, Singapore	NMC,SG	15.7	5.6	µV	10-Nov-14	0.5000	0.0319
MUSSD, Sri Lanka	MUSSD, SL	19.5	105.1	µV	13-Dec-14		
JNMI, Jordan	JNMI	7.2	30.0	µV	30-Jan-15		
SCL, Hong Kong	SCL, HK	10.0	6.0	µV	08-Mar-15		
			Σ			1.0420	0.0757
	x_w	13.8				u_w	3.6

Table 7.1.10.c.iii Loop C Reference Value for AC Voltage 100mV, 1kHz with drift corrected

AC VOLTAGE: 1V 40 Hz - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	121.000	49.000	µV	27-May-11	0
NMI, Australia	NMIA	137.000	50.000	µV	22-Jun-11	26
NMI, South Africa	NMISA	124.000	40.000	µV	07-Aug-11	72
ESLMASM, Mongolia	MASM	108.000	46.000	µV	18-Sep-11	114
NPL, India	NPLI	115.000	49.000	µV	20-Nov-11	177
NIM, Thailand	NIMT	70.900	37.000	µV	27-Jan-12	245
SCL, Hong Kong	SCLHK	79.000	30.000	µV	19-Mar-12	297
NML, Malaysia	NMLMY	75.000	70.000	µV	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	94.000	931.000	µV	30-Jun-12	400

Table 7.1.11.a.i Loop A AC Voltage 1V 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	6.000	Uncertainty of Drift	3.5

Table 7.1.11.a.ii Loop A AC Voltage 1V, 40 Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 1V 40Hz RV	*Ref Val*	109.5	21.7	µV			
[R]NMI, Australia	NMIA	137.9	50.0	µV	22-Jun-11	0.0552	0.0004
[R]NMI, South Africa	NMISA	126.4	40.0	µV	07-Aug-11	0.0790	0.0006
[R]NPL, India	NPLI	121.0	49.0	µV	23-Aug-11	0.0504	0.0004
ESLMASM, Mongolia	MASM	111.9	46.0	µV	18-Sep-11		
[R]NIM, Thailand	NIMT	79.2	37.0	µV	27-Jan-12	0.0579	0.0007
SCL, Hong Kong	SCLHK	89.1	30.0	µV	19-Mar-12		
[R]NML, Malaysia	NMLMY	87.0	70.0	µV	15-May-12	0.0178	0.0002
MUSSD, Sri Lanka	MUSSDSL	107.6	931.0	µV	30-Jun-12		
			Σ			0.2602	0.0024
	x_w (µV)	109.5				u_w (µV)	20.5

Table 7.1.11.a.iii Loop A Reference Value for AC Voltage 1V, 40 Hz with drift corrected

AC VOLTAGE: 1V 40Hz - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	88.000	43.000	µV	22-May-11	-76
NPL, India	NPLI	84.800	37.800	µV	06-Aug-11	0
VMI, Vietnam	VMI	78.000	11.200	µV	20-Oct-11	75
NML, Philippines	NMLPH	-50.000	110.000	µV	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	100.000	93.000	µV	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	70.000	120.000	µV	15-Mar-12	222
NPL, India	NPLI	79.300	37.200	µV	25-May-12	293
KIM, Kazakhstan	KIM	-82.000	605.000	µV	06-Aug-12	366
NIS, Egypt	NIS	87.000	800.000	µV	27-Oct-12	448
NSCL, Syria	NSCL	87.000	41.000	µV	05-Jan-13	518
JNMI, Jordan	JNMI	41.000	62.000	µV	24-Feb-13	568

Table 7.1.11.b.i Loop B AC Voltage 1 V 40 Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	5.5	Uncertainty of Drift	3.2

Table 7.1.11.b.iiLoop B AC Voltage 1V, 40 Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 1V 40Hz RV	*Ref Val*	85.6	29.0	µV			
[R]NMI, Australia	NMIA	86.6	43.0	µV	22-May-11	0.0468	0.0005
VMI, Vietnam	VMI	79.4	11.2	µV	20-Oct-11		
NML, Philippines	NMLPH	-48.1	110.0	µV	16-Nov-11		
[R]NPL, India	NPLI	84.8	37.5	µV	30-Dec-11	0.0603	0.0007
NISIT, Papua New Guinea	NISIT	103.5	93.0	µV	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	74.2	120.0	µV	15-Mar-12		
KIM, Kazakhstan	KIM	-75.1	605.0	µV	06-Aug-12		
NIS, Egypt	NIS	95.4	800.0	µV	27-Oct-12		
NSCL, Syria	NSCL	96.7	41.0	µV	05-Jan-13		
JNMI, Jordan	JNMI	51.7	62.0	µV	24-Feb-13		
			Σ			0.1071	0.0013
	x_w (µV)	85.6				u_w (µV)	28.3

Table 7.1.11.b.iii Loop B Reference Value for AC Voltage 1V, 40 Hz with drift corrected

AC VOLTAGE: 1V 40Hz - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	198.00	33.000	µV	25-May-14	0
NPL, India	NPLI	254.000	33.000	µV	11-Aug-14	78
Singapore	NMC, SG	246.00	30.000	µV	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	302.00	931.000	µV	13-Dec-14	202
JNMI, Jordan	JNMI	124.00	72.000	µV	30-Jan-15	250
SCL, Hong Kong	SCL, HK	232.00	40.000	µV	08-Mar-15	287
NMI, Australia	NMIA	208.00	42.000	µV	15-Apr-15	325

Table 7.1.11.c.i Loop C AC Voltage 1V, 40 Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-10	Drift Uncertainty	5.8

Table 7.1.11.c.ii Loop C AC Voltage 1V, 40 Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 1V 40Hz RV	*Ref Val*	233.4	22.4	µV			
[R]NPL, India	NPLI	251.6	33.0	µV	11-Aug-14	0.2310	0.0009
[R]NMI, Australia	NMIA	198.0	37.8	µV	03-Nov-14	0.1388	0.0007
[R]NMC, Singapore	NMC, SG	240.8	30.0	µV	10-Nov-14	0.2676	0.0011
MUSSD, Sri Lanka	MUSSD, SL	295.8	931.0	µV	13-Dec-14		
JNMI, Jordan	JNMI	116.3	72.0	µV	30-Jan-15		
SCL, Hong Kong	SCL, HK	223.2	40.0	µV	08-Mar-15		
			Σ			0.6374	0.0027
	x_w	233.4435				u_w	19.1

Table 7.1.11.c.iii Loop C Reference Value for AC Voltage 1V, 40 Hz with drift corrected

AC VOLTAGE: 1V 1kHz – LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	61.000	26.000	µV	27-May-11	0
NMI, Australia	NMIA	69.000	32.000	µV	22-Jun-11	26
NMI, South Africa	NMISA	56.000	40.000	µV	07-Aug-11	72
ESLMASM, Mongolia	MASM	29.000	42.000	µV	18-Sep-11	114
NPL, India	NPLI	59.000	26.000	µV	20-Nov-11	177
NIM, Thailand	NIMT	17.900	37.000	µV	27-Jan-12	245
SCL, Hong Kong	SCLHK	25.000	30.000	µV	19-Mar-12	297
NML, Malaysia	NMLMY	17.000	50.000	µV	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	19.000	926.000	µV	30-Jun-12	400

Table 7.1.12.a.i Loop A AC Voltage 1V, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	2.0	Uncertainty of Drift	1.2

Table 7.1.12.a.ii Loop A AC Voltage 1V, 1 kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 1V 1kHz RV	*Ref Val*	51.5	15.6	µV			
[R]NMI, Australia	NMIA	69.3	32.0	µV	22-Jun-11	0.0677	0.0010
[R]NMI, South Africa	NMISA	56.8	40.0	µV	07-Aug-11	0.0355	0.0006
[R]NPL, India	NPLI	61.0	26.0	µV	23-Aug-11	0.0902	0.0015
ESLMASM, Mongolia	MASM	30.3	42.0	µV	18-Sep-11		
[R]NIM, Thailand	NIMT	20.7	37.0	µV	27-Jan-12	0.0151	0.0007
SCL, Hong Kong	SCLHK	28.4	30.0	µV	19-Mar-12		
[R]NML, Malaysia	NMLMY	21.0	50.0	µV	15-May-12	0.0084	0.0004
MUSSD, Sri Lanka	MUSSDSL	23.5	926.0	µV	30-Jun-12		
			Σ			0.2169	0.0042
	x_w (µV)	51.5				u_w (µV)	15.4

Table 7.1.12.a.iii Loop A Reference Value for AC Voltage 1V, 1 kHz with drift corrected

AC VOLTAGE: 1V 1kHz - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	8.000	31.000	µV	22-May-11	-76
NPL, India	NPLI	12.500	20.600	µV	06-Aug-11	0
VMI, Vietnam	VMI	-2.000	66.000	µV	20-Oct-11	75
NML, Philippines	NMLPH	-15.000	51.000	µV	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	36.000	93.000	µV	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	3.000	61.000	µV	15-Mar-12	222
NPL, India	NPLI	10.900	20.100	µV	25-May-12	293
KIM, Kazakhstan	KIM	69.000	329.000	µV	06-Aug-12	366
NIS, Egypt	NIS	-32.000	800.000	µV	27-Oct-12	448
NSCL, Syria	NSCL	28.000	37.000	µV	05-Jan-13	518
JNMI, Jordan	JNMI	-17.000	62.000	µV	24-Feb-13	568

Table 7.1.12.b.i Loop B AC Voltage 1V 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	1.6	Uncertainty of Drift	0.9

Table 7.1.12.b.ii Loop B AC Voltage 1V, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B1 V1 kHz RV	*Ref Val*	11.0	17.1	µV			
[R]NMI, Australia	NMIA	7.6	31.0	µV	22-May-11	0.0079	0.0010
VMI, Vietnam	VMI	-1.6	66.0	µV	20-Oct-11		
NML, Philippines	NMLPH	-14.4	51.0	µV	16-Nov-11		
[R]NPL, India	NPLI	12.5	20.4	µV	30-Dec-11	0.0302	0.0024
NISIT, Papua New Guinea	NISIT	37.0	93.0	µV	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	4.2	61.0	µV	15-Mar-12		
KIM, Kazakhstan	KIM	71.0	329.0	µV	06-Aug-12		
NIS, Egypt	NIS	-29.6	800.0	µV	27-Oct-12		
NSCL, Syria	NSCL	30.8	37.0	µV	05-Jan-13		
JNMI, Jordan	JNMI	-13.9	62.0	µV	24-Feb-13		
			Σ			0.0381	0.0035
	x_w (µV)	11.0				u_w (µV)	17.0

Table 7.1.12.b.iii Loop B Reference Value for AC Voltage 1V, 1kHz with drift corrected

AC VOLTAGE: 1V 1kHz - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	140.00	27.000	µV	25-May-14	0
NPL, India	NPLI	178.000	27.000	µV	11-Aug-14	78
Singapore	NMC, SG	185.00	28.000	µV	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	231.00	926.000	µV	13-Dec-14	202
JNMI, Jordan	JNMI	67.00	72.000	µV	30-Jan-15	250
SCL, Hong Kong	SCL, HK	187.00	30.000	µV	08-Mar-15	287
NMI, Australia	NMIA	144.00	45.000	µV	15-Apr-15	325

Table 7.1.12.c.i Loop C AC Voltage 1V, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-4.0	Drift Uncertainty	2.3

Table 7.1.12.c.ii Loop C AC Voltage 1V, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 1V 1kHz RV	*Ref Val*	171.3	17.8	µV			
[R]NPL, India	NPLI	177.0	27.0	µV	11-Aug-14	0.2429	0.0014
[R]NMI, Australia	NMIA	140.0	37.1	µV	03-Nov-14	0.1017	0.0007
[R]NMC, Singapore	NMC, SG	182.9	28.0	µV	10-Nov-14	0.2333	0.0013
MUSSD, Sri Lanka	MUSSD, SL	228.5	926.0	µV	13-Dec-14		
JNMI, Jordan	JNMI	63.9	72.0	µV	30-Jan-15		
SCL, Hong Kong	SCL, HK	183.5	30.0	µV	08-Mar-15		
			Σ			0.5778	0.0034
	x_w	171.3				u_w	17.2

Table 7.1.12.c.iii Loop C Reference Value for AC Voltage 1V, 1 kHz with drift corrected

AC VOLTAGE: 10 V 40 Hz - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	2.500	0.490	mV	27-May-11	0
NMI, Australia	NMIA	2.410	0.320	mV	22-Jun-11	26
NMI, South Africa	NMISA	2.180	0.400	mV	07-Aug-11	72
ESLMASM, Mongolia	MASM	2.300	0.500	mV	18-Sep-11	114
NPL, India	NPLI	2.300	0.490	mV	20-Nov-11	177
NIM, Thailand	NIMT	1.652	0.390	mV	27-Jan-12	245
SCL, Hong Kong	SCLHK	1.950	0.300	mV	19-Mar-12	297
NML, Malaysia	NMLMY	1.720	0.580	mV	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	2.820	9.300	mV	30-Jun-12	400

Table 7.1.13.a.i Loop A AC Voltage 10V 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	0.2	Uncertainty of Drift	0.1

Table 7.1.13.a.ii Loop A AC Voltage 10V, 40Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 10V 40Hz RV	*Ref Val*	2.3	0.3	mV			
[R]NMI, Australia	NMIA	2.4	0.3	mV	22-Jun-11	23.8221	9.7656
[R]NMI, South Africa	NMISA	2.3	0.4	mV	07-Aug-11	14.1335	6.2500
[R]NPL, India	NPLI	2.5	0.5	mV	23-Aug-11	10.4123	4.1649
ESLMASM, Mongolia	MASM	2.4	0.5	mV	18-Sep-11		
[R]NIM, Thailand	NIMT	1.9	0.4	mV	27-Jan-12	12.6814	6.5746
SCL, Hong Kong	SCLHK	2.3	0.3	mV	19-Mar-12		
[R]NML, Malaysia	NMLMY	2.1	0.6	mV	15-May-12	6.3020	2.9727
MUSSD, Sri Lanka	MUSSDSL	3.3	9.3	mV	30-Jun-12		
			Σ			67.3512	29.7278
	x_w (µV)	2.3				u_w (µV)	0.18

Table 7.1.13.a.iii Loop A Reference Value for AC Voltage 10V, 40Hz with drift corrected

AC VOLTAGE: 10V 40Hz - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	8.370	0.550	mV	22-May-11	-76
NPL, India	NPLI	9.100	0.300	mV	06-Aug-11	0
VMI, Vietnam	VMI	9.677	1.110	mV	20-Oct-11	75
NML, Philippines	NMLPH	9.400	0.830	mV	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	10.880	0.850	mV	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	10.750	1.090	mV	15-Mar-12	222
NPL, India	NPLI	9.700	0.370	mV	25-May-12	293
KIM, Kazakhstan	KIM	-12.360	11.387	mV	06-Aug-12	366
NIS, Egypt	NIS	11.000	8.100	mV	27-Oct-12	448
NSCL, Syria	NSCL	11.990	0.430	mV	05-Jan-13	518
JNMI, Jordan	JNMI	12.160	0.580	mV	24-Feb-13	568

Table 7.1.13.b.i Loop B AC Voltage 10V, 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-0.6	Uncertainty of Drift	0.3

Table 7.1.13.b.ii Loop B AC Voltage 10V, 40Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 10V 40Hz RV	*Ref Val*	8.9	0.8	mV			
[R]NMI, Australia	NMIA	8.5	0.6	mV	22-May-11	28.1839	3.3058
VMI, Vietnam	VMI	9.5	1.1	mV	20-Oct-11		
NML, Philippines	NMLPH	9.2	0.8	mV	16-Nov-11		
[R]NPL, India	NPLI	9.1	0.3	mV	30-Dec-11	80.2115	8.8145
NISIT, Papua New Guinea	NISIT	10.5	0.9	mV	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	10.3	1.1	mV	15-Mar-12		
KIM, Kazakhstan	KIM	-13.1	11.4	mV	06-Aug-12		
NIS, Egypt	NIS	10.1	8.1	mV	27-Oct-12		
NSCL, Syria	NSCL	10.9	0.4	mV	05-Jan-13		
JNMI, Jordan	JNMI	11.0	0.6	mV	24-Feb-13		
			Σ			108.3955	12.1202
	x_w (μV)	8.9				u_w (μV)	0.3

Table 7.1.13.b.iii Loop B Reference Value for AC Voltage 10V, 40Hz with drift corrected

AC VOLTAGE: 10V 40Hz - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	2.39	0.640	mV	25-May-14	0
NPL, India		4.030	0.830	mV	11-Aug-14	78
NMC, Singapore	NMC, SG	3.46	0.280	mV	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	4.38	9.300	mV	13-Dec-14	202
JNMI, Jordan	JNMI	2.73	0.670	mV	30-Jan-15	250
SCL, Hong Kong	SCL, HK	3.63	0.300	mV	08-Mar-15	287
NMI, Australia	NMIA	3.52	0.440	mV	15-Apr-15	325

Table 7.1.13.c.i Loop C AC Voltage 10V, 40 Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-1.13	Drift Uncertainty	0.7

Table 7.1.13.c.ii Loop C AC Voltage 10V, 40 Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 10V 40Hz RV	*Ref Val*	2.9	1.3	mV			
[R]NPL, India	NPLI	3.8	0.8	mV	11-Aug-14	5.456	1.452
[R]NMI, Australia	NMIA	2.4	0.5	mV	03-Nov-14	7.924	3.316
[R]NMC, Singapore	NMC, SG	2.9	0.3	mV	10-Nov-14	36.638	12.755
MUSSD, Sri Lanka	MUSSD, SL	3.7	9.3	mV	13-Dec-14		
JNMI, Jordan	JNMI	1.9	0.7	mV	30-Jan-15		
SCL, Hong Kong	SCL, HK	2.6	0.3	mV	08-Mar-15		
			Σ			50.0184	17.5223
	x_w	2.9				u_w	0.2

Table 7.1.13.c.iii Loop C Reference Value for AC Voltage 10V, 40 Hz with drift corrected

AC VOLTAGE: 10V 1kHz - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	1.830	0.250	mV	27-May-11	0
NMI, Australia	NMIA	1.740	0.380	mV	22-Jun-11	26
NMI, South Africa	NMISA	1.550	0.410	mV	07-Aug-11	72
ESLMASM, Mongolia	MASM	1.500	0.400	mV	18-Sep-11	114
NPL, India	NPLI	1.780	0.250	mV	20-Nov-11	177
NIM, Thailand	NIMT	1.278	0.390	mV	27-Jan-12	245
SCL, Hong Kong	SCLHK	1.410	0.300	mV	19-Mar-12	297
NML, Malaysia	NMLMY	1.110	0.480	mV	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	1.930	9.260	mV	30-Jun-12	400

Table 7.1.14.a.i Loop A AC Voltage 10V, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	0.050	Uncertainty of Drift	0.03

Table 7.1.14.a.ii Loop A AC Voltage 10V, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 10V 1kHz RV	*Ref Val*	1.6	0.2	mV			
[R]NMI, Australia	NMIA	1.7	0.4	mV	22-Jun-11	12.1007	6.9252
[R]NMI, South Africa	NMISA	1.6	0.4	mV	07-Aug-11	9.3417	5.9488
[R]NPL, India	NPLI	1.8	0.3	mV	23-Aug-11	29.2800	16.0000
ESLMASM, Mongolia	MASM	1.5	0.4	mV	18-Sep-11		
[R]NIM, Thailand	NIMT	1.3	0.4	mV	27-Jan-12	8.8574	6.5746
SCL, Hong Kong	SCLHK	1.5	0.3	mV	19-Mar-12		
[R]NML, Malaysia	NMLMY	1.2	0.5	mV	15-May-12	5.2517	4.3403
MUSSD, Sri Lanka	MUSSDSL	2.0	9.3	mV	30-Jun-12		
			Σ			64.8315	39.79
	x_w (µV)	1.6				u_w (µV)	0.2

Table 7.1.14.a.iii Loop A Reference Value for AC Voltage 10V, 1kHz with drift corrected

AC VOLTAGE: 10V 1kHz - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	7.710	0.290	mV	22-May-11	-76
NPL, India	NPLI	8.400	0.190	mV	06-Aug-11	0
VMI, Vietnam	VMI	9.243	1.110	mV	20-Oct-11	75
NML, Philippines	NMLPH	9.320	0.450	mV	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	10.310	0.850	mV	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	10.080	0.570	mV	15-Mar-12	222
NPL, India	NPLI	7.100	0.190	mV	25-May-12	293
KIM, Kazakhstan	KIM	-10.010	20.034	mV	06-Aug-12	366
NIS, Egypt	NIS	11.000	8.000	mV	27-Oct-12	448
NSCL, Syria	NSCL	11.390	0.400	mV	05-Jan-13	518
JNMI, Jordan	JNMI	11.450	0.570	mV	24-Feb-13	568

Table 7.1.14.b.i Loop B AC Voltage 10V, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	1.300	Uncertainty of Drift	0.8

Table 7.1.14.b.ii Loop B AC Voltage 10V, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 10V 1kHz RV	*Ref Val*	8.1	1.5	mV			
[R]NMI, Australia	NMIA	7.4	0.3	mV	22-May-11	87.6670	11.8906
VMI, Vietnam	VMI	9.6	1.1	mV	20-Oct-11		
NML, Philippines	NMLPH	9.8	0.5	mV	16-Nov-11		
[R]NPL, India	NPLI	8.4	0.2	mV	30-Dec-11	232.6870	27.7008
NISIT, Papua New Guinea	NISIT	11.1	0.9	mV	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	11.1	0.6	mV	15-Mar-12		
KIM, Kazakhstan	KIM	-8.4	20.0	mV	06-Aug-12		
NIS, Egypt	NIS	13.0	8.0	mV	27-Oct-12		
NSCL, Syria	NSCL	13.7	0.4	mV	05-Jan-13		
JNMI, Jordan	JNMI	14.0	0.6	mV	24-Feb-13		
			Σ			320.3540	39.5914
	x_w (µV)	8.1				u_w (µV)	0.2

Table 7.1.14.b.iii Loop B Reference Value for AC Voltage 10V, 1kHz with drift corrected

AC VOLTAGE: 10V 1kHz - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
RNMI, Australia	NMIA	1.94	0.290	mV	25-May-14	0
NPL, India	NPLI	3.430	0.610	mV	11-Aug-14	78
NMC, Singapore	NMC, SG	2.83	0.270	mV	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	3.61	9.260	mV	13-Dec-14	202
JNMI, Jordan	JNMI	2.14	0.670	mV	30-Jan-15	250
SCL, Hong Kong	SCL, HK	3.09	0.300	mV	08-Mar-15	287
NMI, Australia	NMIA	2.89	0.290	mV	15-Apr-15	325

Table 7.1.14.c.i Loop C AC Voltage 10V, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-1.0	**Drift Uncertainty**	0.5

Table 7.1.14.c.ii Loop C AC Voltage 10V, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 10V 1kHz RV	*Ref Val*	2.3	1.1	mV			
[R]NPL, India	NPLI	3.2	0.6	mV	11-Aug-14	8.6052	2.6874
[R]NMI, Australia	NMIA	1.9	0.3	mV	03-Nov-14	23.0678	11.8906
[R]NMC, Singapore	NMC, SG	2.3	0.3	mV	10-Nov-14	32.0439	13.7174
MUSSD, Sri Lanka	MUSSD, SL	3.0	9.3	mV	13-Dec-14		
JNMI, Jordan	JNMI	1.4	0.7	mV	30-Jan-15		
SCL, Hong Kong	SCL, HK	2.3	0.3	mV	08-Mar-15		
			Σ			63.7169	28.2955
	x_w	2.3				u_w	0.2

Table 7.1.14.c.iii Loop C Reference Value for AC Voltage 10V, 1kHz with drift corrected

AC VOLTAGE: 100V 40Hz - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	20.200	5.000	mV	27-May-11	0
NMI, Australia	NMIA	21.600	5.200	mV	22-Jun-11	26
NMI, South Africa	NMISA	21.000	4.800	mV	07-Aug-11	72
ESLMASM, Mongolia	MASM	22.000	4.500	mV	18-Sep-11	114
NPL, India	NPLI	21.100	5.000	mV	20-Nov-11	177
NIM, Thailand	NIMT	17.430	3.800	mV	27-Jan-12	245
SCL, Hong Kong	SCLHK	18.600	3.000	mV	19-Mar-12	297
NML, Malaysia	NMLMY	14.500	7.200	mV	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	24.800	93.000	mV	30-Jun-12	400

Table 7.1.15.a.i Loop A AC Voltage 100V 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-0.9	Uncertainty of Drift	0.5

Table 7.1.15.a.ii Loop A AC Voltage 100V, 40Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 100V 40Hz RV	*Ref Val*	18.5	2.4	mV			
[R]NMI, Australia	NMIA	21.5	5.2	mV	22-Jun-11	0.7939	0.0370
[R]NMI, South Africa	NMISA	20.6	4.8	mV	07-Aug-11	0.8956	0.0434
[R]NPL, India	NPLI	20.2	5.0	mV	23-Aug-11	0.8080	0.0400
ESLMASM, Mongolia	MASM	21.4	4.5	mV	18-Sep-11		
[R]NIM, Thailand	NIMT	16.2	3.8	mV	27-Jan-12	1.1208	0.0693
SCL, Hong Kong	SCLHK	17.1	3.0	mV	19-Mar-12		
[R]NML, Malaysia	NMLMY	12.7	7.2	mV	15-May-12	0.2450	0.0193
MUSSD, Sri Lanka	MUSSDSL	22.8	93.0	mV	30-Jun-12		
			Σ			3.8633	0.2089
	x_w (µV)	18.5				u_w (µV)	2.2

Table 7.1.15.a.iii Loop A Reference Value for AC Voltage 100V, 40Hz with drift corrected

AC VOLTAGE: 100V 40Hz - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	79.500	4.500	mV	22-May-11	-76
NPL, India	NPLI	85.800	3.800	mV	06-Aug-11	0
VMI, Vietnam	VMI	93.200	11.300	mV	20-Oct-11	75
NML, Philippines	NMLPH	95.500	6.600	mV	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	108.000	9.500	mV	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	86.000	21.000	mV	15-Mar-12	222
NPL, India	NPLI	90.100	3.800	mV	25-May-12	293
KIM, Kazakhstan	KIM	-108.400	95.517	mV	06-Aug-12	366
NIS, Egypt	NIS	110.000	81.000	mV	27-Oct-12	448
NSCL, Syria	NSCL	116.000	5.000	mV	05-Jan-13	518
JNMI, Jordan	JNMI	116.800	6.600	mV	24-Feb-13	568

Table 7.1.15.b.i Loop B AC Voltage 100V, 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-4.300	Uncertainty of Drift	2.5

Table 7.1.15.b.ii Loop B AC Voltage 100V, 40Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 100V 40Hz RV	*Ref Val*	83.6	5.8	mV			
[R]NMI, Australia	NMIA	80.6	4.5	mV	22-May-11	3.9810	0.0494
VMI, Vietnam	VMI	92.1	11.3	mV	20-Oct-11		
NML, Philippines	NMLPH	94.0	6.6	mV	16-Nov-11		
[R]NPL, India	NPLI	85.8	3.8	mV	30-Dec-11	5.9418	0.0693
NISIT, Papua New Guinea	NISIT	105.3	9.5	mV	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	82.7	21.0	mV	15-Mar-12		
KIM, Kazakhstan	KIM	-113.8	95.5	mV	06-Aug-12		
NIS, Egypt	NIS	103.4	81.0	mV	27-Oct-12		
NSCL, Syria	NSCL	108.4	5.0	mV	05-Jan-13		
JNMI, Jordan	JNMI	108.5	6.6	mV	24-Feb-13		
			Σ			9.9228	0.1186
	x_w (μV)	83.6				u_w (μV)	2.9

Table 7.1.15.b.iii Loop B Reference Value for AC Voltage 100V, 40Hz with drift corrected

AC VOLTAGE: 100V 40Hz - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
RNMI, Australia	NMIA	23.00	4.900	mV	25-May-14	0
NPL, India		46.900	8.300	mV	11-Aug-14	78
NMC, Singapore	NMC, SG	35.50	3.100	mV	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	44.00	93.000	mV	13-Dec-14	202
JNMI, Jordan	JNMI	22.90	7.500	mV	30-Jan-15	250
SCL, Hong Kong	SCL, HK	36.50	4.000	mV	08-Mar-15	287
NMI, Australia	NMIA	33.10	3.500	mV	15-Apr-15	325

Table 7.1.15.c.i Loop C AC Voltage 100V, 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-10.1	Drift Uncertainty	5.8

Table 7.1.15.c.ii Loop C AC Voltage 100V, 40 Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 100V 40Hz RV	*Ref Val*	29.1	11.9	mV			
[R]NPL, India	NPLI	44.5	8.3	mV	11-Aug-14	0.6456	0.0145
[R]NMI, Australia	NMIA	23.0	4.3	mV	03-Nov-14	1.2686	0.0552
[R]NMC, Singapore	NMC, SG	30.2	3.1	mV	10-Nov-14	3.1476	0.1041
MUSSD, Sri Lanka	MUSSD, SL	37.7	93.0	mV	13-Dec-14		
JNMI, Jordan	JNMI	15.1	7.5	mV	30-Jan-15		
SCL, Hong Kong	SCL, HK	27.6	4.0	mV	08-Mar-15		
			Σ			5.0618	0.1737
	x_w	29.1				u_w	2.4

Table 7.1.15.c.iii Loop C Reference Value for AC Voltage 100V, 40Hz with drift corrected

AC VOLTAGE: 100V 1kHz - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	13.400	2.900	mV	27-May-11	0
NMI, Australia	NMIA	14.200	4.100	mV	22-Jun-11	26
NMI, South Africa	NMISA	13.300	4.600	mV	07-Aug-11	72
ESLMASM, Mongolia	MASM	13.000	4.600	mV	18-Sep-11	114
NPL, India	NPLI	13.100	2.900	mV	20-Nov-11	177
NIM, Thailand	NIMT	11.150	3.800	mV	27-Jan-12	245
SCL, Hong Kong	SCLHK	12.500	3.000	mV	19-Mar-12	297
NML, Malaysia	NMLMY	7.600	5.800	mV	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	15.500	92.600	mV	30-Jun-12	400

Table 7.1.16.a.i Loop A AC Voltage 100V, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	0.3	Uncertainty of Drift	0.2

Table 7.1.16.a.ii Loop A AC Voltage 100V, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 100V 1kHz RV	*Ref Val*	12.7	1.8	mV			
[R]NMI, Australia	NMIA	14.2	4.1	mV	22-Jun-11	0.8474	0.0595
[R]NMI, South Africa	NMISA	13.4	4.6	mV	07-Aug-11	0.6343	0.0473
[R]NPL, India	NPLI	13.4	2.9	mV	23-Aug-11	1.5933	0.1189
ESLMASM, Mongolia	MASM	13.2	4.6	mV	18-Sep-11		
[R]NIM, Thailand	NIMT	11.6	3.8	mV	27-Jan-12	0.8009	0.0693
SCL, Hong Kong	SCLHK	13.0	3.0	mV	19-Mar-12		
[R]NML, Malaysia	NMLMY	8.2	5.8	mV	15-May-12	0.2438	0.0297
MUSSD, Sri Lanka	MUSSDSL	16.2	92.6	mV	30-Jun-12		
			Σ			4.1197	0.3246
	x_w (µV)	12.7				u_w (µV)	1.8

Table 7.1.16.a.iii Loop A Reference Value for AC Voltage 100V, 1kHz with drift corrected

AC VOLTAGE: 100V 1kHz - LOOP B results,

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	71.600	3.100	mV	22-May-11	-76
NPL, India	NPLI	79.700	2.500	mV	06-Aug-11	0
VMI, Vietnam	VMI	84.897	7.500	mV	20-Oct-11	75
NML, Philippines	NMLPH	88.300	4.300	mV	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	103.300	9.500	mV	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	97.600	7.000	mV	15-Mar-12	222
NPL, India	NPLI	82.600	2.300	mV	25-May-12	293
KIM, Kazakhstan	KIM	-94.800	68.993	mV	06-Aug-12	366
NIS, Egypt	NIS	100.000	80.000	mV	27-Oct-12	448
NSCL, Syria	NSCL	107.800	4.400	mV	05-Jan-13	518
JNMI, Jordan	JNMI	108.300	6.700	mV	24-Feb-13	568

Table 7.1.16.b.i Loop B AC Voltage 100V 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-2.9	Uncertainty of Drift	1.7

Table 7.1.16.b.ii Loop B AC Voltage 100V, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 100V 1kHz RV	*Ref Val*	76.9	3.8	mV			
[R]NMI, Australia	NMIA	72.4	3.1	mV	22-May-11	7.5288	0.1041
VMI, Vietnam	VMI	84.2	7.5	mV	20-Oct-11		
NML, Philippines	NMLPH	87.3	4.3	mV	16-Nov-11		
[R]NPL, India	NPLI	79.7	2.4	mV	30-Dec-11	13.8128	0.1733
NISIT, Papua New Guinea	NISIT	101.5	9.5	mV	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	95.4	7.0	mV	15-Mar-12		
KIM, Kazakhstan	KIM	-98.4	69.0	mV	06-Aug-12		
NIS, Egypt	NIS	95.6	80.0	mV	27-Oct-12		
NSCL, Syria	NSCL	102.7	4.4	mV	05-Jan-13		
JNMI, Jordan	JNMI	102.7	6.7	mV	24-Feb-13		
			Σ			21.3417	0.2774
	x_w (µV)	76.9				u_w (µV)	1.9

Table 7.1.16.b.iii Loop B Reference Value for AC Voltage 100V, 1kHz with drift corrected

AC VOLTAGE: 100V 1kHz - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
RNMI, Australia	NMIA	17.20	3.300	mV	25-May-14	0
NPL, India	NPLI	39.100	6.100	mV	11-Aug-14	78
NMC, Singapore	NMC, SG	28.90	3.000	mV	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	35.00	92.600	mV	13-Dec-14	202
JNMI, Jordan	JNMI	15.90	7.500	mV	30-Jan-15	250
SCL, Hong Kong	SCL, HK	30.50	4.000	mV	08-Mar-15	287
NMI, Australia	NMIA	25.70	3.800	mV	15-Apr-15	325

Table 7.1.16.c.i. Loop C AC Voltage 100V, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-8.5	Drift Uncertainty	4.9

Table 7.1.16.c.ii Loop C AC Voltage 100V, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 100V 1kHz RV	*Ref Val*	23.4	10.0	mV			
[R]NPL, India	NPLI	37.1	6.1	mV	11-Aug-14	0.9960	0.0269
[R]NMI, Australia	NMIA	17.2	3.6	mV	03-Nov-14	1.3581	0.0790
[R]NMC, Singapore	NMC, SG	24.5	3.0	mV	10-Nov-14	2.7200	0.1111
MUSSD, Sri Lanka	MUSSD, SL	29.7	92.6	mV	13-Dec-14		
JNMI, Jordan	JNMI	9.4	7.5	mV	30-Jan-15		
SCL, Hong Kong	SCL, HK	23.0	4.0	mV	08-Mar-15		
			Σ			5.0740	0.2169
	x_w	23.4				u_w	2.1

Table 7.1.16.c.iii Loop C Reference Value for AC Voltage 100V, 1kHz with drift corrected

AC VOLTAGE: 700V 40Hz - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NPL, India	NPLI	146.000	33.000	mV	27-May-11	0
[R]NMI, Australia	NMIA	137.000	35.000	mV	22-Jun-11	26
NMI, South Africa	NMISA	158.000	36.400	mV	07-Aug-11	72
ESLMASM, Mongolia	MASM	144.000	75.000	mV	18-Sep-11	114
[R]NPL, India	NPLI	142.000	33.000	mV	20-Nov-11	177
NIM, Thailand	NIMT	117.900	29.400	mV	27-Jan-12	245
SCL, Hong Kong	SCLHK	145.000	30.000	mV	19-Mar-12	297
NML, Malaysia	NMLMY	118.000	62.000	mV	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	158.000	588.000	mV	30-Jun-12	400

Table 7.1.17.a.i. Loop A AC Voltage 700V, 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	4.0	Uncertainty of Drift	2.3

Table 7.1.17.a.ii Loop A AC Voltage 700V, 40Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 700V 40Hz RV	*Ref Val*	138.9	16.7	mV			
[R]NMI, Australia	NMIA	137.6	35.0	mV	22-Jun-11	0.1123	0.0008
[R]NMI, South Africa	NMISA	159.6	36.4	mV	07-Aug-11	0.1205	0.0008
[R]NPL, India	NPLI	146.0	33.0	mV	23-Aug-11	0.1341	0.0009
ESLMASM, Mongolia	MASM	146.6	75.0	mV	18-Sep-11		
[R]NIM, Thailand	NIMT	123.4	29.4	mV	27-Jan-12	0.1428	0.0012
SCL, Hong Kong	SCLHK	151.7	30.0	mV	19-Mar-12		
[R]NML, Malaysia	NMLMY	126.0	62.0	mV	15-May-12	0.0328	0.0003
MUSSD, Sri Lanka	MUSSDSL	167.0	588.0	mV	30-Jun-12		
			Σ			0.5424	0.0039
	x_w (µV)	138.9				u_w (µV)	16.0

Table 7.1.17.a.iii Loop A Reference Value for AC Voltage 700V, 40Hz with drift corrected

AC VOLTAGE: 700V 40Hz - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	559.000	34.000	mV	22-May-11	-76
NPL, India	NPLI	498.000	25.000	mV	06-Aug-11	0
VMI, Vietnam	VMI	0.000	0.000	mV	20-Oct-11	75
NML, Philippines	NMLPH	0.000	0.000	mV	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	721.000	106.000	mV	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	0.000	0.000	mV	15-Mar-12	222
NPL, India	NPLI	523.300	26.000	mV	25-May-12	293
KIM, Kazakhstan	KIM	-767.000	529.912	mV	06-Aug-12	366
NIS, Egypt	NIS	780.000	580.000	mV	27-Oct-12	448
NSCL, Syria	NSCL	852.000	44.000	mV	05-Jan-13	518
JNMI, Jordan	JNMI	826.000	60.000	mV		568

Table 7.1.17.b.i Loop B AC Voltage 700V 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-25.3	Uncertainty of Drift	14.6

Table 7.1.17.b.ii Loop B AC Voltage 700V, 40Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 700V 40Hz RV	*Ref Val*	522.3	35.6	mV			
[R]NMI, Australia	NMIA	565.6	34.0	mV	22-May-11	0.4892	0.0009
VMI, Vietnam	VMI			mV	20-Oct-11		
NML, Philippines	NMLPH			mV	16-Nov-11		
[R]NPL, India	NPLI	498.0	25.5	mV	30-Dec-11	0.7656	0.0015
NISIT, Papua New Guinea	NISIT	704.9	106.0	mV	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI			mV	15-Mar-12		
KIM, Kazakhstan	KIM	-798.6	529.9	mV	06-Aug-12		
NIS, Egypt	NIS	741.3	580.0	mV	27-Oct-12		
NSCL, Syria	NSCL	807.3	44.0	mV	05-Jan-13		
JNMI, Jordan	JNMI	777.0	60.0	mV	24-Feb-13		
			Σ			1.2548	0.0024
	x_w (μV)	522.3				u_w (μV)	20.4

Table 7.1.17.b.iii Loop B Reference Value for AC Voltage 700V, 40Hz with drift corrected

AC VOLTAGE: 700V 40Hz - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NMI, Australia	NMIA	166.00	42.000	mV	25-May-14	0
[R]NPL, India		183.000	37.000	mV	11-Aug-14	78
SCL, Hong Kong	SCL, HK	271.00	40.000	mV	08-Mar-15	287
NMC, Singapore	NMC, SG	258.00	30.000	mV	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	305.40	588.300	mV	13-Dec-14	202
JNMI, Jordan	JNMI	173.00	70.000	mV	30-Jan-15	250
[R]NMI, Australia	NMIA	236.00	30.000	mV	15-Apr-15	325

Table 7.1.17.c.i Loop C AC Voltage 700V 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-70.0	**Drift Uncertainty**	40.4

Table 7.1.17.c.ii Loop C AC Voltage 700V, 40Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 700V 40Hz RV	*Ref Val*	189.9	83.2	mV			
[R]NPL, India	NPLI	166.2	37.0	mV	11-Aug-14	0.1214	0.0007
[R]NMI, Australia	NMIA	166.0	36.5	mV	03-Nov-14	0.1246	0.0008
[R]NMC, Singapore	NMC, SG	221.6	30.0	mV	10-Nov-14	0.2462	0.0011
MUSSD, Sri Lanka	MUSSD, SL	261.9	588.3	mV	13-Dec-14		
JNMI, Jordan	JNMI	119.2	70.0	mV	30-Jan-15		
SCL, Hong Kong	SCL, HK	209.2	40.0	mV	08-Mar-15		
			Σ			0.4922	0.0026
	x_w	189.9				u_w	19.6

Table 7.1.17.c.iii Loop C Reference Value for AC Voltage 700V, 40Hz with drift corrected

AC VOLTAGE: 700V 1kHz - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	112.000	32.500	mV	27-May-11	0
NMI, Australia	NMIA	115.000	33.000	mV	22-Jun-11	26
NMI, South Africa	NMISA	113.000	32.900	mV	07-Aug-11	72
ESLMASM, Mongolia	MASM	99.000	55.000	mV	18-Sep-11	114
NPL, India	NPLI	110.000	32.500	mV	20-Nov-11	177
NIM, Thailand	NIMT	82.600	29.400	mV	27-Jan-12	245
SCL, Hong Kong	SCLHK	115.000	30.000	mV	19-Mar-12	297
NML, Malaysia	NMLMY	91.000	48.000	mV	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	128.000	667.000	mV	30-Jun-12	400

Table 7.1.18.a.i. Loop A AC Voltage 700V, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	2.000	Uncertainty of Drift	1.2

Table 7.1.18.a.ii Loop A AC Voltage 700V, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 700V 1kHz RV	*Ref Val*	104.4	15.3	mV			
[R]NMI, Australia	NMIA	115.3	33.0	mV	22-Jun-11	0.1059	0.0009
[R]NMI, South Africa	NMISA	113.8	32.9	mV	07-Aug-11	0.1051	0.0009
[R]NPL, India	NPLI	112.0	32.5	mV	23-Aug-11	0.1060	0.0009
ESLMASM, Mongolia	MASM	100.3	55.0	mV	18-Sep-11		
[R]NIM, Thailand	NIMT	85.4	29.4	mV	27-Jan-12	0.0988	0.0012
SCL, Hong Kong	SCLHK	118.4	30.0	mV	19-Mar-12		
[R]NML, Malaysia	NMLMY	95.0	48.0	mV	15-May-12	0.0412	0.0004
MUSSD, Sri Lanka	MUSSDSL	132.5	667.0	mV	30-Jun-12		
			Σ			0.4571	0.0044
	x_w (μV)	104.4				u_w (μV)	15.1

Table 7.1.18.a.iii Loop A Reference Value for AC Voltage 700V, 1kHz with drift corrected

AC VOLTAGE: 700V 1kHz - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	501.000	22.000	mV	22-May-11	-76
NPL, India	NPLI	490.000	24.000	mV	06-Aug-11	0
VMI, Vietnam	VMI	592.010	69.300	mV	20-Oct-11	75
NML, Philippines	NMLPH	603.000	55.000	mV	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	680.000	86.000	mV	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	658.000	63.000	mV	15-Mar-12	222
NPL, India	NPLI	512.400	24.000	mV	25-May-12	293
KIM, Kazakhstan	KIM	-671.000	259.093	mV	06-Aug-12	366
NIS, Egypt	NIS	650.000	580.000	mV	27-Oct-12	448
NSCL, Syria	NSCL	796.000	41.000	mV	05-Jan-13	518
JNMI, Jordan	JNMI	784.000	60.000	mV	24-Feb-13	568

Table 7.1.18.b.i Loop B AC Voltage 700V 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-22.4	Uncertainty of Drift	12.9

Table 7.1.18.b.ii Loop B AC Voltage 700V, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 700V 1kHz RV	*Ref Val*	499.1	30.5	mV			
[R]NMI, Australia	NMIA	506.8	22.0	mV	22-May-11	1.0471	0.0021
VMI, Vietnam	VMI	586.3	69.3	mV	20-Oct-11		
NML, Philippines	NMLPH	595.2	55.0	mV	16-Nov-11		
[R]NPL, India	NPLI	490.0	24.0	mV	30-Dec-11	0.8507	0.0017
NISIT, Papua New Guinea	NISIT	665.8	86.0	mV	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	641.0	63.0	mV	15-Mar-12		
KIM, Kazakhstan	KIM	-699.0	259.1	mV	06-Aug-12		
NIS, Egypt	NIS	615.8	580.0	mV	27-Oct-12		
NSCL, Syria	NSCL	756.4	41.0	mV	05-Jan-13		
JNMI, Jordan	JNMI	740.6	60.0	mV	24-Feb-13		
			Σ			1.8978	0.0038
	x_w (µV)	499.1				u_w (µV)	16.2

Table 7.1.18.b.iii Loop B Reference Value for AC Voltage 700V, 1kHz with drift corrected

AC VOLTAGE: 700V 1kHz - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	139.00	25.000	mV	25-May-14	0
NPL, India	NPLI	175.000	41.000	mV	11-Aug-14	78
NMC, Singapore	NMC, SG	221.00	29.000	mV	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	319.30	666.500	mV	13-Dec-14	202
JNMI, Jordan	JNMI	146.00	70.000	mV	30-Jan-15	250
SCL, Hong Kong	SCL, HK	239.00	30.000	mV	08-Mar-15	287
NMI, Australia	NMIA	196.00	48.000	mV	15-Apr-15	325

Table 7.1.18.c.i Loop C AC Voltage 700V, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-57.0	Drift Uncertainty	32.9

Table 7.1.18.c.ii Loop C AC Voltage 700V, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 700V 1kHz RV	*Ref Val*	169.6	68.8	mV			
[R]NPL, India	NPLI	161.3	41.0	mV	11-Aug-14	0.0960	0.0006
[R]NMI, Australia	NMIA	139.0	38.3	mV	03-Nov-14	0.0949	0.0007
[R]NMC, Singapore	NMC, SG	191.4	29.0	mV	10-Nov-14	0.2275	0.0012
MUSSD, Sri Lanka	MUSSD, SL	283.9	666.5	mV	13-Dec-14		
JNMI, Jordan	JNMI	102.2	70.0	mV	30-Jan-15		
SCL, Hong Kong	SCL, HK	188.7	30.0	mV	08-Mar-15		
			Σ			0.4184	0.0025
	x_w	169.6				u_w	20.1

Table 7.1.18.c.iiiLoop C Reference Value for AC Voltage 700V, 1kHz with drift corrected

AC CURRENT: 10mA 40Hz - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	15.400	0.960	µA	27-May-11	0
NMI, Australia	NMIA	16.230	0.620	µA	22-Jun-11	26
NMI, South Africa	NMISA	14.630	2.170	µA	07-Aug-11	72
ESLMASM, Mongolia	MASM	15.000	0.900	µA	18-Sep-11	114
NPL, India	NPLI	14.850	0.960	µA	20-Nov-11	177
NIM, Thailand	NIMT	8.860	0.850	µA	27-Jan-12	245
SCL, Hong Kong	SCLHK	9.210	0.600	µA	19-Mar-12	297
NML, Malaysia	NMLMY	9.090	2.480	µA	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	9.100	24.330	µA	30-Jun-12	400

Table 7.1.19.a.i Loop A AC Current 10mA, 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	0.6	Uncertainty of Drift	0.3

Table 7.1.19.a.ii Loop A AC Current 10mA, 40Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 10mA 40Hz RV	*Ref Val*	14.3	0.8	µA			
[R]NMI, Australia	NMIA	16.3	0.6	µA	22-Jun-11	42.4318	2.6015
[R]NMI, South Africa	NMISA	14.9	2.2	µA	07-Aug-11	3.1544	0.2124
[R]NPL, India	NPLI	15.4	1.0	µA	23-Aug-11	16.7101	1.0851
ESLMASM, Mongolia	MASM	15.4	0.9	µA	18-Sep-11		
[R]NIM, Thailand	NIMT	9.6	0.9	µA	27-Jan-12	13.3167	1.3841
SCL, Hong Kong	SCLHK	10.1	0.6	µA	19-Mar-12		
[R]NML, Malaysia	NMLMY	10.2	2.5	µA	15-May-12		
MUSSD, Sri Lanka	MUSSDSL	10.3	24.3	µA	30-Jun-12		
			Σ			75.6130	5.2830
	x_w (µV)	14.3				u_w (µV)	0.4

Table 7.1.19.a.iii Loop A Reference Value for AC Current 10mA, 40Hz with drift corrected

AC CURRENT: 10mA 40Hz - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	-0.010	0.720	µA	22-May-11	-76
NPL, India	NPLI	0.070	0.800	µA	06-Aug-11	0
VMI, Vietnam	VMI	-2.366	1.960	µA	20-Oct-11	75
NML, Philippines	NMLPH	0.650	1.300	µA	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	0.970	2.420	µA	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	0.230	2.160	µA	15-Mar-12	222
NPL, India	NPLI	0.430	0.800	µA	25-May-12	293
KIM, Kazakhstan	KIM	4.700	22.000	µA	06-Aug-12	366
NIS, Egypt	NIS	0.240	21.000	µA	27-Oct-12	448
NSCL, Syria	NSCL	1.810	1.420	µA	05-Jan-13	518
JNMI, Jordan	JNMI	0.100	3.800	µA	24-Feb-13	568

Table 7.1.19.b.i.a Loop B AC Current 10mA 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-0.4	Uncertainty of Drift	0.2

Table 7.1.19.b.i.b Loop B AC Current 10mA, 40Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 10mA 40Hz RV	*Ref Val*	0.1	0.7	µA			
[R]NMI, Australia	NMIA	0.1	0.7	µA	22-May-11	0.1608	1.9290
VMI, Vietnam	VMI	-2.5	2.0	µA	20-Oct-11		
NML, Philippines	NMLPH	0.5	1.3	µA	16-Nov-11		
[R]NPL, India	NPLI	0.1	0.8	µA	30-Dec-11	0.1094	1.5625
NISIT, Papua New Guinea	NISIT	0.7	2.4	µA	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	0.0	2.2	µA	15-Mar-12		
KIM, Kazakhstan	KIM	4.3	22.0	µA	06-Aug-12		
NIS, Egypt	NIS	-0.3	21.0	µA	27-Oct-12		
NSCL, Syria	NSCL	1.2	1.4	µA	05-Jan-13		
JNMI, Jordan	JNMI	-0.6	3.8	µA	24-Feb-13		
			Σ			0.2702	3.4915
	x_w (µV)	0.1				u_w (µV)	0.5

Table 7.1.19.b.i.c Loop B Reference Value for AC Current 10mA, 40Hz with drift corrected

AC CURRENT: 10mA 40Hz - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
RNMI, Australia	NMIA	1.37	0.630	µA	25-May-14	0
NPL, India	NPLI	1.620	2.210	µA	11-Aug-14	78
NMC, Singapore	NMC, SG	2.05	0.570	µA	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	2.03	24.340	µA	13-Dec-14	202
JNMI, Jordan	JNMI	1.00	4.900	µA	30-Jan-15	250
SCL, Hong Kong	SCL, HK	2.33	0.600	µA	08-Mar-15	287
NMI, Australia	NMIA	1.63	0.480	µA	15-Apr-15	325

Table 7.1.19.c.i Loop C AC Current 10mA, 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-0.3	Drift Uncertainty	0.2

Table 7.1.19.c.ii Loop C AC Current 10mA, 40Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 10mA 40Hz RV	*Ref Val*	1.6	0.5	µA			
[R]NPL, India	NPLI	1.6	2.2	µA	11-Aug-14	0.3189	0.2047
[R]NMI, Australia	NMIA	1.4	0.6	µA	03-Nov-14	4.3679	3.1883
[R]NMC, Singapore	NMC, SG	1.9	0.6	µA	10-Nov-14	5.8935	3.0779
MUSSD, Sri Lanka	MUSSD, SL	1.9	24.3	µA	13-Dec-14		
JNMI, Jordan	JNMI	0.8	4.9	µA	30-Jan-15		
SCL, Hong Kong	SCL, HK	2.1	0.6	µA	08-Mar-15		
			Σ			10.5803	6.4709
	x_w	1.6				u_w	0.4

Table 7.1.19.c.iii Loop C Reference Value for AC Current 10mA, 40Hz with drift corrected

AC CURRENT: 10mA 1kHz - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	16.300	0.680	µA	27-May-11	0
NMI, Australia	NMIA	16.020	0.470	µA	22-Jun-11	26
NMI, South Africa	NMISA	14.380	1.910	µA	07-Aug-11	72
ESLMASM, Mongolia	MASM	14.000	1.400	µA	18-Sep-11	114
NPL, India	NPLI	15.800	0.680	µA	20-Nov-11	177
NIM, Thailand	NIMT	9.025	0.850	µA	27-Jan-12	245
SCL, Hong Kong	SCLHK	9.140	0.600	µA	19-Mar-12	297
NML, Malaysia	NMLMY	8.820	2.460	µA	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	8.820	24.300	µA	30-Jun-12	400

Table 7.1.20.a.i Loop A AC Current 10mA, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	0.5	Uncertainty of Drift	0.3

Table 7.1.20.a.ii Loop A AC Current 10mA, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 10mA 1kHz RV	*Ref Val*	15.0	0.7	µA			
[R]NMI, Australia	NMIA	16.1	0.5	µA	22-Jun-11	72.8540	4.5269
[R]NMI, South Africa	NMISA	14.6	1.9	µA	07-Aug-11	3.9975	0.2741
[R]NPL, India	NPLI	16.3	0.7	µA	23-Aug-11	35.2509	2.1626
ESLMASM, Mongolia	MASM	14.3	1.4	µA	18-Sep-11		
[R]NIM, Thailand	NIMT	9.7	0.9	µA	27-Jan-12	13.4493	1.3841
SCL, Hong Kong	SCLHK	10.0	0.6	µA	19-Mar-12		
[R]NML, Malaysia	NMLMY	9.8	2.5	µA	15-May-12		
MUSSD, Sri Lanka	MUSSDSL	9.9	24.3	µA	30-Jun-12		
			Σ			125.5516	8.3478
	x_w (µV)	15.0				u_w (µV)	0.3

Table 7.1.20.a.iii Loop A Reference Value for AC Current 10mA, 1kHz with drift corrected

AC CURRENT: 10mA 1kHz - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	-0.420	0.500	µA	22-May-11	-76
NPL, India	NPLI	0.260	0.700	µA	06-Aug-11	0
VMI, Vietnam	VMI	-0.616	1.620	µA	20-Oct-11	75
NML, Philippines	NMLPH	0.530	1.700	µA	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	0.660	2.520	µA	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	0.200	2.000	µA	15-Mar-12	222
NPL, India	NPLI	0.130	0.800	µA	25-May-12	293
KIM, Kazakhstan	KIM	2.190	22.000	µA	06-Aug-12	366
NIS, Egypt	NIS	-0.010	21.000	µA	27-Oct-12	448
NSCL, Syria	NSCL	1.360	1.370	µA	05-Jan-13	518
JNMI, Jordan	JNMI	-0.130	3.800	µA	24-Feb-13	568

Table 7.1.20.b.i Loop B AC Current 10mA, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	0.1	Uncertainty of Drift	0.1

Table 7.1.20.b.ii Loop B AC Current 10mA, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 10mA 1kHz RV	*Ref Val*	-0.2	0.4	µA			
[R]NMI, Australia	NMIA	-0.5	0.5	µA	22-May-11	-1.8149	4.0000
VMI, Vietnam	VMI	-0.6	1.6	µA	20-Oct-11		
NML, Philippines	NMLPH	0.6	1.7	µA	16-Nov-11		
[R]NPL, India	NPLI	0.3	0.8	µA	30-Dec-11	0.4602	1.7699
NISIT, Papua New Guinea	NISIT	0.7	2.5	µA	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	0.3	2.0	µA	15-Mar-12		
KIM, Kazakhstan	KIM	2.4	22.0	µA	06-Aug-12		
NIS, Egypt	NIS	0.2	21.0	µA	27-Oct-12		
NSCL, Syria	NSCL	1.6	1.4	µA	05-Jan-13		
JNMI, Jordan	JNMI	0.1	3.8	µA	24-Feb-13		
			Σ			-1.3547	5.7699
	x_w (µV)	-0.2				u_w (µV)	0.4

Table 7.1.20.b.iii Loop B Reference Value for AC Current 10mA, 1kHz with drift corrected

AC CURRENT: 10mA 1kHz - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
RNMI, Australia	NMIA	1.09	0.170	µA	25-May-14	0
NPL, India	NPLI	2.810	1.420	µA	11-Aug-14	78
NMC, Singapore	NMC, SG	1.69	0.570	µA	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	1.90	24.311	µA	13-Dec-14	202
JNMI, Jordan	JNMI	0.70	4.900	µA	30-Jan-15	250
SCL, Hong Kong	SCL, HK	1.93	0.700	µA	08-Mar-15	287
NMI, Australia	NMIA	1.21	0.720	µA	15-Apr-15	325

Table 7.1.20.c.i Loop C AC Current 10mA, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-0.1	Drift Uncertainty	0.1

Table 7.1.20.c.ii Loop A AC Current 10mA, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 10mA 1kHz RV	*Ref Val*	1.4	0.4	µA			
[R]NPL, India	NPLI	2.8	1.4	µA	11-Aug-14	1.3793	0.4959
[R]NMI, Australia	NMIA	1.1	0.5	µA	03-Nov-14	3.9832	3.6543
[R]NMC, Singapore	NMC, SG	1.6	0.6	µA	10-Nov-14	5.0095	3.0779
MUSSD, Sri Lanka	MUSSD, SL	1.8	24.3	µA	13-Dec-14		
JNMI, Jordan	JNMI	0.6	4.9	µA	30-Jan-15		
SCL, Hong Kong	SCL, HK	1.8	0.7	µA	08-Mar-15		
			Σ			10.3720	7.2281
	x_w	1.4				u_w	0.4

Table 7.1.20.c.iii Loop A Reference Value for AC Current 10mA, 1kHz with drift corrected

AC CURRENT: 1A 40Hz - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	73.000	48.600	µA	27-May-11	0
NMI, Australia	NMIA	68.000	39.000	µA	22-Jun-11	26
NMI, South Africa	NMISA	12.000	312.000	µA	07-Aug-11	72
ESLMASM, Mongolia	MASM	-26.000	200.000	µA	18-Sep-11	114
NPL, India	NPLI	71.000	48.000	µA	20-Nov-11	177
NIM, Thailand	NIMT	-73.800	85.000	µA	27-Jan-12	245
SCL, Hong Kong	SCLHK	-140.000	100.000	µA	19-Mar-12	297
NML, Malaysia	NMLMY	-147.000	340.000	µA	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	-257.000	1650.000	µA	30-Jun-12	400

Table 7.1.21.a.i Loop A AC Current 1A, 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	2.0	Uncertainty of Drift	1.2

Table 7.1.21.a.ii Loop A AC Current 1A, 40Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 1A 40Hz RV	*Ref Val*	53.8	28.6	µA			
[R]NMI, Australia	NMIA	68.3	39.0	µA	22-Jun-11	0.0449	0.0007
[R]NMI, South Africa	NMISA	12.8	312.0	µA	07-Aug-11	0.0001	0.0000
[R]NPL, India	NPLI	73.0	48.3	µA	23-Aug-11	0.0313	0.0004
ESLMASM, Mongolia	MASM	-24.7	200.0	µA	18-Sep-11		
[R]NIM, Thailand	NIMT	-71.0	85.0	µA	27-Jan-12	-0.0098	0.0001
SCL, Hong Kong	SCLHK	-136.6	100.0	µA	19-Mar-12		
[R]NML, Malaysia	NMLMY	-143.0	340.0	µA	15-May-12		
MUSSD, Sri Lanka	MUSSDSL	-252.5	1650.0	µA	30-Jun-12		
			Σ			0.0665	0.0012
	x_w (µV)	53.8				u_w (µV)	28.5

Table 7.1.21.a.iii Loop A Reference Value for AC Current 1A, 40Hz with drift corrected

AC CURRENT: 1A 40Hz - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	116.000	39.000	µA	22-May-11	-76
NPL, India	NPLI	95.000	53.000	µA	06-Aug-11	0
VMI, Vietnam	VMI	-157.600	309.000	µA	20-Oct-11	75
NML, Philippines	NMLPH	14.000	240.000	µA	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	36.000	266.000	µA	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	70.000	850.000	µA	15-Mar-12	222
NPL, India	NPLI	113.000	56.000	µA	25-May-12	293
KIM, Kazakhstan	KIM	94.000	1720.000	µA	06-Aug-12	366
NIS, Egypt	NIS	92.000	1400.000	µA	27-Oct-12	448
NSCL, Syria	NSCL	99.000	142.000	µA	05-Jan-13	518
JNMI, Jordan	JNMI	-7.000	304.000	µA	24-Feb-13	568

Table 7.1.21.b.i Loop B AC Current 1A 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-18.0	Uncertainty of Drift	10.4

Table 7.1.21.b.ii Loop B AC Current 1A, 40Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 1A 40Hz RV	*Ref Val*	112.0	37.9	µA			
[R]NMI, Australia	NMIA	120.7	39.0	µA	22-May-11	0.0793	0.0007
VMI, Vietnam	VMI	-162.2	309.0	µA	20-Oct-11		
NML, Philippines	NMLPH	7.7	240.0	µA	16-Nov-11		
[R]NPL, India	NPLI	95.0	54.5	µA	30-Dec-11	0.0320	0.0003
NISIT, Papua New Guinea	NISIT	24.6	266.0	µA	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	56.4	850.0	µA	15-Mar-12		
KIM, Kazakhstan	KIM	71.5	1720.0	µA	06-Aug-12		
NIS, Egypt	NIS	64.5	1400.0	µA	27-Oct-12		
NSCL, Syria	NSCL	67.2	142.0	µA	05-Jan-13		
JNMI, Jordan	JNMI	-41.9	304.0	µA	24-Feb-13		
			Σ			0.1113	0.0010
	x_w (µV)	112.0				u_w (µV)	31.7

Table 7.1.21.b.iii Loop B Reference Value for AC Current 1A, 40Hz with drift corrected

AC CURRENT: 1A 40Hz - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NMI, Australia	NMIA	138.00	19.000	µA	25-May-14	0
[R]NPL, India	NPLI	119.000	37.000	µA	11-Aug-14	78
NMC, Singapore	NMC, SG	183.00	120.000	µA	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	200.40	1649.000	µA	13-Dec-14	202
JNMI, Jordan	JNMI	67.00	410.000	µA	30-Jan-15	250
SCL, Hong Kong	SCL, HK	130.00	50.000	µA	08-Mar-15	287
[R]NMI, Australia	NMIA	103.00	36.000	µA	15-Apr-15	325

Table 7.1.21.c.i Loop C AC Current 1A, 40Hz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	35.0	Drift Uncertainty	20.2

Table 7.1.21.c.ii Loop C AC Current 1A, 40Hz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 1A 40Hz RV	*Ref Val*	136.3	46.2	µA			
[R]NPL, India	NPLI	127.4	37.0	µA	11-Aug-14	0.0931	0.0007
[R]NMI, Australia	NMIA	138.0	28.8	µA	03-Nov-14	0.1666	0.0012
[R]NMC, Singapore	NMC, SG	201.2	120.0	µA	10-Nov-14	0.0140	0.0001
MUSSD, Sri Lanka	MUSSD, SL	222.2	1649.0	µA	13-Dec-14		
JNMI, Jordan	JNMI	93.9	410.0	µA	30-Jan-15		
SCL, Hong Kong	SCL, HK	160.9	50.0	µA	08-Mar-15		
			Σ			0.2736	0.0020
	x_w	136.3				u_w	22.3

Table 7.1.21.c.iii Loop C Reference Value for AC Current 1A, 40Hz with drift corrected

AC CURRENT: 1A 1kHz - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	18.000	60.000	µA	27-May-11	0
NMI, Australia	NMIA	9.000	33.000	µA	22-Jun-11	26
NMI, South Africa	NMISA	-39.000	307.000	µA	07-Aug-11	72
ESLMASM, Mongolia	MASM	-93.000	270.000	µA	18-Sep-11	114
NPL, India	NPLI	12.000	60.000	µA	20-Nov-11	177
NIM, Thailand	NIMT	-80.500	85.000	µA	27-Jan-12	245
SCL, Hong Kong	SCLHK	-160.000	100.000	µA	19-Mar-12	297
NML, Malaysia	NMLMY	-188.000	340.000	µA	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	-347.000	1650.000	µA	30-Jun-12	400

Table 7.1.22.a.i Loop AAC Current 1A, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	6.0	Uncertainty of Drift	3.5

Table 7.1.22.a.ii Loop A AC Current 1A, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 1A 1kHz RV	Ref Val	2.7	28.1	µA			
[R]NMI, Australia	NMIA	9.9	33.0	µA	22-Jun-11	0.0091	0.0009
[R]NMI, South Africa	NMISA	-36.6	307.0	µA	07-Aug-11	-0.0004	0.0000
[R]NPL, India	NPLI	18.0	60.0	µA	23-Aug-11	0.0050	0.0003
ESLMASM, Mongolia	MASM	-89.1	270.0	µA	18-Sep-11		
[R]NIM, Thailand	NIMT	-72.2	85.0	µA	27-Jan-12	-0.0100	0.0001
SCL, Hong Kong	SCLHK	-149.9	100.0	µA	19-Mar-12		
[R]NML, Malaysia	NMLMY	-176.0	340.0	µA	15-May-12		
MUSSD, Sri Lanka	MUSSDSL	-333.4	1650.0	µA	30-Jun-12		
			Σ			0.0037	0.0013
	x_w (µV)	2.7				u_w (µV)	27.3

Table 7.1.22.a.iii Loop A Reference Value for AC Current 1A, 1kHz with drift corrected

AC CURRENT: 1A 1kHz - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	65.000	41.000	µA	22-May-11	-76
NPL, India	NPLI	74.000	50.000	µA	06-Aug-11	0
VMI, Vietnam	VMI	-16.600	308.000	µA	20-Oct-11	75
NML, Philippines	NMLPH	-17.000	180.000	µA	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	205.000	267.000	µA	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	30.000	850.000	µA	15-Mar-12	222
NPL, India	NPLI	47.000	60.000	µA	25-May-12	293
KIM, Kazakhstan	KIM	143.000	4216.000	µA	06-Aug-12	366
NIS, Egypt	NIS	-16.000	1500.000	µA	27-Oct-12	448
NSCL, Syria	NSCL	371.000	137.000	µA	05-Jan-13	518
JNMI, Jordan	JNMI	-0.113	305.000	µA	24-Feb-13	568

Table 7.1.22.b.i Loop B AC Current 1A, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	27.000	Uncertainty of Drift	15.6

Table 7.1.22.b.ii Loop B AC Current 1A, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 1A 1kHz RV	*Ref Val*	63.7	45.3	µA			
[R]NMI, Australia	NMIA	58.0	41.0	µA	22-May-11	0.0345	0.0006
VMI, Vietnam	VMI	-9.7	308.0	µA	20-Oct-11		
NML, Philippines	NMLPH	-7.6	180.0	µA	16-Nov-11		
[R]NPL, India	NPLI	74.0	55.2	µA	30-Dec-11	0.0243	0.0003
NISIT, Papua New Guinea	NISIT	222.1	267.0	µA	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	50.5	850.0	µA	15-Mar-12		
KIM, Kazakhstan	KIM	176.7	4216.0	µA	06-Aug-12		
NIS, Egypt	NIS	25.3	1500.0	µA	27-Oct-12		
NSCL, Syria	NSCL	418.7	137.0	µA	05-Jan-13		
JNMI, Jordan	JNMI	52.2	305.0	µA	24-Feb-13		
			Σ			0.0588	0.0009
	x_w (µV)	63.7				u_w (µV)	32.9

Table 7.1.22.b.iii Loop B Reference Value for AC Current 1A, 1kHz with drift corrected

AC CURRENT: 1A 1kHz - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	102.00	13.000	µA	25-May-14	0
NPL, India	NPLI	100.000	34.000	µA	11-Aug-14	78
NMC, Singapore	NMC, SG	142.00	120.000	µA	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	170.40	1649.000	µA	13-Dec-14	202
JNMI, Jordan	JNMI	100.00	410.000	µA	30-Jan-15	250
SCL, Hong Kong	SCL, HK	90.00	50.000	µA	08-Mar-15	287
NMI, Australia	NMIA	57.00	47.000	µA	15-Apr-15	325

Table 7.1.22.c.i Loop C AC Current 1A, 1kHz results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	45	**Drift Uncertainty**	26.0

Table 7.1.22.c.ii Loop C AC Current 1A, 1kHz Artefact Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 1A 1kHz RV	*Ref Val*	108.8	57.1	µA			
^{R}NPL, India	NPLI	110.8	34.0	µA	11-Aug-14	0.0958	0.0009
^{R}NMI, Australia	NMIA	102.0	34.5	µA	03-Nov-14	0.0858	0.0008
^{R}NMC, Singapore	NMC, SG	165.4	120.0	µA	10-Nov-14	0.0115	0.0001
MUSSD, Sri Lanka	MUSSD, SL	198.4	1649.0	µA	13-Dec-14		
JNMI, Jordan	JNMI	134.6	410.0	µA	30-Jan-15		
SCL, Hong Kong	SCL, HK	129.7	50.0	µA	08-Mar-15		
			Σ			0.1931	0.0018
	x_w	108.8				u_w	23.7

Table 7.1.22.c.iii Loop C Reference Value for AC Current 1A, 1kHz with drift corrected

RESISTANCE: 100Ω - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NPL, India	NPLI	1.660	2.980	mΩ	27-May-11	0
[R]NMI, Australia	NMIA	-2.200	0.700	mΩ	22-Jun-11	26
[R]NMI, South Africa	NMISA	1.000	2.000	mΩ	07-Aug-11	72
ESLMASM, Mongolia	MASM	-0.600	1.200	mΩ	18-Sep-11	114
[R]NPL, India	NPLI	0.586	3.016	mΩ	20-Nov-11	177
[R]NIM, Thailand	NIMT	1.960	0.380	mΩ	27-Jan-12	245
SCL, Hong Kong	SCLHK	0.900	2.900	mΩ	19-Mar-12	297
[R]NML, Malaysia	NMLMY	1.400	1.000	mΩ	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	0.700	13.900	mΩ	30-Jun-12	400

Table 7.1.23.a.i Loop A Resistance 100Ω results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	1.1	Uncertainty of Drift	0.6

Table 7.1.23.a.ii Loop A Resistance 100Ω Uncertainty of Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 100Ω RV	*Ref Val*	3.4	1.3	mΩ			
[R]NMI, Australia	NMIA	-2.0	0.7	mΩ	22-Jun-11		
[R]NMI, South Africa	NMISA	1.4	2.0	mΩ	07-Aug-11	0.3592	0.2500
[R]NPL, India	NPLI	1.7	3.0	mΩ	23-Aug-11	0.1847	0.1113
ESLMASM, Mongolia	MASM	0.1	1.2	mΩ	18-Sep-11		
[R]NIM, Thailand	NIMT	3.4	0.4	mΩ	27-Jan-12	23.8685	6.9252
SCL, Hong Kong	SCLHK	2.7	2.9	mΩ	19-Mar-12		
[R]NML, Malaysia	NMLMY	3.5	1.0	mΩ	15-May-12		
MUSSD, Sri Lanka	MUSSDSL	3.1	13.9	mΩ	30-Jun-12		
			Σ			24.4124	7.2865
	x_w (μV)	3.4				u_w (μV)	0.4

Table 7.1.23.a.iii Loop A Reference Value for Resistance 100Ω with drift corrected

RESISTANCE: 100Ω - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NMI, Australia	NMIA	-0.500	0.500	mΩ	22-May-11	-76
[R]NPL, India	NPLI	0.202	2.904	mΩ	06-Aug-11	0
VMI, Vietnam	VMI	1.560	1.900	mΩ	20-Oct-11	75
NML, Philippines	NMLPH	9.000	8.100	mΩ	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	1.400	2.000	mΩ	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	2.100	1.300	mΩ	15-Mar-12	222
[R]NPL, India	NPLI	0.350	2.940	mΩ	25-May-12	293
KIM, Kazakhstan	KIM	0.000	0.000	mΩ	06-Aug-12	366
NIS, Egypt	NIS	1.310	12.000	mΩ	27-Oct-12	448
NSCL, Syria	NSCL	-0.310	0.320	mΩ	05-Jan-13	518
JNMI, Jordan	JNMI	0.300	1.800	mΩ	24-Feb-13	568

Table 7.1.23.b.i Loop B Resistance 100Ω results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-0.148	Uncertainty of Drift	0.1

Table 7.1.23.b.ii Loop B Resistance 100Ω Uncertainty of Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 100Ω RV	*Ref Val*	0.2	2.9	mΩ			
[R]NMI, Australia	NMIA	-0.5	0.5	mΩ	22-May-11		
VMI, Vietnam	VMI	1.5	1.9	mΩ	20-Oct-11		
NML, Philippines	NMLPH	8.9	8.1	mΩ	16-Nov-11		
[R]NPL, India	NPLI	0.2	2.9	mΩ	30-Dec-11	0.0237	0.1171
NISIT, Papua New Guinea	NISIT	1.3	2.0	mΩ	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	2.0	1.3	mΩ	15-Mar-12		
KIM, Kazakhstan	KIM			mΩ	06-Aug-12		
NIS, Egypt	NIS	1.1	12.0	mΩ	27-Oct-12		
NSCL, Syria	NSCL	-0.6	0.3	mΩ	05-Jan-13		
JNMI, Jordan	JNMI	0.0	1.8	mΩ	24-Feb-13		
			Σ			0.0237	0.1171
	x_w (μV)	0.2				u_w (μV)	2.9

Table 7.1.23.b.iii Loop B Reference Value for Resistance 100Ω with drift corrected

RESISTANCE: 100Ω - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	2.63	0.400	mΩ	25-May-14	0
NPL, India	NPLI	8.575	5.837	mΩ	11-Aug-14	78
NMC, Singapore	NMC, SG	3.10	0.300	mΩ	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	2.60	13.900	mΩ	13-Dec-14	202
JNMI, Jordan	JNMI	2.72	2.800	mΩ	30-Jan-15	250
SCL, Hong Kong	SCL, HK	3.20	0.200	mΩ	08-Mar-15	287
NMI, Australia	NMIA	3.23	0.300	mΩ	15-Apr-15	325

Table 7.1.23.c.i Loop C Resistance 100Ω results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-0.6	Drift Uncertainty	0.3

Table 7.1.23.c.ii Loop C Resistance 100Ω Uncertainty of Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 100Ω RV	*Ref Val*	2.7	0.7	mΩ			
^{R}NPL, India	NPLI	8.4	5.8	mΩ	11-Aug-14	0.2475	0.0294
^{R}NMI, Australia	NMIA	2.6	0.4	mΩ	03-Nov-14	21.0400	8.0000
^{R}NMC, Singapore	NMC, SG	2.8	0.3	mΩ	10-Nov-14	30.9778	11.1111
MUSSD, Sri Lanka	MUSSD, SL	2.2	13.9	mΩ	13-Dec-14		
JNMI, Jordan	JNMI	2.3	2.8	mΩ	30-Jan-15		
SCL, Hong Kong	SCL, HK	2.7	0.2	mΩ	08-Mar-15		
			Σ			52.2652	19.1405
	x_w	2.7				u_w	0.2

Table 7.1.23.c.iii Loop C Reference Value for Resistance 100Ω with drift corrected

RESISTANCE: 1kΩ - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	30.560	4.320	mΩ	27-May-11	0
NMI, Australia	NMIA	-28.000	6.000	mΩ	22-Jun-11	26
NMI, South Africa	NMISA	6.000	20.000	mΩ	07-Aug-11	72
ESLMASM, Mongolia	MASM	-5.000	12.000	mΩ	18-Sep-11	114
NPL, India	NPLI	10.772	13.850	mΩ	20-Nov-11	177
NIM, Thailand	NIMT	18.000	2.400	mΩ	27-Jan-12	245
SCL, Hong Kong	SCLHK	3.000	22.000	mΩ	19-Mar-12	297
NML, Malaysia	NMLMY	-5.000	16.000	mΩ	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	0.013	8501.000	mΩ	30-Jun-12	400

Table 7.1.24.a.i.a Loop A Resistance 1kΩ results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	19.8	Uncertainty of Drift	11.4

Table 7.1.24.a.ii Loop A Resistance 1kΩ Uncertainty of Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 1kΩ RV	*Ref Val*	44.2	23.0	mΩ			
[R]NMI, Australia	NMIA	-25.1	6.0	mΩ	22-Jun-11		
[R]NMI, South Africa	NMISA	14.0	20.0	mΩ	07-Aug-11	0.0351	0.0025
[R]NPL, India	NPLI	30.6	10.3	mΩ	23-Aug-11	0.2904	0.0095
ESLMASM, Mongolia	MASM	7.7	12.0	mΩ	18-Sep-11		
[R]NIM, Thailand	NIMT	45.4	2.4	mΩ	27-Jan-12	7.8802	0.1736
SCL, Hong Kong	SCLHK	36.2	22.0	mΩ	19-Mar-12		
[R]NML, Malaysia	NMLMY	34.6	16.0	mΩ	15-May-12		
MUSSD, Sri Lanka	MUSSDSL	44.7	8.5	mΩ	30-Jun-12		
			Σ			8.2057	0.1856
	x_w (μV)	44.2				u_w (μV)	2.3

Table 7.1.24.a.iii Loop A Reference Value for Resistance 1kΩ with drift corrected

RESISTANCE: 1kΩ - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	-5.000	7.000	mΩ	22-May-11	-76
RNPL, India	NPLI	12.940	2.910	mΩ	06-Aug-11	0
VMI, Vietnam	VMI	10.700	18.000	mΩ	20-Oct-11	75
NML, Philippines	NMLPH	22.000	12.000	mΩ	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	-3.000	14.000	mΩ	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	13.000	10.000	mΩ	15-Mar-12	222
RNPL, India	NPLI	16.660	6.690	mΩ	25-May-12	293
KIM, Kazakhstan	KIM	0.000	0.000	mΩ	06-Aug-12	366
NIS, Egypt	NIS	-7.200	90.000	mΩ	27-Oct-12	448
NSCL, Syria	NSCL	8.800	3.600	mΩ	05-Jan-13	518
JNMI, Jordan	JNMI	0.000	10.000	mΩ	24-Feb-13	568

Table 7.1.24.b.iLoop A Resistance 1kΩ results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-3.720	Uncertainty of Drift	2.1

Table 7.1.24.b.iiLoop A Resistance 1kΩ Uncertainty of Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 1kΩ RV	*Ref Val*	12.9	6.7	mΩ			
[R]NMI, Australia	NMIA	-4.0	7.0	mΩ	22-May-11		
VMI, Vietnam	VMI	9.7	18.0	mΩ	20-Oct-11		
NML, Philippines	NMLPH	20.7	12.0	mΩ	16-Nov-11		
[R]NPL, India	NPLI	12.9	5.2	mΩ	30-Dec-11	0.4862	0.0376
NISIT, Papua New Guinea	NISIT	-5.4	14.0	mΩ	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	10.2	10.0	mΩ	15-Mar-12		
KIM, Kazakhstan	KIM			mΩ	06-Aug-12		
NIS, Egypt	NIS	-12.9	90.0	mΩ	27-Oct-12		
NSCL, Syria	NSCL	2.2	3.6	mΩ	05-Jan-13		
JNMI, Jordan	JNMI	-7.2	10.0	mΩ	24-Feb-13		
			Σ			0.4862	0.0376
	x_w (μV)	12.9				u_w (μV)	5.2

Table 7.1.24.b.iii Loop A Reference Value for Resistance 1kΩ with drift corrected

RESISTANCE: 1kΩ - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
NMI, Australia	NMIA	7.50	2.000	mΩ	25-May-14	0
NPL, India	NPLI	27.575	15.200	mΩ	11-Aug-14	78
SCL, Hong Kong	SCL, HK	14.00	1.000	mΩ	08-Mar-15	287
NMC, Singapore	NMC, SG	14.00	2.000	mΩ	10-Nov-14	169
MUSSD, Sri Lanka	MUSSD, SL	8.50	104.300	mΩ	13-Dec-14	202
JNMI, Jordan	JNMI	9.30	15.000	mΩ	30-Jan-15	250
NMI, Australia	NMIA	15.50	2.000	mΩ	15-Apr-15	325

Table 7.1.24.c.i Loop C Resistance 1kΩ results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-8.0	Drift **Uncertainty**	4.6

Table 7.1.24.c.ii Loop C Resistance 1kΩ Uncertainty of Drift

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 1kΩ RV	*Ref Val*	8.8	9.3	mΩ			
^{R}NPL, India	NPLI	25.7	15.2	mΩ	11-Aug-14	0.1110	0.0043
^{R}NMI, Australia	NMIA	7.5	2.0	mΩ	03-Nov-14	1.8750	0.2500
^{R}NMC, Singapore	NMC, SG	9.8	2.0	mΩ	10-Nov-14	2.4600	0.2500
MUSSD, Sri Lanka	MUSSD, SL	3.5	104.3	mΩ	13-Dec-14		
JNMI, Jordan	JNMI	3.1	15.0	mΩ	30-Jan-15		
SCL, Hong Kong	SCL, HK	6.9	1.0	mΩ	08-Mar-15		
			Σ			4.4460	0.5043
	x_w	8.8				u_w	1.4

Table 7.1.24.c.iii Loop C Reference Value for Resistance 1kΩ with drift corrected

RESISTANCE: 10kΩ - LOOP A results

Name		Correction	Uncertainty	Unit	Date	Day
NPL, India	NPLI	187.200	51.860	mΩ	27-May-11	0
NMI, Australia	NMIA	-120.000	30.000	mΩ	22-Jun-11	26
NMI, South Africa	NMISA	40.000	90.000	mΩ	07-Aug-11	72
ESLMASM, Mongolia	MASM	-50.000	84.000	mΩ	18-Sep-11	114
NPL, India	NPLI	41.770	85.990	mΩ	20-Nov-11	177
NIM, Thailand	NIMT	118.000	26.000	mΩ	27-Jan-12	245
SCL, Hong Kong	SCLHK	40.000	130.000	mΩ	19-Mar-12	297
NML, Malaysia	NMLMY	60.000	80.000	mΩ	15-May-12	354
MUSSD, Sri Lanka	MUSSDSL	0.080	8.50	mΩ	30-Jun-12	400

Table 7.1.25.a.i Loop A Resistance 10kΩ results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	145.4	Uncertainty of Drift	84.0

Table 7.1.25.a.ii Loop A Resistance 10kΩ Uncertainty of Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop A 10kΩ RV	*Ref Val*	289.7	169.6	mΩ			
[R]NMI, Australia	NMIA	-98.6	30.0	mΩ	22-Jun-11		
[R]NMI, South Africa	NMISA	99.2	90.0	mΩ	07-Aug-11	0.0122	0.0001
[R]NPL, India	NPLI	187.2	71.0	mΩ	23-Aug-11	0.0371	0.0002
ESLMASM, Mongolia	MASM	43.7	84.0	mΩ	18-Sep-11		
[R]NIM, Thailand	NIMT	319.3	26.0	mΩ	27-Jan-12	0.4723	0.0015
SCL, Hong Kong	SCLHK	284.0	130.0	mΩ	19-Mar-12		
[R]NML, Malaysia	NMLMY	350.9	80.0	mΩ	15-May-12		
MUSSD, Sri Lanka	MUSSDSL	328.7	8.50	mΩ	30-Jun-12		
			Σ			0.5217	0.0018
	x_w (μV)	289.7				u_w (μV)	23.6

Table 7.1.25.a.iii Loop A Reference Value for Resistance 10kΩ with drift corrected

RESISTANCE: 10kΩ - LOOP B results

Name		Correction	Uncertainty	Unit	Date	Day
[R]NMI, Australia	NMIA	-60.000	80.000	mΩ	22-May-11	-76
[R]NPL, India	NPLI	157.400	56.242	mΩ	06-Aug-11	0
VMI, Vietnam	VMI	129.800	89.000	mΩ	20-Oct-11	75
NML, Philippines	NMLPH	220.000	83.000	mΩ	16-Nov-11	102
NISIT, Papua New Guinea	NISIT	-20.000	140.000	mΩ	08-Feb-12	186
KIM-LIPI, Indonesia	KIM-LIPI	150.000	10.000	mΩ	15-Mar-12	222
[R]NPL, India	NPLI	171.000	66.394	mΩ	25-May-12	293
KIM, Kazakhstan	KIM	0.000	0.000	mΩ	06-Aug-12	366
NIS, Egypt	NIS	0.370	900.000	mΩ	27-Oct-12	448
NSCL, Syria	NSCL	119.000	40.000	mΩ	05-Jan-13	518
JNMI, Jordan	JNMI	40.000	90.000	mΩ	24-Feb-13	568

Table 7.1.25.b.i Loop B Resistance 10kΩ results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-13.6	Uncertainty of Drift	7.9

Table 7.1.25.b.ii Loop B Resistance 10kΩ Uncertainty of Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop B 10kΩ RV	*Ref Val*	157.4	63.5	mΩ			
[R]NMI, Australia	NMIA	-56.5	80.0	mΩ	22-May-11		
VMI, Vietnam	VMI	126.3	89.0	mΩ	20-Oct-11		
NML, Philippines	NMLPH	215.3	83.0	mΩ	16-Nov-11		
[R]NPL, India	NPLI	157.4	61.5	mΩ	30-Dec-11	0.0416	0.0003
NISIT, Papua New Guinea	NISIT	-28.6	140.0	mΩ	08-Feb-12		
KIM-LIPI, Indonesia	KIM-LIPI	139.7	10.0	mΩ	15-Mar-12		
KIM, Kazakhstan	KIM			mΩ	06-Aug-12		
NIS, Egypt	NIS	-20.4	900.0	mΩ	27-Oct-12		
NSCL, Syria	NSCL	95.0	40.0	mΩ	05-Jan-13		
JNMI, Jordan	JNMI	13.6	90.0	mΩ	24-Feb-13		
			Σ			0.0416	0.0003
	x_w (μV)	157.4				u_w (μV)	61.5

Table 7.1.25.b.iii Loop B Reference Value for Resistance 10kΩ with drift corrected

RESISTANCE: 10kΩ - LOOP C results

Name		Correction	Uncertainty	Unit	Date	Day
RNMI, Australia	NMIA	61.00	20.000	mΩ	22-May-11	0
NPL, India		0.414	121.176	mΩ	06-Aug-11	78
NMC, Singapore	NMC, SG	120.00	20.000	mΩ	16-Nov-11	169
MUSSD, Sri Lanka	MUSSD, SL	102.00	1042.800	mΩ	08-Feb-12	202
JNMI, Jordan	JNMI	93.00	98.000	mΩ	15-Mar-12	250
SCL, Hong Kong	SCL, HK	120.00	20.000	mΩ	20-Oct-11	287
NMI, Australia	NMIA	131.00	20.000	mΩ	25-May-12	325

Table 7.1.25.c.i Loop C Resistance 10kΩ results uncorrected

Artefact Drift and Uncertainty of Drift, u_{drift}

Artefact Drift	-70.0	Drift Uncertainty	40.4

Table 7.1.25.c.ii Loop C Resistance 10kΩ Uncertainty of Drift

Loop Reference Value (RV)

Name		Correction, x_i	Exp. Unc., u_i	Unit	Date	x_i / u_i^2	$1 / u_i^2$
Loop C 10kΩ RV	*Ref Val*	71.1	82.0	mΩ			
[R]NPL, India	NPLI	-16.4	121.2	mΩ	11-Aug-14	-0.0011	0.0001
[R]NMI, Australia	NMIA	61.0	20.0	mΩ	03-Nov-14	0.1525	0.0025
[R]NMC, Singapore	NMC, SG	83.6	20.0	mΩ	10-Nov-14	0.2090	0.0025
MUSSD, Sri Lanka	MUSSD, SL	58.5	1042.8	mΩ	13-Dec-14		
JNMI, Jordan	JNMI	39.2	98.0	mΩ	30-Jan-15		
SCL, Hong Kong	SCL, HK	58.2	20.0	mΩ	08-Mar-15		
			Σ			0.3604	0.0051
	x_w	71.1				u_w	14.0

Table 7.1.25.c.iii Loop C Reference Value for Resistance 10kΩ with drift corrected

COMBINATION OF RESULTS FROM ALL LOOPS

The results from all the participants of Loop A, Loop B and Loop C have been compiled as plots of correction in measured parameter and the corresponding expanded uncertainty as in Table 7.1.1.a.iii Loop A, Table 7.1.1.b.iii Loop B and Table 7.1.1.c.iii Loop C Reference Value for DC Voltage 100mV with drift corrected using actual measurement dates.

DEVIATION FROM REFERENCE DC VOLTAGE 100mV

To compare the results, the deviation from the loop reference values is used. These are calculated for all participants, and shown here.

Deviation from reference = Participating lab correction – Loop Reference Value

Name		Deviation from reference, d_i(µV)	Exp. Unc., u_i (µV)
[R]NMI, Australia	NMIA	0.3	1.1
[R]NMI, South Africa	NMISA	-0.6	3.0
[R]NPL, India	NPLI	0.3	0.6
ESLMASM, Mongolia	MASM	0.2	1.0
[R]NIM, Thailand	NIMT	-0.3	0.5
SCL, Hong Kong	SCL-HK	-0.6	0.5
[R]NML, Malaysia	NML-MY	-0.5	2.4
MUSSD, Sri Lanka	MUSSD-SL	7.1	7.1

Table 7.2.1.a Loop A Deviation from reference DC Voltage 100mV

Loop A result compared to Loop C result supports the suspicion that the Loop A multimeter suffered damage between Kazakhstan and Egypt.

Name		Deviation from reference, d_i(µV)	Exp. Unc., u_i (µV)
[R]NMI, Australia	NMIA	0.6	1.2
VMI, Vietnam	VMI	0.9	1.3
NML, Philippines	NML-PH	0.1	1.4
[R]NPL, India	NPLI	0.0	0.3
NISIT, Papua New Guinea	NISIT	0.6	0.6
KIM-LIPI, Indonesia	KIM-LIPI	0.9	1.2
KIM, Kazakhstan	KIM	2.0	91.0
NIS, Egypt	NIS	2.6	6.2
NSCL, Syria	NSCL	1.3	1.2
JNMI, Jordan	JNMI	-0.5	6.1

Table 7.2.1.b Loop B Deviation from reference DC Voltage 100mV

Name		Deviation from reference, d_i(µV)	Exp. Unc., u_i (µV)
[R]NPL, India	NPLI	1.0	2.2
SCL, Hong Kong	SCL-HK	0.6	0.7
[R]NMI, Australia	NMIA	0.0	1.3
[R]NMC, Singapore	NMC-SG	-0.1	0.8
MUSSD, Sri Lanka	MUSSD-SL	7.9	7.1
JNMI, Jordan	JNMI	-1.0	7.0

Table 7.2.1.c Loop C Deviation from reference DC Voltage 100mV

DATA USED FOR CORRECTED CHART DC VOLTAGE 100mV

The results for laboratories that participated in more than one loop are evaluated carefully. It is possible that some results be removed, due to suspected damage to one or more of the multimeters. Since the DMM is faulty in Loop B, Data from loop C is being used for Jordan. The Loop C results from Jordan have been used to correct the results of Egypt and Syria.

Data collated corrected for plotting						
Name	**Loop A**		**Loop B**		**Loop C**	
	d_i	u_i	d_i	u_i	d_i	u_i
NMIA	0.3	1.1				
NMISA	-0.6	3.0				
NPLI	0.3	0.6				
MASM	0.2	1.0				
NIMT	-0.3	0.5				
SCL-HK	-0.6	0.5				
NML-MY	-0.5	2.4				
MUSSD-SL	7.1	7.1				
NMIA			0.6	1.2		
VMI			0.9	1.3		
NML-PH			0.1	1.4		
NPLI			0.0	0.3		
NISIT			0.6	0.6		
KIM-LIPI			0.9	1.2		
KIM			2.0	91.0		
NIS			2.1	9.4		
NSCL			0.8	7.1		
NPLI					1.0	2.2
SCL-HK					0.6	0.7
NMIA					0.0	1.3
NMC-SG					-0.1	0.8
MUSSD-SL					7.9	7.1
JNMI					-1.0	7.0

Table 7.2.1.d Data for corrected chart DC Voltage 100 mV

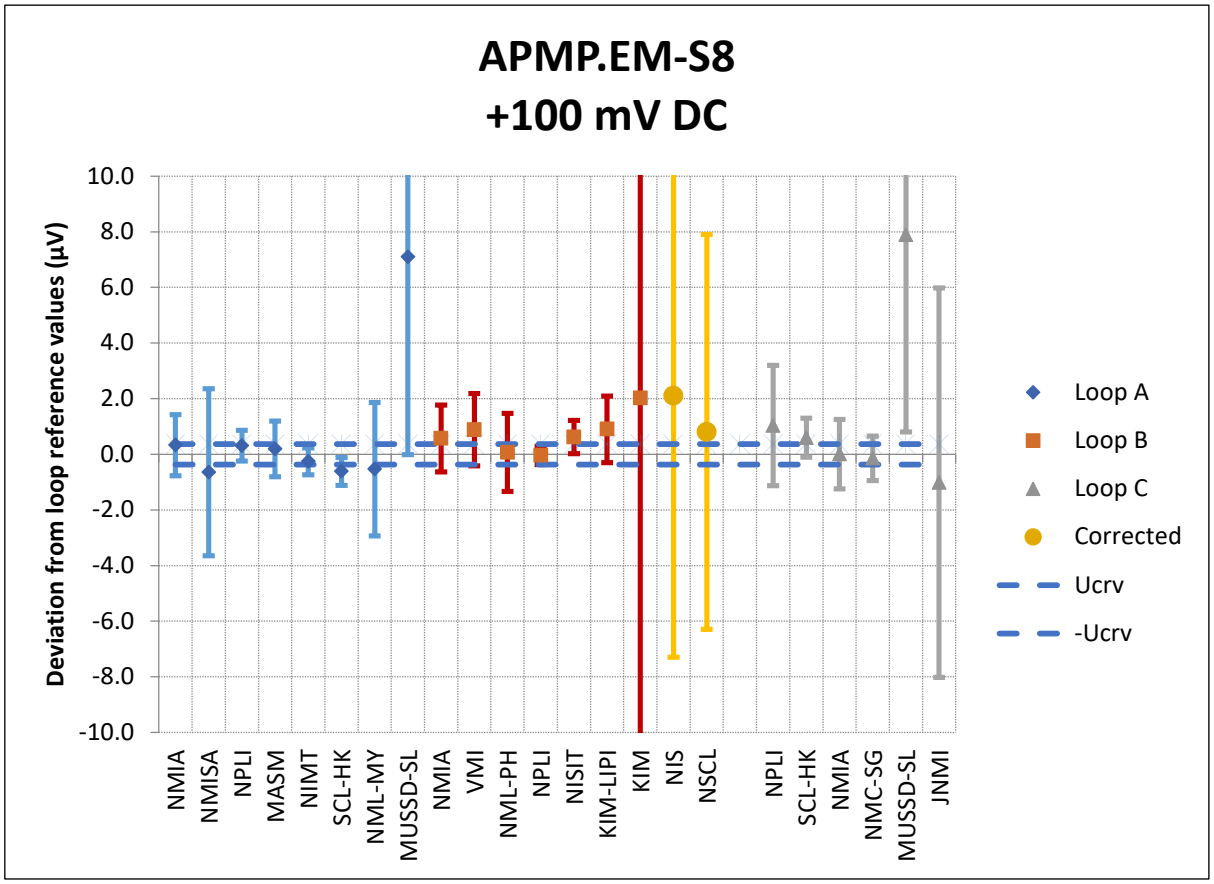

Figure 7.2.1 (Corrected) Comparison Chart for DC Voltage 100mV

COMPARISON REFERENCE VALUE DC VOLTAGE 100mV

The calculations similarly follow the procedure given in the final report on SIM.EM-S5. We now have enough information to calculate the comparison reference value. All the laboratories that contributed to the loop reference values participated in this calculation.

Firstly, obtain a single value for the laboratories that participated more than once. To simplify this calculation, the results for the laboratories that participated more than once is averaged, and combine the uncertainties as if they are statistically independent.

Single value for NMI = Average of Deviation from reference for Loop A, B & C (if applicable)

Uncertainty = Root mean Square of Uncertainty for respected NMI

Name		Deviation from reference, (d_i) µV	Exp. Unc., u_i (µV)
[R]NMI, Australia	NMIA	0.3	1.2
[R]NPL, India	NPLI	0.4	1.3
SCL, Hong Kong	SCL-HK	0.0	0.6
MUSSD, Sri Lanka	MUSSD-SL	7.5	7.1

Table 7.2.1.e Single Value Participated More Than Once DC Voltage 100mV

Laboratories that contributed to the loop reference values

Weight, $(w_i) = 1/(u_i) * \sum 1/(u_i)$

$x_{CRV} = w_i \cdot d_i$ $u_{CRV} = \sqrt{(1 / \sum 1/(u_i)^2)}$

Name		(d_i), µV	(u_i) µV	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	0.3	0.711744	0.0950	0.02860	1.2
[R]NPL, India	NPLI	0.4	0.589383	0.0787	0.03400	1.3
[R]NMI, South Africa	NMISA	-0.6	0.111111	0.0148	-0.00960	3.0
[R]NIM, Thailand	NIMT	-0.3	4.340278	0.5796	-0.14878	0.5
[R]NML, Malaysia	NMLMY	-0.5	0.173611	0.0232	-0.01237	2.4
[R]NMC, Singapore	NMC-SG	-0.1	1.562500	0.2086	-0.02987	0.8
			∑	7.488627	1.0000	-0.13802

x_{CRV} : -0.14 µV

u_{CRV}: 0.37 µV

Table 7.2.1.f Laboratories that contributed to the loop reference values for DC Voltage 100mV

Caution:

The Comparison Reference Value, CRV calculations include data that should probably be excluded.

The uncertainty calculation ignores the covariances in the data set, and probably underestimates the uncertainty. The results for laboratories that participated in more than one loop are evaluated carefully. Since the DMM is faulty in Loop B, Data from loop C is being used for Jordan. The Loop C results from Jordan have been used to correct the results of Egypt and Syria.

Results of Egypt and Syria is corrected from JNMI of Loop B & C

Egypt / Syria = Deviation of JNMI (loop C) + [Deviation of (Egypt/Syria) - Deviation of JNMI (loop B)]

Uncertainty for Egypt/Syria = Uncertainty for Egypt/Syria + Uncertainty of Jordan for Loop C

Degree of Equivalence, DOE = Deviation from reference (d_i) - x_{CRV}

For Laboratories that contributed to the loop reference values

Uncertainty of Degree of Equivalence, $u_{DOE} = \sqrt{((u_i)^2 - u_{CRV}^2)}$

For Others

Uncertainty of Degree of Equivalence, $u_{DOE} = \sqrt{((u_i)^2 + u_{CRV}^2)}$

Name		Deviation from reference, d_i (µV)	Exp. Unc., u_i (µV)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	0.3	1.2	0.4	1.1
[R]NPL, India	NPLI	0.4	1.3	0.6	1.3
[R]NMI, South Africa	NMISA	-0.6	3.0	-0.5	3.0
[R]NIM, Thailand	NIMT	-0.3	0.5	-0.1	0.3
[R]NML, Malaysia	NMLMY	-0.5	2.4	-0.4	2.4
[R]NMC, Singapore	NMC-SG	-0.1	0.8	0.0	0.7
ESLMASM, Mongolia	MASM	0.2	1.0	0.3	1.1
SCL, Hong Kong	SCLHK	0.0	0.6	0.1	0.7
MUSSD, Sri Lanka	MUSSDSL	7.5	7.1	7.6	7.1
VMI, Vietnam	VMI	0.9	1.3	1.0	1.4
NML, Philippines	NML-PH	0.1	1.4	0.2	1.4
NISIT, Papua New Guinea	NISIT	0.6	0.6	0.8	0.7
KIM-LIPI, Indonesia	KIM-LIPI	0.9	1.2	1.0	1.3
KIM, Kazakhstan	KIM	2.0	91.0	2.2	91.0
NIS, Egypt	NIS	2.1	9.4	2.2	9.4
NSCL, Syria	NSCL	0.7	7.1	0.9	7.1
JNMI, Jordan	JNMI	-1.0	7.0	-0.9	7.0

Table 7.2.1.g Degree of Equivalence for DC Voltage 100mV

DEVIATION FROM REFERENCE DC VOLTAGE 1V

Name		Deviation from reference, d_i(μV)	Exp. Unc., u_i (μV)
[R]NMI, Australia	NMIA	2.8	2.4
[R]NMI, South Africa	NMISA	-0.4	2.0
[R]NPL, India	NPLI	9.2	5.0
ESLMASM, Mongolia	MASM	0.5	5.0
[R]NIM, Thailand	NIMT	-2.1	1.7
SCL, Hong Kong	SCL-HK	-4.3	3.0
[R]NML, Malaysia	NML-MY	-2.9	8.0
MUSSD, Sri Lanka	MUSSD-SL	12.9	29.0

Table 7.2.2.a Loop A Deviation from reference DC Voltage 1V

Name		Deviation from reference, d_i(μV)	Exp. Unc., u_i (μV)
[R]NMI, Australia	NMIA	-3.9	4.5
VMI, Vietnam	VMI	-5.1	4.9
NML, Philippines	NML-PH	-2.8	7.3
[R]NPL, India	NPLI	1.5	2.7
NISIT, Papua New Guinea	NISIT	-4.2	3.0
KIM-LIPI, Indonesia	KIM-LIPI	0.0	7.0
KIM, Kazakhstan	KIM	-0.1	10.0
NIS, Egypt	NIS	-2.9	26.0
NSCL, Syria	NSCL	-0.9	2.4
JNMI, Jordan	JNMI	-2.8	10.0

Table 7.2.2.b Loop B Deviation from reference DC Voltage 1V

Name		Deviation from reference, d_i(μV)	Exp. Unc., u_i (μV)
[R]NPL, India	NPLI	0.2	1.4
SCL, Hong Kong	SCL-HK	1.9	1.0
[R]NMI, Australia	NMIA	-1.0	4.9
[R]NMC, Singapore	NMC-SG	-0.4	3.0
MUSSD, Sri Lanka	MUSSD-SL	26.8	29.5
JNMI, Jordan	JNMI	-1.2	15.0

Table 7.2.2.c Loop C Deviation from reference DC Voltage 1V

DATA USED FOR CORRECTED CHART DC VOLTAGE 1V

Data collated corrected for plotting						
Name	**Loop A**		**Loop B**		**Loop C**	
	d_i	u_i	d_i	u_i	d_i	u_i
NMIA	2.8	2.4				
NMISA	-0.4	2.0				
NPLI	9.2	5.0				
MASM	0.5	5.0				
NIMT	-2.1	1.7				
SCL-HK	-4.3	3.0				
NML-MY	-2.9	8.0				
MUSSD-SL	12.9	29.0				
NMIA			-3.9	4.5		
VMI			-5.1	4.9		
NML-PH			-2.8	7.3		
NPLI			1.5	2.7		
NISIT			-4.2	3.0		
KIM-LIPI			0.0	7.0		
KIM			-0.1	10.0		
NIS			-1.3	30.0		
NSCL			0.7	15.2		
-						
NPLI					0.2	1.4
SCL-HK					1.9	1.0
NMIA					-1.0	4.9
NMC-SG					-0.4	3.0
MUSSD-SL					26.8	29.5
JNMI					-1.2	15.0

Table 7.2.2.d Data for corrected chart DC Voltage 1V

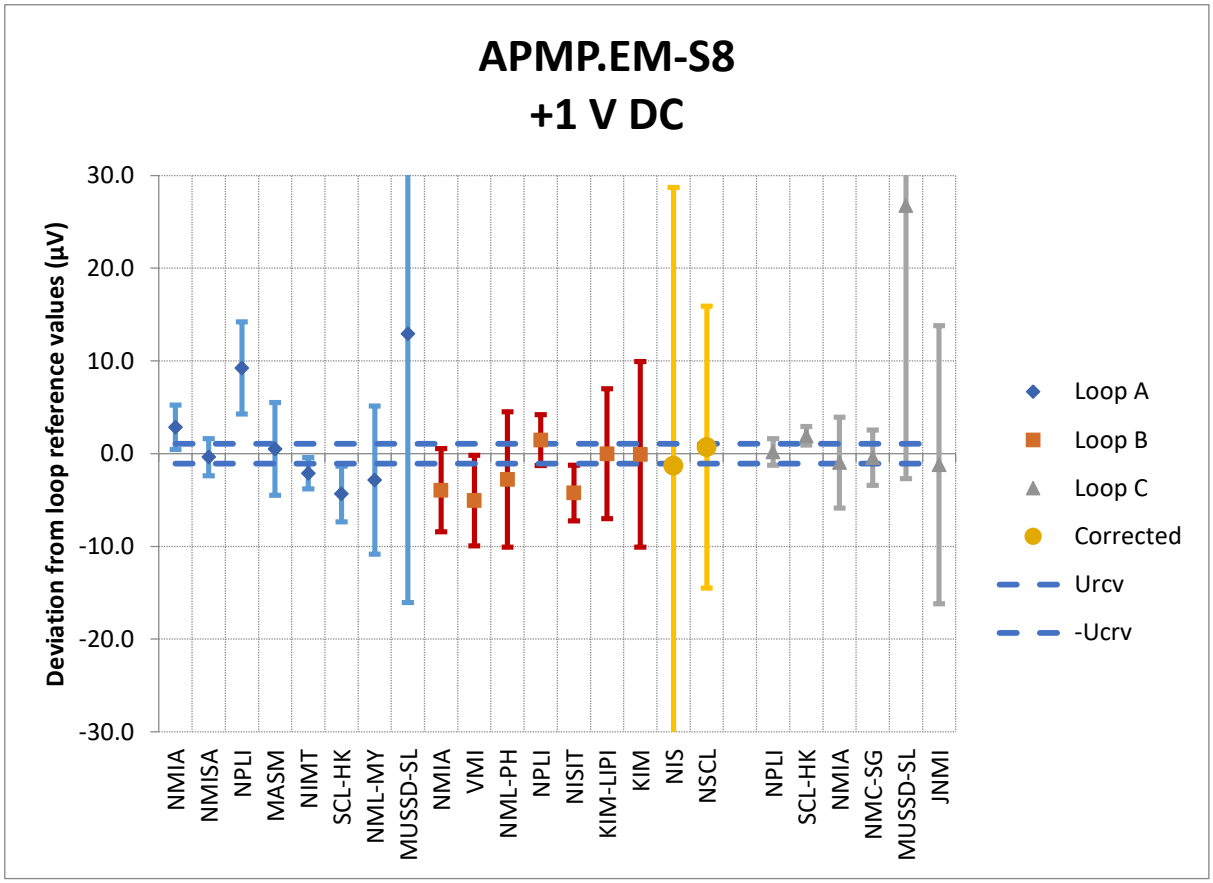

Figure 7.2.2 (Corrected) Comparison Chart for DC Voltage 1V

COMPARISON REFERENCE VALUE DC VOLTAGE 1V

Name		Deviation from reference, (d_i) µV	Uncertainty, (u_i) µV
[R]NMI, Australia	NMIA	-0.7	4.1
[R]NPL, India	NPLI	3.6	3.4
SCL, Hong Kong	SCL-HK	-1.2	2.2
MUSSD, Sri Lanka	MUSSD-SL	19.8	29.2

Table 7.2.2.e Single Value Participated More Than Once DC Voltage 1V

Laboratories that contributed to the loop reference values

Name		(d_i), µV	(u_i) µV	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-0.7	4.1	0.059976	0.0689	-0.04717
[R]NPL, India	NPLI	3.6	3.4	0.087439	0.1005	0.36473
[R]NMI, South Africa	NMISA	-0.4	2.0	0.250000	0.2873	-0.10719
[R]NIM, Thailand	NIMT	-2.1	1.7	0.346021	0.3976	-0.83943
[R]NML, Malaysia	NMLMY	-2.9	8.0	0.015625	0.0180	-0.05121
[R]NMC, Singapore	NMC-SG	-0.4	3.0	0.111111	0.1277	-0.05584
			∑	0.870172	1.0000	-0.73610

x_{CRV}: -0.7 µV

u_{CRV}: 1.1 µV

Table 7.2.2.f Laboratories that contributed to the loop reference values for DC Voltage 1V

Name		Deviation from reference, d_i (µV)	Exp. Unc., u_i (µV)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-0.7	4.1	0.1	3.9
[R]NPL, India	NPLI	3.6	3.4	4.4	3.2
[R]NMI, South Africa	NMISA	-0.4	2.0	0.4	1.7
[R]NIM, Thailand	NIMT	-2.1	1.7	-1.4	1.3
[R]NML, Malaysia	NMLMY	-2.9	8.0	-2.1	7.9
[R]NMC, Singapore	NMC-SG	-0.4	3.0	0.3	2.8
ESLMASM, Mongolia	MASM	0.5	5.0	1.2	5.1
SCL, Hong Kong	SCLHK	-1.2	2.2	-0.5	2.5
MUSSD, Sri Lanka	MUSSDSL	19.8	29.2	20.6	29.3
VMI, Vietnam	VMI	-5.1	4.9	-4.3	5.0
NML, Philippines	NML-PH	-2.8	7.3	-2.1	7.4
NISIT, Papua New Guinea	NISIT	-4.2	3.0	-3.5	3.2
KIM-LIPI, Indonesia	KIM-LIPI	0.0	7.0	0.7	7.1
KIM, Kazakhstan	KIM	-0.1	10.0	0.7	10.1
NIS, Egypt	NIS	-1.4	30.0	-0.6	30.0
NSCL, Syria	NSCL	0.7	15.2	1.4	15.2
JNMI, Jordan	JNMI	-1.2	15.0	-0.5	15.0

Table 7.2.2.g Degree of Equivalence for DC Voltage 1V

DEVIATION FROM REFERENCE DC VOLTAGE 10V

Name		Deviation from reference, d_i(μV)	Exp. Unc., u_i (μV)
[R]NMI, Australia	NMIA	-12.2	20.0
[R]NMI, South Africa	NMISA	-1.7	20.0
[R]NPL, India	NPLI	2.4	28.2
ESLMASM, Mongolia	MASM	-11.3	32.0
[R]NIM, Thailand	NIMT	4.5	14.0
SCL, Hong Kong	SCL-HK	0.6	30.0
[R]NML, Malaysia	NML-MY	31.2	60.0
MUSSD, Sri Lanka	MUSSD-SL	101.7	270.0

Table 7.2.3.a Loop A Deviation from reference DC Voltage 10V

Name		Deviation from reference, d_i(μV)	Exp. Unc., u_i (μV)
[R]NMI, Australia	NMIA	0.5	22.0
VMI, Vietnam	VMI	-12.3	34.0
NML, Philippines	NML-PH	-2.2	54.0
[R]NPL, India	NPLI	-2.9	51.7
NISIT, Papua New Guinea	NISIT	-48.2	30.0
KIM-LIPI, Indonesia	KIM-LIPI	-10.8	40.0
KIM, Kazakhstan	KIM	18.9	84.0
NIS, Egypt	NIS	-65.0	230.0
NSCL, Syria	NSCL	-65.0	22.0
JNMI, Jordan	JNMI	-65.6	60.0

Table 7.2.3.b Loop B Deviation from reference DC Voltage 10V

Name		Deviation from reference, d_i(μV)	Exp. Unc., u_i (μV)
[R]NPL, India	NPLI	0.3	6.4
SCL, Hong Kong	SCL-HK	20.7	20.0
[R]NMI, Australia	NMIA	1.9	55.5
[R]NMC, Singapore	NMC-SG	-2.9	20.0
MUSSD, Sri Lanka	MUSSD-SL	148.1	268.0
JNMI, Jordan	JNMI	-0.4	70.0

Table 7.2.3.c Loop C Deviation from reference DC Voltage 10V

DATA USED FOR CORRECTED CHART DC VOLTAGE 10V

Data collated for plotting						
Name	**Loop A**		**Loop B**		**Loop C**	
	d_i	u_i	d_i	u_i	d_i	u_i
NMIA	-12.2	20.0				
NMISA	-1.7	20.0				
NPLI	2.4	28.2				
MASM	-11.3	32.0				
NIMT	4.5	14.0				
SCL-HK	0.6	30.0				
NML-MY	31.2	60.0				
MUSSD-SL	101.7	270.0				
NMIA			0.5	22.0		
VMI			-12.3	34.0		
NML-PH			-2.2	54.0		
NPLI			-2.9	51.7		
NISIT			-48.2	30.0		
KIM-LIPI			-10.8	40.0		
KIM			18.9	84.0		
NIS			0.2	240.4		
NSCL			0.2	73.4		
-						
NPLI					0.3	6.4
SCL-HK					20.7	20.0
NMIA					1.9	55.5
NMC-SG					-2.9	20.0
MUSSD-SL					148.1	268.0
JNMI					-0.4	70.0

Table 7.2.3.d Data for corrected chart DC Voltage 10V

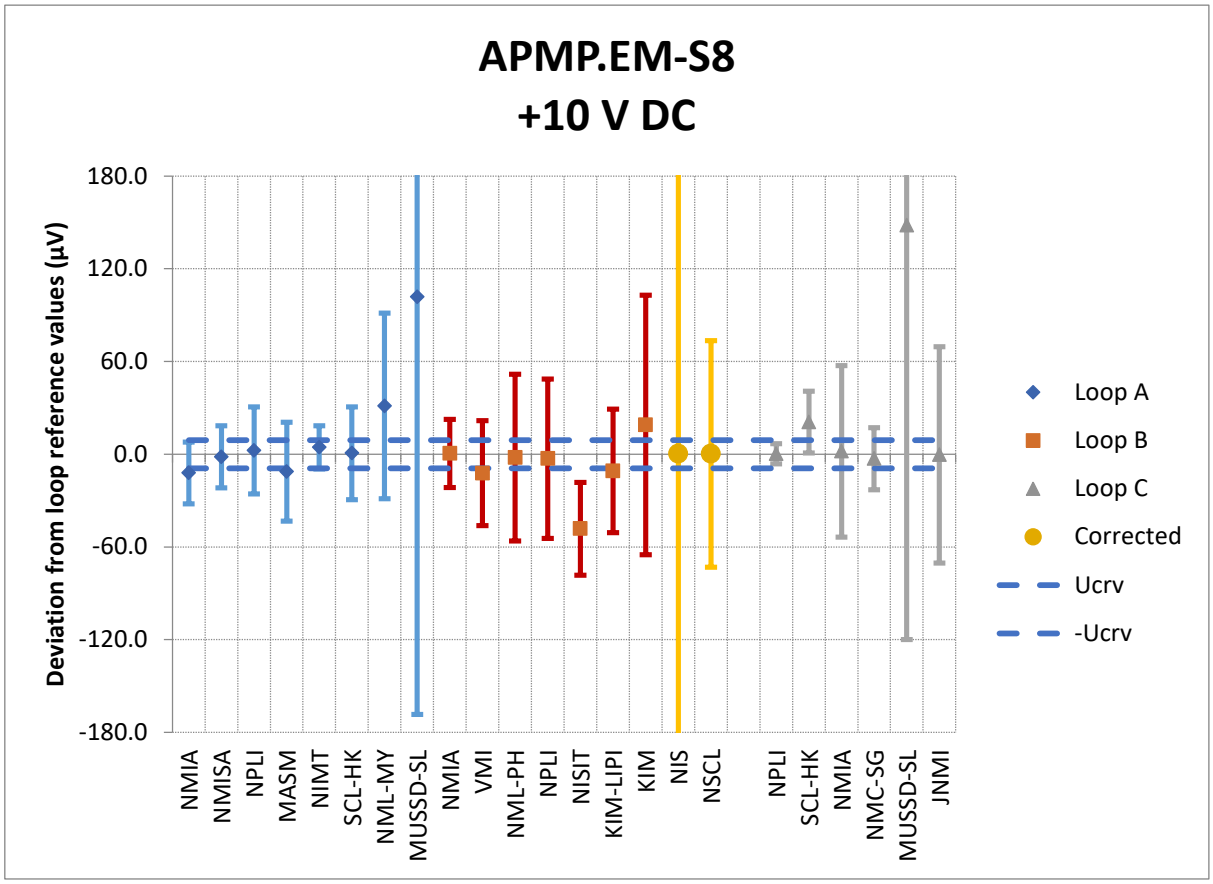

Figure 7.2.3 (Corrected) Comparison Chart for DC Voltage 10V

COMPARISON REFERENCE VALUE DC VOLTAGE 10V

Name		Deviation from reference, (d_i) µV	Exp. Unc., u_i (µV)
[R]NMI, Australia	NMIA	-3.3	36.4
[R]NPL, India	NPLI	-0.1	34.2
SCL, Hong Kong	SCL-HK	10.7	25.5
MUSSD, Sri Lanka	MUSSD-SL	124.9	269.0

Table 7.2.3.e Single Value Participated More Than Once DC Voltage 10V

Laboratories that contributed to the loop reference values

Name	(d_i), µV	(u_i) µV	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$	Name
[R]NMI, Australia	NMIA	-3.3	36.4	0.000757	0.0631	-0.20511
[R]NPL, India	NPLI	-0.1	34.2	0.000856	0.0714	-0.00587
[R]NMI, South Africa	NMISA	-1.7	20.0	0.002500	0.2085	-0.35144
[R]NIM, Thailand	NIMT	4.5	14.0	0.005102	0.4254	1.91138
[R]NML, Malaysia	NMLMY	31.2	60.0	0.000278	0.0232	0.72296
[R]NMC, Singapore	NMC-SG	-2.9	20.0	0.002500	0.2085	-0.60917
			∑	0.011993	1.0000	1.46277

x_{CRV}: 1.5 µV

u_{CRV}: 9.1 µV

Table 7.2.3.f Laboratories that contributed to the loop reference values for DC Voltage 10V

Name		Deviation from reference, d_i (µV)	Exp. Unc., u_i (µV)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-3.3	36.4	-4.7	35.2
[R]NPL, India	NPLI	-0.1	34.2	-1.5	32.9
[R]NMI, South Africa	NMISA	-1.7	20.0	-3.1	17.8
[R]NIM, Thailand	NIMT	4.5	14.0	3.0	10.6
[R]NML, Malaysia	NMLMY	31.2	60.0	29.8	59.3
[R]NMC, Singapore	NMC-SG	-2.9	20.0	-4.4	22.0
ESLMASM, Mongolia	MASM	-11.3	32.0	-12.7	33.3
SCL, Hong Kong	SCLHK	10.7	25.5	9.2	27.1
MUSSD, Sri Lanka	MUSSDSL	124.9	269.0	123.4	269.2
VMI, Vietnam	VMI	-12.3	34.0	-13.8	35.2
NML, Philippines	NML-PH	-2.2	54.0	-3.7	54.8
NISIT, Papua New Guinea	NISIT	-48.2	30.0	-49.7	31.4
KIM-LIPI, Indonesia	KIM-LIPI	-10.8	40.0	-12.3	41.0
KIM, Kazakhstan	KIM	18.9	84.0	17.4	84.5
NIS, Egypt	NIS	0.2	240.4	-1.3	240.6
NSCL, Syria	NSCL	0.2	73.4	-1.3	73.9
JNMI, Jordan	JNMI	-0.4	70.0	-1.9	70.6

Table 7.2.3.g Degree of Equivalence for DC Voltage10V

DEVIATION FROM REFERENCE DC VOLTAGE -10V

Name		Deviation from reference, d_i(μV)	Exp. Unc., u_i (μV)
[R]NMI, Australia	NMIA	0.3	20.0
[R]NMI, South Africa	NMISA	2.0	10.0
[R]NPL, India	NPLI	1.9	30.0
ESLMASM, Mongolia	MASM	-36.4	29.0
[R]NIM, Thailand	NIMT	-4.1	14.0
SCL, Hong Kong	SCL-HK	10.3	30.0
[R]NML, Malaysia	NML-MY	-7.6	60.0
MUSSD, Sri Lanka	MUSSD-SL	-95.9	270.0

Table 7.2.4.a Loop A Deviation from reference DC Voltage -10V

Name		Deviation from reference, d_i(μV)	Exp. Unc., u_i (μV)
[R]NMI, Australia	NMIA	-2.6	22.0
VMI, Vietnam	VMI	-3.2	35.0
NML, Philippines	NML-PH	4.4	42.0
[R]NPL, India	NPLI	3.1	24.0
NISIT, Papua New Guinea	NISIT	22.9	30.0
KIM-LIPI, Indonesia	KIM-LIPI	-17.7	40.0
KIM, Kazakhstan	KIM	-60.1	84.0
NIS, Egypt	NIS	14.5	230.0
NSCL, Syria	NSCL	10.3	22.0
JNMI, Jordan	JNMI	6.4	50.0

Table 7.2.4.b Loop B Deviation from reference DC Voltage -10V

Name		Deviation from reference, d_i(μV)	Exp. Unc., u_i (μV)
[R]NPL, India	NPLI	0.9	7.5
SCL, Hong Kong	SCL-HK	-31.9	20.0
[R]NMI, Australia	NMIA	-14.3	55.5
[R]NMC, Singapore	NMC-SG	-4.7	20.0
MUSSD, Sri Lanka	MUSSD-SL	-146.7	154.0
JNMI, Jordan	JNMI	-9.7	70.0

Table 7.2.4.c Loop C Deviation from reference DC Voltage -10V

DATA USED FOR CORRECTED CHART DC VOLTAGE -10V

Data collated for plotting						
Name	**Loop A**		**Loop B**		**Loop C**	
	d_i	u_i	d_i	u_i	d_i	u_i
NMIA	0.3	20.0				
NMISA	2.0	10.0				
NPLI	1.9	30.0				
MASM	-36.4	29.0				
NIMT	-4.1	14.0				
SCL-HK	10.3	30.0				
NML-MY	-7.6	60.0				
MUSSD-SL	-95.9	270.0				
NMIA			-2.6	22.0		
VMI			-3.2	35.0		
NML-PH			4.4	42.0		
NPLI			3.1	24.0		
NISIT			22.9	30.0		
KIM-LIPI			-17.7	40.0		
KIM			-60.1	84.0		
NIS			-1.6	240.4		
NSCL			-5.8	73.4		
-						
NPLI					0.9	7.5
SCL-HK					-31.9	20.0
NMIA					-14.3	55.5
NMC-SG					-4.7	20.0
MUSSD-SL					-146.7	154.0
JNMI					-9.7	70.0

Table 7.2.4.d Data for corrected chart DC Voltage -10V

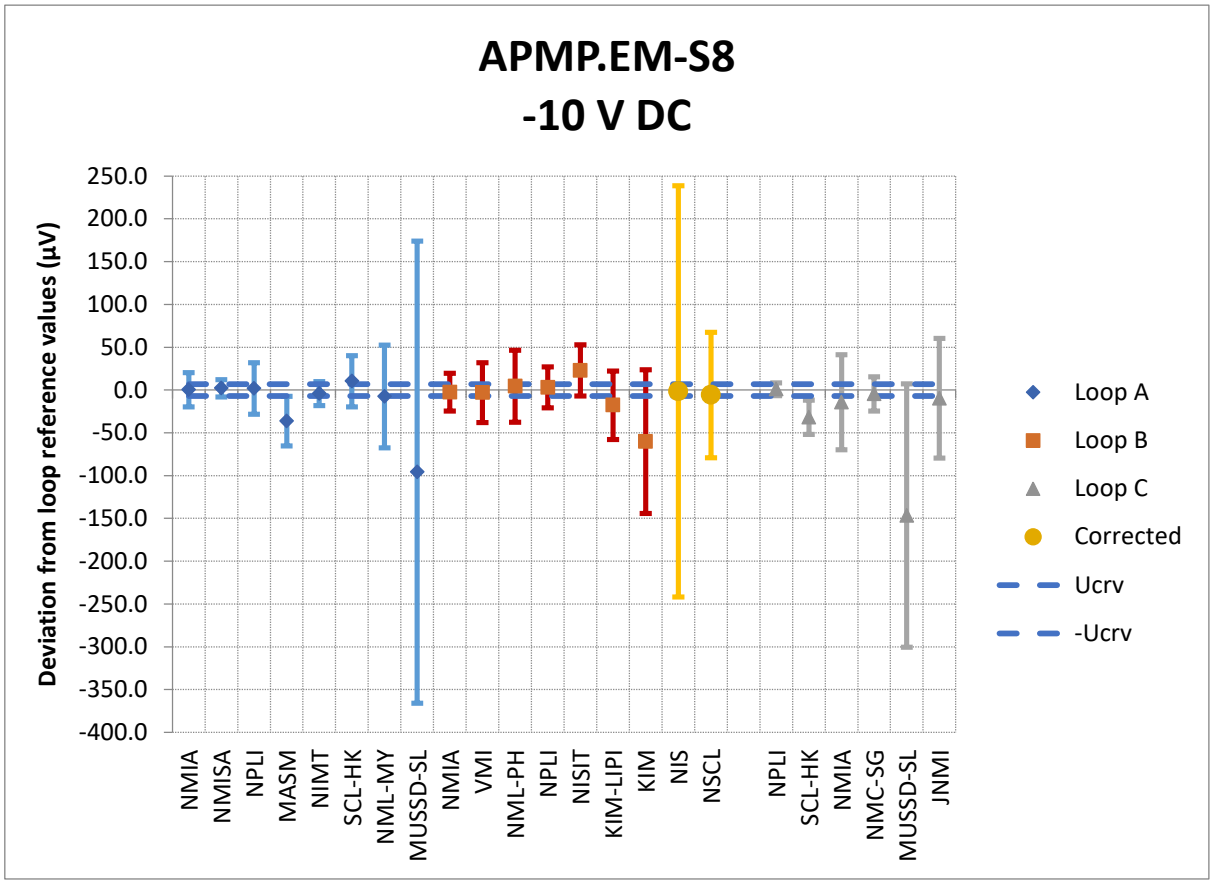

Figure 7.2.4 (Corrected) Comparison Chart for DC Voltage -10V

COMPARISON REFERENCE VALUE DC VOLTAGE -10V

Name		Deviation from reference, d_i(µV)	Exp. Unc., u_i (µV)
[R]NMI, Australia	NMIA	-5.5	36.4
[R]NPL, India	NPLI	2.0	22.6
SCL, Hong Kong	SCL-HK	-10.8	25.5
MUSSD, Sri Lanka	MUSSD-SL	-121.3	219.8

Table 7.2.4.e Single Value Participated More Than Once for DC Voltage -10V

Laboratories that contributed to the loop reference values

Name		(d_i), µV	(u_i) µV	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-5.5	36.4	0.000757	0.0367	-0.20265
[R]NPL, India	NPLI	2.0	22.6	0.001957	0.0950	0.18698
[R]NMI, South Africa	NMISA	2.0	10.0	0.010000	0.4856	0.98252
[R]NIM, Thailand	NIMT	-4.1	14.0	0.005102	0.2478	-1.02163
[R]NML, Malaysia	NMLMY	-7.6	60.0	0.000278	0.0135	-0.10279
[R]NMC, Singapore	NMC-SG	-4.7	20.0	0.002500	0.1214	-0.56749
			∑	0.020593	1.0000	-0.72506

CRV: -0.7 µV

u_{CRV}: 7.0 µV

Table 7.2.4.f Laboratories that contributed to the loop reference values for DC Voltage -10V

Name		Deviation from reference, d_i (µV)	Exp. Unc., u_i (µV)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-5.5	36.4	-4.8	35.7
[R]NPL, India	NPLI	2.0	22.6	2.7	21.5
[R]NMI, South Africa	NMISA	2.0	10.0	2.7	7.2
[R]NIM, Thailand	NIMT	-4.1	14.0	-3.4	12.1
[R]NML, Malaysia	NMLMY	-7.6	60.0	-6.9	59.6
[R]NMC, Singapore	NMC-SG	-4.7	20.0	-3.9	21.2
ESLMASM, Mongolia	MASM	-36.4	29.0	-35.7	29.8
SCL, Hong Kong	SCLHK	-10.8	25.5	-10.1	26.4
MUSSD, Sri Lanka	MUSSDSL	-121.3	219.8	-120.6	219.9
VMI, Vietnam	VMI	-3.2	35.0	-2.5	35.7
NML, Philippines	NML-PH	4.4	42.0	5.1	42.6
NISIT, Papua New Guinea	NISIT	22.9	30.0	23.7	30.8
KIM-LIPI, Indonesia	KIM-LIPI	-17.7	40.0	-17.0	40.6
KIM, Kazakhstan	KIM	-60.1	84.0	-59.4	84.3
NIS, Egypt	NIS	-1.6	240.4	-0.9	240.5
NSCL, Syria	NSCL	-5.8	73.4	-5.1	73.7
JNMI, Jordan	JNMI	-9.7	70.0	-8.9	70.3

Table 7.2.4.g Degree of Equivalence for DC Voltage -10V

DEVIATION FROM REFERENCE DC VOLTAGE 100V

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	0.0	0.3
[R]NMI, South Africa	NMISA	-0.1	0.6
[R]NPL, India	NPLI	0.4	0.3
ESLMASM, Mongolia	MASM	-0.3	0.5
[R]NIM, Thailand	NIMT	-0.1	0.2
SCL, Hong Kong	SCL-HK	-0.9	1.0
[R]NML, Malaysia	NML-MY	0.1	0.8
MUSSD, Sri Lanka	MUSSD-SL	0.2	3.9

Table 7.2.5.a Loop A Deviation from reference DC Voltage 100V

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	-0.4	0.2
VMI, Vietnam	VMI	-0.1	0.5
NML, Philippines	NML-PH	-0.1	0.4
[R]NPL, India	NPLI	0.4	0.3
NISIT, Papua New Guinea	NISIT	-0.9	0.3
KIM-LIPI, Indonesia	KIM-LIPI	0.3	0.6
KIM, Kazakhstan	KIM	-0.3	1.2
NIS, Egypt	NIS	0.0	3.4
NSCL, Syria	NSCL	-1.2	1.0
JNMI, Jordan	JNMI	-0.8	0.8

Table 7.2.5.b Loop B Deviation from reference DC Voltage 100V

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NPL, India	NPLI	2.0	1.9
SCL, Hong Kong	SCL-HK	0.2	0.2
[R]NMI, Australia	NMIA	0.1	0.6
[R]NMC, Singapore	NMC-SG	-0.1	0.3
MUSSD, Sri Lanka	MUSSD-SL	2.6	3.9
JNMI, Jordan	JNMI	0.3	0.9

Table 7.2.5.c Loop C Deviation from reference DC Voltage 100V

DATA USED FOR CORRECTED CHART DC VOLTAGE 100V

Data collated for plotting						
Name	**Loop A**		**Loop B**		**Loop C**	
	d_i	u_i	d_i	u_i	d_i	u_i
NMIA	0.0	0.3				
NMISA	-0.1	0.6				
NPLI	0.4	0.3				
MASM	-0.3	0.5				
NIMT	-0.1	0.2				
SCL-HK	-0.9	1.0				
NML-MY	0.1	0.8				
MUSSD-SL	0.2	3.9				
NMIA			-0.4	0.2		
VMI			-0.1	0.5		
NML-PH			-0.1	0.4		
NPLI			0.4	0.3		
NISIT			-0.9	0.3		
KIM-LIPI			0.3	0.6		
KIM			-0.3	1.2		
NIS			1.1	3.5		
NSCL			-0.1	1.3		
NPLI					2.0	1.9
SCL-HK					0.2	0.2
NMIA					0.1	0.6
NMC-SG					-0.1	0.3
MUSSD-SL					2.6	3.9
JNMI					0.3	0.9

Table 7.2.5.d Data for corrected chart DC Voltage 100V

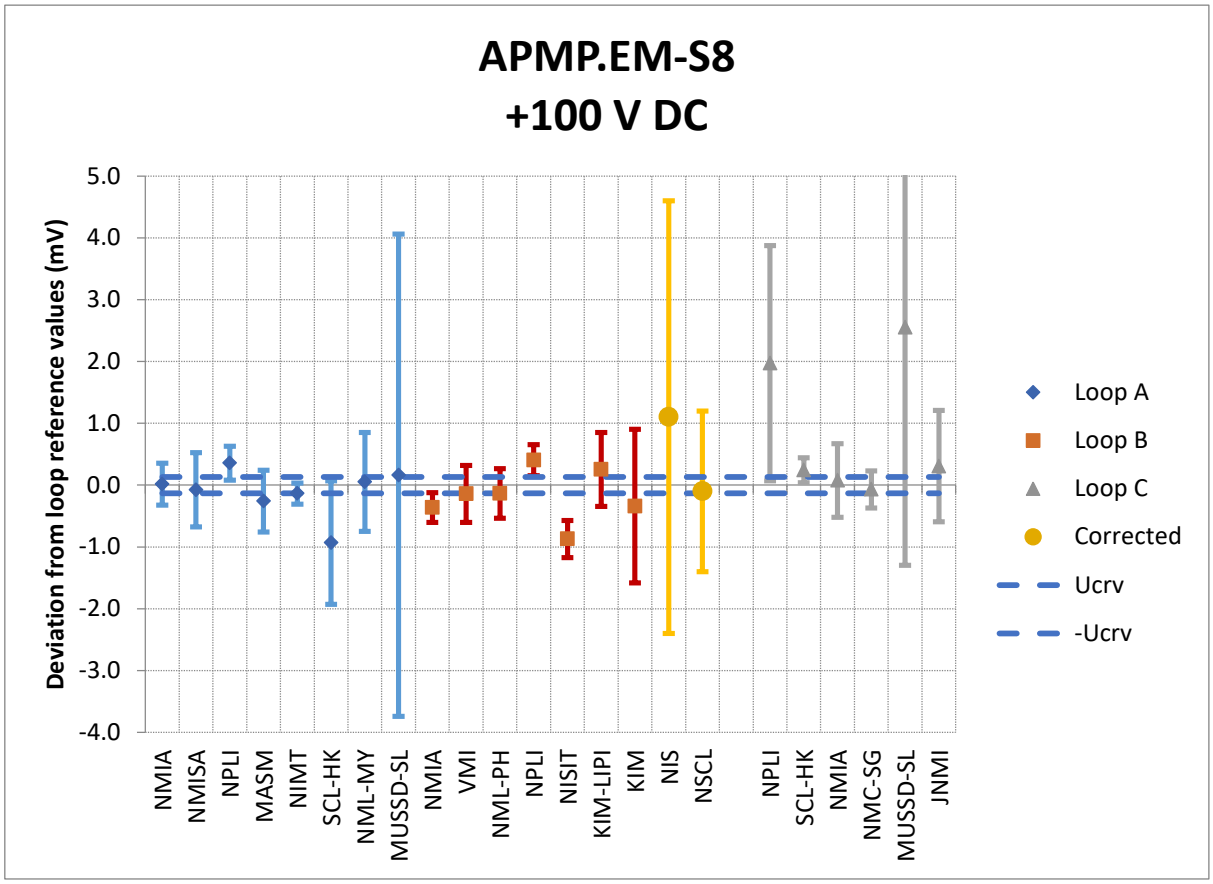

Figure 7.2.5 (Corrected) Comparison Chart for DC Voltage 100V

COMPARISON REFERENCE VALUE DC VOLTAGE 100V

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	-0.1	0.4
[R]NPL, India	NPLI	0.9	1.1
SCL, Hong Kong	SCL-HK	-0.3	0.7
MUSSD, Sri Lanka	MUSSD-SL	1.4	3.9

Table 7.2.5.e Single Value Participated More Than Once for DC Voltage 100V

Laboratories that contributed to the loop reference values

Name		(d_i), mV	(u_i) mV	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-0.1	0.4	5.676980	0.1004	-0.00909
[R]NPL, India	NPLI	0.9	1.1	0.797695	0.0141	0.01286
[R]NMI, South Africa	NMISA	-0.1	0.6	2.777778	0.0491	-0.00375
[R]NIM, Thailand	NIMT	-0.1	0.2	34.602076	0.6121	-0.08343
[R]NML, Malaysia	NMLMY	0.1	0.8	1.562500	0.0276	0.00147
[R]NMC, Singapore	NMC-SG	-0.1	0.3	11.111111	0.1966	-0.01342
			∑	56.528140	1.0000	-0.09537

x_{CRV}: -0.1 mV

u_{CRV}: 0.1 mV

Table 7.2.5.f Laboratories that contributed to the loop reference values for DC Voltage 100V

Name		Deviation from reference, d_i (mV)	Exp. Unc., u_i (mV)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-0.1	0.4	0.0	0.4
[R]NPL, India	NPLI	0.9	1.1	1.0	1.1
[R]NMI, South Africa	NMISA	-0.1	0.6	0.0	0.6
[R]NIM, Thailand	NIMT	-0.1	0.2	0.0	0.1
[R]NML, Malaysia	NMLMY	0.1	0.8	0.1	0.8
[R]NMC, Singapore	NMC-SG	-0.1	0.3	0.0	0.3
ESLMASM, Mongolia	MASM	-0.3	0.5	-0.2	0.5
SCL, Hong Kong	SCLHK	-0.3	0.7	-0.3	0.7
MUSSD, Sri Lanka	MUSSDSL	1.4	3.9	1.5	3.9
VMI, Vietnam	VMI	-0.1	0.5	0.0	0.5
NML, Philippines	NML-PH	-0.1	0.4	0.0	0.4
NISIT, Papua New Guinea	NISIT	-0.9	0.3	-0.8	0.3
KIM-LIPI, Indonesia	KIM-LIPI	0.3	0.6	0.3	0.6
KIM, Kazakhstan	KIM	-0.3	1.2	-0.2	1.2
NIS, Egypt	NIS	1.1	3.5	1.2	3.5
NSCL, Syria	NSCL	-0.1	1.3	0.0	1.4
JNMI, Jordan	JNMI	0.3	0.9	0.4	0.9

Table 7.2.5.g Degree of Equivalence for DC Voltage 100V

DEVIATION FROM REFERENCE DC VOLTAGE 1000V

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	2.4	3.8
[R]NMI, South Africa	NMISA	-5.8	6.0
[R]NPL, India	NPLI	2.5	2.7
ESLMASM, Mongolia	MASM	-0.8	6.0
[R]NIM, Thailand	NIMT	-1.3	2.0
SCL, Hong Kong	SCL-HK	-12.3	11.0
[R]NML, Malaysia	NML-MY	-2.6	8.0
MUSSD, Sri Lanka	MUSSD-SL	0.2	48.0

Table 7.2.6.a Loop A Deviation from reference DC Voltage 1000V

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	-1.6	3.9
VMI, Vietnam	VMI	-5.4	5.8
NML, Philippines	NML-PH	-0.3	3.8
[R]NPL, India	NPLI	0.6	2.4
NISIT, Papua New Guinea	NISIT	4.3	2.0
KIM-LIPI, Indonesia	KIM-LIPI	-5.1	9.0
KIM, Kazakhstan	KIM	10.6	12.6
NIS, Egypt	NIS	-7.0	42.0
NSCL, Syria	NSCL	-21.0	12.0
JNMI, Jordan	JNMI	-14.2	10.0

Table 7.2.6.b Loop B Deviation from reference DC Voltage 1000V

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NPL, India	NPLI	0.7	0.9
SCL, Hong Kong	SCL-HK	-11.2	2.0
[R]NMI, Australia	NMIA	-10.3	6.8
[R]NMC, Singapore	NMC-SG	-12.9	4.0
MUSSD, Sri Lanka	MUSSD-SL	1.3	47.9
JNMI, Jordan	JNMI	-8.1	12.0

Table 7.2.6.c Loop C Deviation from reference DC Voltage 1000V

DATA USED FOR CORRECTED CHART DC VOLTAGE 1000V

Data collated for plotting						
Name	**Loop A**		**Loop B**		**Loop C**	
	d_i	u_i	d_i	u_i	d_i	u_i
NMIA	2.4	3.8				
NMISA	-5.8	6.0				
NPLI	2.5	2.7				
MASM	-0.8	6.0				
NIMT	-1.3	2.0				
SCL-HK	-12.3	11.0				
NML-MY	-2.6	8.0				
MUSSD-SL	0.2	48.0				
NMIA			-1.6	3.9		
VMI			-5.4	5.8		
NML-PH			-0.3	3.8		
NPLI			0.6	2.4		
NISIT			4.3	2.0		
KIM-LIPI			-5.1	9.0		
KIM			10.6	12.6		
NIS			-0.9	43.7		
NSCL			-14.9	17.0		
NPLI					0.7	0.9
SCL-HK					-11.2	2.0
NMIA					-10.3	6.8
NMC-SG					-12.9	4.0
MUSSD-SL					1.3	47.9
JNMI					-8.1	12.0

Table 7.2.6.d Data for corrected chart DC Voltage 1000V

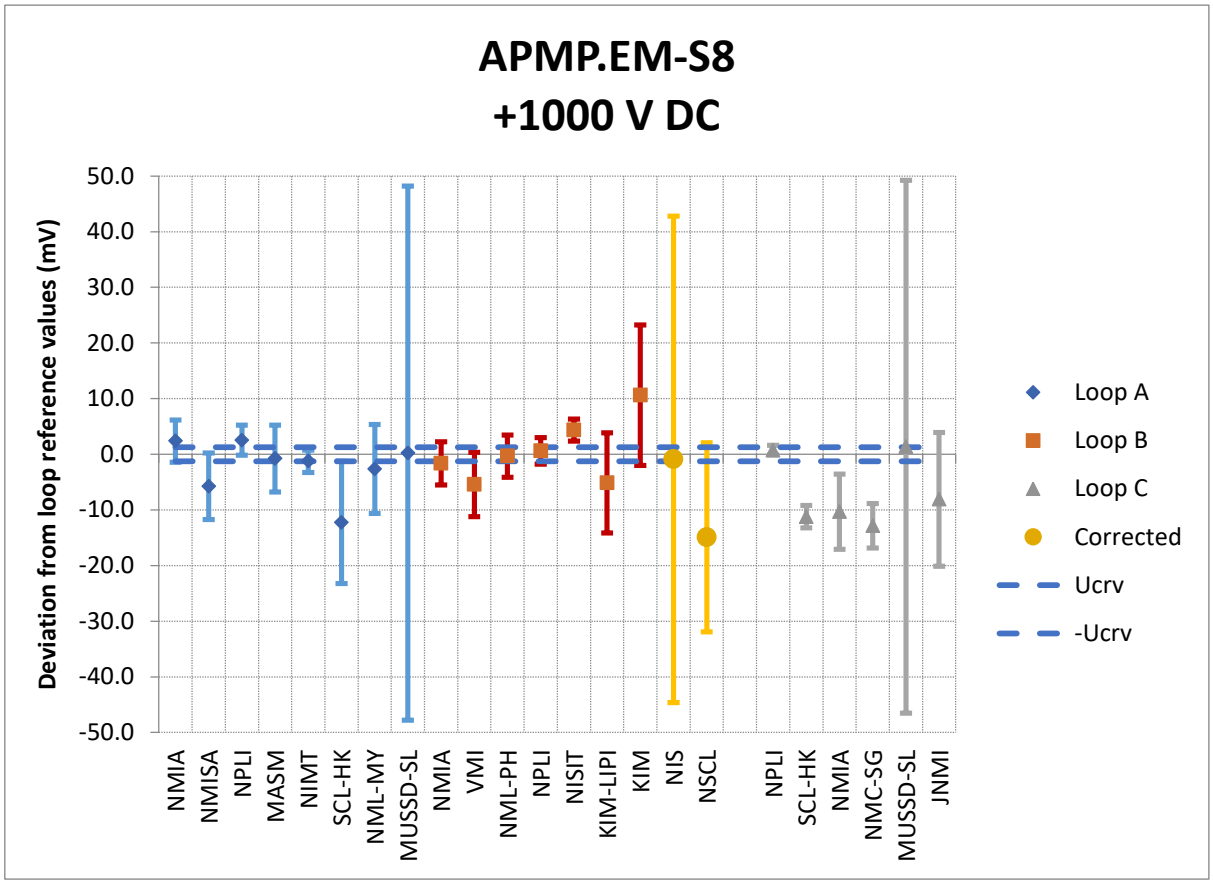

Figure 7.2.6 (Corrected) Comparison Chart for DC Voltage 1000V

COMPARISON REFERENCE VALUE DC VOLTAGE 1000V

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	-3.2	5.0
[R]NPL, India	NPLI	1.3	2.1
SCL, Hong Kong	SCL-HK	-11.7	7.9
MUSSD, Sri Lanka	MUSSD-SL	0.8	47.9

Table 7.2.6.e Single Value Participated More Than Once for DC Voltage 1000V

Laboratories that contributed to the loop reference values

Name		(d_i), mV	(u_i) mV	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-3.2	5.0	0.039886	0.0649	-0.20727
[R]NPL, India	NPLI	1.3	2.1	0.219181	0.3564	0.46249
[R]NMI, South Africa	NMISA	-5.8	6.0	0.027778	0.0452	-0.25973
[R]NIM, Thailand	NIMT	-1.3	2.0	0.250000	0.4065	-0.50910
[R]NML, Malaysia	NMLMY	-2.6	8.0	0.015625	0.0254	-0.06730
[R]NMC, Singapore	NMC-SG	-12.9	4.0	0.062500	0.1016	-1.30650
				0.614970	1.0000	-1.88742

x_{CRV}: -1.9 mV

u_{CRV}: 1.3 mV

Table 7.2.6.f Laboratories that contributed to the loop reference values for DC Voltage 1000V

Name		Deviation from reference, d_i (mV)	Exp. Unc., u_i (mV)	D.O.E.	$U_{i\,DOE}$
[R]NMI, Australia	NMIA	-3.2	5.0	-1.3	4.8
[R]NPL, India	NPLI	1.3	2.1	3.2	1.7
[R]NMI, South Africa	NMISA	-5.8	6.0	-3.9	5.9
[R]NIM, Thailand	NIMT	-1.3	2.0	0.6	1.5
[R]NML, Malaysia	NMLMY	-2.6	8.0	-0.8	7.9
[R]NMC, Singapore	NMC-SG	-12.9	4.0	-11.0	3.8
ESLMASM, Mongolia	MASM	-0.8	6.0	1.1	6.1
SCL, Hong Kong	SCLHK	-11.7	7.9	-9.8	8.0
MUSSD, Sri Lanka	MUSSDSL	0.8	47.9	2.7	48.0
VMI, Vietnam	VMI	-5.4	5.8	-3.5	5.9
NML, Philippines	NML-PH	-0.3	3.8	1.6	4.0
NISIT, Papua New Guinea	NISIT	4.3	2.0	6.2	2.4
KIM-LIPI, Indonesia	KIM-LIPI	-5.1	9.0	-3.2	9.1
KIM, Kazakhstan	KIM	10.6	12.6	12.5	12.7
NIS, Egypt	NIS	-0.9	43.7	1.0	43.7
NSCL, Syria	NSCL	-14.9	17.0	-13.0	17.0
JNMI, Jordan	JNMI	-8.1	12.0	-6.2	12.1

Table 7.2.6.g Degree of Equivalence for DC Voltage 1000V

DEVIATION FROM REFERENCE DC CURRENT 10mA

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NMI, Australia	NMIA	-6.7	0.5
[R]NMI, South Africa	NMISA	-4.9	0.5
[R]NPL, India	NPLI	-1.6	0.5
ESLMASM, Mongolia	MASM	-1.9	0.4
[R]NIM, Thailand	NIMT	1.1	0.2
SCL, Hong Kong	SCL-HK	4.1	0.2
[R]NML, Malaysia	NML-MY	7.4	1.1
MUSSD, Sri Lanka	MUSSD-SL	8.8	5.9

Table 7.2.7.a Loop A Deviation from reference DC Current 10mA

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NMI, Australia	NMIA	-1.3	0.7
VMI, Vietnam	VMI	-0.1	0.6
NML, Philippines	NML-PH	0.1	0.3
[R]NPL, India	NPLI	0.7	0.5
NISIT, Papua New Guinea	NISIT	0.6	0.5
KIM-LIPI, Indonesia	KIM-LIPI	0.1	0.8
KIM, Kazakhstan	KIM	0.0	1.0
NIS, Egypt	NIS	1.0	5.0
NSCL, Syria	NSCL	0.7	0.2
JNMI, Jordan	JNMI	0.4	0.5

Table 7.2.7.b Loop B Deviation from reference DC Current 10mA

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NPL, India	NPLI	0.3	0.2
SCL, Hong Kong	SCL-HK	-0.4	0.2
[R]NMI, Australia	NMIA	-1.0	0.4
[R]NMC, Singapore	NMC, SG	-0.4	0.3
MUSSD, Sri Lanka	MUSSD-SL	-0.4	5.9
JNMI, Jordan	JNMI	-1.3	0.5

Table 7.2.7.c Loop C Deviation from reference DC Current 10mA

DATA USED FOR CORRECTED CHART DC CURRENT 10mA

Data collated for plotting						
	Loop A		Loop B		Loop C	
Name	d_i	u_i	d_i	u_i	d_i	u_i
NMIA			-1.3	0.7		
VMI			-0.1	0.6		
NML-PH			0.1	0.3		
NPLI			0.7	0.5		
NISIT			0.6	0.5		
KIM-LIPI			0.1	0.8		
KIM			0.0	1.0		
NIS			-0.7	5.0		
NSCL			-1.0	0.5		
-						
NPLI					0.3	0.2
SCL-HK					-0.4	0.2
NMIA					-1.0	0.4
NMC, SG					-0.4	0.3
MUSSD-SL					-0.4	5.9
JNMI					-1.3	0.5

Table 7.2.7.d Data for corrected chart DC Current 10mA

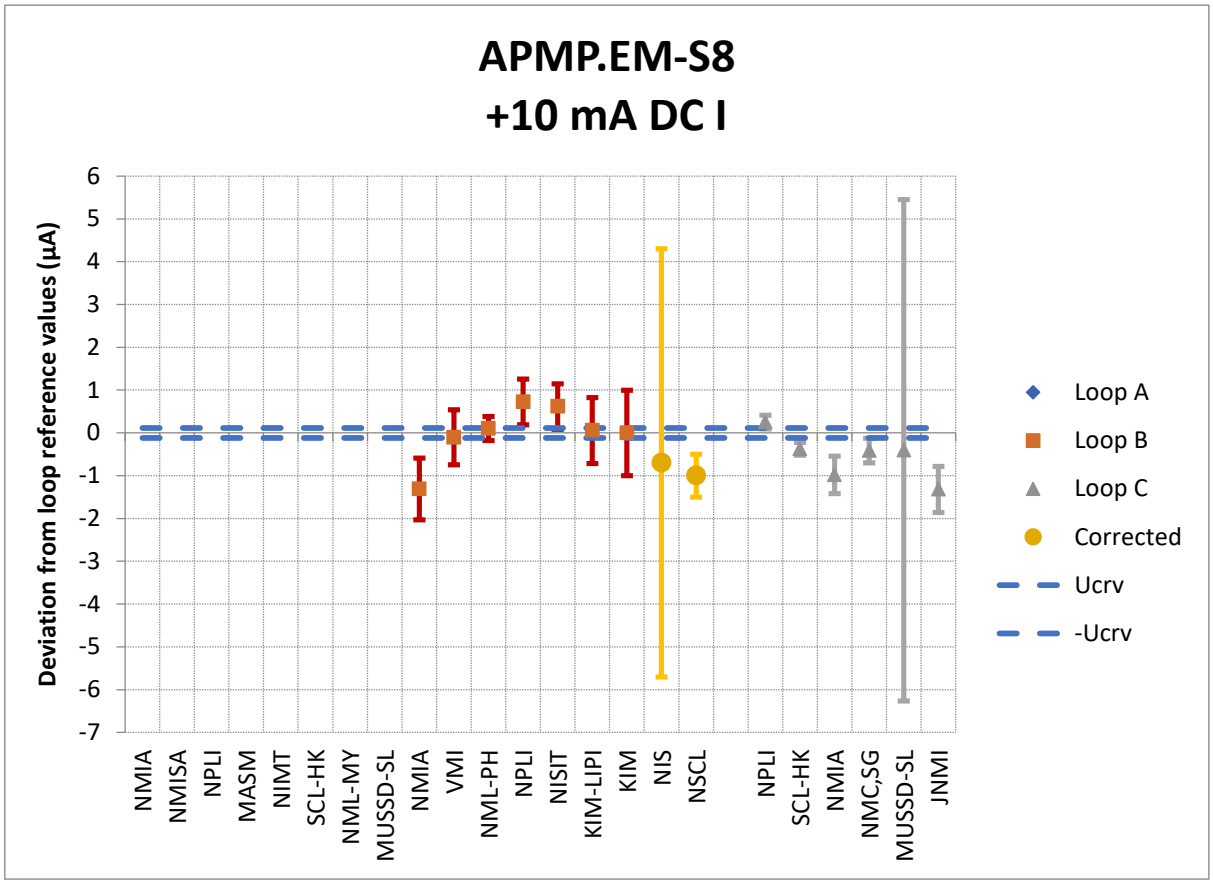

Figure 7.2.7 (Corrected) Comparison Chart for DC Current 10mA

COMPARISON REFERENCE VALUE DC CURRENT 10mA

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NMI, Australia	NMIA	-1.1	0.6
[R]NPL, India	NPLI	0.3	0.3

Table 7.2.7.e Single Value Participated More Than Once for DC Current 10mA

Laboratories that contributed to the loop reference values

Name		(d_i), µA	(u_i) µA	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-1.1	0.6	2.818291	0.0387	-0.04437
[R]NPL, India	NPLI	0.3	0.3	9.651128	0.1326	0.04302
[R]NMI, South Africa	NMISA	-4.9	0.5	4.000000	0.0549	-0.27033
[R]NIM, Thailand	NIMT	1.1	0.2	44.444444	0.6105	0.67465
[R]NMC, Singapore	NMC-SG	-0.4	0.3	11.890606	0.1633	-0.06765
			∑	72.804469	1.0000	0.33531

x_{CRV}: 0.3 µA

u_{CRV}: 0.1 µA

Table 7.2.7.f Laboratories that contributed to the loop reference values for DC Current 10mA

Name		Deviation from reference (d_i), µA	Uncertainty, (u_i) µA	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-1.1	0.6	-1.5	0.6
[R]NPL, India	NPLI	0.3	0.3	0.0	0.3
[R]NMI, South Africa	NMISA	-4.9	0.5	-5.3	0.5
[R]NIM, Thailand	NIMT	1.1	0.2	0.8	0.1
[R]NMC, Singapore	NMC-SG	-0.4	0.3	-0.7	0.3
ESLMASM, Mongolia	MASM	-1.9	0.4	-2.2	0.4
SCL, Hong Kong	SCLHK	-0.4	0.2	-0.7	0.2
[R]NML, Malaysia	NMLMY	7.4	1.1	7.1	1.1
MUSSD, Sri Lanka	MUSSDSL	-0.4	5.9	-0.7	5.9
VMI, Vietnam	VMI	-0.1	0.6	-0.4	0.7
NML, Philippines	NML-PH	0.1	0.3	-0.2	0.3
NISIT, Papua New Guinea	NISIT	0.6	0.5	0.3	0.5
KIM-LIPI, Indonesia	KIM-LIPI	0.1	0.8	-0.3	0.8
KIM, Kazakhstan	KIM	0.0	1.0	-0.3	1.0
NIS, Egypt	NIS	-0.7	5.0	-1.0	5.0
NSCL, Syria	NSCL	-1.1	0.6	-1.4	0.6
JNMI, Jordan	JNMI	-1.3	0.5	-1.7	0.6

Table 7.2.7.g Degree of Equivalence for DC Current 10mA

DEVIATION FROM REFERENCE DC CURRENT 1A

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NMI, Australia	NMIA	-24.3	17.0
[R]NMI, South Africa	NMISA	-77.1	30.0
[R]NPL, India	NPLI	28.5	14.0
ESLMASM, Mongolia	MASM	19.1	92.0
[R]NIM, Thailand	NIMT	17.0	27.0
SCL, Hong Kong	SCL-HK	-61.3	100.0
[R]NML, Malaysia	NML-MY	-71.4	64.0
MUSSD, Sri Lanka	MUSSD-SL	328.8	699.0

Table 7.2.8.a Loop A Deviation from reference DC Current 1A

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NMI, Australia	NMIA	13.9	19.0
VMI, Vietnam	VMI	-37.1	91.0
NML, Philippines	NML-PH	-51.0	24.0
[R]NPL, India	NPLI	-13.4	18.7
NISIT, Papua New Guinea	NISIT	-10.2	28.0
KIM-LIPI, Indonesia	KIM-LIPI	20.4	160.0
KIM, Kazakhstan	KIM	142.8	95.0
NIS, Egypt	NIS	18.7	610.0
NSCL, Syria	NSCL	-90.5	21.4
JNMI, Jordan	JNMI	-143.0	110.0

Table 7.2.8.b Loop B Deviation from reference DC Current 1A

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NPL, India	NPLI	434.4	72.1
SCL, Hong Kong	SCL-HK	-5.9	20.0
[R]NMI, Australia	NMIA	-31.9	19.6
[R]NMC, Singapore	NMC, SG	-2.5	53.0
MUSSD, Sri Lanka	MUSSD-SL	20.0	698.9
JNMI, Jordan	JNMI	-50.8	150.0

Table 7.2.8.c Loop C Deviation from reference DC Current 1A

DATA USED FOR CORRECTED CHART DC CURRENT 1A

Data collated for plotting						
	Loop A		Loop B		Loop C	
Name	d_i	u_i	d_i	u_i	d_i	u_i
NMIA	-24.3	17.0				
NMISA	-77.1	30.0				
NPLI	28.5	14.0				
MASM	19.1	92.0				
NIMT	17.0	27.0				
SCL-HK	-61.3	100.0				
NML-MY	-71.4	64.0				
MUSSD-SL	328.8	699.0				
NMIA			13.9	19.0		
VMI			-37.1	91.0		
NML-PH			-51.0	24.0		
NPLI			-13.4	18.7		
NISIT			-10.2	28.0		
KIM-LIPI			20.4	160.0		
KIM			142.8	95.0		
NIS			110.9	628.2		
NSCL			1.7	151.5		
-						
NPLI					434.4	72.1
SCL-HK					-5.9	20.0
NMIA					-31.9	19.6
NMC, SG					-2.5	53.0
MUSSD-SL					20.0	698.9
JNMI					-50.8	150.0

Table 7.2.8.d Data for corrected chart DC Current 1A

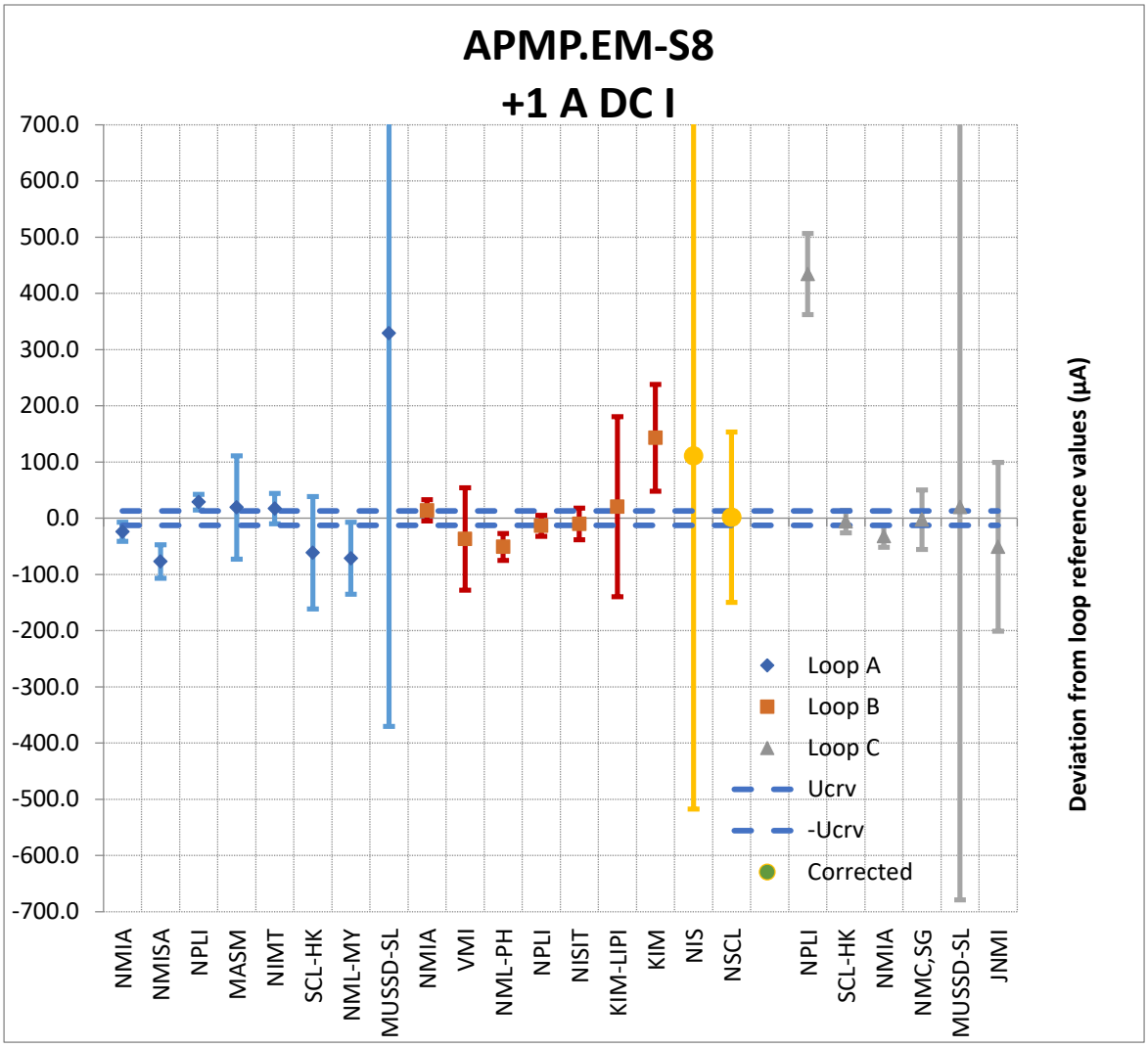

Figure 7.2.7 (Corrected) Comparison Chart for DC Current 1A

COMPARISON REFERENCE VALUE DC CURRENT 1A

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NMI, Australia	NMIA	-14.1	18.6
[R]NPL, India	NPLI	149.9	43.8
SCL, Hong Kong	SCL-HK	-33.6	72.1
MUSSD, Sri Lanka	MUSSD-SL	174.4	699.0

Table 7.2.8.e Single Value Participated More Than Once for DC Current 1A

Laboratories that contributed to the loop reference values

Name		(d_i), µA	(u_i), µA	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-14.1	18.6	0.002896	0.4628	-6.53203
[R]NPL, India	NPLI	149.9	43.8	0.000522	0.0834	12.50429
[R]NMI, South Africa	NMISA	-77.1	30.0	0.001111	0.1776	-13.69438
[R]NIM, Thailand	NIMT	17.0	27.0	0.001372	0.2192	3.72995
[R]NMC, Singapore	NMC-SG	-2.5	53.0	0.000356	0.0569	-0.14323
			∑	0.006257	1.0000	-4.13539

x_{CRV}: -4.1 µA

u_{CRV}: 12.6 µA

Table 7.2.8.f Laboratories that contributed to the loop reference values for DC Current 1A

Name		Deviation from reference (d_i), µA	Exp. Unc., u_i (µA)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-14.1	18.6	-10.0	13.6
[R]NPL, India	NPLI	149.9	43.8	154.0	41.9
[R]NMI, South Africa	NMISA	-77.1	30.0	-73.0	27.2
[R]NIM, Thailand	NIMT	17.0	27.0	21.1	23.9
[R]NMC, Singapore	NMC-SG	-2.5	53.0	1.6	51.5
ESLMASM, Mongolia	MASM	19.1	92.0	23.3	91.1
SCL, Hong Kong	SCLHK	-33.6	72.1	-29.5	73.2
[R]NML, Malaysia	NMLMY	-71.4	64.0	-67.2	65.2
MUSSD, Sri Lanka	MUSSDSL	174.4	699.0	178.6	699.1
VMI, Vietnam	VMI	-37.1	91.0	-32.9	91.9
NML, Philippines	NML-PH	-51.0	24.0	-46.9	27.1
NISIT, Papua New Guinea	NISIT	-10.2	28.0	-6.1	30.7
KIM-LIPI, Indonesia	KIM-LIPI	20.4	160.0	24.5	160.5
KIM, Kazakhstan	KIM	142.8	95.0	147.0	95.8
NIS, Egypt	NIS	110.8	628.2	115.0	628.3
NSCL, Syria	NSCL	1.6	151.5	5.8	152.0
JNMI, Jordan	JNMI	-50.8	150.0	-46.7	150.5

Table 7.2.8.g Degree of Equivalence for DC Current 1A

DEVIATION FROM REFERENCE AC VOLTAGE 100mV 40Hz

Name		Deviation from reference, d_i(μV)	Exp. Unc., u_i (μV)
[R]NMI, Australia	NMIA	1.6	5.5
[R]NMI, South Africa	NMISA	0.5	11.1
[R]NPL, India	NPLI	0.6	7.1
ESLMASM, Mongolia	MASM	1.4	8.6
[R]NIM, Thailand	NIMT	-1.4	4.7
SCL, Hong Kong	SCL-HK	-5.2	6.0
[R]NML, Malaysia	NML-MY	-1.1	14.8
MUSSD, Sri Lanka	MUSSD-SL	4.4	105.2

Table 7.2.9.a Loop A Deviation from reference AC Voltage 100mV, 40Hz

Name		Deviation from reference, d_i(μV)	Exp. Unc., u_i (μV)
[R]NMI, Australia	NMIA	-0.4	5.2
VMI, Vietnam	VMI	3.0	20.6
NML, Philippines	NML-PH	3.4	9.7
[R]NPL, India	NPLI	0.6	6.2
NISIT, Papua New Guinea	NISIT	8.3	9.9
KIM-LIPI, Indonesia	KIM-LIPI	2.5	29.3
KIM, Kazakhstan	KIM	3.1	1569.0
NIS, Egypt	NIS	-3.5	92.0
NSCL, Syria	NSCL	-0.2	10.1
JNMI, Jordan	JNMI	0.2	19.7

Table 7.2.9.b Loop B Deviation from reference AC Voltage 100mV, 40 Hz

Name		Deviation from reference, d_i(μV)	Exp. Unc., u_i (μV)
[R]NPL, India	NPLI	6.1	14.3
SCL, Hong Kong	SCL-HK	-6.4	6.0
[R]NMI, Australia	NMIA	-6.7	10.2
[R]NMC, Singapore	NMC, SG	1.1	5.6
MUSSD, Sri Lanka	MUSSD-SL	4.5	105.2
JNMI, Jordan	JNMI	-8.4	30.0

Table 7.2.9.c Loop C Deviation from reference AC Voltage 100mV, 40Hz

DATA USED FOR CORRECTED CHART AC 100mV 40Hz

Data collated for plotting						
Name	**Loop A**		**Loop B**		**Loop C**	
	d_i	u_i	d_i	u_i	d_i	u_i
NMIA	1.6	5.5				
NMISA	0.5	11.1				
NPLI	0.6	7.1				
MASM	1.4	8.6				
NIMT	-1.4	4.7				
SCL-HK	-5.2	6.0				
NML-MY	-1.1	14.8				
MUSSD-SL	4.4	105.2				
NMIA			-0.4	5.2		
VMI			3.0	20.6		
NML-PH			3.4	9.7		
NPLI			0.6	6.2		
NISIT			8.3	9.9		
KIM-LIPI			2.5	29.3		
KIM			3.1	1569.0		
NIS			-12.1	96.8		
NSCL			-8.8	31.7		
NPLI					6.1	14.3
SCL-HK					-6.4	6.0
NMIA					-6.7	10.2
NMC, SG					1.1	5.6
MUSSD-SL					4.5	105.2
JNMI					-8.4	30.0

Table 7.2.9.d Data for corrected chart AC Voltage 100mV, 40Hz

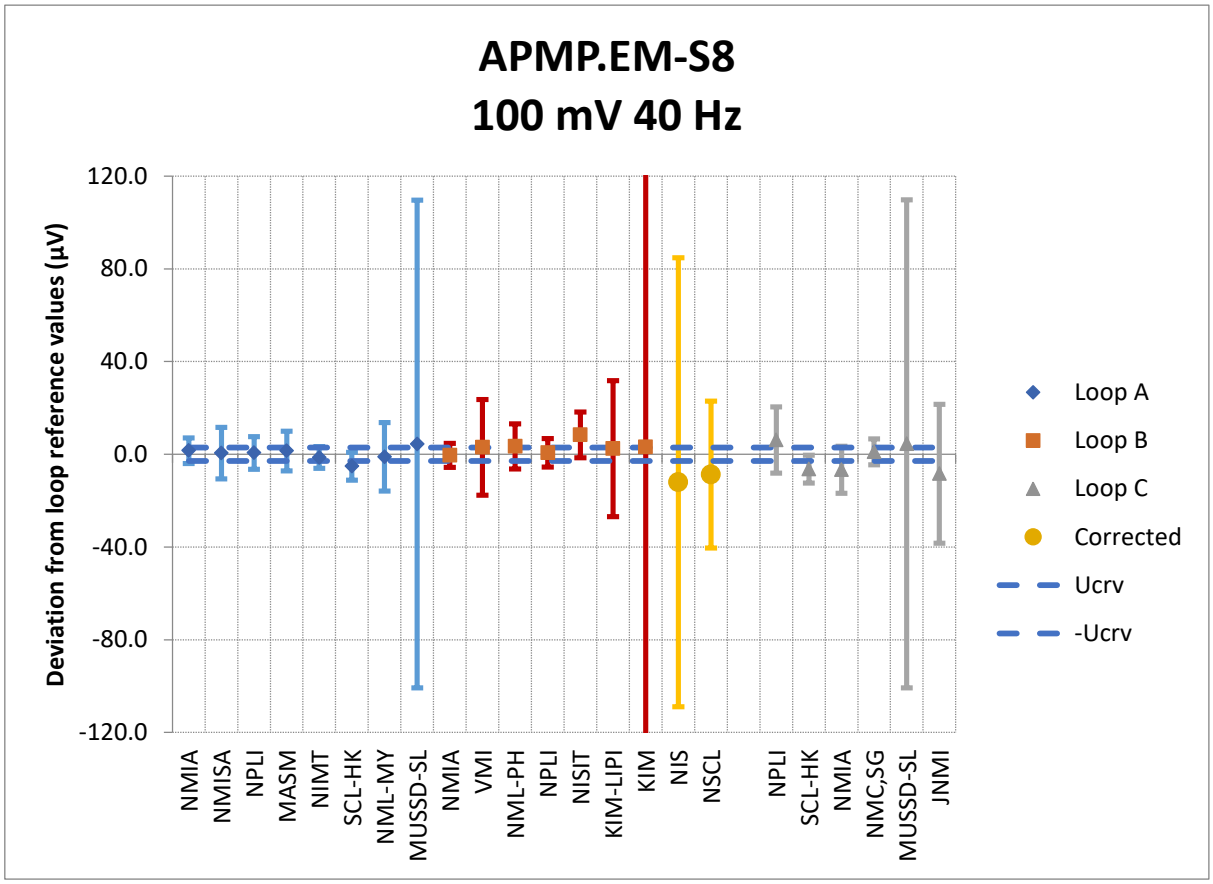

Figure 7.2.9 (Corrected) Comparison Chart for AC Voltage 100mV, 40Hz

COMPARISON REFERENCE VALUE 100mV 40Hz

Name		Deviation from reference, d_i(µV)	Exp. Unc., u_i (µV)
[R]NMI, Australia	NMIA	-1.9	7.3
[R]NPL, India	NPLI	2.4	9.9
SCL, Hong Kong	SCL-HK	-5.8	6.0
MUSSD, Sri Lanka	MUSSD-SL	4.4	105.2

Table 7.2.9.e Single Value Participated More Than Once for AC Voltage 100mV, 40Hz

Laboratories that contributed to the loop reference values

Name		(d_i), µV	(u_i) µV	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-1.9	7.3	0.018681	0.1573	-0.29305
[R]NPL, India	NPLI	2.4	9.9	0.010266	0.0864	0.21125
[R]NMI, South Africa	NMISA	0.5	11.1	0.008116	0.0683	0.03749
[R]NIM, Thailand	NIMT	-1.4	4.7	0.045269	0.3811	-0.53205
[R]NML, Malaysia	NMLMY	-1.1	14.8	0.004565	0.0384	-0.04223
[R]NMC, Singapore	NMC-SG	1.1	5.6	0.031888	0.2684	0.29557
			∑	0.118786	1.0000	-0.32301

x_{CRV}: -0.3 µV

u_{CRV}: 2.9 µV

Table 7.2.9.f Laboratories that contributed to the loop reference values for AC Voltage 100mV 40Hz

Name		Deviation from reference (d_i), µV	Exp. Unc., u_i (µV)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-1.9	7.3	-1.5	6.7
[R]NPL, India	NPLI	2.4	9.9	2.8	9.4
[R]NMI, South Africa	NMISA	0.5	11.1	0.9	10.7
[R]NIM, Thailand	NIMT	-1.4	4.7	-1.1	3.7
[R]NML, Malaysia	NMLMY	-1.1	14.8	-0.8	14.5
[R]NMC, Singapore	NMC-SG	1.1	5.6	1.4	4.8
ESLMASM, Mongolia	MASM	1.4	8.6	1.7	9.1
SCL, Hong Kong	SCLHK	-5.8	6.0	-5.4	6.7
MUSSD, Sri Lanka	MUSSDSL	4.4	105.2	4.8	105.2
VMI, Vietnam	VMI	3.0	20.6	3.3	20.8
NML, Philippines	NML-PH	3.4	9.7	3.7	10.1
NISIT, Papua New Guinea	NISIT	8.3	9.9	8.7	10.3
KIM-LIPI, Indonesia	KIM-LIPI	2.5	29.3	2.8	29.4
KIM, Kazakhstan	KIM	3.1	1569.0	3.4	1569.0
NIS, Egypt	NIS	-12.2	96.8	-11.8	96.8
NSCL, Syria	NSCL	-8.8	31.7	-8.5	31.8
JNMI, Jordan	JNMI	-8.4	30.0	-8.1	30.1

Table 7.2.9.5 Degree of Equivalence for AC Voltage 100mV, 40Hz

DEVIATION FROM REFERENCE AC VOLTAGE 100mV 1kHz

Name		Deviation from reference, d_i(μV)	Exp. Unc., u_i (μV)
[R]NMI, Australia	NMIA	0.3	4.6
[R]NMI, South Africa	NMISA	-0.9	6.9
[R]NPL, India	NPLI	0.6	5.2
ESLMASM, Mongolia	MASM	-1.6	7.9
[R]NIM, Thailand	NIMT	-0.2	4.7
SCL, Hong Kong	SCL-HK	-5.5	6.0
[R]NML, Malaysia	NML-MY	-1.4	14.6
MUSSD, Sri Lanka	MUSSD-SL	-0.8	105.1

Table 7.2.10.a Loop A Deviation from reference AC Voltage 100mV, 1kHz

Name		Deviation from reference, d_i(μV)	Exp. Unc., u_i (μV)
[R]NMI, Australia	NMIA	0.7	4.7
VMI, Vietnam	VMI	4.8	19.8
NML, Philippines	NML-PH	8.7	8.7
[R]NPL, India	NPLI	-0.9	5.5
NISIT, Papua New Guinea	NISIT	10.8	9.9
KIM-LIPI, Indonesia	KIM-LIPI	5.7	14.1
KIM, Kazakhstan	KIM	19.1	1321.0
NIS, Egypt	NIS	-1.1	92.0
NSCL, Syria	NSCL	4.6	9.3
JNMI, Jordan	JNMI	4.4	19.7

Table 7.2.10.b Loop B Deviation from reference AC Voltage 100mV, 1kHz

Name		Deviation from reference, d_i(μV)	Exp. Unc., u_i (μV)
[R]NPL, India	NPLI	3.2	7.4
SCL, Hong Kong	SCL-HK	-3.8	6.0
[R]NMI, Australia	NMIA	-4.7	6.3
[R]NMC, Singapore	NMC, SG	1.9	5.6
MUSSD, Sri Lanka	MUSSD-SL	5.7	105.1
JNMI, Jordan	JNMI	-6.5	30.0

Table 7.2.10.c Loop C Deviation from reference AC Voltage 100mV, 1kHz

DATA USED FOR CORRECTED CHART 100mV 1kHz

Data collated for plotting						
	Loop A		Loop B		Loop C	
Name	d_i	u_i	d_i	u_i	d_i	u_i
NMIA	0.3	4.6				
NMISA	-0.9	6.9				
NPLI	0.6	5.2				
MASM	-1.6	7.9				
NIMT	-0.2	4.7				
SCL-HK	-5.5	6.0				
NML-MY	-1.4	14.6				
MUSSD-SL	-0.8	105.1				
NMIA			0.7	4.7		
VMI			4.8	19.8		
NML-PH			8.7	8.7		
NPLI			-0.9	5.5		
NISIT			10.8	9.9		
KIM-LIPI			5.7	14.1		
KIM			19.1	1321.0		
NIS			-12.0	96.8		
NSCL			-6.3	31.4		
-						
NPLI					3.2	7.4
SCL-HK					-3.8	6.0
NMIA					-4.7	6.3
NMC, SG					1.9	5.6
MUSSD-SL					5.7	105.1
JNMI					-6.5	30.0

Table 7.2.10.d Data for corrected chart AC Voltage 100mV, 1kHz

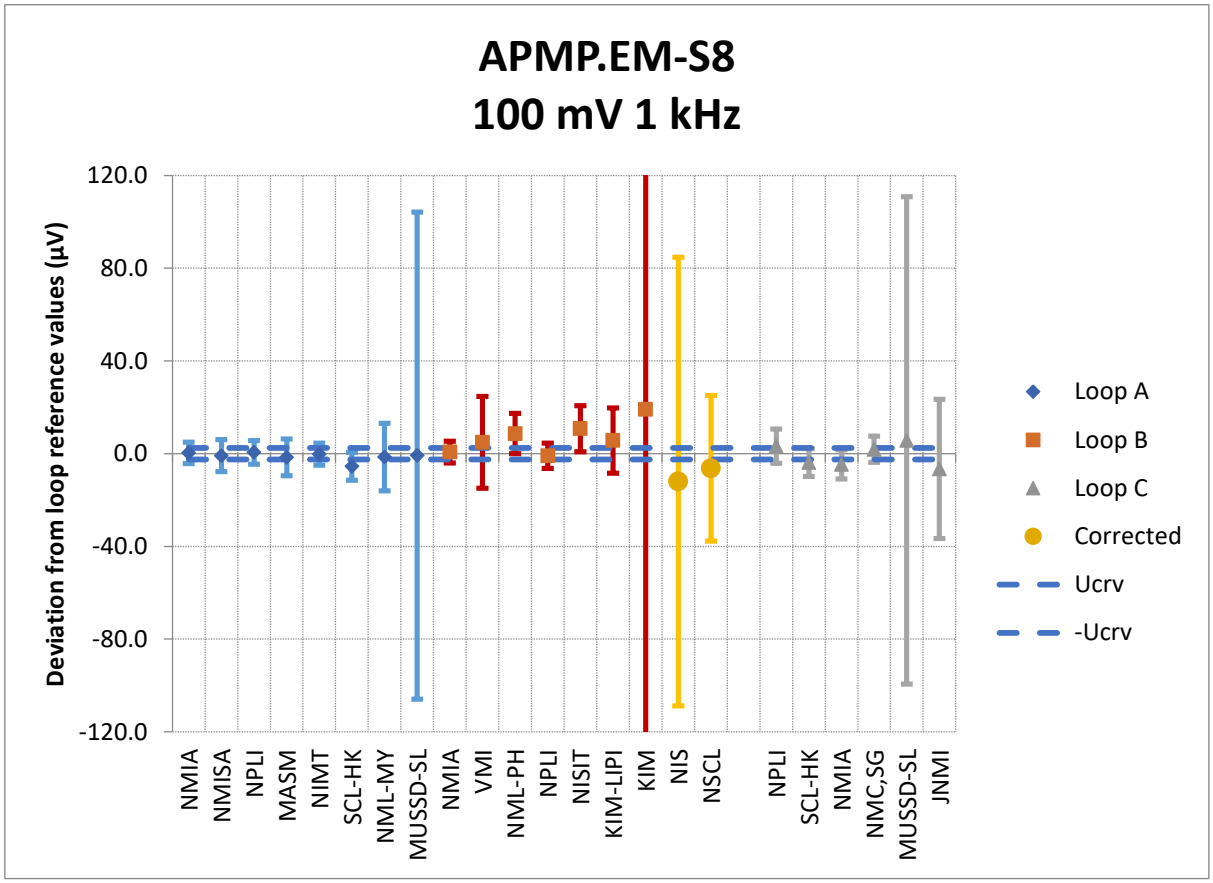

Figure 7.2.10 (Corrected) Comparison Chart for AC Voltage 100mV, 1kHz

COMPARISON REFERENCE VALUE 100mV 1kHz

Name		Deviation from reference, d_i(µV)	Exp. Unc., u_i (µV)
[R]NMI, Australia	NMIA	-1.2	5.2
[R]NPL, India	NPLI	0.9	6.1
SCL, Hong Kong	SCL-HK	-4.6	6.0
MUSSD, Sri Lanka	MUSSD-SL	2.4	105.1

Table 7.2.10.e Single Value Participated More Than Once for AC Voltage 100mV, 1kHz

Laboratories that contributed to the loop reference values

Name		(d_i), µV	(u_i) µV	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-1.2	5.2	0.036399	0.2189	-0.26905
[R]NPL, India	NPLI	0.9	6.1	0.027029	0.1626	0.15286
[R]NMI, South Africa	NMISA	-0.9	6.9	0.021004	0.1263	-0.10838
[R]NIM, Thailand	NIMT	-0.2	4.7	0.045269	0.2722	-0.06057
[R]NML, Malaysia	NMLMY	-1.4	14.6	0.004691	0.0282	-0.04061
[R]NMC, Singapore	NMC-SG	1.9	5.6	0.031888	0.1918	0.36644
				0.166281	1.0000	0.04070

x_{CRV}: 0.0 µV

u_{CRV}: 2.5 µV

Table 7.2.10.4 Laboratories that contributed to the loop reference values for AC Voltage 100mV 1kHz

Name		Deviation from reference (d_i), µV	Exp. Unc., u_i (µV)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-1.2	5.2	-1.3	4.6
[R]NPL, India	NPLI	0.9	6.1	0.9	5.6
[R]NMI, South Africa	NMISA	-0.9	6.9	-0.9	6.4
[R]NIM, Thailand	NIMT	-0.2	4.7	-0.3	4.0
[R]NML, Malaysia	NMLMY	-1.4	14.6	-1.5	14.4
[R]NMC, Singapore	NMC-SG	1.9	5.6	1.9	5.0
ESLMASM, Mongolia	MASM	-1.6	7.9	-1.7	8.3
SCL, Hong Kong	SCLHK	-4.6	6.0	-4.7	6.5
MUSSD, Sri Lanka	MUSSDSL	2.4	105.1	2.4	105.1
VMI, Vietnam	VMI	4.8	19.8	4.8	20.0
NML, Philippines	NML-PH	8.7	8.7	8.6	9.0
NISIT, Papua New Guinea	NISIT	10.8	9.9	10.7	10.2
KIM-LIPI, Indonesia	KIM-LIPI	5.7	14.1	5.6	14.3
KIM, Kazakhstan	KIM	19.1	1321.0	19.1	1321.0
NIS, Egypt	NIS	-12.0	96.8	-12.0	96.8
NSCL, Syria	NSCL	-6.3	31.4	-6.3	31.5
JNMI, Jordan	JNMI	-6.5	30.0	-6.6	30.1

Table 7.2.10.5 Degree of Equivalence for AC Voltage 100mV, 1kHz

DEVIATION FROM REFERENCE AC VOLTAGE 1V 40Hz

Name		Deviation from reference, d_i(µV)	Exp. Unc., u_i (µV)
[R]NMI, Australia	NMIA	28.4	50.0
[R]NMI, South Africa	NMISA	16.9	40.0
[R]NPL, India	NPLI	11.5	49.0
ESLMASM, Mongolia	MASM	2.4	46.0
[R]NIM, Thailand	NIMT	-30.3	37.0
SCL, Hong Kong	SCL-HK	-20.4	30.0
[R]NML, Malaysia	NML-MY	-22.5	70.0
MUSSD, Sri Lanka	MUSSD-SL	-1.9	931.0

Table 7.2.11.a Loop A Deviation from reference AC Voltage 1V, 40Hz

Name		Deviation from reference, d_i(µV)	Exp. Unc., u_i (µV)
[R]NMI, Australia	NMIA	1.0	43.0
VMI, Vietnam	VMI	-6.2	11.2
NML, Philippines	NML-PH	-133.7	110.0
[R]NPL, India	NPLI	-0.8	37.5
NISIT, Papua New Guinea	NISIT	17.9	93.0
KIM-LIPI, Indonesia	KIM-LIPI	-11.4	120.0
KIM, Kazakhstan	KIM	-160.7	605.0
NIS, Egypt	NIS	9.8	800.0
NSCL, Syria	NSCL	11.2	41.0
JNMI, Jordan	JNMI	-33.9	62.0

Table 7.2.11.b Loop B Deviation from reference AC Voltage 1V, 40Hz

Name		Deviation from reference, d_i(µV)	Exp. Unc., u_i (µV)
[R]NPL, India	NPLI	18.2	33.0
SCL, Hong Kong	SCL-HK	-10.3	40.0
[R]NMI, Australia	NMIA	-35.4	37.8
[R]NMC, Singapore	NMC, SG	7.4	30.0
MUSSD, Sri Lanka	MUSSD-SL	62.3	931.0
JNMI, Jordan	JNMI	-117.1	72.0

Table 7.2.11.c Loop C Deviation from reference AC Voltage 1V, 40Hz

DATA USED FOR CORRECTED CHART AC 1V 40Hz

Data collated for plotting						
	Loop A		Loop B		Loop C	
Name	d_i	u_i	d_i	u_i	d_i	u_i
NMIA	28.4	50.0				
NMISA	16.9	40.0				
NPLI	11.5	49.0				
MASM	2.4	46.0				
NIMT	-30.3	37.0				
SCL-HK	-20.4	30.0				
NML-MY	-22.5	70.0				
MUSSD-SL	-1.9	931.0				
NMIA			1.0	43.0		
VMI			-6.2	11.2		
NML-PH			-133.7	110.0		
NPLI			-0.8	37.5		
NISIT			17.9	93.0		
KIM-LIPI			-11.4	120.0		
KIM			-160.7	605.0		
NIS			-73.4	803.2		
NSCL			-72.0	82.9		
NPLI					18.2	33.0
SCL-HK					-10.3	40.0
NMIA					-35.4	37.8
NMC, SG					7.4	30.0
MUSSD-SL					62.3	931.0
JNMI					-117.1	72.0

Table 7.2.11.d Data for corrected chart AC Voltage 1V, 40Hz

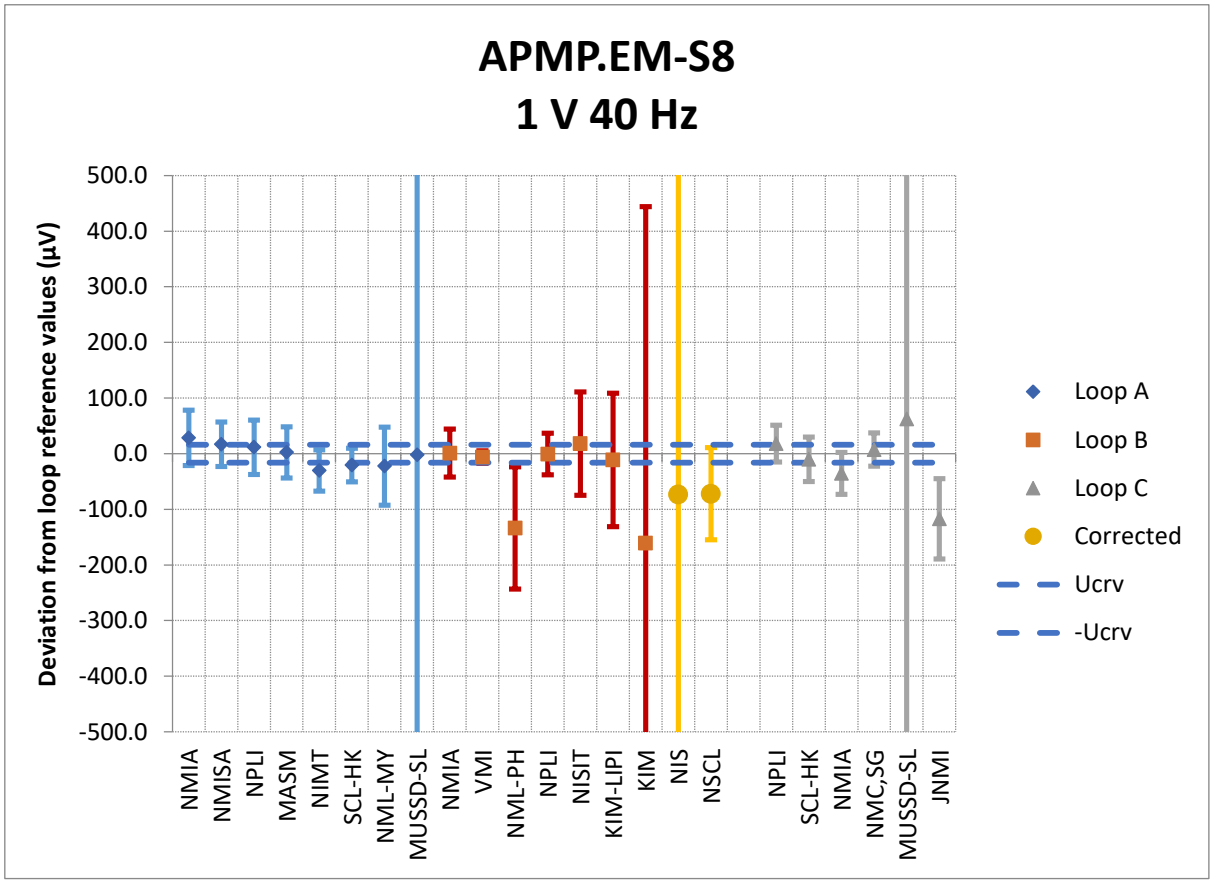

Figure 7.2.11 (Corrected) Comparison Chart for AC Voltage 1V, 40Hz

COMPARISON REFERENCE VALUE 1V 40Hz

Name		Deviation from reference, d_i(µV)	Exp. Unc., u_i (µV)
[R]NMI, Australia	NMIA	-2.0	43.9
[R]NPL, India	NPLI	9.6	40.4
SCL, Hong Kong	SCL-HK	-15.4	35.4
MUSSD, Sri Lanka	MUSSD-SL	30.2	931.0

Table 7.2.11.e Single Value Participated More than Once for AC Voltage 1V, 40Hz

Laboratories that contributed to the loop reference values

Name		(d_i), µV	(u_i) µV	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-2.0	43.9	0.000519	0.136593	-0.27586
[R]NPL, India	NPLI	9.6	40.4	0.000613	0.161119	1.55139
[R]NMI, South Africa	NMISA	16.9	40.0	0.000625	0.164353	2.78362
[R]NIM, Thailand	NIMT	-30.3	37.0	0.000730	0.192085	-5.81994
[R]NML, Malaysia	NMLMY	-22.5	70.0	0.000204	0.053666	-1.20770
[R]NMC, Singapore	NMC-SG	7.4	30.0	0.001111	0.292183	2.14944
			∑	0.003803	1.0000	-0.81904

x_{CRV}: -0.8 µV

u_{CRV}: 16.2 µV

Table 7.2.11.f Laboratories that contributed to the loop reference values for AC Voltage 1V 40Hz

Name		Deviation from reference (d_i), µV	Exp. Unc., u_i (µV)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-2.0	43.9	-1.2	40.8
[R]NPL, India	NPLI	9.6	40.4	10.4	37.0
[R]NMI, South Africa	NMISA	16.9	40.0	17.8	36.6
[R]NIM, Thailand	NIMT	-30.3	37.0	-29.5	33.3
[R]NML, Malaysia	NMLMY	-22.5	70.0	-21.7	68.1
[R]NMC, Singapore	NMC-SG	7.4	30.0	8.2	25.2
ESLMASM, Mongolia	MASM	2.4	46.0	3.2	48.8
SCL, Hong Kong	SCLHK	-15.4	35.4	-14.5	38.9
MUSSD, Sri Lanka	MUSSDSL	30.2	931.0	31.0	931.1
VMI, Vietnam	VMI	-6.2	11.2	-5.3	19.7
NML, Philippines	NML-PH	-133.7	110.0	-132.8	111.2
NISIT, Papua New Guinea	NISIT	17.9	93.0	18.7	94.4
KIM-LIPI, Indonesia	KIM-LIPI	-11.4	120.0	-10.6	121.1
KIM, Kazakhstan	KIM	-160.7	605.0	-159.9	605.2
NIS, Egypt	NIS	-73.4	803.2	-72.6	803.4
NSCL, Syria	NSCL	-72.1	82.9	-71.3	84.4
JNMI, Jordan	JNMI	-117.1	72.0	-116.3	73.8

Table 7.2.11.g Degree of Equivalence for AC Voltage 1V, 40Hz

DEVIATION FROM REFERENCE AC VOLTAGE 1V 1kHz

Name		Deviation from reference, d_i(µV)	Exp. Unc., u_i (µV)
[R]NMI, Australia	NMIA	17.8	32.0
[R]NMI, South Africa	NMISA	5.3	40.0
[R]NPL, India	NPLI	9.5	26.0
ESLMASM, Mongolia	MASM	-21.2	42.0
[R]NIM, Thailand	NIMT	-30.8	37.0
SCL, Hong Kong	SCL-HK	-23.2	30.0
[R]NML, Malaysia	NML-MY	-30.5	50.0
MUSSD, Sri Lanka	MUSSD-SL	-28.0	926.0

Table 7.2.12.a Loop A Deviation from reference AC Voltage 1V, 1kHz

Name		Deviation from reference, d_i(µV)	Exp. Unc., u_i (µV)
[R]NMI, Australia	NMIA	-3.4	31.0
VMI, Vietnam	VMI	-12.6	66.0
NML, Philippines	NML-PH	-25.5	51.0
[R]NPL, India	NPLI	1.5	20.4
NISIT, Papua New Guinea	NISIT	26.0	93.0
KIM-LIPI, Indonesia	KIM-LIPI	-6.8	61.0
KIM, Kazakhstan	KIM	60.0	329.0
NIS, Egypt	NIS	-40.6	800.0
NSCL, Syria	NSCL	19.8	37.0
JNMI, Jordan	JNMI	-24.9	62.0

Table 7.2.12.b Loop B Deviation from reference AC Voltage 1V, 1kHz

Name		Deviation from reference, d_i(µV)	Exp. Unc., u_i (µV)
[R]NPL, India	NPLI	5.8	27.0
SCL, Hong Kong	SCL-HK	12.2	30.0
[R]NMI, Australia	NMIA	-31.3	37.1
[R]NMC, Singapore	NMC, SG	11.6	28.0
MUSSD, Sri Lanka	MUSSD-SL	57.2	926.0
JNMI, Jordan	JNMI	-107.4	72.0

Table 7.2.12.c Loop C Deviation from reference AC Voltage 1V, 1kHz

DATA USED FOR CORRECTED CHART 1V 1kHz

Data collated for plotting						
Name	**Loop A**		**Loop B**		**Loop C**	
NMIA	17.8	32.0				
NMISA	5.3	40.0				
NPLI	9.5	26.0				
MASM	-21.2	42.0				
NIMT	-30.8	37.0				
SCL-HK	-23.2	30.0				
NML-MY	-30.5	50.0				
MUSSD-SL	-28.0	926.0				
NMIA			-3.4	31.0		
VMI			-12.6	66.0		
NML-PH			-25.5	51.0		
NPLI			1.5	20.4		
NISIT			26.0	93.0		
KIM-LIPI			-6.8	61.0		
KIM			60.0	329.0		
NIS			-123	803.2		
NSCL			-62.7	81.0		
NPLI					5.8	27.0
SCL-HK					12.2	30.0
NMIA					-31.3	37.1
NMC, SG					11.6	28.0
MUSSD-SL					57.2	926.0
JNMI					-107.4	72.0

Table 7.2.12.d Data for corrected chart AC Voltage 1V, 1kHz

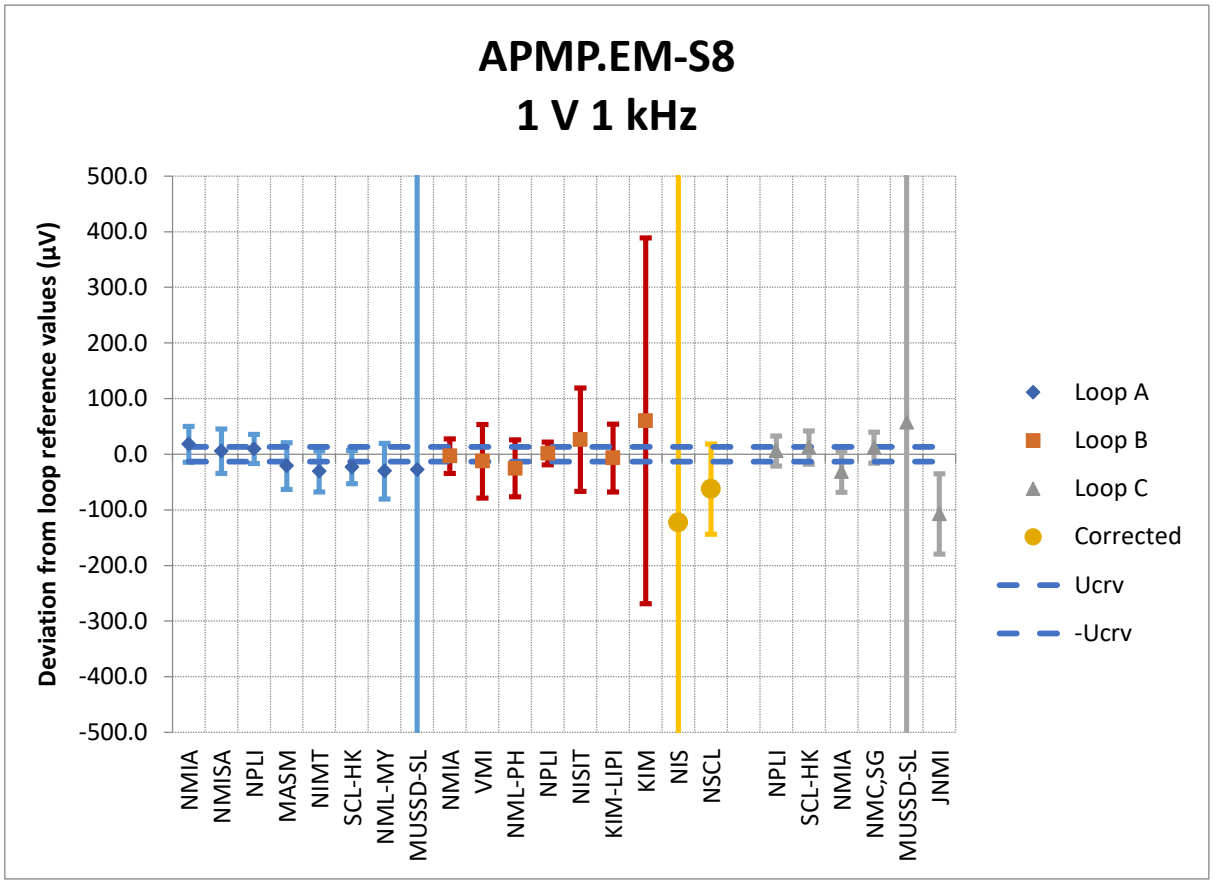

Figure 7.2.12 (Corrected) Comparison Chart for AC Voltage 1V, 1kHz

COMPARISON REFERENCE VALUE 1V 1kHz

Name		Deviation from reference, d_i(µV)	Exp. Unc., u_i (µV)
[R]NMI, Australia	NMIA	-5.6	33.5
[R]NPL, India	NPLI	5.6	24.6
SCL, Hong Kong	SCL-HK	-5.5	30.0
MUSSD, Sri Lanka	MUSSD-SL	14.6	926.0

Table 7.2.12.e Single Value Participated More Than Once for AC Voltage 1V, 1kHz

Laboratories that contributed to the loop reference values

Name		(d_i), µV	(u_i) µV	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-5.6	33.5	0.000892	0.1601	-0.90409
[R]NPL, India	NPLI	5.6	24.6	0.001649	0.2959	1.64974
[R]NMI, South Africa	NMISA	5.3	40.0	0.000625	0.1122	0.59518
[R]NIM, Thailand	NIMT	-30.8	37.0	0.000730	0.1311	-4.04251
[R]NML, Malaysia	NMLMY	-30.5	50.0	0.000400	0.0718	-2.18987
[R]NMC, Singapore	NMC-SG	11.6	28.0	0.001276	0.2289	2.66220
			∑	0.005572	1.0000	-2.22935

x_{CRV}: -2.2 µV

u_{CRV}: 13.4 µV

Table 7.2.12.f Laboratories that contributed to the loop reference values for AC Voltage 1V 1kHz

Name		Deviation from reference (d_i), µV	Exp. Unc., u_i (µV)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-5.6	33.5	-3.4	30.7
[R]NPL, India	NPLI	5.6	24.6	7.8	20.7
[R]NMI, South Africa	NMISA	5.3	40.0	7.5	37.7
[R]NIM, Thailand	NIMT	-30.8	37.0	-28.6	34.5
[R]NML, Malaysia	NMLMY	-30.5	50.0	-28.3	48.2
[R]NMC, Singapore	NMC-SG	11.6	28.0	13.9	24.6
ESLMASM, Mongolia	MASM	-21.2	42.0	-19.0	44.1
SCL, Hong Kong	SCLHK	-5.5	30.0	-3.3	32.9
MUSSD, Sri Lanka	MUSSDSL	14.6	926.0	16.8	926.1
VMI, Vietnam	VMI	-12.6	66.0	-10.4	67.3
NML, Philippines	NML-PH	-25.5	51.0	-23.2	52.7
NISIT, Papua New Guinea	NISIT	26.0	93.0	28.2	94.0
KIM-LIPI, Indonesia	KIM-LIPI	-6.8	61.0	-4.6	62.5
KIM, Kazakhstan	KIM	60.0	329.0	62.2	329.3
NIS, Egypt	NIS	-123.0	803.2	-120.8	803.3
NSCL, Syria	NSCL	-62.6	81.0	-60.4	82.1
JNMI, Jordan	JNMI	-107.4	72.0	-105.1	73.2

Table 7.2.12.5 Degree of Equivalence for AC Voltage 1V, 1kHz

DEVIATION FROM REFERENCE AC VOLTAGE 10V 40Hz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	0.2	0.3
[R]NMI, South Africa	NMISA	0.0	0.4
[R]NPL, India	NPLI	0.2	0.5
ESLMASM, Mongolia	MASM	0.2	0.5
[R]NIM, Thailand	NIMT	-0.3	0.4
SCL, Hong Kong	SCL-HK	0.0	0.3
[R]NML, Malaysia	NML-MY	-0.1	0.6
MUSSD, Sri Lanka	MUSSD-SL	1.0	9.3

Table 7.2.13.a Loop A Deviation from reference AC Voltage 10V, 40Hz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	-0.4	0.6
VMI, Vietnam	VMI	0.6	1.1
NML, Philippines	NML-PH	0.2	0.8
[R]NPL, India	NPLI	0.2	0.3
NISIT, Papua New Guinea	NISIT	1.6	0.9
KIM-LIPI, Indonesia	KIM-LIPI	1.4	1.1
KIM, Kazakhstan	KIM	-22.1	11.4
NIS, Egypt	NIS	1.1	8.1
NSCL, Syria	NSCL	2.0	0.4
JNMI, Jordan	JNMI	2.1	0.6

Table 7.2.13.b Loop B Deviation from reference AC Voltage 10V, 40Hz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NPL, India	NPLI	0.9	0.8
SCL, Hong Kong	SCL-HK	-0.2	0.3
[R]NMI, Australia	NMIA	-0.5	0.5
[R]NMC, Singapore	NMC, SG	0.0	0.3
MUSSD, Sri Lanka	MUSSD-SL	0.8	9.3
JNMI, Jordan	JNMI	-1.0	0.7

Table 7.2.13.c Loop C Deviation from reference AC Voltage 10V, 40Hz

DATA USED FOR CORRECTED CHART 10V 40Hz

Data collated for plotting						
	Loop A		Loop B		Loop C	
Name						
NMIA	0.2	0.3				
NMISA	0.0	0.4				
NPLI	0.2	0.5				
MASM	0.2	0.5				
NIMT	-0.3	0.4				
SCL-HK	0.0	0.3				
NML-MY	-0.1	0.6				
MUSSD-SL	1.0	9.3				
NMIA			-0.4	0.6		
VMI			0.6	1.1		
NML-PH			0.2	0.8		
NPLI			0.2	0.3		
NISIT			1.6	0.9		
KIM-LIPI			1.4	1.1		
KIM			-22.1	11.4		
NIS			-2.0	8.1		
NSCL			-1.1	0.8		
NPLI					0.9	0.8
SCL-HK					-0.2	0.3
NMIA					-0.5	0.5
NMC, SG					0.0	0.3
MUSSD-SL					0.8	9.3
JNMI					-1.0	0.7

Table 7.2.13.d Data for corrected chart AC Voltage 10V, 40Hz

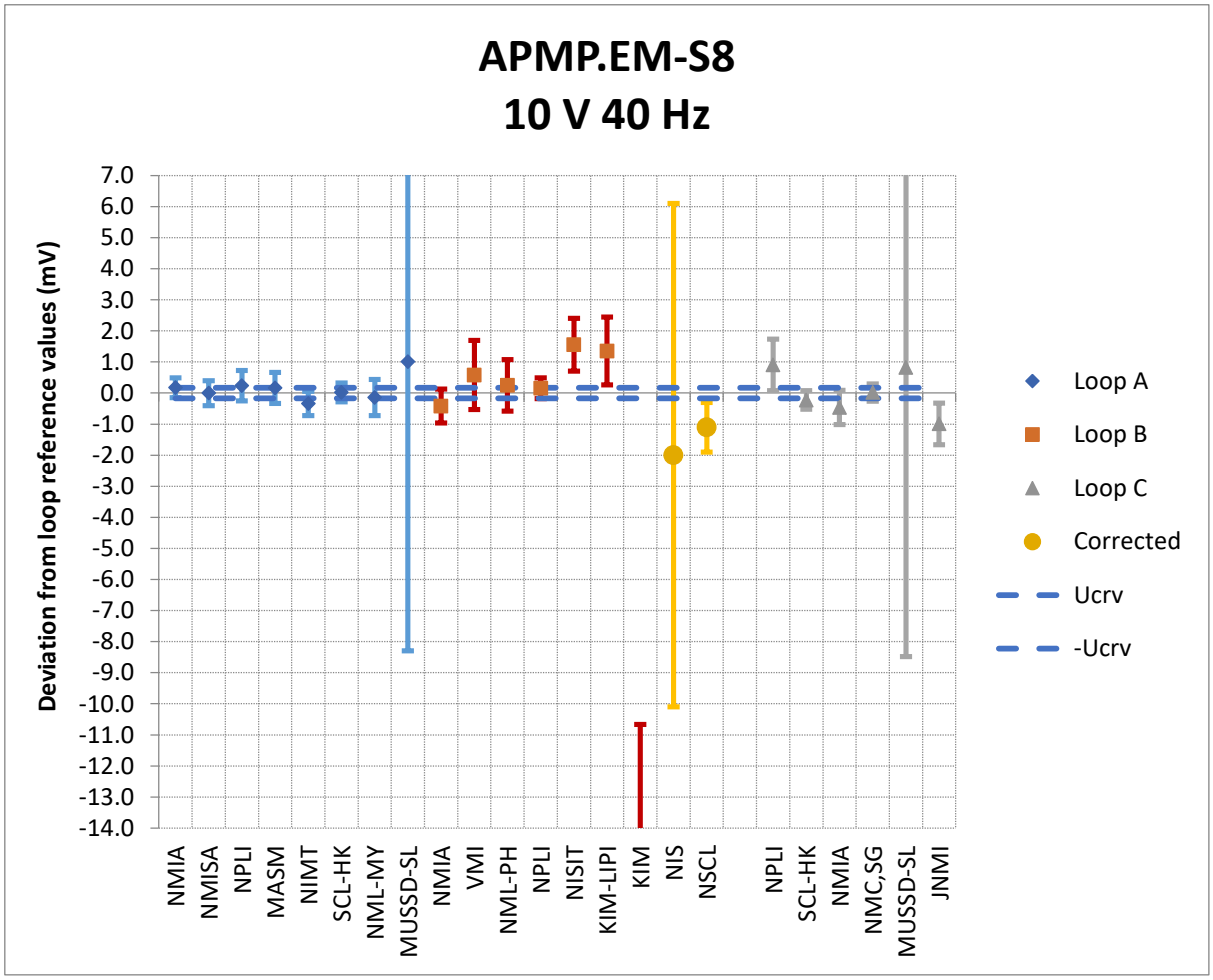

Figure 7.2.13 (Corrected) Comparison Chart for AC Voltage 10V, 40Hz

COMPARISON REFERENCE VALUE 10V 40Hz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	-0.2	0.5
[R]NPL, India	NPLI	0.4	0.6
SCL, Hong Kong	SCL-HK	-0.1	0.3
MUSSD, Sri Lanka	MUSSD-SL	0.9	9.3

Table 7.2.13.e Single Value Participated More than Once for AC Voltage 10V, 40Hz

Laboratories that contributed to the loop reference values

Name		(d_i), mV	(u_i) mV	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-0.2	0.5	4.2463	0.1190	-0.0281
[R]NPL, India	NPLI	0.4	0.6	2.8778	0.0807	0.0348
[R]NMI, South Africa	NMISA	0.0	0.4	6.2500	0.1752	-0.0007
[R]NIM, Thailand	NIMT	-0.3	0.4	6.5746	0.1843	-0.0621
[R]NML, Malaysia	NMLMY	-0.1	0.6	2.9727	0.0833	-0.0121
[R]NMC, Singapore	NMC-SG	0.0	0.3	12.7551	0.3575	0.0064
			∑	35.6765	1.0000	-0.0618

x_{CRV}: -0.1 mV

u_{CRV}: 0.2 mV

Table 7.2.13.f Laboratories that contributed to the loop reference values for AC Voltage 10V 40Hz

Name		Deviation from reference (d_i), mV	Exp. Unc., u_i (mV)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-0.2	0.5	-0.2	0.5
[R]NPL, India	NPLI	0.4	0.6	0.5	0.6
[R]NMI, South Africa	NMISA	0.0	0.4	0.1	0.4
[R]NIM, Thailand	NIMT	-0.3	0.4	-0.3	0.4
[R]NML, Malaysia	NMLMY	-0.1	0.6	-0.1	0.6
[R]NMC, Singapore	NMC-SG	0.0	0.3	0.1	0.2
ESLMASM, Mongolia	MASM	0.2	0.5	0.2	0.5
SCL, Hong Kong	SCLHK	-0.1	0.3	0.0	0.3
MUSSD, Sri Lanka	MUSSDSL	0.9	9.3	1.0	9.3
VMI, Vietnam	VMI	0.6	1.1	0.6	1.1
NML, Philippines	NML-PH	0.2	0.8	0.3	0.8
NISIT, Papua New Guinea	NISIT	1.6	0.9	1.6	0.9
KIM-LIPI, Indonesia	KIM-LIPI	1.4	1.1	1.4	1.1
KIM, Kazakhstan	KIM	-22.1	11.4	-22.0	11.4
NIS, Egypt	NIS	-1.9	8.1	-1.8	8.1
NSCL, Syria	NSCL	-1.1	0.8	-1.0	0.8
JNMI, Jordan	JNMI	-1.0	0.7	-0.9	0.7

Table 7.2.13.5 Degree of Equivalence for AC Voltage 10V, 40Hz

DEVIATION FROM REFERENCE AC VOLTAGE 10V 1kHz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	0.1	0.4
[R]NMI, South Africa	NMISA	-0.1	0.4
[R]NPL, India	NPLI	0.2	0.3
ESLMASM, Mongolia	MASM	-0.1	0.4
[R]NIM, Thailand	NIMT	-0.3	0.4
SCL, Hong Kong	SCL-HK	-0.1	0.3
[R]NML, Malaysia	NML-MY	-0.4	0.5
MUSSD, Sri Lanka	MUSSD-SL	0.4	9.3

Table 7.2.14.a Loop A Deviation from reference AC Voltage 10V, 1kHz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	-0.7	0.3
VMI, Vietnam	VMI	1.5	1.1
NML, Philippines	NML-PH	1.7	0.5
[R]NPL, India	NPLI	0.3	0.2
NISIT, Papua New Guinea	NISIT	3.0	0.9
KIM-LIPI, Indonesia	KIM-LIPI	3.0	0.6
KIM, Kazakhstan	KIM	-16.5	20.0
NIS, Egypt	NIS	4.9	8.0
NSCL, Syria	NSCL	5.6	0.4
JNMI, Jordan	JNMI	5.9	0.6

Table 7.2.14.b Loop B Deviation from reference AC Voltage 10V, 1kHz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NPL, India	NPLI	1.0	0.6
SCL, Hong Kong	SCL-HK	0.0	0.3
[R]NMI, Australia	NMIA	-0.3	0.3
[R]NMC, Singapore	NMC, SG	0.1	0.3
MUSSD, Sri Lanka	MUSSD-SL	0.8	9.3
JNMI, Jordan	JNMI	-0.8	0.7

Table 7.2.14.c Loop C Deviation from reference AC Voltage 10V, 1kHz

DATA USED FOR CORRECTED CHART 10V 1kHz

Data collated for plotting						
	Loop A		Loop B		Loop C	
Name	d_i	u_i	d_i	u_i	d_i	u_i
NMIA	0.1	0.4				
NMISA	-0.1	0.4				
NPLI	0.2	0.3				
MASM	-0.1	0.4				
NIMT	-0.3	0.4				
SCL-HK	-0.1	0.3				
NML-MY	-0.4	0.5				
MUSSD-SL	0.4	9.3				
NMIA			-0.7	0.3		
VMI			1.5	1.1		
NML-PH			1.7	0.5		
NPLI			0.3	0.2		
NISIT			3.0	0.9		
KIM-LIPI			3.0	0.6		
KIM			-16.5	20.0		
NIS			-1.8	8.0		
NSCL			-1.1	0.8		
NPLI					1.0	0.6
SCL-HK					0.0	0.3
NMIA					-0.3	0.3
NMC, SG					0.1	0.3
MUSSD-SL					0.8	9.3
JNMI					-0.8	0.7

Table 7.2.14.d Data for corrected chart AC Voltage 10V, 1kHz

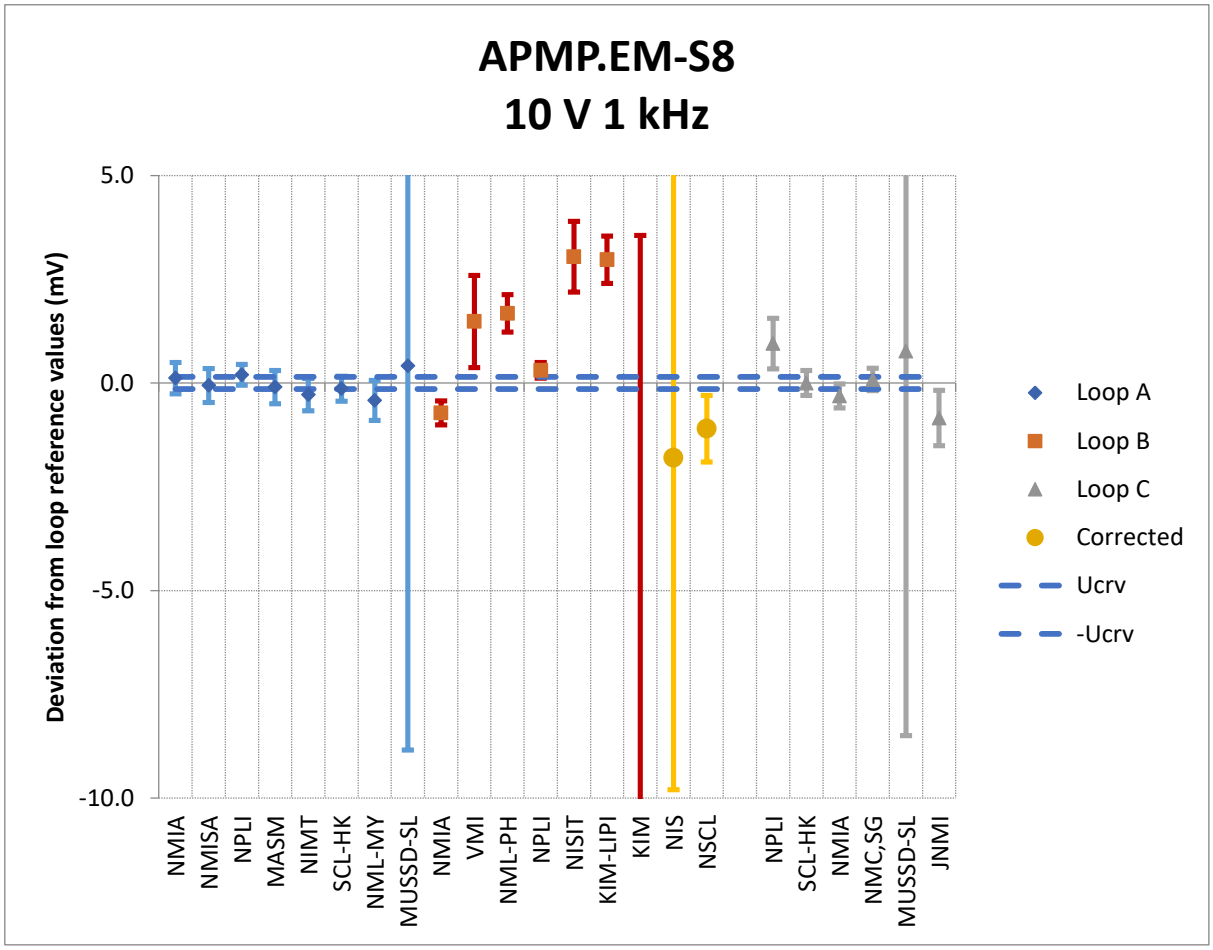

Figure 7.2.14 (Corrected) Comparison Chart for AC Voltage 10V, 1kHz

COMPARISON REFERENCE VALUE 10V 1kHz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	-0.3	0.3
[R]NPL, India	NPLI	0.5	0.4
SCL, Hong Kong	SCL-HK	-0.1	0.3
MUSSD, Sri Lanka	MUSSD-SL	0.6	9.3

Table 7.2.14.e Single Value Participated More Than Once for AC Voltage 10V, 1kHz

Laboratories that contributed to the loop reference values

Name		(d_i), mV	(u_i) mV	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-0.3	0.3	9.596929	0.2062	-0.06271
[R]NPL, India	NPLI	0.5	0.4	6.373486	0.1369	0.06660
[R]NMI, South Africa	NMISA	-0.1	0.4	5.948840	0.1278	-0.00755
[R]NIM, Thailand	NIMT	-0.3	0.4	6.574622	0.1412	-0.03985
[R]NML, Malaysia	NMLMY	-0.4	0.5	4.340278	0.0932	-0.03910
[R]NMC, Singapore	NMC-SG	0.1	0.3	13.717421	0.2947	0.02480
				46.551576	1.0000	-0.05781

x_{CRV}: -0.1 mV

u_{CRV}: 0.1 mV

Table 7.2.14.f Laboratories that contributed to the loop reference values for AC Voltage 10V, 1kHz

Name		Deviation from reference (d_i), mV	Exp. Unc., u_i (mV)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-0.3	0.3	-0.2	0.3
[R]NPL, India	NPLI	0.5	0.4	0.5	0.4
[R]NMI, South Africa	NMISA	-0.1	0.4	0.0	0.4
[R]NIM, Thailand	NIMT	-0.3	0.4	-0.2	0.4
[R]NML, Malaysia	NMLMY	-0.4	0.5	-0.4	0.5
[R]NMC, Singapore	NMC-SG	0.1	0.3	0.1	0.2
ESLMASM, Mongolia	MASM	-0.1	0.4	0.0	0.4
SCL, Hong Kong	SCLHK	-0.1	0.3	0.0	0.3
MUSSD, Sri Lanka	MUSSDSL	0.6	9.3	0.6	9.3
VMI, Vietnam	VMI	1.5	1.1	1.5	1.1
NML, Philippines	NML-PH	1.7	0.5	1.7	0.5
NISIT, Papua New Guinea	NISIT	3.0	0.9	3.1	0.9
KIM-LIPI, Indonesia	KIM-LIPI	3.0	0.6	3.0	0.6
KIM, Kazakhstan	KIM	-16.5	20.0	-16.4	20.0
NIS, Egypt	NIS	-1.8	8.0	-1.8	8.0
NSCL, Syria	NSCL	-1.1	0.8	-1.1	0.8
JNMI, Jordan	JNMI	-0.8	0.7	-0.8	0.7

Table 7.2.14.g Degree of Equivalence for AC Voltage 10V, 1kHz

DEVIATION FROM REFERENCE AC VOLTAGE 100V 40Hz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	3.0	5.2
[R]NMI, South Africa	NMISA	2.1	4.8
[R]NPL, India	NPLI	1.7	5.0
ESLMASM, Mongolia	MASM	2.9	4.5
[R]NIM, Thailand	NIMT	-2.3	3.8
SCL, Hong Kong	SCL-HK	-1.4	3.0
[R]NML, Malaysia	NML-MY	-5.8	7.2
MUSSD, Sri Lanka	MUSSD-SL	4.3	93.0

Table 7.2.15.a Loop A Deviation from reference AC Voltage 100V, 40Hz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	-3.0	4.5
VMI, Vietnam	VMI	8.5	11.3
NML, Philippines	NML-PH	10.4	6.6
[R]NPL, India	NPLI	2.2	3.8
NISIT, Papua New Guinea	NISIT	21.6	9.5
KIM-LIPI, Indonesia	KIM-LIPI	-0.9	21.0
KIM, Kazakhstan	KIM	-197.4	95.5
NIS, Egypt	NIS	19.8	81.0
NSCL, Syria	NSCL	24.8	5.0
JNMI, Jordan	JNMI	24.8	6.6

Table 7.2.15.b Loop B Deviation from reference AC Voltage 100V, 40Hz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NPL, India	NPLI	15.3	8.3
SCL, Hong Kong	SCL-HK	-1.6	4.0
[R]NMI, Australia	NMIA	-6.1	4.3
[R]NMC, Singapore	NMC, SG	1.1	3.1
MUSSD, Sri Lanka	MUSSD-SL	8.6	93.0
JNMI, Jordan	JNMI	-14.0	7.5

Table 7.2.15.c Loop C Deviation from reference AC Voltage 100V, 40Hz

DATA USED FOR CORRECTED CHART 100V 40Hz

Data collated for plotting						
	Loop A		Loop B		Loop C	
Name	d_i	u_i	d_i	u_i	d_i	u_i
NMIA	3.0	5.2				
NMISA	2.1	4.8				
NPLI	1.7	5.0				
MASM	2.9	4.5				
NIMT	-2.3	3.8				
SCL-HK	-1.4	3.0				
NML-MY	-5.8	7.2				
MUSSD-SL	4.3	93.0				
NMIA			-3.0	4.5		
VMI			8.5	11.3		
NML-PH			10.4	6.6		
NPLI			2.2	3.8		
NISIT			21.6	9.5		
KIM-LIPI			-0.9	21.0		
KIM			-197.4	95.5		
NIS			-19.0	81.3		
NSCL			-14.0	9.0		
-						
NPLI					15.3	8.3
SCL-HK					-1.6	4.0
NMIA					-6.1	4.3
NMC, SG					1.1	3.1
MUSSD-SL					8.6	93.0
JNMI					-14.0	7.5

Table 7.2.15.d Data for corrected chart AC Voltage 100V, 40Hz

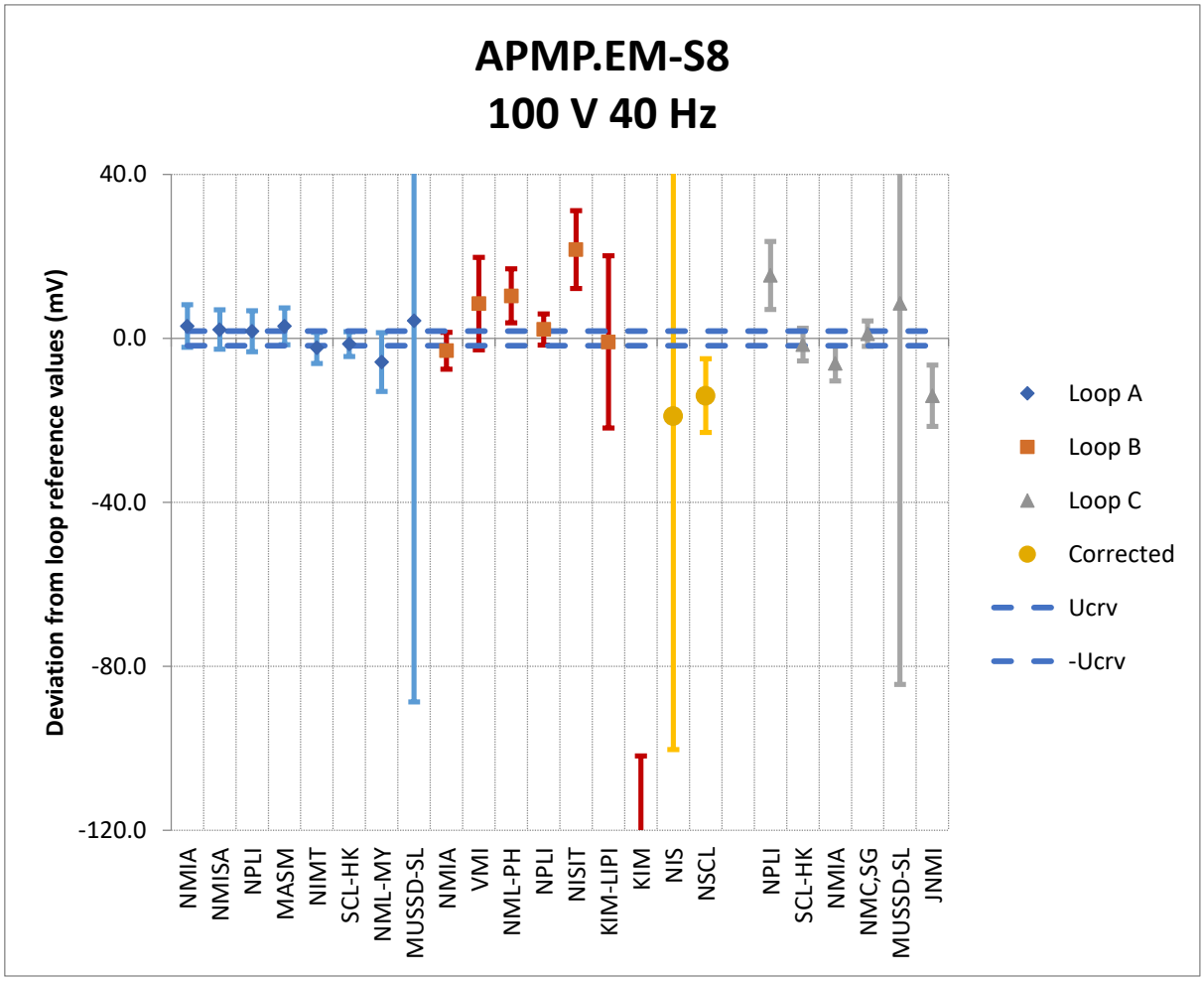

Figure 7.2.15 (Corrected) Comparison Chart for AC Voltage 100V, 40Hz

COMPARISON REFERENCE VALUE 100V 40Hz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	-2.1	4.7
[R]NPL, India	NPLI	6.4	6.0
SCL, Hong Kong	SCL-HK	-1.5	3.5
MUSSD, Sri Lanka	MUSSD-SL	6.4	93.0

Table 7.2.15.e Single Value Participated More Than Once for AC Voltage 100V, 40Hz

Laboratories that contributed to the loop reference values

Name		(d_i), mV	(u_i) mV	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-2.1	4.7	0.045858	0.1481	-0.30543
[R]NPL, India	NPLI	6.4	6.0	0.027693	0.0895	0.57278
[R]NMI, South Africa	NMISA	2.1	4.8	0.043403	0.1402	0.30046
[R]NIM, Thailand	NIMT	-2.3	3.8	0.069252	0.2237	-0.51606
[R]NML, Malaysia	NMLMY	-5.8	7.2	0.019290	0.0623	-0.36087
[R]NMC, Singapore	NMC-SG	1.1	3.1	0.104058	0.3362	0.37392
			∑	0.309554	1.0000	0.06479

x_{CRV}: 0.1 mV

u_{CRV}: 1.8 mV

Table 7.2.15.f Laboratories that contributed to the loop reference values for AC Voltage 100V, 40Hz

Name		Deviation from reference (d_i), mV	Exp. Unc., u_i (mV)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-2.1	4.7	-2.1	4.3
[R]NPL, India	NPLI	6.4	6.0	6.3	5.7
[R]NMI, South Africa	NMISA	2.1	4.8	2.1	4.5
[R]NIM, Thailand	NIMT	-2.3	3.8	-2.4	3.3
[R]NML, Malaysia	NMLMY	-5.8	7.2	-5.9	7.0
[R]NMC, Singapore	NMC-SG	1.1	3.1	1.0	2.5
ESLMASM, Mongolia	MASM	2.9	4.5	2.9	4.8
SCL, Hong Kong	SCLHK	-1.5	3.5	-1.5	4.0
MUSSD, Sri Lanka	MUSSDSL	6.4	93.0	6.4	93.0
VMI, Vietnam	VMI	8.5	11.3	8.4	11.4
NML, Philippines	NML-PH	10.4	6.6	10.3	6.8
NISIT, Papua New Guinea	NISIT	21.6	9.5	21.6	9.7
KIM-LIPI, Indonesia	KIM-LIPI	-0.9	21.0	-1.0	21.1
KIM, Kazakhstan	KIM	-197.4	95.5	-197.5	95.5
NIS, Egypt	NIS	-19.0	81.3	-19.1	81.4
NSCL, Syria	NSCL	-14.1	9.0	-14.1	9.2
JNMI, Jordan	JNMI	-14.0	7.5	-14.1	7.7

Table 7.2.15.g Degree of Equivalence for AC Voltage 100V, 40Hz

DEVIATION FROM REFERENCE AC VOLTAGE 100V 1kHz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	1.6	4.1
[R]NMI, South Africa	NMISA	0.7	4.6
[R]NPL, India	NPLI	0.7	2.9
ESLMASM, Mongolia	MASM	0.5	4.6
[R]NIM, Thailand	NIMT	-1.1	3.8
SCL, Hong Kong	SCL-HK	0.3	3.0
[R]NML, Malaysia	NML-MY	-4.5	5.8
MUSSD, Sri Lanka	MUSSD-SL	3.5	92.6

Table 7.2.16.a Loop A Deviation from reference AC Voltage 100V, 1kHz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	-4.6	3.1
VMI, Vietnam	VMI	7.2	7.5
NML, Philippines	NML-PH	10.3	4.3
[R]NPL, India	NPLI	2.8	2.4
NISIT, Papua New Guinea	NISIT	24.5	9.5
KIM-LIPI, Indonesia	KIM-LIPI	18.5	7.0
KIM, Kazakhstan	KIM	-175.4	69.0
NIS, Egypt	NIS	18.6	80.0
NSCL, Syria	NSCL	25.7	4.4
JNMI, Jordan	JNMI	25.7	6.7

Table 7.2.16.b Loop B Deviation from reference AC Voltage 100V, 1kHz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NPL, India	NPLI	13.7	6.1
SCL, Hong Kong	SCL-HK	-0.4	4.0
[R]NMI, Australia	NMIA	-6.2	3.6
[R]NMC, Singapore	NMC, SG	1.1	3.0
MUSSD, Sri Lanka	MUSSD-SL	6.3	92.6
JNMI, Jordan	JNMI	-14.0	7.5

Table 7.2.16.c Loop C Deviation from reference AC Voltage 100V, 1kHz

DATA USED FOR CORRECTED CHART 100V 1kHz

Data collated for plotting						
	Loop A		Loop B		Loop C	
Name	d_i	u_i	d_i	u_i	d_i	u_i
NMIA	1.6	4.1				
NMISA	0.7	4.6				
NPLI	0.7	2.9				
MASM	0.5	4.6				
NIMT	-1.1	3.8				
SCL-HK	0.3	3.0				
NML-MY	-4.5	5.8				
MUSSD-SL	3.5	92.6				
NMIA			-4.6	3.1		
VMI			7.2	7.5		
NML-PH			10.3	4.3		
NPLI			2.8	2.4		
NISIT			24.5	9.5		
KIM-LIPI			18.5	7.0		
KIM			-175.4	69.0		
NIS			-21.1	80.4		
NSCL			-14.0	8.7		
-						
NPLI					13.7	6.1
SCL-HK					-0.4	4.0
NMIA					-6.2	3.6
NMC, SG					1.1	3.0
MUSSD-SL					6.3	92.6
JNMI					-14.0	7.5

Table 7.2.16.d Data for corrected chart AC Voltage 100V, 1kHz

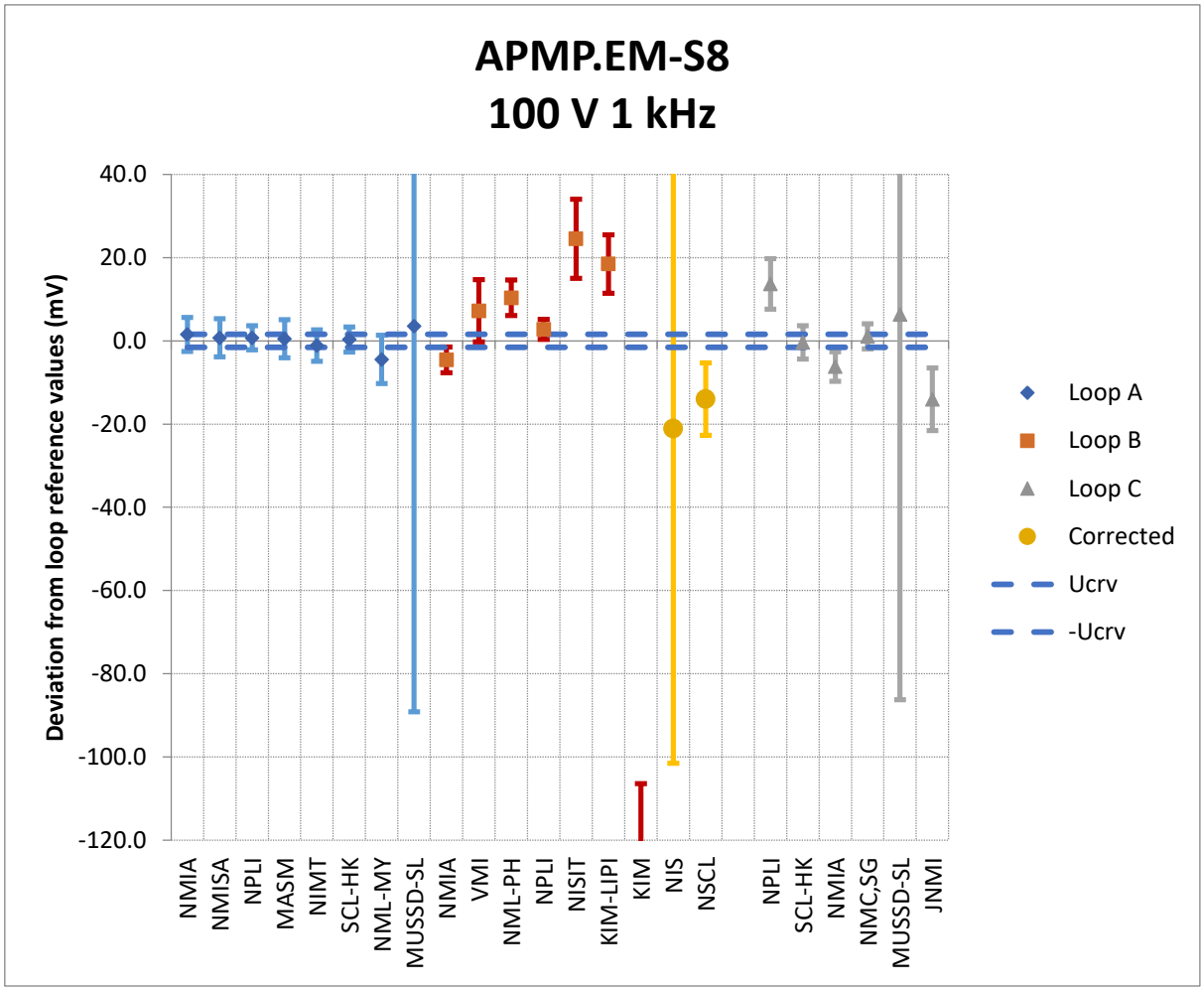

Figure 7.2.15 (Corrected) Comparison Chart for AC Voltage 100V, 1kHz

COMPARISON REFERENCE VALUE 100V 1kHz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	-3.1	3.6
[R]NPL, India	NPLI	5.7	4.1
SCL, Hong Kong	SCL-HK	0.0	3.5
MUSSD, Sri Lanka	MUSSD-SL	4.9	92.6

Table 7.2.16.e Single Value Participated More Than Once for AC Voltage 100V, 1kHz

Laboratories that contributed to the loop reference values

Name		(d_i), mV	(u_i) mV	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-3.1	3.6	0.07676	0.19557	-0.60144
[R]NPL, India	NPLI	5.7	4.1	0.05838	0.14874	0.84967
[R]NMI, South Africa	NMISA	0.7	4.6	0.04726	0.12041	0.08811
[R]NIM, Thailand	NIMT	-1.1	3.8	0.06925	0.17645	-0.19851
[R]NML, Malaysia	NMLMY	-4.5	5.8	0.02973	0.07574	-0.34010
[R]NMC, Singapore	NMC-SG	1.1	3.0	0.11111	0.28310	0.30892
				0.39248	1.00000	0.10664

x_{CRV}: 0.1 mV

u_{CRV}: 1.6 mV

Table 7.2.16.f Laboratories that contributed to the loop reference values for AC Voltage 100V, 1kHz

Name		Deviation from reference (d_i), mV	Exp. Unc. (u_i), mV	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-3.1	3.6	-3.2	3.2
[R]NPL, India	NPLI	5.7	4.1	5.6	3.8
[R]NMI, South Africa	NMISA	0.7	4.6	0.6	4.3
[R]NIM, Thailand	NIMT	-1.1	3.8	-1.2	3.4
[R]NML, Malaysia	NMLMY	-4.5	5.8	-4.6	5.6
[R]NMC, Singapore	NMC-SG	1.1	3.0	1.0	2.5
ESLMASM, Mongolia	MASM	0.5	4.6	0.4	4.9
SCL, Hong Kong	SCLHK	0.0	3.5	-0.1	3.9
MUSSD, Sri Lanka	MUSSDSL	4.9	92.6	4.8	92.6
VMI, Vietnam	VMI	7.2	7.5	7.1	7.7
NML, Philippines	NML-PH	10.3	4.3	10.2	4.6
NISIT, Papua New Guinea	NISIT	24.5	9.5	24.4	9.6
KIM-LIPI, Indonesia	KIM-LIPI	18.5	7.0	18.4	7.2
KIM, Kazakhstan	KIM	-175.4	69.0	-175.5	69.0
NIS, Egypt	NIS	-21.1	80.4	-21.2	80.4
NSCL, Syria	NSCL	-14.0	8.7	-14.1	8.8
JNMI, Jordan	JNMI	-14.0	7.5	-14.1	7.7

Table 7.2.16.g Degree of Equivalence for AC Voltage 100V, 1kHz

DEVIATION FROM REFERENCE AC VOLTAGE 700V 40Hz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	-1.3	35.0
[R]NMI, South Africa	NMISA	20.8	36.4
[R]NPL, India	NPLI	7.1	33.0
ESLMASM, Mongolia	MASM	7.7	75.0
[R]NIM, Thailand	NIMT	-15.4	29.4
SCL, Hong Kong	SCL-HK	12.9	30.0
[R]NML, Malaysia	NML-MY	-12.9	62.0
MUSSD, Sri Lanka	MUSSD-SL	28.2	588.0

Table 7.2.17.a Loop A Deviation from reference AC Voltage 700V, 40Hz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	43.2	34.0
VMI, Vietnam	VMI		
NML, Philippines	NML-PH		
[R]NPL, India	NPLI	-24.3	25.5
NISIT, Papua New Guinea	NISIT	182.6	106.0
KIM-LIPI, Indonesia	KIM-LIPI		
KIM, Kazakhstan	KIM	-1320.9	529.9
NIS, Egypt	NIS	219.0	580.0
NSCL, Syria	NSCL	284.9	44.0
JNMI, Jordan	JNMI	254.6	60.0

Table 7.2.17.b Loop B Deviation from reference AC Voltage 700V, 40Hz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NPL, India	NPLI	-23.7	37.0
SCL, Hong Kong	SCL-HK	19.3	40.0
[R]NMI, Australia	NMIA	-23.9	36.5
[R]NMC, Singapore	NMC, SG	31.7	30.0
MUSSD, Sri Lanka	MUSSD-SL	72.0	588.3
JNMI, Jordan	JNMI	-70.7	70.0

Table 7.2.17.c Loop C Deviation from reference AC Voltage 700V, 40Hz

DATA USED FOR CORRECTED CHART 700V 40Hz

Data collated for plotting						
Name	**Loop A**		**Loop B**		**Loop C**	
	d_i	**u_i**	**d_i**	**u_i**	**d_i**	**u_i**
NMIA	-1.3	35.0				
NMISA	20.8	36.4				
NPLI	7.1	33.0				
MASM	7.7	75.0				
NIMT	-15.4	29.4				
SCL-HK	12.9	30.0				
NML-MY	-12.9	62.0				
MUSSD-SL	28.2	588.0				
NMIA			43.2	34.0		
VMI						
NML-PH						
NPLI			-24.3	25.5		
NISIT			182.6	106.0		
KIM-LIPI						
KIM			-1320.9	529.9		
NIS			-106.3	584.2		
NSCL			-40.4	82.7		
-						
NPLI					-23.7	37.0
SCL-HK					19.3	40.0
NMIA					-23.9	36.5
NMC, SG					31.7	30.0
MUSSD-SL					72.0	588.3
JNMI					-70.7	70.0

Table 7.2.17.d Data for corrected chart AC Voltage 700V, 40Hz

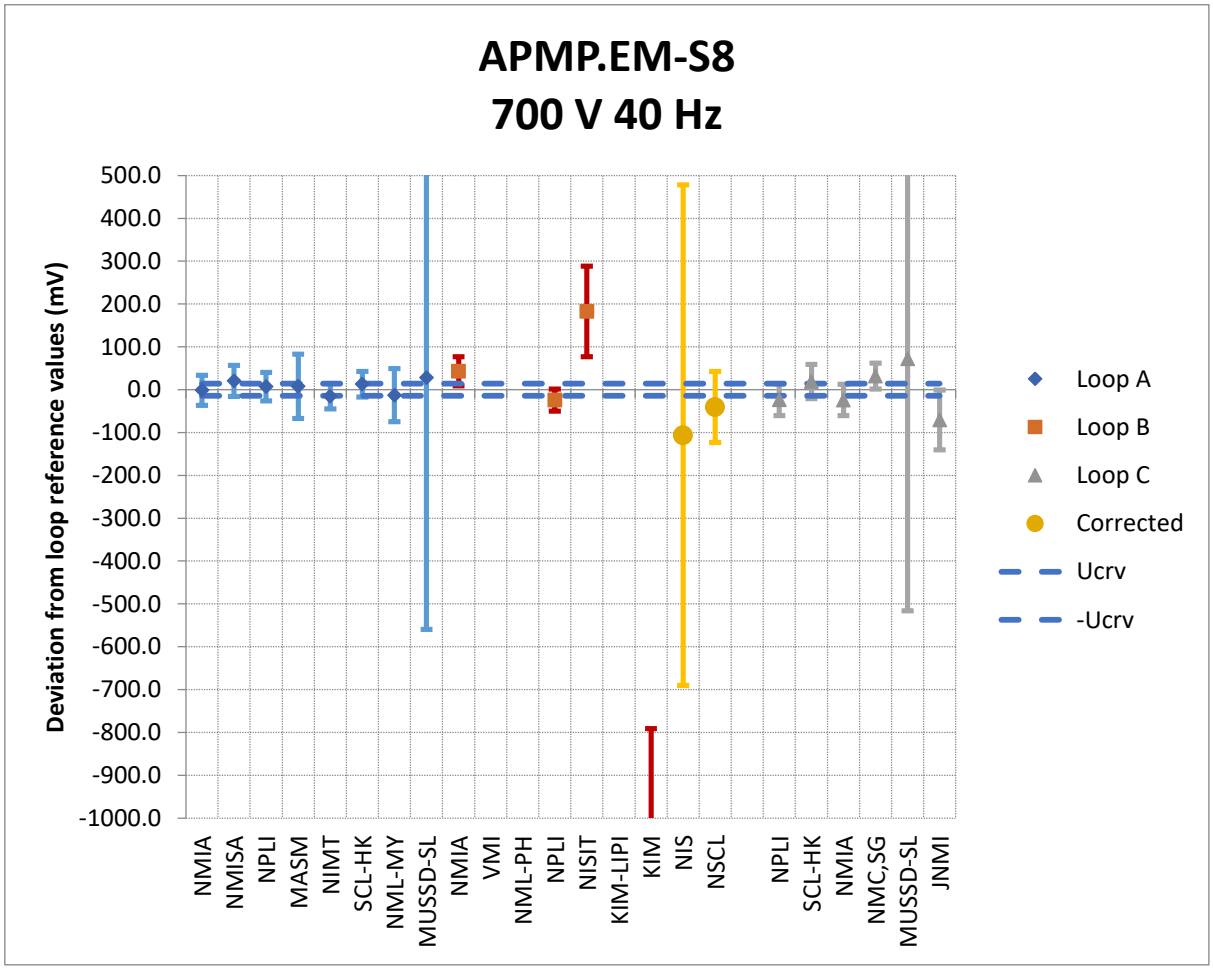

Figure 7.2.17 (Corrected) Comparison Chart for AC Voltage 700V, 40Hz

COMPARISON REFERENCE VALUE 700V 40Hz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	6.0	35.2
[R]NPL, India	NPLI	-13.6	32.2
SCL, Hong Kong	SCL-HK	16.1	35.4
MUSSD, Sri Lanka	MUSSD-SL	50.1	588.2

Table 7.2.17 e Single Value Participated More than Once for AC Voltage 700V, 40Hz

Laboratories that contributed to the loop reference values

Name		(d_i), mV	(u_i) mV	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	6.0	35.2	0.000808	0.1598	0.96275
[R]NPL, India	NPLI	-13.6	32.2	0.000965	0.1909	-2.60086
[R]NMI, South Africa	NMISA	20.8	36.4	0.000755	0.1493	3.09995
[R]NIM, Thailand	NIMT	-15.4	29.4	0.001157	0.2288	-3.52934
[R]NML, Malaysia	NMLMY	-12.9	62.0	0.000260	0.0515	-0.66172
[R]NMC, Singapore	NMC-SG	31.7	30.0	0.001111	0.2198	6.96920
				0.005056	1.0000	4.23997

x_{CRV}: 4.2 mV

u_{CRV}: 14.1 mV

Table 7.2.17.f Laboratories that contributed to the loop reference values for AC Voltage 700V, 40Hz

Name		Deviation from reference (d_i), mV	Exp. Unc., u_i (mV)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	6.0	35.2	1.8	32.2
[R]NPL, India	NPLI	-13.6	32.2	-17.9	29.0
[R]NMI, South Africa	NMISA	20.8	36.4	16.5	33.6
[R]NIM, Thailand	NIMT	-15.4	29.4	-19.7	25.8
[R]NML, Malaysia	NMLMY	-12.9	62.0	-17.1	60.4
[R]NMC, Singapore	NMC-SG	31.7	30.0	27.5	26.5
ESLMASM, Mongolia	MASM	7.7	75.0	3.5	76.3
SCL, Hong Kong	SCLHK	16.1	35.4	11.8	38.0
MUSSD, Sri Lanka	MUSSDSL	50.1	588.2	45.9	588.3
VMI, Vietnam	VMI				
NML, Philippines	NML-PH				
NISIT, Papua New Guinea	NISIT	182.6	106.0	178.4	106.9
KIM-LIPI, Indonesia	KIM-LIPI				
KIM, Kazakhstan	KIM	-1320.9	529.9	-1325.2	530.1
NIS, Egypt	NIS	-106.4	584.2	-110.6	584.4
NSCL, Syria	NSCL	-40.4	82.7	-44.7	83.9
JNMI, Jordan	JNMI	-70.7	70.0	-75.0	71.4

Table 7.2.17.g Degree of Equivalence for AC Voltage 700V, 40Hz

DEVIATION FROM REFERENCE AC VOLTAGE 700V 1kHz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	10.9	33.0
[R]NMI, South Africa	NMISA	9.5	32.9
[R]NPL, India	NPLI	7.6	32.5
ESLMASM, Mongolia	MASM	-4.1	55.0
[R]NIM, Thailand	NIMT	-19.0	29.4
SCL, Hong Kong	SCL-HK	14.0	30.0
[R]NML, Malaysia	NML-MY	-9.4	48.0
MUSSD, Sri Lanka	MUSSD-SL	28.2	667.0

Table 7.2.18.a Loop A Deviation from reference AC Voltage 700V, 1kHz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	7.7	22.0
VMI, Vietnam	VMI	87.1	69.3
NML, Philippines	NML-PH	96.1	55.0
[R]NPL, India	NPLI	-9.1	24.0
NISIT, Papua New Guinea	NISIT	166.6	86.0
KIM-LIPI, Indonesia	KIM-LIPI	141.9	63.0
KIM, Kazakhstan	KIM	-1198.1	259.1
NIS, Egypt	NIS	116.6	580.0
NSCL, Syria	NSCL	257.3	41.0
JNMI, Jordan	JNMI	241.4	60.0

Table 7.2.18.b Loop B Deviation from reference AC Voltage 700V, 1kHz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NPL, India	NPLI	-8.3	41.0
SCL, Hong Kong	SCL-HK	19.0	30.0
[R]NMI, Australia	NMIA	-30.6	38.3
[R]NMC, Singapore	NMC, SG	21.7	29.0
MUSSD, Sri Lanka	MUSSD-SL	114.3	666.5
JNMI, Jordan	JNMI	-67.5	70.0

Table 7.2.18.c Loop C Deviation from reference AC Voltage 700V, 1kHz

DATA USED FOR CORRECTED CHART 700V 1kHz

Data collated for plotting						
	Loop A		Loop B		Loop C	
Name	d_i	u_i	d_i	u_i	d_i	u_i
NMIA	10.9	33.0				
NMISA	9.5	32.9				
NPLI	7.6	32.5				
MASM	-4.1	55.0				
NIMT	-19.0	29.4				
SCL-HK	14.0	30.0				
NML-MY	-9.4	48.0				
MUSSD-SL	28.2	667.0				
NMIA			7.7	22.0		
VMI			87.1	69.3		
NML-PH			96.1	55.0		
NPLI			-9.1	24.0		
NISIT			166.6	86.0		
KIM-LIPI			141.9	63.0		
KIM			-1198.1	259.1		
NIS			-192.3	584.2		
NSCL			-51.6	81.1		
-						
NPLI					-8.3	41.0
SCL-HK					19.0	30.0
NMIA					-30.6	38.3
NMC, SG					21.7	29.0
MUSSD-SL					114.3	666.5
JNMI					-67.5	70.0

Table 7.2.18.d Data for corrected chart AC Voltage 700V, 1kHz

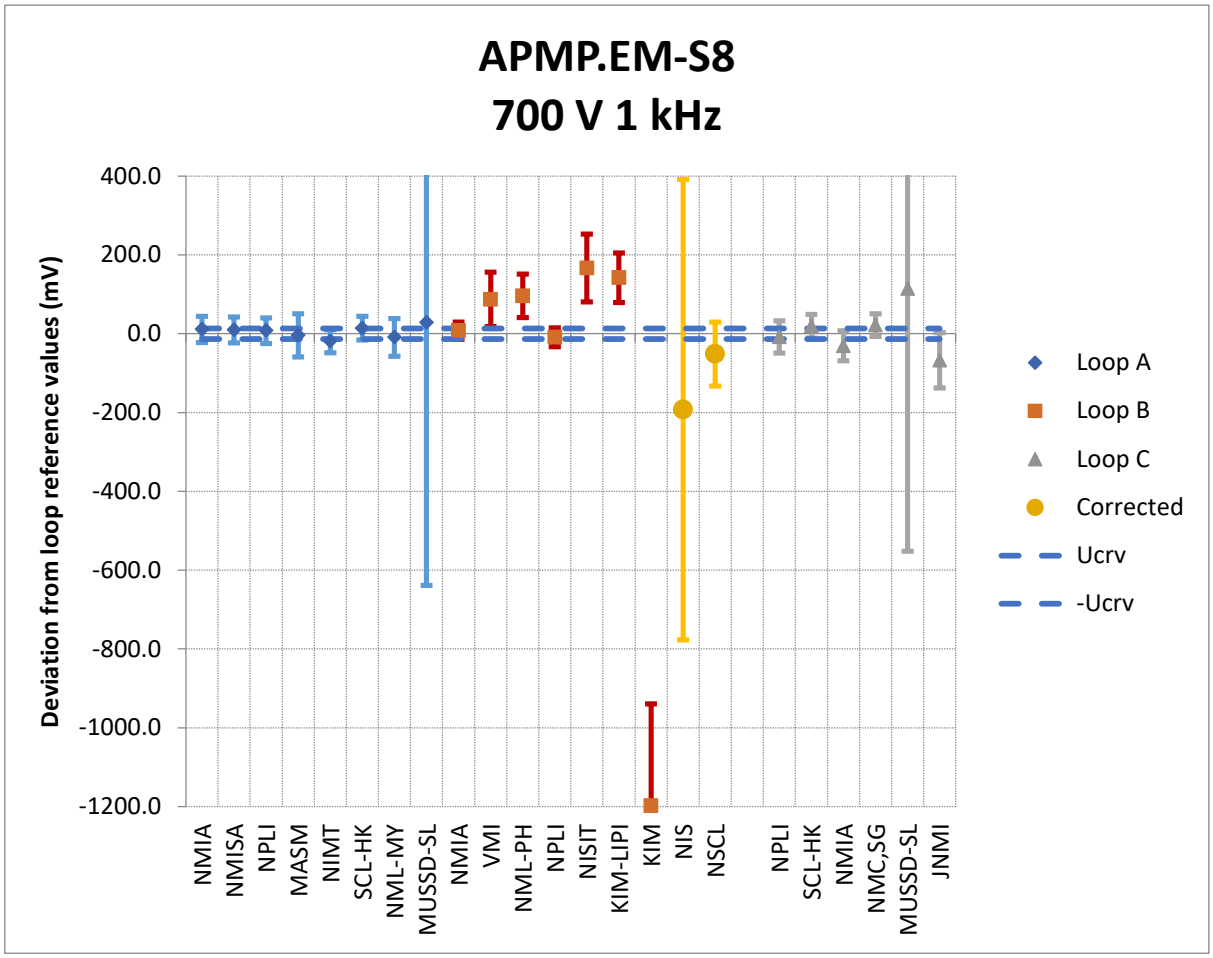

Figure 7.2.18 (Corrected) Comparison Chart for AC Voltage 700V, 1kHz

COMPARISON REFERENCE VALUE 700V 1kHz

Name		Deviation from reference, d_i(mV)	Exp. Unc., u_i (mV)
[R]NMI, Australia	NMIA	-4.0	31.8
[R]NPL, India	NPLI	-3.3	33.2
SCL, Hong Kong	SCL-HK	16.5	30.0
MUSSD, Sri Lanka	MUSSD-SL	71.2	666.8

Table 7.2.18.e Single Value Participated More Than Once for AC Voltage 700V, 1kHz

Laboratories that contributed to the loop reference values

Name		(d_i), mV	(u_i) mV	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-4.0	31.8	0.0010	0.1765	-0.7062
[R]NPL, India	NPLI	-3.3	33.2	0.0009	0.1618	-0.5279
[R]NMI, South Africa	NMISA	9.5	32.9	0.0009	0.1651	1.5615
[R]NIM, Thailand	NIMT	-19.0	29.4	0.0012	0.2067	-3.9244
[R]NML, Malaysia	NMLMY	-9.4	48.0	0.0004	0.0775	-0.7254
[R]NMC, Singapore	NMC-SG	21.7	29.0	0.0012	0.2124	4.6182
			∑	0.0056	1.0000	0.2958

x_{CRV}: 0.3 mV

u_{CRV}: 13.4 mV

Table 7.2.18.f Laboratories that contributed to the loop reference values for AC Voltage 700V, 1kHz

Name		Deviation from reference (d_i), mV	Exp. Unc. (u_i), mV	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-4.0	31.8	-4.3	28.9
[R]NPL, India	NPLI	-3.3	33.2	-3.6	30.4
[R]NMI, South Africa	NMISA	9.5	32.9	9.2	30.1
[R]NIM, Thailand	NIMT	-19.0	29.4	-19.3	26.2
[R]NML, Malaysia	NMLMY	-9.4	48.0	-9.6	46.1
[R]NMC, Singapore	NMC-SG	21.7	29.0	21.4	25.7
ESLMASM, Mongolia	MASM	-4.1	55.0	-4.4	56.6
SCL, Hong Kong	SCLHK	16.5	30.0	16.2	32.8
MUSSD, Sri Lanka	MUSSDSL	71.2	666.8	70.9	666.9
VMI, Vietnam	VMI	87.1	69.3	86.8	70.6
NML, Philippines	NML-PH	96.1	55.0	95.8	56.6
NISIT, Papua New Guinea	NISIT	166.6	86.0	166.3	87.0
KIM-LIPI, Indonesia	KIM-LIPI	141.9	63.0	141.6	64.4
KIM, Kazakhstan	KIM	-1198.1	259.1	-1198.4	259.4
NIS, Egypt	NIS	-192.3	584.2	-192.6	584.4
NSCL, Syria	NSCL	-51.6	81.1	-51.9	82.2
JNMI, Jordan	JNMI	-67.5	70.0	-67.8	71.3

Table 7.2.18.g Degree of Equivalence for AC Voltage 700V, 1kHz

DEVIATION FROM REFERENCE AC CURRENT 10mA 40Hz

Name		Deviation from reference, d_i(μA)	Exp. Unc., u_i (μA)
[R]NMI, Australia	NMIA	2.0	0.6
[R]NMI, South Africa	NMISA	0.5	2.2
[R]NPL, India	NPLI	1.1	1.0
ESLMASM, Mongolia	MASM	1.0	0.9
[R]NIM, Thailand	NIMT	-4.7	0.9
SCL, Hong Kong	SCL-HK	-4.2	0.6
[R]NML, Malaysia	NML-MY	-4.1	2.5
MUSSD, Sri Lanka	MUSSD-SL	-4.0	24.3

Table 7.2.19.a Loop A Deviation from reference AC Current 10mA, 40Hz

Name		Deviation from reference, d_i(μA)	Exp. Unc., u_i (μA)
[R]NMI, Australia	NMIA	0.0	0.7
VMI, Vietnam	VMI	-2.5	2.0
NML, Philippines	NML-PH	0.4	1.3
[R]NPL, India	NPLI	0.0	0.8
NISIT, Papua New Guinea	NISIT	0.7	2.4
KIM-LIPI, Indonesia	KIM-LIPI	-0.1	2.2
KIM, Kazakhstan	KIM	4.2	22.0
NIS, Egypt	NIS	-0.4	21.0
NSCL, Syria	NSCL	1.1	1.4
JNMI, Jordan	JNMI	-0.7	3.8

Table 7.2.19.b Loop B Deviation from reference AC Current 10mA, 40Hz

Name		Deviation from reference, d_i(μA)	Exp. Unc., u_i (μA)
[R]NPL, India	NPLI	-0.1	2.2
SCL, Hong Kong	SCL-HK	0.5	0.6
[R]NMI, Australia	NMIA	-0.3	0.6
[R]NMC, Singapore	NMC, SG	0.3	0.6
MUSSD, Sri Lanka	MUSSD-SL	0.2	24.3
JNMI, Jordan	JNMI	-0.8	4.9

Table 7.2.19.c Loop C Deviation from reference AC Current 10mA, 40Hz

DATA USED FOR CORRECTED CHART AC CURRENT 10mA 40Hz

Data collated for plotting						
Name	**Loop A**		**Loop B**		**Loop C**	
	d_i	**u_i**	**d_i**	**u_i**	**d_i**	**u_i**
NMIA			0.0	0.7		
VMI			-2.5	2.0		
NML-PH			0.4	1.3		
NPLI			0.0	0.8		
NISIT			0.7	2.4		
KIM-LIPI			-0.1	2.2		
KIM			4.2	22.0		
NIS			-0.5	21.6		
NSCL			1.0	5.1		
-						
NPLI					-0.1	2.2
SCL-HK					0.5	0.6
NMIA					-0.3	0.6
NMC, SG					0.3	0.6
MUSSD-SL					0.2	24.3
JNMI					-0.8	4.9

Table 7.2.19.d Data for corrected chart AC Current 10mA, 40Hz

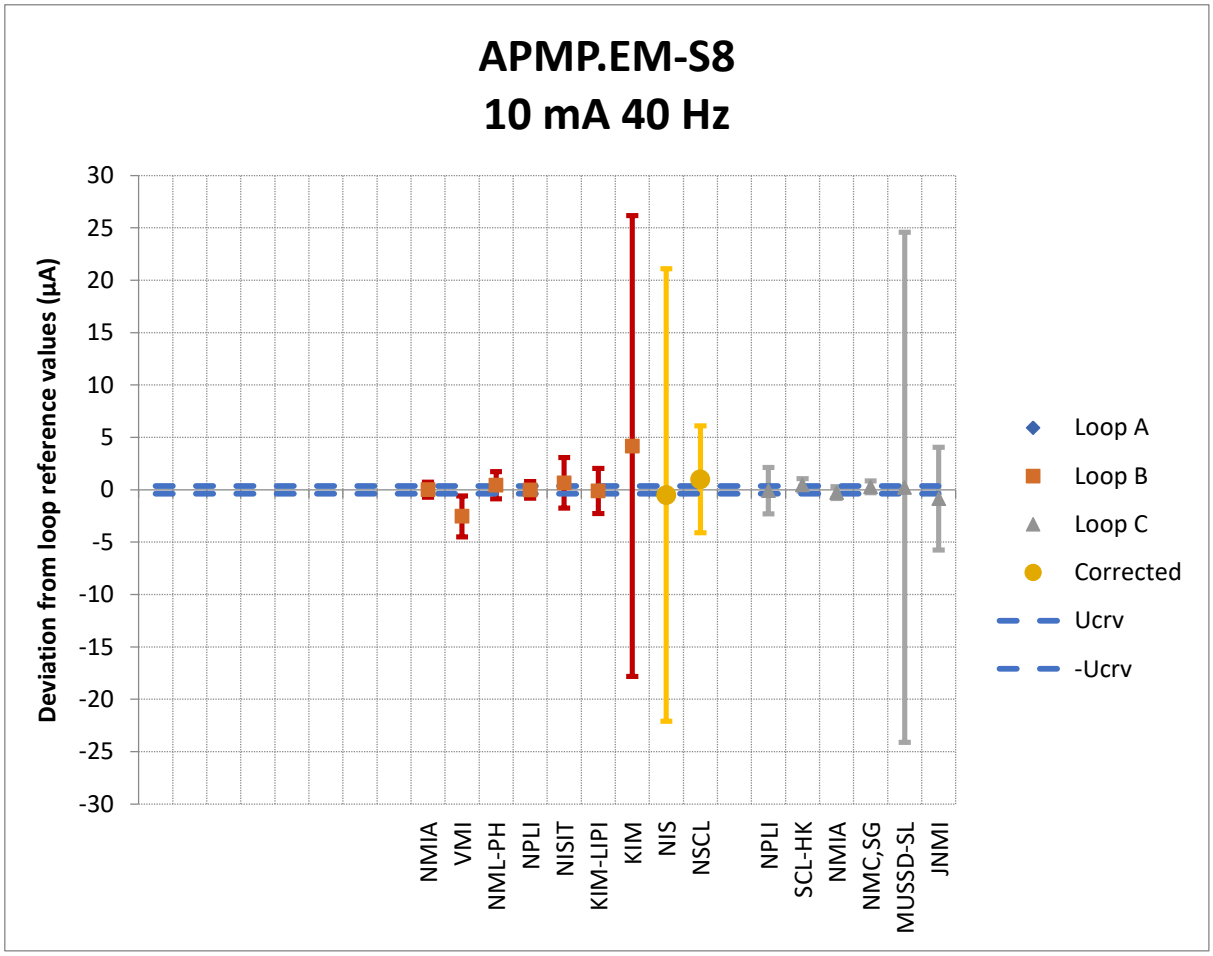

Figure 7.2.18 (Corrected) Comparison Chart for AC Current 10mA, 40Hz

COMPARISON REFERENCE VALUE AC CURRENT 10mA 40Hz

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NMI, Australia	NMIA	-0.1	0.6
[R]NPL, India	NPLI	0.0	1.6

Table 7.2.19.e Single Value Participated More Than Once for AC Current 10mA, 40Hz

Laboratories that contributed to the loop reference values

Name		(d_i), µA	(u_i) µA	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-0.1	0.6	2.403702	0.3210	-0.04159
[R]NPL, India	NPLI	0.0	1.6	0.409492	0.0547	-0.00232
[R]NMI, South Africa	NMISA	0.5	2.2	0.212364	0.0284	0.01535
[R]NIM, Thailand	NIMT	-4.7	0.9	1.384083	0.1849	-0.86719
[R]NMC, Singapore	NMC-SG	0.3	0.6	3.077870	0.4111	0.11499
				7.487511	1.0000	-0.78076

x_{CRV}: -0.78 µA

u_{CRV}: 0.37 µA

Table 7.2.19.f Laboratories that contributed to the loop reference values for AC Current 10mA, 40Hz

Name		Deviation from reference (d_i), µA	Exp. Unc., u_i (µA)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-0.1	0.6	0.7	0.5
[R]NPL, India	NPLI	0.0	1.6	0.7	1.5
[R]NMI, South Africa	NMISA	0.5	2.2	1.3	2.1
[R]NIM, Thailand	NIMT	-4.7	0.9	-3.9	0.8
[R]NMC, Singapore	NMC-SG	0.3	0.6	1.1	0.4
ESLMASM, Mongolia	MASM	1.0	0.9	1.8	0.8
SCL, Hong Kong	SCLHK	0.5	0.6	1.2	0.7
[R]NML, Malaysia	NMLMY	-4.1	2.5	-3.3	2.5
MUSSD, Sri Lanka	MUSSDSL	0.2	24.3	1.0	24.3
VMI, Vietnam	VMI	-2.5	2.0	-1.8	2.0
NML, Philippines	NML-PH	0.4	1.3	1.2	1.4
NISIT, Papua New Guinea	NISIT	0.7	2.4	1.4	2.4
KIM-LIPI, Indonesia	KIM-LIPI	-0.1	2.2	0.7	2.2
KIM, Kazakhstan	KIM	4.2	22.0	5.0	22.0
NIS, Egypt	NIS	-0.5	21.6	0.2	21.6
NSCL, Syria	NSCL	0.9	5.1	1.7	5.1
JNMI, Jordan	JNMI	-0.8	4.9	-0.1	4.9

Table 7.2.19.g Degree of Equivalence for AC Current 10mA, 40Hz

DEVIATION FROM REFERENCE AC CURRENT 10mA 1kHz

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NMI, Australia	NMIA	1.1	0.5
[R]NMI, South Africa	NMISA	-0.5	1.9
[R]NPL, India	NPLI	1.3	0.7
ESLMASM, Mongolia	MASM	-0.7	1.4
[R]NIM, Thailand	NIMT	-5.3	0.9
SCL, Hong Kong	SCL-HK	-5.1	0.6
[R]NML, Malaysia	NML-MY	-5.2	2.5
MUSSD, Sri Lanka	MUSSD-SL	-5.1	24.3

Table 7.2.20.a Loop A Deviation from reference AC Current 10mA, 1kHz

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NMI, Australia	NMIA	-0.2	0.5
VMI, Vietnam	VMI	-0.3	1.6
NML, Philippines	NML-PH	0.8	1.7
[R]NPL, India	NPLI	0.5	0.8
NISIT, Papua New Guinea	NISIT	1.0	2.5
KIM-LIPI, Indonesia	KIM-LIPI	0.5	2.0
KIM, Kazakhstan	KIM	2.6	22.0
NIS, Egypt	NIS	0.4	21.0
NSCL, Syria	NSCL	1.8	1.4
JNMI, Jordan	JNMI	0.4	3.8

Table 7.2.20.b Loop B Deviation from reference AC Current 10mA, 1kHz

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NPL, India	NPLI	1.3	1.4
SCL, Hong Kong	SCL-HK	0.4	0.7
[R]NMI, Australia	NMIA	-0.3	0.5
[R]NMC, Singapore	NMC, SG	0.2	0.6
MUSSD, Sri Lanka	MUSSD-SL	0.4	24.3
JNMI, Jordan	JNMI	-0.8	4.9

Table 7.2.20.c Loop C Deviation from reference AC Current 10mA, 1kHz

DATA USED FOR CORRECTED CHART AC CURRENT 10 mA 1kHz

Data collated for plotting						
Name	**Loop A**		**Loop B**		**Loop C**	
	d_i	u_i	d_i	u_i	d_i	u_i
NMIA			-0.2	0.5		
VMI			-0.3	1.6		
NML-PH			0.8	1.7		
NPLI			0.5	0.8		
NISIT			1.0	2.5		
KIM-LIPI			0.5	2.0		
KIM			2.6	22.0		
NIS			-0.8	21.6		
NSCL			0.6	5.1		
-						
NPLI					1.3	1.4
SCL-HK					0.4	0.7
NMIA					-0.3	0.5
NMC, SG					0.2	0.6
MUSSD-SL					0.4	24.3
JNMI					-0.8	4.9

Table 7.2.20.d Data for corrected chart AC Current 10mA, 1kHz

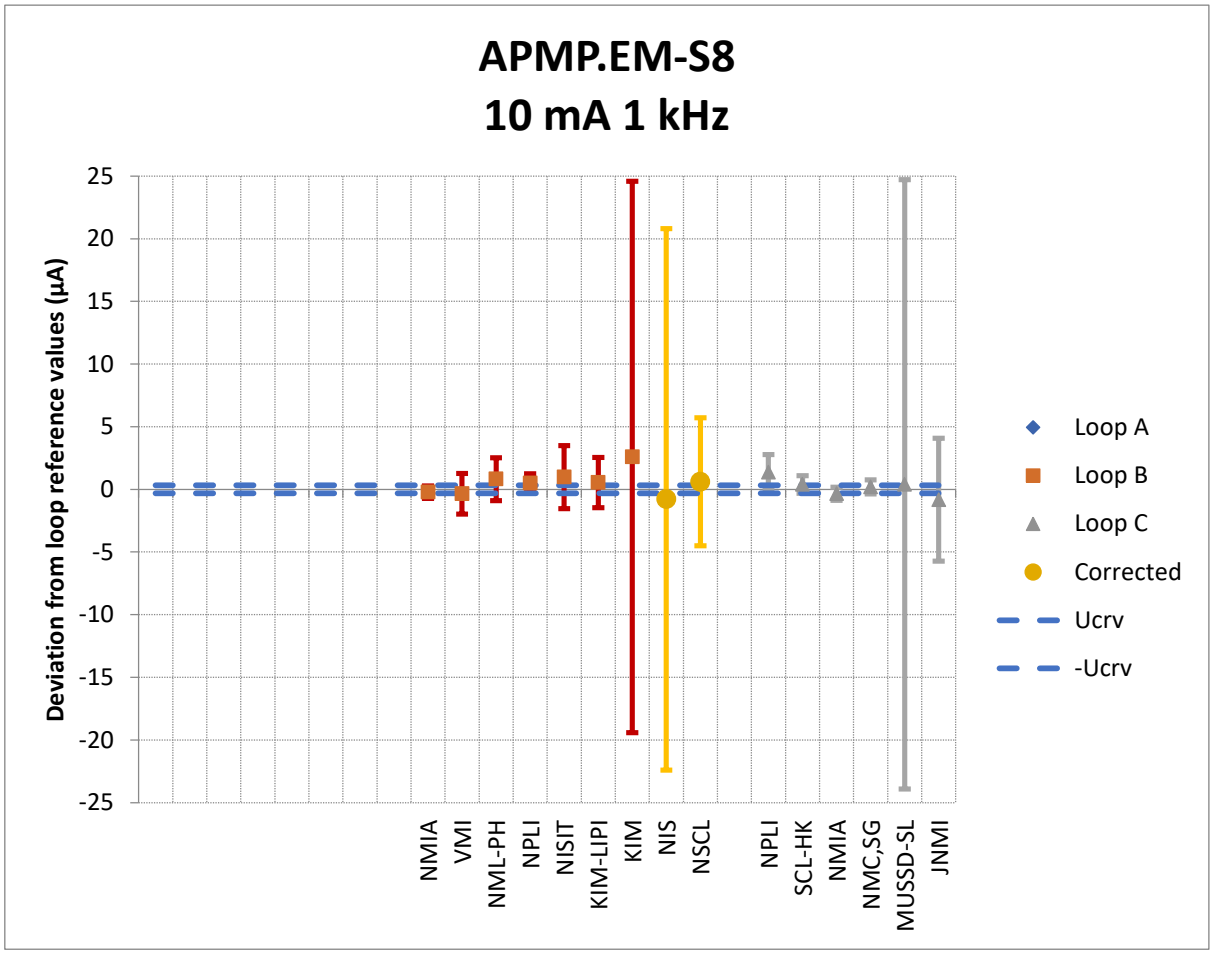

Figure 7.2.20 (Corrected) Comparison Chart for AC Current 10mA, 1kHz

COMPARISON REFERENCE VALUE AC CURRENT 10mA 1kHz

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NMI, Australia	NMIA	-0.3	0.5
[R]NPL, India	NPLI	0.9	0.9

Table 7.2.20.e Single Value Participated More Than Once for AC Current 10mA 1kHz

Laboratories that contributed to the loop reference values

Name		(d_i), µA	(u_i) µA	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-0.3	0.5	3.819345	0.3930	-0.11081
[R]NPL, India	NPLI	0.9	0.9	1.162160	0.1196	0.11009
[R]NMI, South Africa	NMISA	-0.5	1.9	0.274115	0.0282	-0.01288
[R]NIM, Thailand	NIMT	-5.3	0.9	1.384083	0.1424	-0.75817
[R]NMC, Singapore	NMC-SG	0.2	0.6	3.077870	0.3167	0.06102
				9.717574	1.0000	-0.71076

x_{CRV}: -0.71 µA

u_{CRV}: 0.32 µA

Table 7.2.20.f Laboratories that contributed to the loop reference values for AC Current 10mA, 1kHz

Name		Deviation from reference (d_i), µA	Exp. Unc., u_i (µA)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-0.3	0.5	0.4	0.4
[R]NPL, India	NPLI	0.9	0.9	1.6	0.9
[R]NMI, South Africa	NMISA	-0.5	1.9	0.3	1.9
[R]NIM, Thailand	NIMT	-5.3	0.9	-4.6	0.8
[R]NMC, Singapore	NMC-SG	0.2	0.6	0.9	0.5
ESLMASM, Mongolia	MASM	-0.7	1.4	0.0	1.4
SCL, Hong Kong	SCLHK	0.4	0.7	1.1	0.8
[R]NML, Malaysia	NMLMY	-5.2	2.5	-4.5	2.5
MUSSD, Sri Lanka	MUSSDSL	0.4	24.3	1.1	24.3
VMI, Vietnam	VMI	-0.3	1.6	0.4	1.7
NML, Philippines	NML-PH	0.8	1.7	1.5	1.7
NISIT, Papua New Guinea	NISIT	1.0	2.5	1.7	2.5
KIM-LIPI, Indonesia	KIM-LIPI	0.5	2.0	1.2	2.0
KIM, Kazakhstan	KIM	2.6	22.0	3.3	22.0
NIS, Egypt	NIS	-0.8	21.6	0.0	21.6
NSCL, Syria	NSCL	0.6	5.1	1.4	5.1
JNMI, Jordan	JNMI	-0.8	4.9	-0.1	4.9

Table 7.2.20.g Degree of Equivalence for AC Current 10mA, 1kHz

DEVIATION FROM REFERENCE AC CURRENT 1A 40Hz

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NMI, Australia	NMIA	14.4	39.0
[R]NMI, South Africa	NMISA	-41.0	312.0
[R]NPL, India	NPLI	19.2	48.3
ESLMASM, Mongolia	MASM	-78.6	200.0
[R]NIM, Thailand	NIMT	-124.9	85.0
SCL, Hong Kong	SCL-HK	-190.5	100.0
[R]NML, Malaysia	NML-MY	-196.8	340.0
MUSSD, Sri Lanka	MUSSD-SL	-306.3	1650.0

Table 7.2.21.a Loop A Deviation from reference AC Current 1A, 40Hz

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NMI, Australia	NMIA	8.7	39.0
VMI, Vietnam	VMI	-274.2	309.0
NML, Philippines	NML-PH	-104.2	240.0
[R]NPL, India	NPLI	-17.0	54.5
NISIT, Papua New Guinea	NISIT	-87.4	266.0
KIM-LIPI, Indonesia	KIM-LIPI	-55.6	850.0
KIM, Kazakhstan	KIM	-40.5	1720.0
NIS, Egypt	NIS	-47.5	1400.0
NSCL, Syria	NSCL	-44.8	142.0
JNMI, Jordan	JNMI	-153.9	304.0

Table 7.2.21.b Loop B Deviation from reference AC Current 1A, 40Hz

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NPL, India	NPLI	-8.9	37.0
SCL, Hong Kong	SCL-HK	24.6	50.0
[R]NMI, Australia	NMIA	1.7	28.8
[R]NMC, Singapore	NMC, SG	64.9	120.0
MUSSD, Sri Lanka	MUSSD-SL	85.8	1649.0
JNMI, Jordan	JNMI	-42.4	410.0

Table 7.2.21.c Loop C Deviation from reference AC Current 1A, 40Hz

DATA USED FOR CORRECTED CHART AC CURRENT 1A 40Hz

Data collated for plotting						
Name	**Loop A**		**Loop B**		**Loop C**	
	d_i	**u_i**	**d_i**	**u_i**	**d_i**	**u_i**
NMIA	14.4	39.0				
NMISA	-41.0	312.0				
NPLI	19.2	48.3				
MASM	-78.6	200.0				
NIMT	-124.9	85.0				
SCL-HK	-190.5	100.0				
NML-MY	-196.8	340.0				
MUSSD-SL	-306.3	1650.0				
NMIA			8.7	39.0		
VMI			-274.2	309.0		
NML-PH			-104.2	240.0		
NPLI			-17.0	54.5		
NISIT			-87.4	266.0		
KIM-LIPI			-55.6	850.0		
KIM			-40.5	1720.0		
NIS			64.0	1458.8		
NSCL			66.7	433.9		
-						
NPLI					-8.9	37.0
SCL-HK					24.6	50.0
NMIA					1.7	28.8
NMC, SG					64.9	120.0
MUSSD-SL					85.8	1649.0
JNMI					-42.4	410.0

Table 7.2.21.d Data for corrected chart AC Current 1A, 40Hz

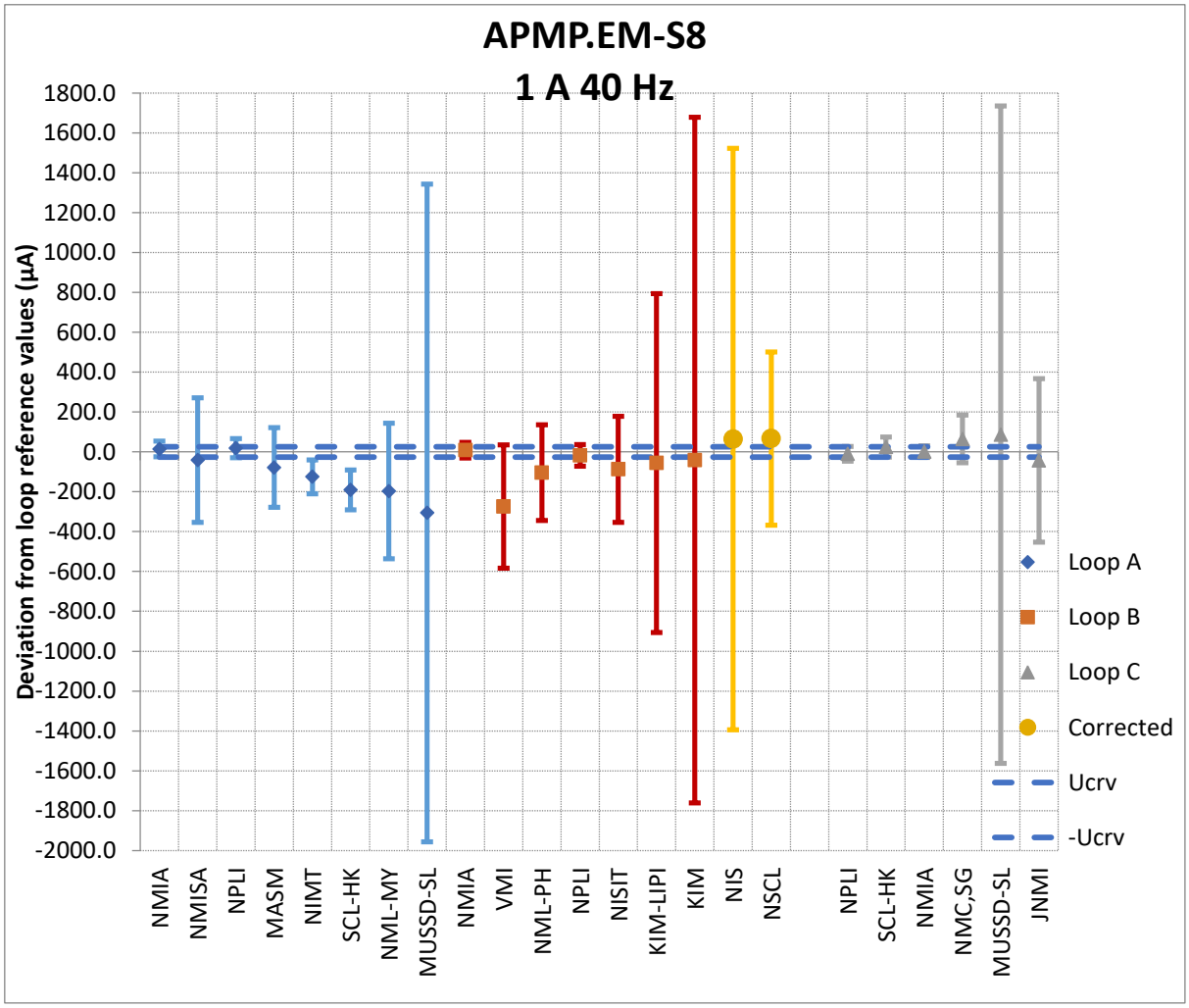

Figure 7.2.21 (Corrected) Comparison Chart for AC Current 1A, 40Hz

COMPARISON REFERENCE VALUE AC CURRENT 1A 40Hz

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NMI, Australia	NMIA	8.3	35.9
[R]NPL, India	NPLI	-2.3	47.2
SCL, Hong Kong	SCL-HK	-83.0	79.1
MUSSD, Sri Lanka	MUSSD-SL	-110.3	1649.5

Table 7.2.21.e Single Value Participated More Than Once for AC Current 1A, 40Hz

Laboratories that contributed to the loop reference values

Name		(d_i), µA	(u_i) µA	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	8.3	35.9	0.000775	0.5373	4.44219
[R]NPL, India	NPLI	-2.3	47.2	0.000449	0.3116	-0.70180
[R]NMI, South Africa	NMISA	-41.0	312.0	0.000010	0.0071	-0.29220
[R]NIM, Thailand	NIMT	-124.9	85.0	0.000138	0.0959	-11.98071
[R]NMC, Singapore	NMC-SG	64.9	120.0	0.000069	0.0481	3.12260
				0.001443	1.0000	-5.40991

x_{CRV}: -5.4 µA

u_{CRV}: 26.3 µA

Table 7.2.21.f Laboratories that contributed to the loop reference values for AC Current 1A, 40Hz

Name		Deviation from reference (d_i), µA	Exp. Unc., u_i (µA)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	8.3	35.9	13.7	24.4
[R]NPL, India	NPLI	-2.3	47.2	3.2	39.1
[R]NMI, South Africa	NMISA	-41.0	312.0	-35.6	310.9
[R]NIM, Thailand	NIMT	-124.9	85.0	-119.5	80.8
[R]NMC, Singapore	NMC-SG	64.9	120.0	70.3	117.1
ESLMASM, Mongolia	MASM	-78.6	200.0	-73.2	198.3
SCL, Hong Kong	SCLHK	-83.0	79.1	-77.5	83.3
[R]NML, Malaysia	NMLMY	-196.8	340.0	-191.4	341.0
MUSSD, Sri Lanka	MUSSDSL	-110.3	1649.5	-104.8	1649.7
VMI, Vietnam	VMI	-274.2	309.0	-268.8	310.1
NML, Philippines	NML-PH	-104.2	240.0	-98.8	241.4
NISIT, Papua New Guinea	NISIT	-87.4	266.0	-82.0	267.3
KIM-LIPI, Indonesia	KIM-LIPI	-55.6	850.0	-50.2	850.4
KIM, Kazakhstan	KIM	-40.5	1720.0	-35.1	1720.2
NIS, Egypt	NIS	64.0	1458.8	69.4	1459.0
NSCL, Syria	NSCL	66.7	433.9	72.1	434.7
JNMI, Jordan	JNMI	-42.4	410.0	-37.0	410.8

Table 7.2.21.g Degree of Equivalence for AC Current 1A, 40Hz

DEVIATION FROM REFERENCE AC CURRENT 1A 1kHz

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NMI, Australia	NMIA	7.1	33.0
[R]NMI, South Africa	NMISA	-39.3	307.0
[R]NPL, India	NPLI	15.3	60.0
ESLMASM, Mongolia	MASM	-91.9	270.0
[R]NIM, Thailand	NIMT	-74.9	85.0
SCL, Hong Kong	SCL-HK	-152.7	100.0
[R]NML, Malaysia	NML-MY	-178.7	340.0
MUSSD, Sri Lanka	MUSSD-SL	-336.2	1650.0

Table 7.2.22.a Loop A Deviation from reference AC Current 1A, 1kHz

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NMI, Australia	NMIA	-5.7	41.0
VMI, Vietnam	VMI	-73.4	308.0
NML, Philippines	NML-PH	-71.3	180.0
[R]NPL, India	NPLI	10.3	55.2
NISIT, Papua New Guinea	NISIT	158.5	267.0
KIM-LIPI, Indonesia	KIM-LIPI	-13.2	850.0
KIM, Kazakhstan	KIM	113.0	4216.0
NIS, Egypt	NIS	-38.4	1500.0
NSCL, Syria	NSCL	355.1	137.0
JNMI, Jordan	JNMI	-11.5	305.0

Table 7.2.22.b Loop B Deviation from reference AC Current 1A, 1kHz

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NPL, India	NPLI	2.0	34.0
SCL, Hong Kong	SCL-HK	21.0	50.0
[R]NMI, Australia	NMIA	-6.8	34.5
[R]NMC, Singapore	NMC, SG	56.6	120.0
MUSSD, Sri Lanka	MUSSD-SL	89.6	1649.0
JNMI, Jordan	JNMI	25.8	410.0

Table 7.2.22.c Loop C Deviation from reference AC Current 1A 1kHz

DATA USED FOR CORRECTED CHART AC CURRENT 1A 1kHz

Data collated for plotting						
	Loop A		Loop B		Loop C	
Name	d_i	u_i	d_i	u_i	d_i	u_i
NMIA	7.1	33.0				
NMISA	-39.3	307.0				
NPLI	15.3	60.0				
MASM	-91.9	270.0				
NIMT	-74.9	85.0				
SCL-HK	-152.7	100.0				
NML-MY	-178.7	340.0				
MUSSD-SL	-336.2	1650.0				
NMIA			-5.7	41.0		
VMI			-73.4	308.0		
NML-PH			-71.3	180.0		
NPLI			10.3	55.2		
NISIT			158.5	267.0		
KIM-LIPI			-13.2	850.0		
KIM			113.0	4216.0		
NIS			-1.1	1555.0		
NSCL			392.4	432.3		
-						
NPLI					2.0	34.0
SCL-HK					21.0	50.0
NMIA					-6.8	34.5
NMC, SG					56.6	120.0
MUSSD-SL					89.6	1649.0
JNMI					25.8	410.0

Table 7.2.22.d Data for corrected chart AC Current 1A, 1kHz

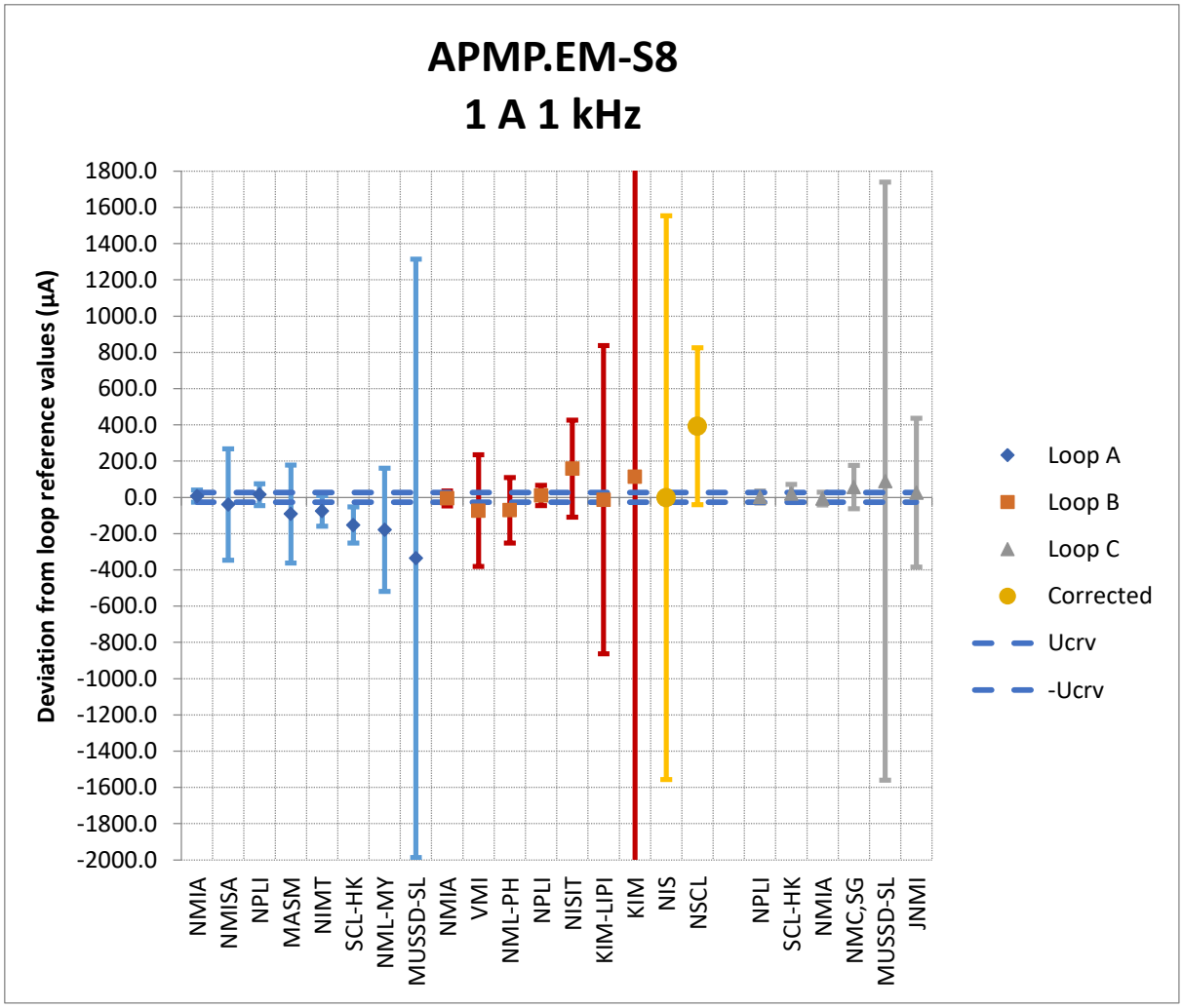

Figure 7.2.22 (Corrected) Comparison Chart for AC Current 1A, 1kHz

COMPARISON REFERENCE VALUE AC CURRENT 1A 1kHz

Name		Deviation from reference, d_i(µA)	Exp. Unc., u_i (µA)
[R]NMI, Australia	NMIA	-1.8	36.3
[R]NPL, India	NPLI	9.2	51.0
SCL, Hong Kong	SCL-HK	-65.9	79.1
MUSSD, Sri Lanka	MUSSD-SL	-123.3	1649.5

Table 7.2.22.e Single Value Participated More Than Once for AC Current 1A, 1kHz

Laboratories that contributed to the loop reference values

Name		(d_i), µA	(u_i) µA	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-1.8	36.3	0.000758	0.5570	-0.98729
[R]NPL, India	NPLI	9.2	51.0	0.000384	0.2825	2.59914
[R]NMI, South Africa	NMISA	-39.3	307.0	0.000011	0.0078	-0.30652
[R]NIM, Thailand	NIMT	-74.9	85.0	0.000138	0.1017	-7.62371
[R]NMC, Singapore	NMC-SG	56.6	120.0	0.000069	0.0510	2.89063
				0.001361	1.0000	-3.42775

x_{CRV}: -3.4 µA

u_{CRV}: 27.1 µA

Table 7.2.22.f Laboratories that contributed to the loop reference values for AC Current 1A, 1kHz

Name		Deviation from reference (d_i), µA	Exp. Unc., u_i (µA)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-1.8	36.3	1.7	24.2
[R]NPL, India	NPLI	9.2	51.0	12.6	43.2
[R]NMI, South Africa	NMISA	-39.3	307.0	-35.9	305.8
[R]NIM, Thailand	NIMT	-74.9	85.0	-71.5	80.6
[R]NMC, Singapore	NMC-SG	56.6	120.0	60.1	116.9
ESLMASM, Mongolia	MASM	-91.9	270.0	-88.5	268.6
SCL, Hong Kong	SCLHK	-65.9	79.1	-62.4	83.6
[R]NML, Malaysia	NMLMY	-178.7	340.0	-175.3	341.1
MUSSD, Sri Lanka	MUSSDSL	-123.3	1649.5	-119.9	1649.7
VMI, Vietnam	VMI	-73.4	308.0	-69.9	309.2
NML, Philippines	NML-PH	-71.3	180.0	-67.9	182.0
NISIT, Papua New Guinea	NISIT	158.5	267.0	161.9	268.4
KIM-LIPI, Indonesia	KIM-LIPI	-13.2	850.0	-9.8	850.4
KIM, Kazakhstan	KIM	113.0	4216.0	116.5	4216.1
NIS, Egypt	NIS	-1.1	1555.0	2.3	1555.3
NSCL, Syria	NSCL	392.4	432.3	395.8	433.1
JNMI, Jordan	JNMI	25.8	410.0	29.3	410.9

Table 7.2.22.g Degree of Equivalence for AC Current 1A, 1kHz

DEVIATION FROM REFERENCE RESISTANCE 100Ω

Name		Deviation from reference, d_i (mΩ)	Exp. Unc., u_i (mΩ)
[R]NMI, Australia	NMIA	-5.4	0.7
[R]NMI, South Africa	NMISA	-1.9	2.0
[R]NPL, India	NPLI	-1.7	3.0
ESLMASM, Mongolia	MASM	-3.3	1.2
[R]NIM, Thailand	NIMT	0.1	0.4
SCL, Hong Kong	SCL-HK	-0.6	2.9
[R]NML, Malaysia	NML-MY	0.2	1.0
MUSSD, Sri Lanka	MUSSD-SL	-0.2	13.9

Table 7.2.23.a Loop A Deviation from reference DC Resistance 100Ω

Name		Deviation from reference, d_i (mΩ)	Exp. Unc., u_i (mΩ)
[R]NMI, Australia	NMIA	-0.7	0.5
VMI, Vietnam	VMI	1.3	1.9
NML, Philippines	NML-PH	8.7	8.1
[R]NPL, India	NPLI	0.0	2.9
NISIT, Papua New Guinea	NISIT	1.1	2.0
KIM-LIPI, Indonesia	KIM-LIPI	1.8	1.3
KIM, Kazakhstan	KIM		
NIS, Egypt	NIS	0.9	12.0
NSCL, Syria	NSCL	-0.8	0.3
JNMI, Jordan	JNMI	-0.2	1.8

Table 7.2.23.b Loop B Deviation from reference DC Resistance 100Ω

Name		Deviation from reference, d_i (mΩ)	Exp. Unc., u_i (mΩ)
[R]NPL, India	NPLI	5.7	5.8
SCL, Hong Kong	SCL-HK	-0.1	0.2
[R]NMI, Australia	NMIA	-0.1	0.4
[R]NMC, Singapore	NMC, SG	0.1	0.3
MUSSD, Sri Lanka	MUSSD-SL	-0.5	13.9
JNMI, Jordan	JNMI	-0.5	2.8

Table 7.2.23.c Loop C Deviation from reference DC Resistance 100Ω

DATA USED FOR CORRECTED CHART RESISTANCE 100Ω

Data collated for plotting						
	Loop A		Loop B		Loop C	
NAME	d_i	u_i	d_i	u_i	d_i	u_i
NMISA	-1.9	2.0				
NPLI	-1.7	3.0				
MASM	-3.3	1.2				
NIMT	0.1	0.4				
SCL-HK	-0.6	2.9				
NML-MY	0.2	1.0				
MUSSD-SL	-0.2	13.9				
VMI			1.3	1.9		
NML-PH			8.7	8.1		
NPLI			0.0	2.9		
NISIT			1.1	2.0		
KIM-LIPI			1.8	1.3		
NIS			0.6	12.3		
NSCL			-1.1	2.8		
-						
NPLI					5.7	5.8
SCL-HK					-0.1	0.2
NMIA					-0.1	0.4
NMC, SG					0.1	0.3
MUSSD-SL					-0.5	13.9
JNMI					-0.5	2.8

Table 7.2.23.d Data for corrected chart DC Resistance 100Ω

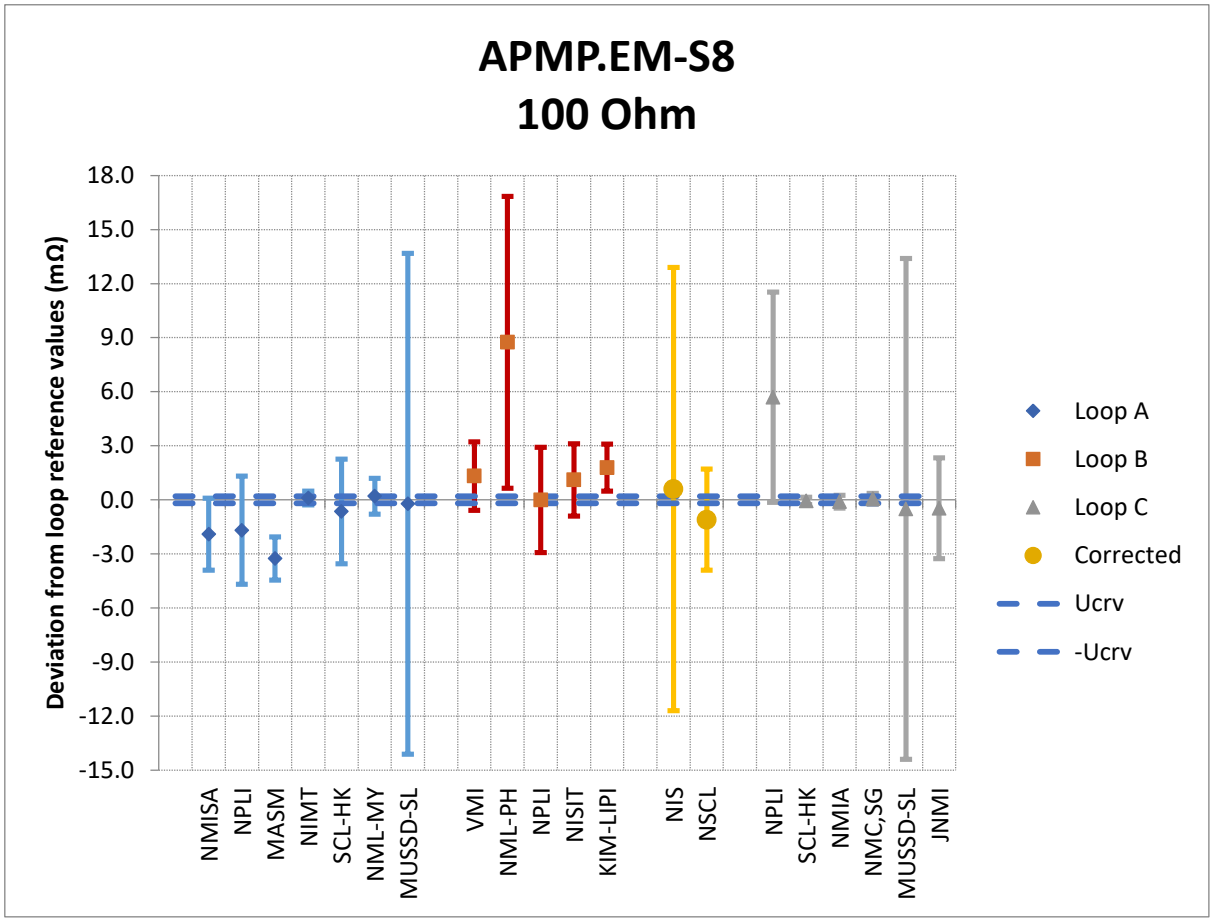

Figure 7.2.23 (Corrected) Comparison Chart for DC Resistance 100Ω

COMPARISON REFERENCE VALUE RESISTANCE 100Ω

Name		Deviation from reference, d_i (mΩ)	Exp. Unc., u_i (mΩ)
[R]NPL, India	NPLI	1.3	4.1
SCL, Hong Kong	SCL-HK	-0.4	2.1
MUSSD, Sri Lanka	MUSSD-SL	-0.4	13.9

Table 7.2.23.e Single Value Participated More Than Once for DC Resistance 100Ω

Laboratories that contributed to the loop reference values

Name		(d_i), mΩ	(u_i) mΩ	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-0.1	0.4	8.000000	0.3037	-0.03055
[R]NPL, India	NPLI	1.3	4.1	0.058143	0.0022	0.00295
[R]NMI, South Africa	NMISA	-1.9	2.0	0.250000	0.0095	-0.01816
[R]NIM, Thailand	NIMT	0.1	0.4	6.925208	0.2629	0.02530
[R]NMC, Singapore	NMC-SG	0.1	0.3	11.111111	0.4218	0.02420
				26.344461	1.0000	0.00374

x_{CRV}: 0.004 mΩ

u_{CRV}: 0.195 mΩ

Table 7.2.23.f Laboratories that contributed to the loop reference values for DC Resistance 100Ω

Name		Deviation from reference (d_i), mΩ	Exp. Unc., u_i (mΩ)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-0.1	0.4	-0.1	0.3
[R]NPL, India	NPLI	1.3	4.1	1.3	4.1
[R]NMI, South Africa	NMISA	-1.9	2.0	-1.9	2.0
[R]NIM, Thailand	NIMT	0.1	0.4	0.1	0.3
[R]NMC, Singapore	NMC-SG	0.1	0.3	0.1	0.2
ESLMASM, Mongolia	MASM	-3.3	1.2	-3.3	1.2
SCL, Hong Kong	SCLHK	-0.4	2.1	-0.4	2.1
[R]NML, Malaysia	NMLMY	0.2	1.0	0.2	1.0
MUSSD, Sri Lanka	MUSSDSL	-0.4	13.9	-0.4	13.9
VMI, Vietnam	VMI	1.3	1.9	1.3	1.9
NML, Philippines	NML-PH	8.7	8.1	8.7	8.1
NISIT, Papua New Guinea	NISIT	1.1	2.0	1.1	2.0
KIM-LIPI, Indonesia	KIM-LIPI	1.8	1.3	1.8	1.3
KIM, Kazakhstan	KIM				
NIS, Egypt	NIS	0.6	12.3	0.6	12.3
NSCL, Syria	NSCL	-1.1	2.8	-1.1	2.8
JNMI, Jordan	JNMI	-0.5	2.8	-0.5	2.8

Table 7.2.23.g Degree of Equivalence for DC Resistance 100Ω

DEVIATION FROM REFERENCE RESISTANCE 1kΩ

Name		Deviation from reference, d_i (mΩ)	Exp. Unc., u_i (mΩ)
[R]NMI, Australia	NMIA	-69.3	6.0
[R]NMI, South Africa	NMISA	-30.2	20.0
[R]NPL, India	NPLI	-13.6	10.3
ESLMASM, Mongolia	MASM	-36.5	12.0
[R]NIM, Thailand	NIMT	1.2	2.4
SCL, Hong Kong	SCL-HK	-8.0	22.0
[R]NML, Malaysia	NML-MY	-9.6	16.0
MUSSD, Sri Lanka	MUSSD-SL	0.5	8.5

Table 7.2.24.a Loop A Deviation from reference DC Resistance 1kΩ

Name		Deviation from reference, d_i (mΩ)	Exp. Unc., u_i (mΩ)
[R]NMI, Australia	NMIA	-17.0	7.0
VMI, Vietnam	VMI	-3.2	18.0
NML, Philippines	NML-PH	7.8	12.0
[R]NPL, India	NPLI	0.0	5.2
NISIT, Papua New Guinea	NISIT	-18.3	14.0
KIM-LIPI, Indonesia	KIM-LIPI	-2.8	10.0
KIM, Kazakhstan	KIM		
NIS, Egypt	NIS	-25.8	90.0
NSCL, Syria	NSCL	-10.7	3.6
JNMI, Jordan	JNMI	-20.2	10.0

Table 7.2.24.b Loop B Deviation from reference DC Resistance 1kΩ

Name		Deviation from reference, d_i (mΩ)	Exp. Unc., u_i (mΩ)
[R]NPL, India	NPLI	16.8	15.2
SCL, Hong Kong	SCL-HK	-1.9	1.0
[R]NMI, Australia	NMIA	-1.3	2.0
[R]NMC, Singapore	NMC, SG	1.0	2.0
MUSSD, Sri Lanka	MUSSD-SL	-5.3	104.3
JNMI, Jordan	JNMI	-5.7	15.0

Table 7.2.24.c Loop C Deviation from reference DC Resistance 1kΩ

DATA USED FOR CORRECTED CHART RESISTANCE 1kΩ

Data collated for plotting						
Name	**Loop A**		**Loop B**		**Loop C**	
	d_i	u_i	d_i	u_i	d_i	u_i
NMISA	-30.2	20.0				
NPLI	-13.6	10.3				
MASM	-36.5	12.0				
NIMT	1.2	2.4				
SCL-HK	-8.0	22.0				
NML-MY	-9.6	16.0				
MUSSD-SL	0.5	8.5				
VMI			-3.2	18.0		
NML-PH			7.8	12.0		
NPLI			0.0	5.2		
NISIT			-18.3	14.0		
KIM-LIPI			-2.8	10.0		
NIS			-11.3	91.2		
NSCL			3.8	15.4		
-						
NPLI					16.8	15.2
SCL-HK					-1.9	1.0
NMIA					-1.3	2.0
NMC, SG					1.0	2.0
MUSSD-SL					-5.3	104.3
JNMI					-5.7	15.0

Table 7.2.24.d Data for corrected chart DC Resistance 1kΩ

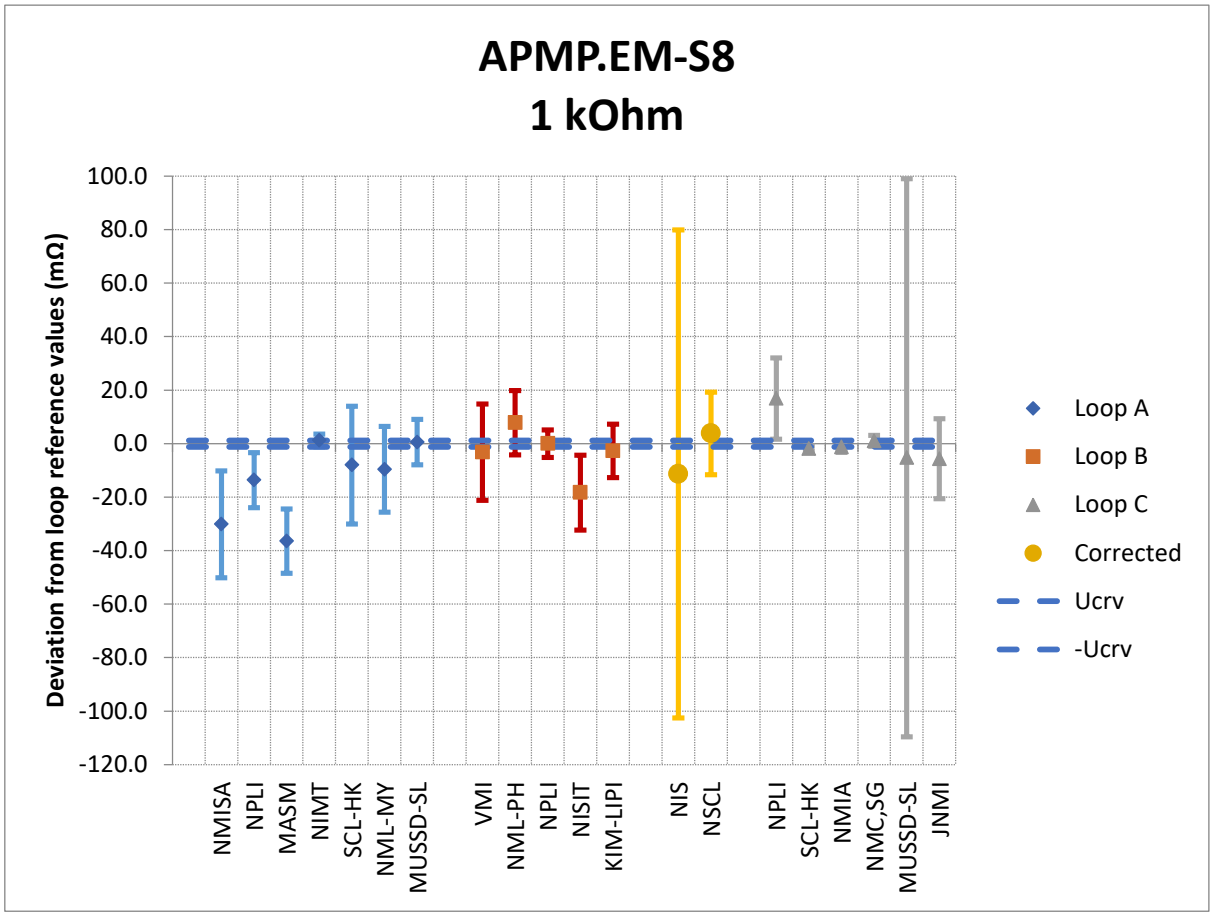

Figure 7.2.24 (Corrected) Comparison Chart for DC Resistance 1kΩ

COMPARISON REFERENCE VALUE RESISTANCE 1kΩ

Name		Deviation from reference, d_i (mΩ)	Exp. Unc., u_i (mΩ)
[R]NMI, Australia	NMIA		
[R]NPL, India	NPLI	1.1	11.0
SCL, Hong Kong	SCL-HK	-4.9	15.6
MUSSD, Sri Lanka	MUSSD-SL	-2.4	6011.6

Table 7.2.24.e Single Value Participated More Than Once for DC Resistance 1kΩ

Laboratories that contributed to the loop reference values

Name		(d_i), mΩ	(u_i) mΩ	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-1.3	2.0	0.250000	0.3653	-0.48064
[R]NPL, India	NPLI	1.1	11.0	0.008267	0.0121	0.01285
[R]NMI, South Africa	NMISA	-30.2	20.0	0.002500	0.0037	-0.11017
[R]NIM, Thailand	NIMT	1.2	2.4	0.173611	0.2537	0.29967
[R]NMC, Singapore	NMC-SG	1.0	2.0	0.250000	0.3653	0.37415
				0.684378	1.0000	0.09585

x_{CRV}: 0.1 mΩ

u_{CRV}: 1.2 mΩ

Table 7.2.24.f Laboratories that contributed to the loop reference values for DC Resistance 1kΩ

Name		Deviation from reference (d_i), mΩ	Exp. Unc., u_i (mΩ)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-1.3	2.0	-1.4	1.6
[R]NPL, India	NPLI	1.1	11.0	1.0	10.9
[R]NMI, South Africa	NMISA	-30.2	20.0	-30.3	20.0
[R]NIM, Thailand	NIMT	1.2	2.4	1.1	2.1
[R]NMC, Singapore	NMC-SG	1.0	2.0	0.9	1.6
ESLMASM, Mongolia	MASM	-36.5	12.0	-36.6	12.1
SCL, Hong Kong	SCLHK	-4.9	15.6	-5.0	15.6
[R]NML, Malaysia	NMLMY	-9.6	16.0	-9.7	16.0
MUSSD, Sri Lanka	MUSSDSL	-2.4	6011.6	-2.5	6011.6
VMI, Vietnam	VMI	-3.2	18.0	-3.3	18.0
NML, Philippines	NML-PH	7.8	12.0	7.7	12.1
NISIT, Papua New Guinea	NISIT	-18.3	14.0	-18.4	14.1
KIM-LIPI, Indonesia	KIM-LIPI	-2.8	10.0	-2.9	10.1
KIM, Kazakhstan	KIM				
NIS, Egypt	NIS	-11.3	91.2	-11.4	91.2
NSCL, Syria	NSCL	3.8	15.4	3.7	15.5
JNMI, Jordan	JNMI	-5.7	15.0	-5.8	15.0

Table 7.2.24.g Degree of Equivalence for DC Resistance 1kΩ

DEVIATION FROM REFERENCE RESISTANCE 10kΩ

Name		Deviation from reference, d_i (mΩ)	Exp. Unc., u_i (mΩ)
NMI, Australia	NMIA	-388.3	30.0
[R]NMI, South Africa	NMISA	-190.5	90.0
[R]NPL, India	NPLI	-102.5	71.0
ESLMASM, Mongolia	MASM	-246.0	84.0
[R]NIM, Thailand	NIMT	29.6	26.0
SCL, Hong Kong	SCL-HK	-5.6	130.0
[R]NML, Malaysia	NML-MY	61.2	80.0
MUSSD, Sri Lanka	MUSSD-SL	39.1	8560.0

Table 7.2.25.a Loop A Deviation from reference DC Resistance 10kΩ

Name		Deviation from reference, d_i (mΩ)	Exp. Unc., u_i (mΩ)
[R]NMI, Australia	NMIA	-213.9	80.0
VMI, Vietnam	VMI	-31.1	89.0
NML, Philippines	NML-PH	57.9	83.0
[R]NPL, India	NPLI	0.0	61.5
NISIT, Papua New Guinea	NISIT	-186.0	140.0
KIM-LIPI, Indonesia	KIM-LIPI	-17.7	10.0
KIM, Kazakhstan	KIM		
NIS, Egypt	NIS	-177.8	900.0
NSCL, Syria	NSCL	-62.4	40.0
JNMI, Jordan	JNMI	-143.8	90.0

Table 7.2.25.b Loop B Deviation from reference DC Resistance 10kΩ

Name		Deviation from reference, d_i (mΩ)	Exp. Unc., u_i (mΩ)
[R]NPL, India	NPLI	-87.5	121.2
SCL, Hong Kong	SCL-HK	-12.9	20.0
[R]NMI, Australia	NMIA	-10.1	20.0
[R]NMC, Singapore	NMC, SG	12.5	20.0
MUSSD, Sri Lanka	MUSSD-SL	-12.6	1042.8
JNMI, Jordan	JNMI	-32.0	98.0

Table 7.2.25.c Loop C Deviation from reference DC Resistance 10kΩ

DATA USED FOR CORRECTED CHART RESISTANCE 10kΩ

Data collated for plotting						
Name	**Loop A**		**Loop B**		**Loop C**	
	d_i	**u_i**	**d_i**	**u_i**	**d_i**	**u_i**
NMISA	-190.5	90.0				
NPLI	-102.5	71.0				
MASM	-246.0	84.0				
NIMT	29.6	26.0				
SCL-HK	-5.6	130.0				
NML-MY	61.2	80.0				
MUSSD-SL	39.1	8560.0				
VMI			-31.1	89.0		
NML-PH			57.9	83.0		
NPLI			0.0	61.5		
NISIT			-186.0	140.0		
KIM-LIPI			-17.7	10.0		
NIS			-66.0	905.3		
NSCL			49.4	105.8		
-						
NPLI					-87.5	121.2
SCL-HK					-12.9	20.0
NMIA					-10.1	20.0
NMC, SG					12.5	20.0
MUSSD-SL					-12.6	1042.8
JNMI					-32.0	98.0

Table 7.2.25.d Data for corrected chart DC Resistance 10kΩ

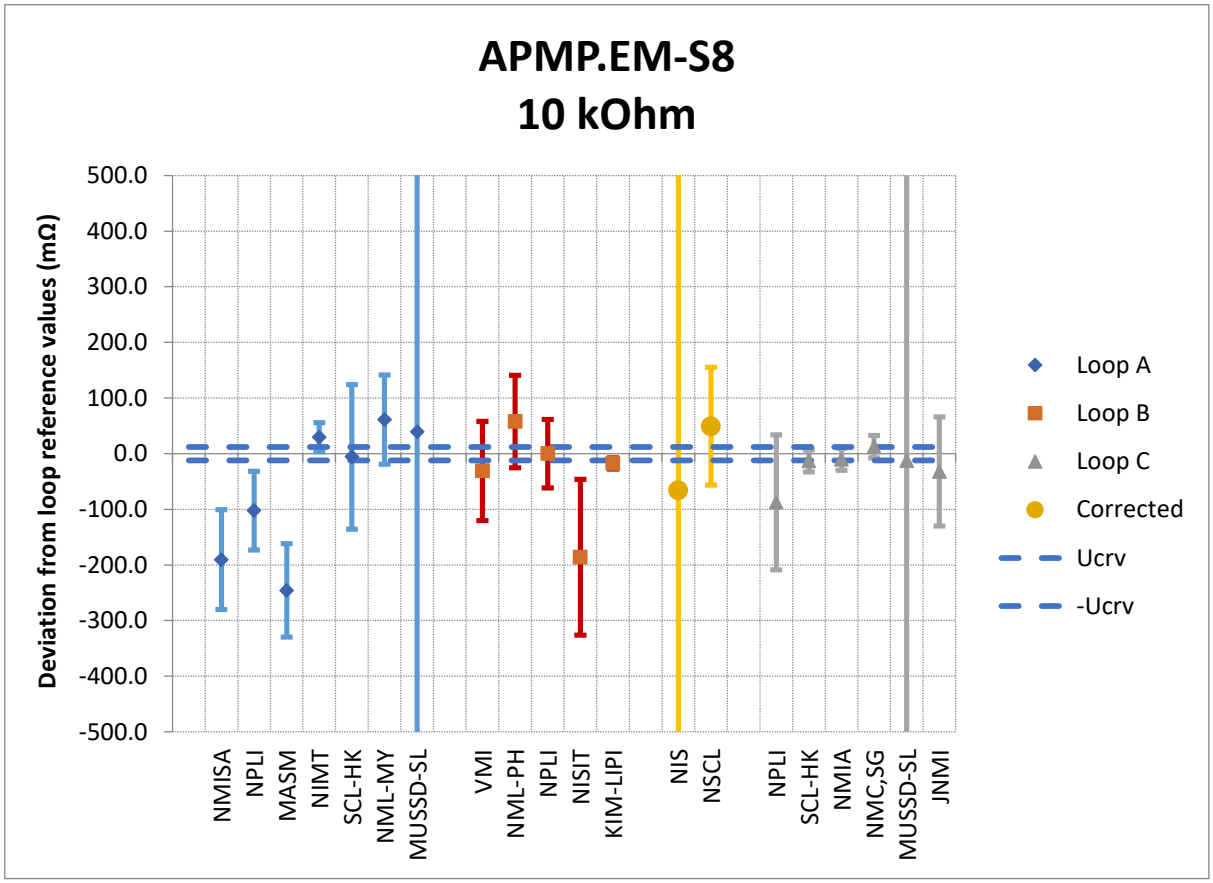

Figure 7.2.25 (Corrected) Comparison Chart for DC Resistance 10kΩ

COMPARISON REFERENCE VALUE RESISTANCE 10 kΩ

Name		Deviation from reference, d_i (mΩ)	Exp. Unc., u_i (mΩ)
[R]NMI, Australia	NMIA		
[R]NPL, India	NPLI	-63.3	88.5
SCL, Hong Kong	SCL-HK	-9.3	93.0
MUSSD, Sri Lanka	MUSSD-SL	13.2	6097.6

Table 7.2.25.e Single Value Participated More Than Once for DC Resistance 10kΩ

Laboratories that contributed to the loop reference values

Name		(d_i), mΩ	(u_i) mΩ	$1/(u_i)^2$	(w_i)	$w_i \cdot d_i$
[R]NMI, Australia	NMIA	-10.1	20.0	0.002500	0.3715	-3.75474
[R]NPL, India	NPLI	-63.3	88.5	0.000128	0.0190	-1.20046
[R]NMI, South Africa	NMISA	-190.5	90.0	0.000123	0.0183	-3.49451
[R]NIM, Thailand	NIMT	29.6	26.0	0.001479	0.2198	6.51407
[R]NMC, Singapore	NMC-SG	12.5	20.0	0.002500	0.3715	4.64008
				0.006730	1.0000	2.70444

x_{CRV}: 2.7 mΩ

u_{CRV}: 12.2 mΩ

Table 7.2.24.f Laboratories that contributed to the loop reference values for DC Resistance 10kΩ

Name		Deviation from reference (d_i), mΩ	Exp. Unc., u_i (mΩ)	D.O.E.	$U_{i\ DOE}$
[R]NMI, Australia	NMIA	-10.1	20.0	-12.8	15.9
[R]NPL, India	NPLI	-63.3	88.5	-66.0	87.7
[R]NMI, South Africa	NMISA	-190.5	90.0	-193.2	89.2
[R]NIM, Thailand	NIMT	29.6	26.0	26.9	23.0
[R]NMC, Singapore	NMC-SG	12.5	20.0	9.8	15.9
ESLMASM, Mongolia	MASM	-246.0	84.0	-248.7	84.9
SCL, Hong Kong	SCLHK	-9.3	93.0	-12.0	93.8
[R]NML, Malaysia	NMLMY	61.2	80.0	58.5	80.9
MUSSD, Sri Lanka	MUSSDSL	13.2	6097.6	10.5	6097.6
VMI, Vietnam	VMI	-31.1	89.0	-33.8	89.8
NML, Philippines	NML-PH	57.9	83.0	55.2	83.9
NISIT, Papua New Guinea	NISIT	-186.0	140.0	-188.7	140.5
KIM-LIPI, Indonesia	KIM-LIPI	-17.7	10.0	-20.4	15.8
KIM, Kazakhstan	KIM				
NIS, Egypt	NIS	-66.0	905.3	-68.7	905.4
NSCL, Syria	NSCL	49.4	105.8	46.7	106.5
JNMI, Jordan	JNMI	-32.0	98.0	-34.7	98.8

Table 7.2.25.g Degree of Equivalence for DC Resistance 10kΩ

8 Acknowledgements

The authors would like to extend their thanks to Mr. A.K.Saxena, Ex-Chief Scientist, CSIR-NPL for Coordinating (till Dec. 2014) the inter-comparison, all the participants and their team members.

We extend our thanks to Ms Sunidhi Luthra, Mr. Bijendra Pal, Ms Usha Kiran, Ms Jyotsna and Mr. M. A. Ansari, for their continuous help during the inter-comparison exercise.

Furthermore, the authors would like to thank PTB Technical Cooperation, particularly A. Cypionka, C. Sanetra and K. Kiesow, for the support of the two workshops.

9 Conclusions

The Supplementary comparisons of Digital Multimeter have been conducted between participating APMP member laboratories. In general, there is good agreement between participating laboratories in the region for all quantities. The measurement results are tabulated in Table 7.1.1 – 7.1.25, with which the Supplementary comparison reference value (CRV) was calculated as Table 7.2.1 – 7.2.25.

Overall, good agreement among the values provided by the participants has been observed with a few exceptions. The comparison was a good opportunity for all the participants to validate their measurement competence under the APMP umbrella.

Technical Protocol

Version 1.2 (11 May 2015)

SUPPLEMENTARY COMPARISON
ON
DIGITAL MULTIMETER
(APMP.EM-S8)

Contents

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1. Introduction

At the 8th Meeting of APMP Developing Economies' Committee (DEC) on 12th April 2004 in Kuala Lumpur, Malaysia, it was decided to initiate an international comparison of digital multimeter calibration. The artifact i.e. digital multimeter will be supplied by the National Physical Laboratory, India (NPLI). This comparison was proposed to test the capabilities of the NMIs in measuring the following quantities:

DC voltage, DC current, DC resistance, AC voltage and AC current

The NPLI agreed to act as the pilot laboratory and coordinate this comparison and 16 laboratories agreed to participate.

This protocol was prepared in accordance with the "Guidelines for CIPM key comparisons" [1].

2. Travelling Standard

2.1 Description of the standard

The travelling standard is a 6½ digit multimeter (Fluke model 8846A). This instrument can measure DC voltage up to 1000V, DC current up to 10A, resistance up to 1GΩ, AC voltage up to 1000V, and AC current up to 10A. The details of the digital multimeter are given in Table 1:

Table 1

General Information	
Power supply requirement	100V / 120V / 220V / 240V ± 10%
Power line frequency	50Hz to 60Hz
Power consumption	28VA peak (12W average)
Warm-up time	1 Hour
Operating temperature range	0 °C to 50 °C
Operating humidity range	0% to 80% relative humidity
Temperature coefficient (18 °C - 28 °C)	Not specified
Transport Information	
Storage temperature range	–40°C to 70°C
Dimension (H × W × D)	89mm (H) × 217mm (W) × 297mm (D)
Shipping container (H × W × D)	167mm (H) × 470mm (W) × 360mm (D)
Weight	3.6 kg
Shipping Weight	6.0 kg

2.2 Quantities to be measured

The quantities to be measured are DC voltage, DC current, DC resistance, AC voltage and AC current. The details of the measured parameters are given in Table 2.

Table 2

Parameter	Nominal value
DC Voltage	100mV, 1V, 10V, –10V, 100V and 1000V
DC Current	10mA and 1A
DC Resistance	100Ω, 1kΩ and 10kΩ (using 4-wire)
AC Voltage	100mV, 1V, 10V, 100V and 700V at 40Hz and 1kHz
AC Current	10mA and 1A at 40Hz and 1kHz

2.3 Method of computation of the Comparison Reference Value

The Comparison Reference Value (CRV) will be computed by weighted mean of the results from laboratories with independent realizations of relevant primary standards [2-4].

3. Organization of Comparison

3.1 Comparison communication

All communication must be directed to **apmp_dmm@nplindia.org**. In case of any problem, participants can contact Thomas John and P S Negi (refer to paragraph 8).

3.2 Participants

The list of participating institutes with persons responsible for the comparison is given in Annexure1.

3.3 Time schedule

The circulation of the travelling standard has been organized in loops of not more than four laboratories in order to allow close monitoring of the behavior of the standard. Each laboratory will have at least four weeks for measurement and transportation. The circulation time schedule is given in Annexure-2.

If unforeseen circumstances prevent a laboratory from carrying out its measurements within the time allotted, it should send the travelling standard without delay to the laboratory next in line with information to pilot lab. If time allows, the laboratory may be able to carry out measurements towards the end.

3.4 Transportation, unpacking, handling and packing

The artifact will be transported using an **ATA Carnet** for custom clearance where possible. A separate comparison loop will be organized for those participants that do not qualify for the **ATA Carnet** scheme.

An enclosure is provided for the digital multimeter so that it can be shipped as freight. This enclosure has dimensions and weight as shown in table 1. Extreme temperatures or pressure changes as well as violent impacts should be avoided. With the travelling standard, one receipt form (Annexure-5), dispatch form (Annexure-6) and one checklist will be sent for each participant in the current loop. The pilot laboratory must be informed of receipt of the artifact and its dispatch to the next laboratory using the forms provided.

When shipping the standard, the shipping checklist form should be carefully followed in order to include all the material for the next laboratory.

3.5 Failure of travelling standard

In case of damage or malfunction of the travelling standard, this must be immediately reported to the pilot laboratory.

3.6 Financial aspects

Each participant laboratory is responsible for its own costs for the measurements, transportation to the next participant and insurance of the shipment to the next participant and any customs charges as well as any damage that may occur within its country.

4. Measurement Instructions

4.1 Tests before measurements

After arrival of the travelling standard, it should be checked for any physical damage. Ensure that the mains voltage setting is applicable to the local supply, and check that the instrument is functioning correctly. It should be allowed to stabilize in a temperature and possibly, humidity controlled environment for at least 24 hours before commencing measurements.

4.2 Measurement conditions

1. The digital multimeter should be used in the configurations given in Annexure 3.

2. The instrument will be supplied without input leads. The input voltage, current and resistance are defined at the input terminals of the instrument.

3. A single earth connection must be used in the measurement setup to avoid ground loops.

4. The minimum settling time given in the table should be used after first application of the test signal.

5. The standard ambient conditions for measurement are

   Temperature: (23 ± 1) °C
   Relative humidity: 50% ± 10%

6. Before making DC measurements, for each point, a zero value should be applied and Auto Zero (check function) should be executed.

7. The measurement result is the correction for the Digital Multimeter calculated as: DMM correction = True (Applied) value – DMM reading.

Any standard method may be used for calibrating the digital multimeter. For example, the participant laboratories may use the following techniques:

- Direct comparison with a multifunction calibrator;
- Direct comparison with DC reference voltage standard and standard resistors; and
- Indirect comparison using voltage drop method for currents.

The calibration method must be presented in detail in the comparison report.

5. Uncertainty of Measurement

5.1 Uncertainty components

All contributions to the measurement uncertainty should be listed in the report submitted by each participant.

Even though some contributions to the uncertainty are specific to each method of measurement, it may be useful to consider the following list to try to assure more comparable uncertainty evaluations (the list may be considered as the guidelines).

1. Reference voltage standard (for dc voltage parameter);
2. Standard resistor (for resistance parameter);
3. Reference divider (for high voltage);
4. Multifunction calibrator (for all or some of the parameters);
5. Thermal electromotive force (emf) (for low dc voltage);
6. Drift of the calibrator / reference standard since last calibration;
7. Effect of offset, non-linearity and differences in the gain of calibrator (when using a calibrator as the reference);
8. Repeatability; and
9. Finite resolution of the DMM to be calibrated.

5.2 Uncertainty budget

The uncertainty must be calculated according to the "Guide to the Expression of Uncertainty in Measurement" [5] for a 95% confidence level. In uncertainty evaluations, all uncertainty components taken into account should be included. The coverage factor and the effective degrees of freedom should be reported.

6. Measurement results of the laboratories

Results should be communicated to the pilot laboratory within 30 days of completing the measurements. An early report helps in evaluating the behavior of the travelling standard. A format-of-results form (Annexure-4) is given in order to help summarize the essential information. The report should contain (for each measurement):

- A detailed description of the method used;
- The conditions of the measurement: values of temperature, humidity, with their limits of variation;
- Results of measurement;
- Standard uncertainties for each contributor;
- Combined standard uncertainty;
- Coverage factor;

- Effective degrees of freedom;
- Expanded uncertainty; and
- A detailed uncertainty budget.

7. Final report of the comparison

The process that will lead to the preparation of the final report of the comparison is explained in the “Guidelines for CIPM key comparisons” [1]. In short it is reported here.
After the conclusion of the circulation of the travelling standard the pilot laboratory will prepare a first draft (draft A) of the final report and will send it to the participants. This draft will be confidential. The draft will be prepared within 4 months from the end of the measurements.
The participants will have two months to send their comments on draft A. If a laboratory’s result is anomalous, it can decide, at this stage, to withdraw its result or, if an explanation is found, can correct it. A laboratory may eventually request to make a second measurement of the travelling standard, but this will not hold up the final report.

On the basis of the comments received, the pilot laboratory prepares the second draft (draft B), where the withdrawn results will not appear or, in case of correction, the original and the corrected results, with the given explanation, are reported. Draft B will be submitted to the TCEM-APMP and, after approval, will become the Final Report. The Final Report will form the basis for the publication of results, if any.

8. Comparison coordinator

The Coordinator and Deputy Coordinator for this comparison at pilot laboratory is Thomas John and P S Negi respectively and their addresses are:

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5. Guide to the Expression of Uncertainty in Measurement, JCGM 100:2008, First edition September 2008 (available on the BIPM website: http://www.bipm.org/utils/common/documents/jcgm/JCGM_100_2008_E.pdf)

10 Annexure-1: Participant details

No.	Name and address of laboratory	Contact person	Shipping address	ATA CARNET
1.	SCL (Standard and Calibration Laboratory) 36/F., Immigration Tower, 7 Gloucester Road, Wanchai, Hong Kong	Mr. Steven Yang Email: steven.yang@itc.gov.hk	36/F, Immigration Tower, Gloucester Road, Wanchai, Hong Kong	Yes
2.	Measurement Units, Standard and Services Department No 101, Park Road, Colombo 05, Sri Lanka	Mr. R.D.M. Alanka Email: metrolg@sltnet.lk adpower@measurementsdept.gov.lk	Measurement Units, Standard and Services Department No. 101, Park Road, Colombo 05, Sri Lanka	Yes
3.	Kazakhstan Institute of Metrology 11, Orynbor str ., Astana, 010000 Republic of Kazakhstan	Mr. Marat Konkanov Email: marconzenti@bk.ru	11, Orynbor str., Astana, 010000, Republic of Kazakhstan	No
4.	National Measurement Institute, Australia PO Box 264, Lindfield, NSW 2070, Australia	Mr. Louis Marais Email: louis.marais@measurement.gov.au	NMI Receiving store, Bradfield Road, West Lindfield, NSW 2070, Australia	Yes
5.	Electrical Quantities Metrology Laboratory, National Institute for Standards (NIS) Tersa St. EL Haram Giza. Egypt. P.O. Box 136, Giza. Code 12211	Prof. Dr. Nadia Nassif Tadros E mail: nntadros@yahoo.com, halaabdelmegeed@yahoo.com	Head of Electrical Quantities Metrology Laboratory, National Institute for Standards (NIS), Tersa St. EL Haram, Giza, Egypt. P.O. Box 136 Giza. Code 12211	No
6.	National Metrology Institute South Africa CSIR Campus, Bld 5 Meiring Naude Road, Brummeria, PRETORIA 0001	Mr. P. J. Prinsloo Email : fprinsloo@nmisa.org	CSIR Campus, Bld 5, Meiring Naude Road Brummeria PRETORIA 001 South Africa	Yes
7.	Electrical Measuring Instrument Laboratory, Electrical Metrology Department National Institute of Metrology (Thailand) 3/4-5 Moo 3, Klong 5, Klong Luang, Pathumthani 12120 Thailand	Ms. Jutarat Tanarom or Mr. Narat Rujirat Email: jutarat@nimt.or.th narat@nimt.or.th	National Institute of Metrology (Thailand), 3/4 -5 Moo 3, Klong 5, Klong Luang, Pathumthani 12120 Thailand	Yes

No.	Name and address of laboratory	Contact person	Shipping address	ATA CARNET
8.	Measurement Standards Laboratory, National Institute of Standards & Industrial Technology P O Box 3042 Boroko, National Capital District, Papua New Guinea	Joe Panga/Victor Gabi Email: Joe.Panga@nisit.gov.pg Victor.Gabi@nisit.gov.pg	Measurement Standards Laboratory, National Institute of Standards & Industrial Technology, P O Box 3042 Boroko, National Capital District, Papua New Guinea	No
9.	Vietnam Metrology Institute No. 8 – Hoang Quoc Viet Str. – Cau Giay Dist – Hanoi City – Vietnam	Mr. Phung Thi Kieu Linh Email: linhptk@vmi.gov.vn	Vietnam Metrology Institute No. 8 – Hoang Quoc Viet Str. – Cau Giay Dist – Hanoi City – Vietnam	No
10.	Jordan National Metrology Institute Royal Scientific Society, Jordan National Metrology Institute P.O. Box: 1438, Str. Ahmad Al-Tarawneh, Al-Jubeiha (11941), Amman, Jordan	Eng, Ibrahim Sehweil E mail: jnmi-emd@rss.jo	P.O. Box: 1438, Str. Ahmad Al-Tarawneh Al-Jubeiha (11941), Amman, Jordan	No
11.	Electrical Standard Laboratory of Mongolian Agency for Standardization and Metrology Mongolia, Ulaanbaatar 210351, Peace street -46A, P.O. Box 48	Ariuntungalag Jargal E mail: r_aagii@yahoo.com masm@mongol.net	Mongolia, Ulaanbaatar 210351, Peace street -46A, P.O. Box 48	Yes
12.	National Metrology Laboratory Industrial Technology Development Institute (NML-ITDI) Metrology Building –ITDI, DOST Compound. Gen Santos Avenue Biscutan, Taguig City, Metro Manila, Philippines 1631	Sabino Paulo B. Leones, Jr Email: paulo_leones@yahoo.com	Metrology Building –ITDI, DOST Compound. Gen Santos Avenue Biscutan, Taguig City, Metro Manila, Philippines 1631	No (Remarks)
13.	National Metrology Laboratory, SIRIM Berhad Lot PT 4803, Bandar Baru Salak Tinggi 43900 Sepang, Selangor, Malaysia	Dr. Mohd Nasir Zainal Abidin Email: mohd.nasir_z.abidin@sirim.my	National Metrology Laboratory, SIRIM Berhad, Lot PT 4803, Bandar Baru Salak Tinggi, 43900 Sepang, Selangor, Malaysia	Yes (Remarks)
14.	Electrical Metrology Sub. Division – Metrology Division – Puslit KIM – LIPI Komplek PUSPIPTEK, Serpong (15314) Tangerang, Banten – INDONESIA	Ahnan Ma'ruf Email: ahnan@kim.lipi.go.id	Puslit. KIM – LIPI, Gd. 420, Komplek PUSPIPTEK, Serpong (15314) Tangerang, Banten – INDONESIA	No

No.	Name and address of laboratory	Contact person	Shipping address	ATA CARNET
15.	National Standards and Calibration Laboratory (NSCL), Barzeh, Pre-fabricated Houses Area, P.O. Box: 30116, Damascus – Syria	Dr. Samir Al Zaher Email: nscl@nscl.sy	National Standards and Calibration Laboratory (NSCL), Barzeh, Pre-fabricated Houses Area, P.O. Box: 30116, Damascus - Syria	No
16.	National Physical Laboratory (Council of Scientific and Industrial Research) Dr K S Krishnan Marg New Delhi 110012 India	Thomas John/ P S Negi apmp_dmm@nplindia.org alternate: tjohn@nplindia.org psnegi@nplindia.org	National Physical Laboratory (Council of Scientific and Industrial Research) Dr K S Krishnan Marg New Delhi 110012 India	Yes
17.	National Metrology Centre No. 1, #02-27, Science Park Drive, Singapore 118221	Tay Siew Choon tay_siew_choon@nmc.a-star.edu.sg	National Metrology Centre No. 1, #02-27, Science Park Drive, Singapore 118221	Yes

11 Annexure-2: Circulation Scheme

Circulation Scheme for Participants covered under ATA Carnet

Laboratory	Receipt of Travelling Standard (DD-MM-YY)	Departure of Travelling standard (DD-MM-YY)	Report Dispatch (DD-MM-YY)
Loop 1			
NPL, India	---	27-05-11	---
NMI, Australia	15-06-11	15-07-11	17-08-11
NMI, South Africa	01-08-11	02-09-11	02-10-11
ESLMASM, Mongolia	12-09-11	30-09-11	30-10-11
NPL, India	31-10-11	---	---
Loop 2			
NPL, India	---	02-12-11	---
NIM, Thailand	16-01-12	13-02-12	13-03-12
SCL, Hong Kong	02-03-12	02-04-12	02-05-12
NML, Malaysia	20-04--12	18-05-12	18-06-12
MUSSD, Sri Lanka	04-06-12	06-07-12	06-08-12
NMI, Australia	20-07-12	24-08-12	24-09-12
NPL, India	24-09-12	---	---

Travelling standard: Fluke model 8846A S/N 9481013

Circulation Scheme for Participants not covered under ATA Carnet

Travelling standard: Fluke model 8846A S/N 9273015

Laboratory	Receipt of Travelling Standard (DD-MM-YY)	Departure of Travelling standard (DD-MM-YY)	Report Dispatch (DD-MM-YY)
Loop 1			
NMI, Australia	---	11-06-11	11-07-11
NPL, India	11-07-11	29-08-11	---
VMI, Vietnam	08-09-11	10-10-11	09-11-11
NML, Philippines	26-10-11	28-11-11	28-12-11
NISIT, Papua New Guinea	07-12-11	26-12-11	25-01-12
KIM-LIPI, Indonesia	27-01-12	17-02-12	17-03-12
NPL, India	17-03-12	---	---
Loop 2			
NPL, India	---	18-04-12	---
KIM, Kazakhstan	18-05-12	13-06-12	13-07-12
NIS, Egypt	27-06-12	27-07-12	28-08-12
NSCL, Syria	10-08-12	10-09-12	10-10-12
JNMI, Jordan	02-10-12	17-10-12	17-11-12
NPL, India	19-11-12	17-12-12	---
NMI, Australia	17-01-13	---	17-03-13

Circulation Scheme for Participants of Loop 3
Travelling standard: Fluke model 8846A S/N 2608004

Laboratory	Receipt of Travelling Standard (DD-MM-YY)	Departure of Travelling standard (DD-MM-YY)	Report Dispatch (DD-MM-YY)
Loop 3			
NMI, Australia	---	16-06-14	---
NPL, India	11-07-14	11-09-14	---
SCL, Hong Kong	19-09-14	20-10-14	20-11-14
Singapore	29-10-14	21-11-14	21-12-14
MUSSD, Sri Lanka	28-11-14	29-12-14	29-01-15
JNMI, Jordon	22-01-15	06-02-15	06-03-15
NMI, Australia	13-02-15	---	16-3-15

[12] Annexure-3: Operational Settings

Digital Multimeter Fluke 8846A for APMP.EM-S8 Comparison

1. Manual range selection must be made for all measurements. Select the range before applying the test signal to the multimeter.
2. The front input terminals must be used for all measurements.
3. Reset the instrument to default settings before starting measurements (see page 3-22 of the User Manual [1]).
4. Refer to table 3 for additional measurement setup requirements.

Table 3

Parameter	DC Voltage	DC Current	Resistance	AC Voltage	AC Current
Connection	As per figure 4.1 page 4-4 of the User Manual [1]	As per figure 4.4 (10 mA) and 4.5 (1 A) on page 4-10 of the User Manual [1]	As per figure 4.2 page 4-8 of the User Manual [1]	As per figure 4.1 page 4-4 of the User Manual [1]	As per figure 4.4 (10 mA) and 4.5 (1 A) on page 4-10 of the User Manual [1]
Input impedance	High Input Z [2]	Not applicable [3]	Not applicable [3]	Not applicable [3]	Not applicable [3]
Filter selection	FILTER off [4]	FILTER off [4]	FILTER off [4]	Select 3 HZ SLOW [4]	Select 3 HZ SLOW [4]
Display resolution	6 Digit, 100 PLC [5]	6 Digit, 100 PLC [5]	6 Digit, 100 PLC [5]	HIGH [5]	HIGH [5]
Zeroing	Required [6]	Required [6]	Required [6]	Not applicable	Not applicable
Settling time	5 minutes (min)	5 min for 10 mA, 30 min for 1 A	5 min	5 min	5 min for 10 mA, 30 min for 1 A

[1] Fluke 8845A/8846A Digital Multimeter User Manual,
[2] Enable 'Automatic Input Impedance'. Page 3-9 of the User Manual [1]
[3] Although it is possible to turn on the "HIGH INPUT Z" function on the front panel for these parameters, doing so does not change the input impedance of the Digital Multimeter
[4] Pages 4-4 and 4-5 of the User Manual [1]
[5] Pages 3-7 and 3-8 of the User Manual [1]
[6] Pages 3-3, 3-4 and 3-12 of the User Manual [1]

13 Annexure-4: Format of Measurement Results

1. Participating Laboratory:

a. Name of Laboratory: _____

b. Address: _____

c. Name of Contact Person: _____

d. Tel No.: _____

e. Fax No.: _____

f. E-mail: _____

2. Standards and Instruments Used:
   a. Standard Used (Type or Model):
   b. Measuring Instruments (Model):
3. Measurement Method:
4. Measured Data:
   a. Environmental Conditions during measurements:

	Minimum	Average	Maximum
Temperature:	°C	°C	°C
Relative Humidity:	%	%	%

b. Measurement Results:

Nominal Value	Mean Applied Value	Mean DMM reading	Mean DMM Correction	Uncertainty (95% C.L.)

Please Attach detailed Uncertainty Budgets as per “GUM” document:

Date _____

Signature _____

14 Annexure-5: RECEIPT FORM

SUPPLEMENTARY COMPARISON ON DIGITAL MULTIMETER (APMP.EM-S8)

RECEIPT FORM

To:	_____	**From:**	_____
Attn:	_____	**Fax No.:**	_____
Fax No.:	_____	**Tel No.:**	_____
Date:	_____	**Pages:**	_____

The APMP.EM-S8 comparison pack was received on ____ / ____ / _____ *(date)*
The contents of the transport case, checked against the Packing List, were:

☐ Complete (INCLUDING CARNET)

☐ Incomplete (*please list missing items*)

_____

___

After inspection, the 'travelling standard' (digital multimeter) is in working condition? _____ (Yes / No)

If no, is the damage serious? _____ (Yes / No)

Remarks, if any:

_____

_____

_____

Signature

15 Annexure-6: DISPATCH FORM

SUPPLEMENTARY COMPARISON ON DIGITAL MULTIMETER (APMP.EM-S8)

DISPATCH FORM

Participating laboratory _____

Contact person _____

Phone _____ Fax _____ E-mail _____

The audit pack was dispatched on____ / ____ / _____ *(date)*

Courier (if applicable) _____ Tracking no _____

Airline _____ Flight no _____ Dated _____

The contents of the pack have been inspected after measurement in our laboratory and were found to be in good condition. _____ (Yes / No)

Please give details of any problems

_____

_____

_____

_____

_____

Kindly send a copy to next Participant and the Pilot Laboratory.

Appendix B APMP.EM-S8 COUNTRY REPORTS

Circulation Scheme for Participants covered under ATA Carnet

Travelling standard: Fluke model 8846A S/N 9481013

Loop A

NPL, India
NMI, Australia
NMI, South Africa
ESLMASM, Mongolia
NPL, India

NPL, India
NIM, Thailand
SCL, Hong Kong
NML, Malaysia
MUSSD, Sri Lanka

Circulation Scheme for Participants not covered under ATA Carnet

Travelling standard: Fluke model 8846A S/N 9273015

Loop B

NMI, Australia
NPL, India
VMI, Vietnam
NML, Philippines
NISIT, Papua New Guinea
KIM-LIPI, Indonesia
NPL, India

NPL, India
KIM, Kazakhstan
NIS, Egypt
NSCL, Syria
JNMI, Jordan

Circulation Scheme for Participants of mix loop A and B

Travelling standard: Fluke model 8846A S/N 2608004

Loop C

NMI, Australia
NPL, India
SCL, Hong Kong
NMC, Singapore
MUSSD, Sri Lanka
JNMI, Jordan
NMI, Australia

----------END OF REPORT----------