

ACTIVITY REPORT FOR

Training Course on the Verification of Non-automatic Weighing Instruments including Weighbridges

Dates: 8-11 May 2018

Venue: National Metrology Institute of Malaysia (NMIM), Sepang, Malaysia

Host: National Metrology Institute of Malaysia (NMIM)

Trainers: Mr Matthew Lux, NMI, Australia

Mrs Suliana Binti Ghazalli, NMI, Malaysia

Ms Suhaidah Amizam, NMI, Malaysia

Mr Muhammad Fadhil Sahrom, NMI, Malaysia

Mr Kiveen Suycano, National Metrology Laboratory of the Philippines

APLMF Rep: Mrs Marian Haire, APLMF Training Coordinator

1. Objective of the Training

Accurate measurement in the marketplace is an important component of an economies' metrological system and is closely linked to quality of life. APLMF has conducted training courses on non-automatic weighing instruments (NAWIs) for the past 20 years in order to support developing economies to implement harmonized verification procedures to ensure consumers and vendors are benefiting equally from a sound measurement infrastructure that inspires confidence and trust within the community.

Participants learned how to verify NAWI in accordance with OIML recommendations. All participants were expected to have previous practical experience in the field. This training was composed of lectures and practical activities. The lectures outlined the test procedures and the reference standards of measurement used to ensure they are operating correctly within the maximum permissible error. The practical component provided an opportunity for participants to demonstrate their ability to test a NAWI in accordance with OIML recommendations. In the case of weighbridges participants observed a weighbridge being verified using NMIM's unique facility especially constructed for delivering training.

This course provided participants with the knowledge and skills to:

- understand the role of trade measurement within an economy
- identify the major components of a NAWI
- analyse the NAWI operating environment to determine how it could impact on its performance
- identify sources of any possible operational error

- verify a NAWI in accordance with the test procedures and workplace health and safety guidelines

2. Target Group

This program is designed for people who verify NAWI including shop scales and weighbridges or who have a responsibility for ensuring that these instruments are verified in accordance with OIML R76 recommendations. In addition to some training experience, all participants are expected to have practical experience in carrying out verification tests for NAWI.

3. Training Course Programme

Dr Osmen Zakaria, Senior Director of National Metrology Institute of Malaysia, opened this training course by welcoming all participants heartily to Malaysia and encouraging them to study hard and learn lots during the week. Marian Haire welcomed participants on behalf of APLMF.

This training was delivered by three trainers from developing economies who were delivering to an international audience for the first time. They all did an excellent job. They were supported by experienced trainers from Australia, Matthew Lux and Suliana Ghazalli from Malaysia. This support was greatly appreciated and helped ensure the participants fully understood the materials presented. The participants asked lots of questions especially in the breaks where they felt more confident to approach one of the trainers.

Mr Peter J Berinus Agang, from the Ministry of Domestic Trade, Cooperatives and Consumerism explained how the legal metrology system works in Malaysia. His Department manages 10 different Acts and works closely with NMIM and Metrology Cooperation, Malaysia. This talk generated lots of questions.

A talk on the ASEAN Guidelines was presented by Ms Suhaidah Armizam from NMIM. This provided an insight into how these guidelines are implemented within the region. It was useful to recognize how ASEAN countries are interpreting OIML recommendations.

Ms. Suliana Ghazalli, from NMIM lead a discussion on issues and matters relating to cheating using NAWIs. Explanations were given of how software can be used to manipulate data and create fraudulent situations. This will be useful information for the participants to pass on when they return to their economies.

At the end of day 1 participants relaxed together over a very nice welcome diner which was hosted at Putrajaya on board a river cruiser. It was a beautiful setting and it allowed the participants to get to know each other better.

On day 2 we divided the participants into 4 groups and set them tasks to work on over the following days. They then presented their tasks on day 4. This ensured they had all questions answered and demonstrated their understanding of the verification procedures. On day 3 we travelled to NMIM to carry out a weighbridge verification using substitution loads. For many of the participants this was the first time they had seen this take place.

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A copy of the full agenda can be found at Annex 1 and Annex 2 contains a list of all participants. Mettler Toledo made a presentation showing how a weighbridge is constructed and they also showed some common ways that load cells can be manipulated to commit fraud. They also showed how their systems manage data received from a weighbridge so fraud can be easily detected.

Instead of asking participants to present a country report explaining how they verify NAWIs this information was requested at enrollment. This was then presented as a table and a short time was spent discussing the similarities and differences and clarification of certain comments. This saved quite a bit of time and allowed time for the ASEAN and cheating discussions. Annex 3 contains a copy of this information.

The closing ceremony was held at the farewell dinner which was held at the hotel. Dr Osman and senior managers attended representing NMIM. All participants were presented with certificates of participation.

4. Highlights/ Lessons Learned

The following points were compiled from feedback from the trainers and the participants.

- The course was highly evaluated with scores above 4 out of 5 for all aspects of the delivery (included logistics, training and group work plus overall score).
- Eliminating country reports provided more time for delivery of technical information.
- The trainers from developing economies did an excellent job but did require support of more experienced trainers. There were some comments about not understanding the accents of some trainers. With 5 different trainers there were multiple accents for participants to deal with. This was difficult for a few people.
- The participants were the correct target group. They all had responsibility for training verifiers. However, they were mostly from laboratories (NMIs) so had very limited experience in the actual verification of NAWIs in the field. The training did give them an insight into the concept of legal metrology. Hopefully, they now understand the practical nature of legal metrology. This is important if they are to effectively train inspectors in their economies.
- The participants worked cooperatively with each other and took new ideas on board. Their presentations on the last day showed they understood the principles and would be able to train others.
- Equipment and other resources are a problem for several economies. Seeing a weighbridge being verified was important to provide them with confidence to make changes in their economies.
- Some economies are thinking of purchasing standards masses from Malaysia and one economy is hoping to install a training weighbridge similar to the one at NMIM.
- The practical work at NMIM was the highlight of the course as it brought all the knowledge together and allowed participants to fully understand what needs to be achieved.
- Having trainers from different economies created some difficulties as they did not have adequate time to meet and discuss beforehand. It was essential that Matthew Lux was

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available to answer more difficult questions and to explain differences in explanations and to guide the trainers.

- One participant had difficulty downloading materials from Google Drive and requested hard copy. However, everyone else was fine with Google Drive.
- Participants said they gained new skills: calculating error/MPE, how to conduct the verification of a weighbridge following OIML procedures and they gained confidence.
- It was clear the most useful part of this training was the practical demonstration of testing a weighbridge. This for some was the first time they had experienced this with substitution materials.

5. Next Steps/ Follow-up

Participants agreed to complete their action plans and to report to their Directors and to send a report to the Secretariat within 6 months. Annex 4 contains a list of action plans. Most people agreed they would be improving their procedures and would be training others or delivering awareness raising programs when they return to their economies.

Annex 1: Workshop Program

Training Course on the Verification of Non-automatic Weighing Instruments (NAWI) including Weighbridges

8–11 May 2018 at NMIM, Sepang, Malaysia

Tuesday 8 May Venue: Nilai Springs Hotel

Time	Details	Presenter
08:30 – 09:00	Registration	Host
09:00 – 09:40	Welcoming address from the host economy Opening ceremony (APLMF Secretariat) Group photo taking	APLMF and Host
09:40 – 10:00	Introduction	APLMF and Host
10:00 – 10:45	Overview of the course Review how NAWI are verified within the region	All
10:45 – 11:15	Coffee Break	
11:15 – 12:00	Legal Metrology System in Malaysia	Mr. Peter J. Berinus Agang, MTDCC
12:00 – 12:45	Traceability and Construction of NAWI / weighbridges	Mr. Muhammad Fadhil Sahrom, NMIM
12.45 – 14.30	Lunch	
14:30 – 15:30	Overview of ASEAN Guidelines of Non-Automatic Weighing Instruments	Ms. Suhaidah Amizam, NMIM
15:30 – 16:00	Coffee break	
16:00 – 17:00	Issues and matters related to NAWI (Weighbridge)	Ms. Suliana Ghazalli, NMIM

18:00 – 17:00	Welcome dinner at Putrajaya	All & Invited Guest
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Wednesday 9 May Venue: Nilai Springs Hotel

Time	Details	Presenter
9:00 – 10:45	Calculating Maximum Permissible Error	Ms. Suhaidah Amizam, NMIM
10:45 – 11:15	<i>Coffee Break</i>	
11:15 – 12:45	Test Procedures (Visual inspection, Repeatability, Eccentricity)	Mr. Kiveen Suycano, NMLP
12:45 – 14:30	<i>Lunch</i>	
14:30 – 15:30	Test Procedures (Visual inspection, Repeatability, Eccentricity)	Mr. Kiveen Suycano, NMLP
15:30 – 16:00	<i>Coffee break</i>	
16:00 – 17:00	Weighing Test using Substitution Material, Calculating the actual weight of the substitution load	Mr. Kiveen Suycano, NMLP

Thursday 10 May Venue: NMIM, SIRIM

Time	Details	Presenter
9:00 – 10:30	Observation of weighbridge being verified	All Trainers
10:30 – 11:00	<i>Coffee Break</i>	
11:00 – 12:30	Observation of weighbridge being verified	All Trainers
12:30 – 14:30	<i>Lunch</i>	
14:30 – 15:30	Observation of weighbridge being verified	All Trainers
15:30 – 16:00	<i>Coffee Break</i>	
16:00 – 17:00	Cont... Observation of weighbridge being verified	All Trainers

Friday 11 May **Venue: Nilai Springs Hotel**

Time	Details	Presenter
9:00 – 10:00	Preparation and survey monkey feedback	Participants
10:00 – 10:30	<i>Coffee Break</i>	
10:30 – 11:30	Group 4 presentations – Discussion and feedback	Participants
11:30 – 12:30	Group 3 presentations – Discussion and feedback	
12:30 – 13:30	<i>Lunch</i>	Participants
13:30 – 14:30	Group 2 presentations – Discussion and feedback	
14:30 – 15:00	<i>Coffee Break</i>	Participants
15:00 – 16:00	Group 1 presentations – Discussion and feedback	Participants
16:00 – 17:00	Presentation of action plans	APLMF rep
19:00 – 21:00	Closing Ceremony and Farewell dinner	APLMF and Host All & Invited Guest

Annex 2 List of Participants

Name	Economy	Institution
Mr Nidup Dorji	Bhutan	Bhutan Standards Bureau
Mr Ganesh Bdr Mongar	Bhutan	Bhutan Standards Bureau
Ms Nidhi Singh	India	CSIR - National Physical Laboratory (NPLI)
Dr Dudi Adi Firmansyah	Indonesia	Metrology and Instrumentation Academy (Akmet), Center of Metrological Resources Development, Ministry of Trade
Mr Henry Gunawan	Indonesia	Directorate of Metrology
Mr Yusrizal Modh Yusop	Malaysia	NMIM
Mr Modh Faizol Ruslee	Malaysia	NMIM
Mrs Nurul Atiqah Mohd Zukni	Malaysia	Ministry of Domestic Trade, Cooperative and Consumerism
Mr Galbaatar Altangerel	Mongolia	MASM
Mrs Altantsetseg Tserenpil	Mongolia	MASM
Mrs Swe Mar Kyaw	Myanmar	Ministry of Education
Ms Nann Ei Khaing	Myanmar	Ministry of Education
Mr Aries Ordon	Philippines	Industrial Technology Development Institute
Mr Ivan Opao	Philippines	Industrial Technology Development Institute
Mr Geoffrey Dan Hou'ua	Solomon Islands (LDC)	Trade and Measurements Unit
Mr Humphrey Ricky Tautai	Solomon Islands (LDC)	Ministry of Commerce, Industry, Labor and Immigration
Mr Bandula Chandralal Jayawickrama	Sri Lanka	Measurement Units Standards and Services Department
Mr Uggaldeniya Pathiranalage Pushpika Shiral	Sri Lanka	Measurement Units Standards and Services Department
Mrs Ana Moala	Tonga	Ministry of Commerce, Consumer, Trade, Innovation and Labour
Mr Samiuela Veleika	Tonga	Ministry of Commerce, Consumer, Trade, Innovation and Labour
Mr Nguyen Duc Tam	Vietnam	Vietnam Metrology Institute
Mr Bach Cao Viet	Vietnam	STAMEQ

Annex 3 Economy Reports

Summary of Economy reports 8–11 May 2018 at NMIM, Sepang, Malaysia											
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Economy	Law	Who does verify	Verification period	MPEs used	Traceable weights	% stand wts used for sub	Type approval (SS)	Type approval weighbridges (WB)	OIML R76 Implemented	Problems	Other information
Bhutan	No	Inspectors	SS: 1 year;	SS: R76 WB: not verified	SS: Yes WB: no	n/a	No, but verified by NML before using	No, presently NML, does not verify WB	Yes	Legal metrology law being framed	N/A
Cambodia	Yes	Inspectors	SS: 1 year; WB: 1 year	SS/WB: R76	SS: Yes; WB: Yes	-	No, verified without checking type approval	No, verified without checking type approval	Yes	N/A	
India	Yes	Inspectors	SS: 1 year; WB: 1 year	SS/WB: R76	SS: Yes; WB: Yes	30%	Yes	Yes	Yes	None	
Indonesia	Yes	Inspectors	SS: 1 year; WB: 1 year	SS/WB: R76	SS: Yes; WB: no, as expensive	10%	Yes	Yes	Partially	Lack of standard weights and equipment; geographical issues.	Educational Backgrounds of Inspector
Malaysia	Yes	Inspectors	SS: 1 year; WB: 1 year	SS/WB: R76	SS: Yes; WB: Yes	10 t	Yes	Yes	Partially	Update Weights and Measures Act	
Mongolia	Yes	Inspectors	SS: 1 year; WB: > 60 t 6 months < 60 t 1 year	SS/WB: R76	SS: Yes	20%	Only metrological tests. There is no testing equipment for technical tests	Only metrological tests. No testing equipment for technical tests. No manufacturers of weighing instruments in the Mongolia	Partially implemented	Need to improve the skills of verification officers.	Increase /improve capacity of standard weights and other equipment.

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Philippines	No	Inspectors	SS: 6 months, WB: 1 year	SS & WB: In-service MPE,	SS: yes, WB: No	10-20%	No. Local Government Unit carry out inservice inspection	No. NML conducts subsequent verification which involves Shift Test, Repeatability Test and Errors of Indication.	Partially implemented	No facilities for verification of NAWI. Inadequate standards. No legislation related to metrological control of NAWI	N/A
Solomon Islands	Yes	Inspectors	SS: 6 month WB: 1 year	SS: 2.0g; WB: 1.5kg	SS: Yes; WB: no, All the higher weights owned by private companies	20%	No, Act and Regs require a permit to import measuring instruments. Must provide Type Approval Certificate from the manufacturers/testing institutes.	No, Act and Regs but require a permit to import measuring instruments. Must provide Type Approval Certificate from the manufacturers/testing institutes.			Inspectors verify NAWIs before they can be used for trade. No traceable weights to verify and calibrate weighbridges *
Sri Lanka	Yes	Inspectors	SS: 1 year; WB: 1 year	SS: 1g-100g; WB: 5kg, 10kg, 20kg	SS & WB: R76	30%	Yes	Yes	Fully implemented	Introduce new procedure accordingly to new technology. e.g. pollution testing	Regulations, Testing & management procedures, experience,
Tonga	Yes But under review	Inspectors	SS: 6 month WB: 6 month	SS: 0.5; WB: 0.5	SS: Yes; WB: Yes	10%	Yes	Yes	Not implemented yet	Need to incorporate OIML into current Legislations	N/A
Vietnam	Yes	Inspectors	SS: 1 year; WB: 1 year	SS/WB R76	SS: Yes; WB: Yes	20%	Yes	Yes		No	N/A

* Economies with well developed Metrology Systems should assist developing economies with equipment and technical expertise.

Annex 4 Action Plans

Summary of Action Plans		
MEDEA Project APLMF1: Course on NAWI (including Weighbridges) Sepang, Malaysia 8-11 May 2018		
Name	Economy	Action Plans
Mr Nidup Dorji Mr Ganesh Bdr Mongar	Bhutan	<ol style="list-style-type: none"> 1. Implement NAWI verification procedures as per OIML recommendations. 2. Carry out country wide NAWI verification to have fair system of measurement policy of Government. 3. Training knowledge on weighbridge can be used for technical guidance to be rendered to Bhutanese weigh bridge users in the check points. Further, weighbridge verification which is being presently carried out by Indian counterpart will be monitored as per OIML recommendation so-as-to have harmonized verification procedures. 4. The planning can be initiated to have our own standards and resources for carrying out weighbridge verification though it may take time.
Ms Nidhi Singh	India	<ol style="list-style-type: none"> 1. Tour report will be submitted to management. 2. Presentation will be made to share the information and knowledge availed during the training. 3. The training programme is organized twice a year for Legal Metrology Officer and the information will be disseminated to them through the training programme.
Dr Dudi Adi Firmansyah Mr Henry Gunawan	Indonesia	<ol style="list-style-type: none"> 1. Material will be used and adapted in the training centre 2. Transfer new methods to training activity 3. Provide some recommendations to Ministry regarding possible modifications to the regulations.
Mrs Nurul Atiqah Mohd Zukni Mr Mohd Faizol Ruslee Mr Yusrizal Mohd Yusop	Malaysia	<ol style="list-style-type: none"> 1. Revise current weighbridge procedures according to ASEAN Guidelines.
Mr Galbaatar Altangerel	Mongolia	<ol style="list-style-type: none"> 1. Translate the training materials into Mongolian language. 2. Organize the training course for verification officers (25 persons).

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Mrs Altantsetseg Tserenpil		3. Develop the NAWI verification procedures.
Mrs Swe Mar Kyaw Ms Nann Ei Khaing	Myanmar	1. Report to our Director General. 2. Plan to establish NAWIs including Weighbridges verification system. 3. Discuss with our donor organizers (PTB, UNIDO, GIZ) to implement that.
Mr Aries Ordoná Mr Ivan Opao	Philippines	1. Conduct general assembly early October with private industries and the representatives from enforcement agencies of the government regarding the verification of Non-automatic Weighing Instruments including Weighbridges.
Mr Geoffrey Dan Hou'ua Mr Humphrey Ricky Tautai	Solomon Islands (LDC)	<p><u>Short Term Plans</u></p> <ol style="list-style-type: none"> 1. Do a presentation to the Ministry's Management 2. Organise 2 or 3 days inhouse training for staff 3. Organise Awareness Programs at least for 2 or 3 days for other stakeholders, shops and market vendors <p><u>Long Term Plan</u></p> <ol style="list-style-type: none"> 1. Liaise with responsible Gov't Office for the review of the Weights and Measures Act and the Regulation 2. Procure new equipment in-order-to improve the Verification System in Solomon Islands.
Mr Bandula Chandralal Jayawickrama Mr Uggaldeniya Pathiranalage Pushpika Shiral	Sri Lanka	<ol style="list-style-type: none"> 1. Develop our NAWI test procedures 2. Update our testing procedures for weighbridges in-order-to new methods 3. We should be use 1000 kg weights for testing weighbridges 4. It should be implement new fields (verify parking machine, taxi meters)
Mrs Ana Moala Mr Samiuela Veleika	Tonga	<ol style="list-style-type: none"> 1. Implement the procedures of verification of weighing instruments 2. Apply the activities we have done in the training by comparing with what we do in our economy 3. Plan to get our own standard for the weighbridge calibration and verification. 4. Would like to have trainer to come to Tonga to provide training.
Mr Nguyen Duc Tam Mr Bach Cao Viet	Vietnam	<ol style="list-style-type: none"> 1. Discuss options with our colleagues regarding ASEAN Guidelines 2. Work with technical committee regarding official procedures and the need to revise them. If they agree it will go on long term plan to revise procedures.

Annex 5 Photographs





