

Foreword

This booklet is one of outcomes of the APEC Seminars and Training Courses in Legal Metrology titled “Train the Trainer Course on the Verification of Mechanical Weighing Scales” which was held on May 13-16, 2008 at the Cholchan Pattaya Resort, Pattaya, Thailand.

This course was organized by APLMF and arranged as one of the APEC TILF projects, CTI-12/2008T. Also, it was supported by Weights and Measures Bureau of Department of Internal Trade, Ministry of Commerce (CBWM) of Thailand and National Metrology Institute of Japan (NMIJ). Having this result, I would like to extend my sincere gratitude to all the staffs of CBWM and two speakers from NMIJ. Also, special thanks should be extended to the APEC Secretariat for their great contributions.

We have conducted the survey among the APEC member economies concerning seminar and training programs in legal metrology to find their needs as well as possible resources available in the region. The survey showed that there is still a strong need for repeating training course on Non-Automatic Weighing Instruments, especially emphasized on the practical training on verification on mechanical weighing scales which are widely used in the member economies.

The target of this training course was the experts in charge of verification of mechanical weighing scales in the APEC/APLMF member economies. The main objective was to experience and learn the actual operation of verification on the scales by hands-on exercise. The contents of the training course comply with the international standard recommended by OIML. Also, the training provided an opportunity to share information on the method and current status of verification in participated economies. Regardless of its heavy use, the legal metrology on verification of mechanical scales has not been well established in developing economies. We looked at this point and determined to serve for the members' demand for long.

In this view, this training course not only meet the highly demand in the APEC / APLMF member economies, but also enhance the verification capability of the Non-Automatic Weighing Instruments by experts. I would like to say that this training course is certainly a fruitful activity!

Finally, I would like to express my deeply appreciate again to the APEC Secretariat's generosity in contributing to the development in legal metrology among the APLMF member economies.

July 14, 2008



Mr. Pu Changcheng
APLMF President

Summary Report

According with the rapid growth of the globalization of international trade, the compliance to the international recommendation OIML R76 has become a major issue for the APLMF member economies in the field of non-automatic weighing scales, which is one of the most important categories of instruments in legal metrology. In order to accommodate such trend, the APLMF Working Group on Training Coordination chaired by Mrs. Marian Haire of Australia has given much effort in organizing a number of training courses in the last few years.

However, the R76 as well as the past training programs put much focus on electrical weighing instruments and did not give much consideration to the mechanical weighing scales regardless of its heavy use in the member economies. This area is in which our members are interested for the training course. To respond to such demand, the Working Group determined to organize the second training course designed only for mechanical scales. From the area of specialty, Mr. Kazuo Neda and Mr. Tsutomu Horikoshi of the National Metrology Institute of Japan (NMIJ) determined to serve as trainers for this training course.

Based on such background, the Train the Trainer Course on the Verification of Mechanical Weighing Scales was held from September 13th to 16th, 2008 at the Cholchan Pattaya Resort, Pattaya, Thailand. As you can see in the title, the course put emphasis on verification procedure and aimed to train the future trainers who would lead in training programs in their home economies. This training course was jointly organized by APEC and APLMF with supported by the Weights and Measures Bureau, Department of Internal Trade, Ministry of Commerce (CBWM), Thailand, and National Metrology Institute of Japan (NMIJ), AIST.

A total of 28 trainees including 20 local trainees attended this course from the following 7 economies: PR China, Indonesia, Malaysia, Peru, Singapore, Viet Nam and Thailand. In addition, many staff from the CBWM in Pattaya contributed to the course. From the Secretariat, Mr. Li Jinsi and Ms. Zheng Huaxin from ACSIQ in PR China attended the course.

On Tuesday the 13th, the training course started off with the opening ceremony. Mr. Veerasak Vissutthatham, Director General of CBWM welcomed all participants with his opening address and send them words of encouragement. After his speech, Mr. Li Jinsi as the APLMF Executive Secretary gave an address. After the opening ceremony, each economy delivered a short presentation about the current situation on the verification of NAWI including mechanical scales in their economy. Then, Mr. Neda gave the lectures starting with the basic understandings of mechanical weighing scales. In the evening, the host provided a welcome dinner at Tungkae Restaurant in Pattaya.

On Wednesday the 14th, Mr. Neda continued his lectures on technical requirements for mechanical weighing scales based on the OIML R76. In the afternoon, practical training on each verification test item was conducted in groups of eight using brand new mechanical scales provided by the host economy accompanied with set weights. All trainees worked very

hard on each activity under the instruction by Mr. Neda and Mr. Horikoshi and enthusiastically threw many questions.

On Thursday the 15th, all participants continued the practical training in the morning. After the practice, Mr. Neda gave a lecture on test methods for verification practiced in Japan as an example. In the afternoon, all participants left the hotel by bus prepared by the host and visited the Eastern Verification Center located in Cholburi. At the testing center, they were impressed by the advanced facilities for verification and calibration in several fields of metrology. In the evening, APLMF provided a farewell dinner at the Ruen Thai Restaurant. The delegates and assistant staffs from the host economy were also present the dinner.

On Friday the 16th, each of the eight groups demonstrated what they learned by using a scale and an overhead projector in reply to the several assignments given by the trainers. After the demonstrations, the closing ceremony was held. Certificates of completion were granted to all 28 trainees from Mr. Veerasak Vissutthatham, Director General of CBWM who represented the host economy. The ceremony was closed with remarks from Mr. Veerasak and Mr. Li Jinsi.

On departure of the trainees for home, they were granted a CD-ROM that contains text books, reports from the trainees and photos taken during the course. These materials are also available on the APLMF member's website.

Finally, the Secretariat would like to give our sincere and deepest gratitude to the hard work and dedication by the staffs of the CBWM represented by Mr. Veerasak Vissutthatham, Director General of CBWM. In addition, we greatly appreciate the dedicated efforts by the two trainers, Mr. Neda and Mr. Horikoshi who provided well prepared lectures and materials with kind care for all trainees. Also, we can never forget the tremendous support from the Secretariat of Asia-Pacific Economic Cooperation (APEC) although their representatives could not attend this training course.

APLMF Secretariat



Asia-Pacific
Economic Cooperation



Asia-Pacific
Legal Metrology Forum

APEC / APLMF Seminars and Training Courses in Legal Metrology
(CTI-12 / 2008T)

**Train the Trainer Course on the Verification of
Mechanical Weighing Scales**

May 13-16, 2008

at the Cholchan Pattaya Resort, Pattaya, Thailand

Program

Organizers:

- Asia-Pacific Economic Cooperation (APEC)
- Asia-Pacific Legal Metrology Forum (APLMF)

Supporting Organizations:

- Weights and Measures Bureau,
Department of Internal Trade, Ministry of Commerce (CBWM), Thailand
- General Administration of Quality Supervision, Inspection and Quarantine of the People's
Republic of China (AQSIQ)
- National Metrology Institute of Japan (NMIJ),
National Institute of Advanced Industrial Science and Technology (AIST)

Trainers:

- Mr. Kazuo Neda
Director, Legal Metrology Division, National Metrology Institute of Japan (NMIJ)
- Mr. Tsutomu Horikoshi
Legal Metrology Division, National Metrology Institute of Japan (NMIJ)

Registration:

- Fill the attached **Registration Form** and send it to the APLMF secretariat by **April 15**. Please also reply the **type of mechanical scales** commonly used in your economy using this form. This information will be very important to organize the training course effectively.

Venue and Accommodation:

- **Venue**
- Cholchan Resort Pattaya, Thailand, Please Contact:
 1. Mr. Sakchai Hasamin, hasakchai@ hotmail. com, Tel: 662-5474-348 Fax: 662-547-4342

2. Mr. Chartree Areewong, chartreea@cbwmthai.org, Tel: 662-5474-345 Fax: 662-547-4342

- **Accommodations**

The accommodation will be prepared at the Cholchan Resort Pattaya with the rates below. If you hope to reserve the accommodation, please fill and send the separated **Hotel Reservation Form** to the host by **April 21**.

Superior: USD75.00 / single / double / Day

- **Access Information:** The Cholchan Resort Pattaya is located one hour distance by TAXI from the Suvarnabhumi International airport, our host will arrange the pick up for the international trainees from the Suvarnabhumi International airport to our Hotel.

Travel Support:

- **APEC travel support**, composed of a roundtrip airfare in a discount economy class and per diem including accommodation, would be prepared for the participants from **Chile, China, Indonesia, Malaysia, Mexico, Papua New Guinea, Philippines, Peru, the Russian Federation, and Viet Nam**.
- **APLMF travel support** would be complementary prepared for the non-APEC and full-APLMF member economies; **Cambodia, DPR Korea and Mongolia**.
- The maximum number of supported participants is limited to **one** for each economy. The final eligible participants will be decided after an approval by the APEC/APLMF secretariat. All supported participants are required to prepare a presentation with a document during the course. The English proficiency of your selected participant will very much affect the training accomplishments, so we hope you can recommend the right participant for the right training course.
- The candidates of the **APEC support** will be requested to submit an airfare quotation and itinerary in advance and have to wait to buy air ticket until it is approved by the APEC secretariat. Basically, all payment will be reimbursed directly from APEC after the **travel is finished. The supported participants have to pay their airfare and accommodation temporarily by themselves until the reimbursement.**

Visa Assistance:

- If you need visa to enter Thailand, fill the **bottom part** of the **Registration Form** and send it to the secretariat. This information will be forwarded to the host in Thailand and they will provide an invitation letter.

Presentation from each economy:

- At least **one trainee** from each economy will be requested to provide a **brief presentation** about the legal metrology system on non-automatic weighing instruments including mechanical scales in his/her economy. The **recommended topics** of the presentation are given below.
 - 1 Self introduction
 - 1.1 Explain about your organization and department.
 - 1.2 Explain your professional experience in your organization.

- 2 Non Automatic Weighing Instruments (NAWI) in your economy
 - 2.1 What are the major purposes or targets to use NAWI?
 - 2.2 How many manufacturers of NAWI are there in your economy?
 - 2.3 If you know, please mention approximate total number of production of NAWI.
 - 2.4 If you know, please mention approximate ratio (%) of numbers in use for the
 - (a) electronic weighing scales,
 - (b) mechanical scales using a spring, and
 - (c) mechanical balances using a weigh beam and weights.
 - 2.5 What are the accuracy class and the maximum capacity, which are most commonly used?
- 3 Legal metrology system in your economy
 - 3.1 Who implements the measurement law (government, metrology institute, verification body, testing laboratory, etc.)?
 - 3.2 Describe briefly the types of weighing instruments and its measuring range, which are covered by the measurement law.
 - 3.3 Are initial verification and re-verification required? If yes, which organization performs the verification? How long is the re-verification period? How much verification is performed in a year? Are they increasing or decreasing?
 - 3.4 Are type approvals required? If yes, which organization performs the type approvals? How many type approval tests are performed in a year?
- 4 Explain current situation in your economy about the compliance to the international standards / recommendations, such as OIML R76?
- 5 Are there any other requirements from your economy? Do you have any problems in order to implement the legal metrology system (budget, human resources, etc.)?

Contact Persons about the Training Course:

- **APLMF Secretariat** (lecture, registration and travel support)

Mr. Li Jinsi or Mr. Guo Su No.9 Madiandong Lu, Haidian District, Beijing 100088
P. R. China
Fax: +86 10 8226 0131, Tel: +86 10 8226 0335
E-mail: aplmf@aqsiq.gov.cn; sec@aplmf.org
- **Host in Vietnam** (visa assistance, accommodation, venue and access information)

Mr. Sakchai Hasamin, hasakchai@hotmail.com, Tel: 662-547-4348 Fax: 662-547-4342
Mr. Chartree Areewong, chartreea@cbwmthai.org, Tel: 662-5474-345 Fax: 662-547-4342

Program

Day 1 May. 13 Tuesday	9 : 00 - 9 : 30	Opening ceremony : <ul style="list-style-type: none"> • Roll-call By: Mr. Li Jinsi, APLMF Secretary • Welcome address by Director General of Department of Internal Trade, Ministry of Commerce • Opening address by Mr. Li Jinsi, APLMF Secretary • Take a group photo
	9 : 30 - 10 : 00	<i>Coffee Break</i>
	10 : 00 - 12 : 30	Presentation from the economies : <ul style="list-style-type: none"> • Each participant provides a brief presentation of the legal metrology system on non-automatic weighing instruments including mechanical scales
	12 : 30 - 14 : 00	<i>Lunch Break</i>
	14 : 00 - 15 : 40	Basic understandings of mechanical weighing scales presented by Mr. Neda : <ul style="list-style-type: none"> • Legal metrology system for weighing scales in Japan Understandings of principle, structure and influence factors
	15 : 40 - 16 : 10	<i>Coffee Break</i>
	16 : 10 - 17 : 00	<ul style="list-style-type: none"> • Outline of the practical training
19 : 00 - 20 : 30	<ul style="list-style-type: none"> • <i>Welcome dinner hosted by Department of Internal Trade, Ministry of Commerce</i> <i>At The Cholchan Pattaya Resort</i>	
Day 2 May. 14 Wednesday	9 : 00 - 10 : 30	Technical requirements for mechanical weighing scales based on the OIML R76 presented by Mr. Neda & Mr. Horikoshi : <ul style="list-style-type: none"> • Calculation of Maximum Permissible Error (MPE)
	10 : 30 - 11 : 00	<i>Coffee Break</i>
	11 : 00 - 12 : 30	Continue the lecture
	12 : 30 - 14 : 00	<i>Lunch Break</i>
	14 : 00 - 15 : 15	Practical training participated by the trainees instructed by Mr. Neda & Mr. Horikoshi : <ul style="list-style-type: none"> • Training on verification test items for Spring type : • Evaluation of instrumental error • Repeatability • Discrimination • Eccentricity error • Zero-setting accuracy
	15 : 15 - 15 : 45	<i>Coffee break</i>
15 : 45 - 17 : 00	Continue the practical training	

Day 3 May. 15 Thursday	9 : 00 - 10 : 30	Practical training participated by the trainees instructed by Mr. Neda & Mr. Horikoshi (cont.) : <ul style="list-style-type: none"> • Training on verification test items for Lever type : • Evaluation of instrumental error • Repeatability • Discrimination • Eccentricity error • Zero-setting accuracy
	10 : 30 - 11 : 00	<i>Coffee Break</i>
	11 : 00 - 12 : 30	Continue the practical training by Mr. Neda & Mr. Horikoshi (cont.)
	12 : 30 - 14 : 00	<i>Lunch Break</i>
	14 : 00	Leave the hotel by bus
	14 : 30 - 16 : 45	Technical tour guided by the host to visit the Eastern Verification Center , Cholburi.
	17 : 00	Back to the Cholchan Resort Pattaya by bus
	18 : 30	Leave the hotel by bus
	19 : 30 - 21 : 30	Farewell dinner hosted by APLMF at the Ruen Thai Restaurant
Day 4 May. 16 Friday	9 : 00 - 10 : 30	Presentation with demonstration of test methods by the trainees instructed by Mr. Neda & Mr. Horikoshi <ul style="list-style-type: none"> • Prepare for the presentation in separated group
	10 : 30 - 11 : 00	<i>Coffee break</i>
	11 : 00 - 12 : 30	<ul style="list-style-type: none"> • Presentation with demonstration in separated groups
	12 : 30 - 14 : 00	<i>Lunch Break</i>
	14 : 00 - 16 : 00	<ul style="list-style-type: none"> • Presentation with demonstration in separated groups (cont.)
	16 : 00 - 16 : 15	<i>Coffee break</i>
	16 : 15 - 16 : 50	Closing ceremony : <ul style="list-style-type: none"> • Presentation of certificates to all trainees • Closing address by Mr. Veerasak Visuthatham Director of CBWM • Closing address by Mr. Li Jinsi , APLMF Secretary

Participants List

APEC / APLMF Seminar and Training Courses in Legal Metrology (CTI-12 / 2008T) Training Course on the Verification of Mechanical Weighing Scales (NAWI)

No.	Category	Economy	Name	Organization
1	Trainee	China PR	Mr. Zhang Guangxin	Yunnan Institute of Metrology and Testing Technology
2	APLMF	China PR	Mr. Li Jinsi	APLMF Secretary, Department of Metrology, AQSIQ
3	APLMF	China PR	Ms. Zheng Huaxin	APLMF Secretary, Department of Metrology, AQSIQ
4	Trainee	Indonesia	Ms. Sri Astuti	Directorate of Metrology
5	Trainee	Indonesia	Mr. Adi Candra Purnama	Metrology Training Centre Indonesia
6	Trainer	Japan	Mr. Kazuo Neda	Ministry of Trade
7	Trainer	Japan	Mr. Tsutomu Horikoshi	National Metrology Institute of Japan (NMIJ)
8	Trainee	Malaysia	Ms. Hairani Nordin	Mechanical Metrology Section, National Metrology Laboratory, SIRIM Berhad
9	Trainee	Peru	Mr. Nikko Meza Valencia	National Institute for the Defense of Competition and the Protection of Intellectual Property (INDECOPI)
10	Trainee	Singapore	Ms. Koh Swee Moi	Weights & Measures Office, SPRING Singapore
11	Trainee	Singapore	Ms. Lena Soh Mei Lin	Weights Measures Office, SPRING Singapore
12	Trainee	Viet Nam	Ms. TRAN THI THUY HA	Directorate for Standards and Quality, STAMEQ
13	Host	Thailand	Mr. Veerasak Vissutthatham	Weights and Measures Bureau, Department of Internal Trade, Ministry of Commerce
14	Host	Thailand	Mr. Somsak Panpaisan	Weights and Measures Bureau, Department of Internal Trade, Ministry of Commerce
15	Host	Thailand	Mr. Sakchai Hasamin	Weights and Measures Bureau, Department of Internal Trade, Ministry of Commerce
16	Host	Thailand	Mr. Chartree Arreewong	Weights and Measures Bureau, Department of Internal Trade, Ministry of Commerce
17	Host	Thailand	Ms. Khemsai Rahannok	Weights and Measures Bureau, Department of Internal Trade, Ministry of Commerce
18	Host	Thailand	Ms. Pattaraporn Surasit	Weights and Measures Bureau, Department of Internal Trade, Ministry of Commerce
19	Local Trainee	Thailand	Mr. Surachat Suwanaraw	Central Bureau of Weights & Measures Department of Internal Trade, Ministry of Commerce

20	Local Trainee	Thailand	Mr. Nirun Tamprasith	Central Bureau of Weights & Measures Department of Internal Trade, Ministry of Commerce
21	Local Trainee	Thailand	Mr. Phitsanurach Yoopum	Northern Weights and Measures Center (Chiang Mai)
22	Local Trainee	Thailand	Mr. Poramain Watthananup- rasit	Central Bureau of Weights & Measures Department of Internal Trade, Ministry of Commerce
23	Local Trainee	Thailand	Ms. Hathairat Kasun	Central Bureau of Weights & Measures Department of Internal Trade, Ministry of Commerce
24	Local Trainee	Thailand	Mr. Phongchai Kwunkum	Central Bureau of Weights & Measures Department of Internal Trade, Ministry of Commerce
25	Local Trainee	Thailand	Mr. Nattapoj Kuthong	Central Bureau of Weights & Measures Department of Internal Trade, Ministry of Commerce
26	Local Trainee	Thailand	Ms. Prapussorn Moungmee	Central Bureau of Weights & Measures Department of Internal Trade, Ministry of Commerce
27	Local Trainee	Thailand	Mr. Thanakorn Ngerueng- chai	Central Bureau of Weights & Measures Department of Internal Trade, Ministry of Commerce
28	Local Trainee	Thailand	Mr. Supachai Jaengjad	Central Bureau of Weights & Measures Department of Internal Trade, Ministry of Commerce
29	Local Trainee	Thailand	Ms. Supaporn Promsuk	Central Bureau of Weights & Measures Department of Internal Trade, Ministry of Commerce
30	Local Trainee	Thailand	Mr. Nopporn Shoopol	Central Bureau of Weights & Measures Department of Internal Trade, Ministry of Commerce
31	Local Trainee	Thailand	Mr. Wichain Sukjit	Weights and Measures Branch Offices (Nakorn Ratchasrima)
32	Local Trainee	Thailand	Ms. Pisakorn Pisankul	Central Bureau of Weights & Measures Department of Internal Trade, Ministry of Commerce
33	Local Trainee	Thailand	Mr. Phanomwase Phukerd- pim	Central Bureau of Weights & Measures Department of Internal Trade, Ministry of Commerce
34	Local Trainee	Thailand	Ms. Jintana Pengyai	Central Bureau of Weights & Measures Department of Internal Trade, Ministry of Commerce

35	Local Trainee	Thailand	Ms. Panawan Khumlor	Central Bureau of Weights & Measures Department of Internal Trade , Ministry of Commerce
36	Local Trainee	Thailand	Mr. Saard Joyrung	Central Bureau of Weights & Measures Department of Internal Trade , Ministry of Commerce
37	Local Trainee	Thailand	Mr. Sayomporn Rongneam	Central Bureau of Weights & Measures Department of Internal Trade , Ministry of Commerce
38	Local Trainee	Thailand	Mr. Warachai Triarun	Central Bureau of Weights & Measures Department of Internal Trade , Ministry of Commerce