

REPORT FOR TRAINING COURSE ON THE VERIFICATION AND CALIBRATION OF CNG DISPENSERS

Dates: 08 – 11 September 2015

Venue: Concorde Hotel, Shah Alam, Malaysia

Host: 1. National Metrology Institute of Malaysia (NMIM)
2. Ministry of Domestic Trade, Consumerism and Cooperative of Malaysia (MDTCC)

Trainers: 1. Dr. Abdul Rahman Mohamed (NMIM)
2. Mohd Fazlieyza Din (PETRONAS)

1. Objective of the Training

The objective of the training course is to provide fundamental understanding on CNG dispenser workings and most importantly, for the participants to be able to conduct verification and calibration activities according to statutory requirements. The training course also will assist the member economies to understand and harmonized the approval (pattern) process for the dispenser.

Reference is made to the International Recommendation OIML R 139-1 'Compressed gaseous fuel measuring systems for vehicles', Part 1: Metrology and technical requirements.

To achieve the above objectives, the training course is designed to be conducted as lectures in classroom as well as field training at a refueling station for vehicles using natural gas.

2. Target Group

The target groups for the training course are:

- i) Weights and measures officials
- ii) Technical staff members of testing laboratories and companies appointed to undertake verification/testing tasks for CNG fuel dispensers
- iii) Supervisors and technical personnel of CNG stations
- iv) Suppliers of measuring systems for CNG fuel dispensers

3. Description of the Training Course

The registration of the participants, on the first day, went smoothly with the assistance of a few staffs of NMIM. The opening ceremony of the training course started with an opening address by the Senior General Manager of NMIM, Dr. Osman Zakaria. This is followed by speeches from the APLMF Secretariat Mr. Guo Su and PTB representative Mr. A. Rashid Zainal Abidin. Full list of the participants can be found in Annex 2. A total of 19 participants from 11 economies attended this training course and on top of this, there were additional 9 participants from Malaysia as observers.

Following the opening ceremony and group photo session, participants were presented with an overview of the training course, the main modules of which are:

- understanding the CNG : properties, safety
- concept of CNG dispenser calibration : methodology
- field demonstration and practical session: applying what you learned, enhancing your level of understanding

Each economy is then asked to deliver a short report on their experience with CNG as an automotive fuel and metrological control system for dispensers within their respective economies. The information presented revealed the diversifying level of usage of CNG in each economy. The first day program also includes a short presentation by Mr. Lee Giok Seng, the Executive Director of the Asia Pacific Natural Gas Vehicles Association (ANGVA). His presentation is on updates of NGV application in the Asia Pacific region which includes the role of ANGVA and application of biomethane as a source of fuel to run the vehicles.

Two days of lecture reinforced with a power point presentation gave the participants an opportunity to interact and contribute to the training course. The two trainers divided the information for the lecture according to their experience and expertise. Dr. Abdul Rahman presented mainly on the metrology aspect of the dispenser while Mr. Fazlieyza presented on the safety, CNG station and application for vehicles.

The field training was very exciting and successful due to the well-coordinated effort from the host and PETRONAS. The NGV refueling station belongs to PETRONAS who also provides other support for the field training e.g. equipment and technicians. To make the field training session more effective, the trainees were divided into two groups so that every trainee could have a better interaction with the trainer and be closer to the dispenser and verification/calibration equipment used. While one group attended the verification and calibration session led by Dr. Abdul Rahman, the other group will tour the station and the facility with an excellent explanation from Mr. Fazlieyza.

On the final day, prior to the closing ceremony, the verification and calibration data from the field practical session for each group were presented and discussed. Most of the

trainees took part in the discussion, to have a clearer understanding on the method used and parameters which contributed to the error and problem of repeatability. Quite a lengthy time is spend on discussion and explanation on the 'litre equivalent of petrol', a figure which is used to convert the mass of CNG given by the dispenser flowmeter to the energy in one litre of petrol. Every trainee was then asked to deliver their view on what they have learned and to comment on the program. All of them satisfied with the knowledge gained.

4. Highlights/ Lessons Learned

The training course has been successfully conducted, as planned. All trainees satisfied with what they have learned and understand the technical part of the program. They seems so eager to implement what they have learned back in their respective economy.

The trainees come from variety of positions and levels of experience. Some trainees do not have any experience on handling of CNG as their country has not yet implement the usage of CNG as automotive fuel, however as an verification officer, they have had experiences in similar activities of verification e.g on liquid fuel dispenser or LPG. There are few trainees who could not communicate in English well, however they seems to understand the presentation. In general, it seems that the target group of trainees were well selected.

Feedbacks from the participants showed that almost all of them are satisfied with what they have learned. A few of them suggested that the training period to be longer but with no specific suggestion of what is lacking with the present schedule.

The participants were willing to share and participate in the discussion and asked questions to get clearer information during the presentation and practical session. The subjects of interest are:

- litre equivalent of petrol : the calculation for the value to convert the mass of CNG given by the dispenser and its usage in retail price based on energy.
- the master-meter method for verification of the dispenser: the advantages/disadvantages of using this method compared to others e.g gravimetric technique.

Although the training course was successfully conducted, however, there always rooms for improvement such as in the selection of participant, only those which already involves or having little experience with CNG as fuel for vehicles should be selected. There were three to four participants, who not only without any experience but also having difficulty in speaking in English.



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5. Next Steps/ Follow-up

Majority of the participants would like to enhance the application of CNG as vehicle fuel in their countries and would like to have follow-up training at home.

Annex 1: Workshop Program

Training Course on the Verification and Calibration of CNG Dispensers

08 – 11 September 2015, Shah Alam, Malaysia

Day 1 (Tuesday) – 8 September 2015

TIME	PROGRAM	PRESENTER
08.30 – 09.00	Registration	
09.00 – 09.30	<ul style="list-style-type: none"> •Opening ceremony - Opening address by Host economy - Welcome address from PTB - Group photo session 	Host, APLMF and PTB
09.30 – 10.00	<i>Coffee break</i>	
10.00 – 10.20	<ul style="list-style-type: none"> •Course overview 	Dr A Rahman
10.20 – 12.30	<ul style="list-style-type: none"> •Presentation by each economy: Current situation on the metrological control and verification of NGV fuel dispensers and future directions of the respective economy 	A trainee from each economy
12.30 – 14.00	<i>Lunch break</i>	
14.00 – 15.30	<ul style="list-style-type: none"> • Presentation on Asia Pacific Natural Gas Vehicles Association (ANGVA) • Introduction to NGV (properties and safety) 	Lee Giok Seng Fazlieya Din
15.30 – 16.00	<i>Coffee break</i>	
16.00 – 17.00	<ul style="list-style-type: none"> • Overview on compressed natural gases application and system for vehicles - NGV supply, components and standards 	Fazlieya Din/ Dr A Rahman

Day 2 (Wednesday) – 9 September 2015

9.00 – 10.10	<ul style="list-style-type: none"> • Dispenser construction and components • Dispenser testing and verification 	Dr A Rahman
10.10 – 10.40	<i>Coffee break</i>	
10.40 – 12.00	<ul style="list-style-type: none"> • Method of calibration for NGV fuel dispensers • Questions & Answers session 	Dr A Rahman
12.00 – 13.00	<i>Lunch break</i>	
13.00 – 14.00	Bus transfer from hotel to NML-SIRIM Berhad	
14.00 – 17.00	<ul style="list-style-type: none"> • Technical visit to National Metrology Laboratory, SIRIM Berhad 	Zainal
17.00 – 20.00	Bus transfer from hotel to KL tower for welcome dinner, then back to hotel	Zainal

Day 3 (Thursday) – 10 September 2015

8.00 – 9.00	Bus transfer from hotel to KLIA 3 PETRONAS NGV station	Zainal
9.00 – 10.00	<ul style="list-style-type: none"> • Site briefing and NGV refuelling system tour • Demonstration on calibration of master meter • Demonstration on calibration of dispenser 	Dr A Rahman/ Fazlieyza Din
10.00 – 10.30	<i>Coffee break</i>	
10.30 – 12.30	<ul style="list-style-type: none"> • Continue with demonstration on calibration • Demonstration on the sealing of dispenser and master meter • Group work on calibration and verification 	Dr A Rahman/ Fazlieyza Din
12.30 – 14.00	<i>Lunch break</i>	
14.00 – 16.00	•Continue on group work	Participants
16.00 – 17.00	Return to the hotel (via Putrajaya)	

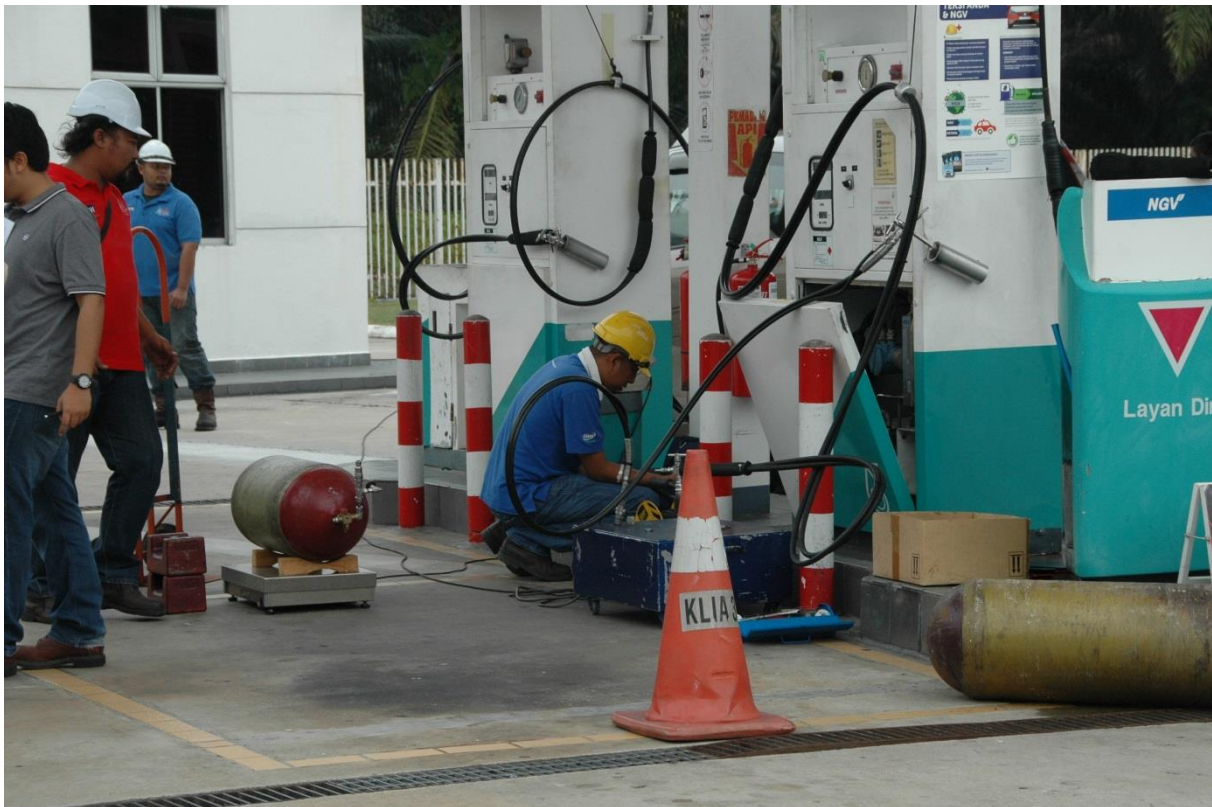
Day 4 (Friday) – 11 September 2015

08.30 – 10.00	<ul style="list-style-type: none"> • Data analysis and discussion on the field work 	Dr A Rahman/ Fazlieyza Din
10.00 – 10.30	<i>Coffee break</i>	
10.30 – 12.00	<ul style="list-style-type: none"> • Recap of the program by the trainers and trainees • Questions and Answers Session 	Dr A Rahman/ Fazlieyza Din and participant
12.00 – 12.30	Closing ceremony	
12.30 – 14.30	<i>Lunch break</i>	
14.30	Bus departure from the hotel	Zainal
14.30 – 19.00	•City tour to Kuala Lumpur	

Annex 2: List of Participants

	First Name	Last Name	Institute	Economy
Mr.	Mohammad Abdul	Hannan	Bangladesh Standards and Testing Institution	Bangladesh
Mr.	Sanjoy Kumar	Sarker	Bangladesh Standards and Testing Institution	Bangladesh
Mr.	Wangda	Jamtsho	Bhutan Standards Bureau	Bhutan
Mr.	Kuenga	Tshetrim	Regional Trade and Industry Office	Bhutan
Mr.	Vannsis	Suy	National Metrology Center (NMC)	Cambodia
Dr. Mr.	Ashok	Sharma	Regional Reference Standards Laboratory	India
Ms.	Santi Retno	Sasi	Directorate of Metrology	Indonesia
Mr.	Purwanto	Nugroho	Directorate of Metrology	Indonesia
Mr.	Dmitry	Pisarevsky	The Bishkek Center for Testing, Certification and Metrology	Kyrgyzstan
Mrs.	Asel	Zheebaeva	Center for Standardization and Metrology	Kyrgyzstan
Mr.	Saidi	Mohammad Zulkifli	Ministry of Domestic Trade, Cooperative and Consumerism	Malaysia
Mrs.	Daud	Wan Nur Fara Shimma	Ministry of Domestic Trade, Cooperative and Consumerism	Malaysia
Mr.	Galbaatar	Altangerel	Mongolian Agency for Standardization and Metrology	Mongolia
Mr.	Gendenjamts	Luvsanjamts	Mongolian Agency for Standardization and Metrology	Mongolia
Dr. Mr.	Yogendra Kumar	Paudel	Nepal Bureau of Standards & Metrology	Nepal
Ms.	Satanee	Puruppa	Bureau of Weights and Measures	Thailand
Mrs.	Hathairat	Kasun	Bureau of Weights and Measures	Thailand
Mr.	Trung Dung	Bui	Directorate for Standards, Metrology and Quality	Vietnam
Mr.	Nguyen	Nhu Y	Quality Assurance and Testing Center 3	Vietnam

Photographs (if available)



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