

Use and Development of Virtual-and-Augmented-Reality-Assisted Training in Vehicle Maintenance

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2-3. Use and Development of Virtual-and-Augmented-Reality-Assisted Training in Vehicle Maintenance

To stimulate trainees' interest and motivation for learning, strengthen occupational safety and minimise related risks, the Automobile Industry Training Centre of the Vocational Training Council has introduced Virtual Reality (VR) and Augmented Reality (AR) technologies to develop assisted training simulator for trainees. VR technology can simulate various working environments and perform a multitude of tasks, including provision of training programmes with workshop facilities. Trainees can carry out various safety procedures in disconnecting high voltage electricity in the VR environments of multiple electric vehicles. After putting on the VR headsets, trainees will find themselves in a simulated workshop where they can complete the disconnection of high voltage electricity following the instructions and procedures (see Figure 1).

Looking forward, the Automobile Industry Training Centre will continue to launch different programmes, such as the assisted training simulator with AR technology. Programmes currently under development include the application of AR technology in the training on diagnosis of ignition systems and replacement of ignition coils and spark plugs. After putting on the AR smartglasses, the built-in cameras will automatically identify the engine parts, and show the relevant tools and procedures on the smartglasses according to the pre-set instructions, guiding the trainees to complete the practical training along with the AR demonstration of the pre-set guided procedures. With AR technology, trainees can complete the training on diagnosis and parts replacement without having to check the operational manuals.



Vocational Training Council

4-5. Sharing on Vehicle Engineering

Airport Emergency Response Vehicles

Serving as one of the busiest air transportation hubs in the world, the Hong Kong International Airport operates to the highest standards of safety. Being an airport of Category 10, the highest rating given by the International Civil Aviation Organization (ICAO), it has the response capabilities to handle fires and emergencies in the airport premises. To tie in with the Three-runway System project, the Fire Services Department commissioned the Electrical and Mechanical Services Trading Fund to procure a total of 14 airport emergency response vehicles for two new fire stations.

There are four types of airport emergency response vehicles: (1) the Rapid Intervention Vehicle (RIV) reaches the scene promptly to control the fire; (2) the Crash Fire Tender (CFT) fights the blaze; (3) the High Reach Extendable Turret (HRET) extinguishes the fire in the aircraft cabin; (4) the Hose Foam Carrier supplies ancillary equipment. The fleet of vehicles have to meet the requirements on response time and volume of water for firefighting as stipulated by the ICAO. Since the RIV, CFT and HRET will be engaged in firefighting operations, their performance and safety level have to fulfil the requirements of American National Standard NFPA 412. Here are some of the features of the airport emergency response vehicles:

(1) To ensure that the vehicles are ready for operations within the shortest possible time, when there is no air pressure in the entire air system, the RIV, CFT and HRET should have sufficient air pressure to release the handbrake within the first 15 seconds of the air pressure build-up after the engine is started. As such, the vehicles are equipped with a small intermediate air cylinder to temporarily provide air pressure for the main brake and handbrake before air pressure is built up for the main braking system (air cylinder of the front and rear brakes). When air pressure is built up to an adequate level, the intermediate air cylinder will cease operating, ensuring that each braking air passage operates independently. This differs from the mechanics of air pressure build-up of typical heavy vehicles in that drivers can still release the handbrake to start the vehicle in a short period of time on the premise that there is air pressure for the main braking system.

(2) Despite its high gross weight of 39 tonnes, the CFT, armed with an engine of over 700 horsepower and an unique gear box design, is capable of operating a firefighting monitor that discharges 6 000 litres of water per minute while moving on a 1:2.5 slope. This powerful performance allows it to manoeuvre swiftly and flexibly at the fire scene without causing interruption to the operations of firefighting equipment.

(3) To ensure that the emergency response vehicles can reach the scene promptly and safely, the RIV, CFT and HRET have to undergo stringent tests on acceleration, deceleration, cornering, evasive manoeuvres and tilting. With the installation of the latest electronic stability control system, their safety and stability levels are further enhanced, and firefighters could rest more assured about safety and security while rushing to the scene in an emergency.

6. Latest Updates of Vehicle Maintenance Registration Unit

Committee Members Assuming Office - Members of the 8th Term of the Vehicle Maintenance Technical Advisory Committee Formally Takes Office

The Vehicle Maintenance Technical Advisory Committee (VMTAC) has reached the 8th term since its establishment in 2006. Members of the new term of the VMTAC already took office on 22 June 2020 for a two-year tenure. To maintain its broad representation, the VMTAC, as in the past, comprises members from different trade associations, professional institutions, training institutes, transport operators employing a large number of vehicle mechanics, vehicle suppliers' associations, vehicle owners' associations, representatives from relevant government departments, and an independent person, with a view to advising the Government on the vehicle maintenance registration schemes. In addition to the 22 members and Chairman of the VMTAC, there are also eight co-opted members of the Subcommittees to mainly offer professional advice on the registration schemes for individual special industries in the trade to the Subcommittee on Management and Review and the Subcommittee on Research and Development.

The list of members of the new term of VMTAC and the list of co-opted members are set out in the following tables:

List of Members of the 8th VMTAC

Mr TANG Wing-hong, Madison	Mr CHAN Sze-tat	Mr WONG Lik-kuen	Mr HO Kin-san
Mr YEUNG Ka-wo	Mr LEE Hong-yip	Mr MOK Chi-fai	Mr YIM Man-lung
Mr LAM Hing-cheong	Mr LAM Kit, Wilson	Mr YIP Sui-pong, Ponthey	Ms SHAR Wing-suen
Mr TAM Kum-fai	Mr HUI Kin-wah	Mr WONG Kim-ying	Mr YIP Lai-hing
Mr CHEUNG Kam-hing, Gary	Mr CHAN Tung, Tony	Mr YUEN Wai-ming	Ms WONG Shun-kwan, Shenky
Representative of the Transport Department	Representative of the Environmental Protection Department		

Note: The VMTAC is chaired by the Director of Electrical and Mechanical Services.

List of Co-opted Members of the VMTAC

Prof. CHAN Chi-kau, Johnnie	Mr CHEUNG Kam-hung	Mr CHEUNG Kam-fai	Mr CHAN Kwok-tin
Mr MOK Kin-yu	Mr SHUM Cheuk-hung	Mr LEE Wing-chi, Steven	Mr WONG Koon-wai, Max

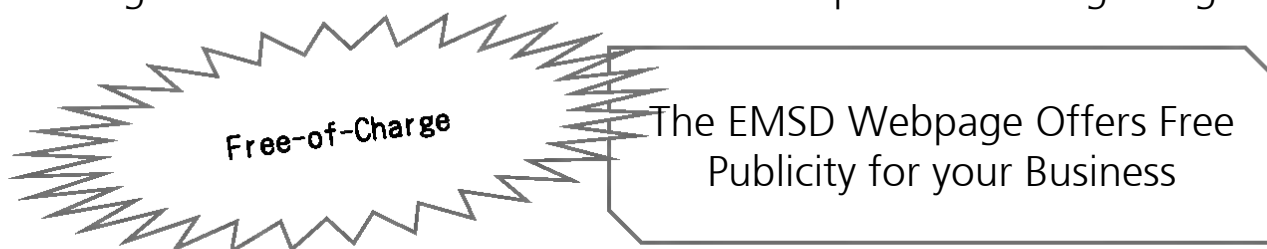
As the new term begins, the VMTAC will continue to promote the Voluntary Registration Scheme for Vehicle Mechanics (VRSVM) and the Voluntary Registration Scheme for Vehicle Maintenance Workshops (VRSVMW), while reviewing the contents, effectiveness and development directions of the

two voluntary registration schemes, so that they can keep abreast of the times and fulfil public aspirations. Starting from this year, the VMTAC will step up audit inspections of registered mechanics and registered workshops to oversee the trade's compliance with the Code of Conduct for Registered Vehicle Mechanics as well as the Practice Guidelines for Vehicle Maintenance Workshops, and assist mechanics or workshops that fail to meet the requirements in making improvements, thereby facilitating the trade's enhancement of its service standards and a smooth transition to the mandatory registration system in the future.

In the new term, the VMTAC and the Vehicle Maintenance Registration Unit of the EMSD will continue to strive to enhance the image and standards of the vehicle maintenance trade. We look forward to receiving staunch support from the trade!

7. Latest Updates of Vehicle Maintenance Registration Unit

Map of Registered Vehicle Maintenance Workshops across Hong Kong



The EMSD webpage incorporates information on registered vehicle maintenance workshops across Hong Kong, enabling members of the public to better understand the business of the individual workshops, including their addresses, telephone numbers, business hours, scope of services provided and types of vehicles serviced, anytime and anywhere. Users can also get the recommended driving routes to selected workshops at their fingertips with mobile phones or web maps.

The information is also available on the websites including "Data.gov.hk" (<https://data.gov.hk>), "GeoInfo Map" (<https://www.map.gov.hk>) and "Hong Kong GeoData Store" (<https://geodata.gov.hk>). Members of the public may obtain the information of workshops by different means.

If you are interested in providing your information, please complete the relevant form (Form A) and send it to the Vehicle Maintenance Registration Unit (VMRU) of the EMSD by fax, by e-mail or by post.

Fax No.: 3968 7646

Email Address: vmru@emsd.gov.hk

Postal Address: 3 Kai Shing Street, Kowloon, Hong Kong (Attention: EMSD Vehicle Maintenance Registration Unit)

The form is available for downloading at the following webpage:

https://www.emsd.gov.hk/filemanager/en/content_651/Application_FormA_EMSD_VMA_en.pdf

For enquiries, please call the Vehicle Maintenance Registration Unit at 2808 3545.



8. Voluntary Registration Scheme for Vehicle Maintenance Promotional Video Competition

Competition Content

Participants are required to produce a creative and compelling video (no longer than one minute) to introduce and promote the Voluntary Registration Scheme for Vehicle Mechanics or the Voluntary Registration Scheme for Vehicle Maintenance Workshops. The video may introduce the two Schemes, their objectives and benefits to the trade and the public. Slogan(s), chant(s) or song(s) may also be added to the video to further promote the message.

Eligibility

Participants must be Hong Kong permanent residents and may enter the competition as an individual or a team of two to five members. Each participant or team can submit only one entry. Participants who submit multiple or incomplete entries will be disqualified, and all of their other submissions will be rendered void.

Prizes

There will be a champion, a 1st runner-up, and a 2nd runner-up in each category (open category, universities and tertiary institutions category, secondary school category and primary school category), and a Most Supportive School Award.

<u>Open category</u>	Champion: cash coupons of HK\$5,000 1st runner-up: cash coupons of HK\$3,500 2nd runner-up: cash coupons of HK\$1,500
<u>University and tertiary institution category</u>	Champion: cash coupons of HK\$4,000 1st runner-up: cash coupons of HK\$2,500 2nd runner-up: cash coupons of HK\$1,000
<u>Secondary school category</u>	Champion: book coupons of HK\$3,000 1st runner-up: book coupons of HK\$2,000 2nd runner-up: book coupons of HK\$1,000
<u>Primary school category</u>	Champion: book coupons of HK\$3,000 1st runner-up: book coupons of HK\$2,000 2nd runner-up: book coupons of HK\$1,000
<u>Most Supportive School Award</u>	Book coupons of HK\$2,500 and a trophy

* Each winner will be awarded a merit certificate.

Details and Submission of Entries

Please refer to:

https://www.emsd.gov.hk/en/supporting_government_initiatives/registration_scheme_for_vehicle_maintenance/index.html



* Results will be announced on the EMSD website in June 2021.

* Participants who, upon submission of entries, upload the submitted video on their personal social media platforms (e.g. Facebook, Instagram, etc.) may make an appointment with the VMRU of the EMSD at 2808 3545 to redeem a souvenir during office hours (from 9:00 am to 4:30 pm on Mondays to Fridays, except public holidays) on or before 31 May 2021. Participants will be required to present the information on their personal social media platforms for confirmation.

Submission Deadline

30 April 2021 (Friday)

9. New Online Continuing Education Platform

To strengthen communication with the trade and to promote online learning, the VMRU has established an online platform to consolidate the latest information on continuing education. It covers a wealth of information, including free online Continuing Professional Development (CPD) courses, the RVM Newsletter quizzes and other continuing education materials. Registered vehicle mechanics and those who have not registered or whose registrations have expired would find appropriate CPD courses on the platform to obtain CPD hours for registration purpose.

The CPD platform is accessible on desktop computers and mobile devices. Mobile device users can click on the triple bar symbol at the top left corner of the homepage to open the menu and select the relevant tab for browsing online self-learning courses of the current quarter. After gaining access to the contents of the current quarter, vehicle mechanics can study the materials selected and answer the questions set out on the relevant page. Vehicle mechanics will receive notification email about the CPD hours earned for registration purpose within one month after the event. Apart from CPD materials provided by the VMRU, the platform also contains the links to training institutes that provide CPD courses. After selecting "Other Links" from the menu and clicking on the logo of the training institute, a new relevant webpage will pop up for browsing. Enquiries may also be made by selecting "Contact Us" from the menu.

To learn more about the latest CPD information, vehicle mechanics may access the CPD platform by scanning the QR code or clicking the link below.

<https://sites.google.com/view/vmru-cpd>



10. Latest Developments of the Registration Schemes

1. Registered vehicle mechanics who have switched to work in another vehicle maintenance workshop should notify the VMRU by e-mail (vmru@emsd.gov.hk) or fax (3968 7646) the name, address and telephone number of the new workshop.
2. If there is any change in the information of the vehicle maintenance workshop (such as name of the workshop, registration number of the workshop, address, contact number and business registration certificate, etc.) or alteration in the type of workshop being registered, the person-in-charge of the workshop must, within 14 working days of such change, notify the VMRU of the change in writing, and submit the relevant documents for processing.

Information on the Voluntary Registration Scheme for Vehicle Mechanics:

Total number of vehicle mechanics	10 303 ^{Note1}
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Number of registered vehicle mechanics (as at end-January 2021)	8 160
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Information on the Voluntary Registration Scheme for Vehicle Maintenance Workshops:

Total number of vehicle maintenance workshops	2 783 ^{Note 2}
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Number of registered workshops (as at end-January 2021)	2 053
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Note1: 2019 Manpower Survey Report (updated on 13 January 2020) by the VTC and the Automobile Training Board

Note2: Database of the VMRU (updated in July 2019)

If you wish to help protect our environment by receiving the electronic version of RVM Newsletters and leaflets, please send us the completed reply slip by e-mail or Whatsapp (email: vmru@emsd.gov.hk or WhatsApp: 9016 3185). We will contact you by means of e-mail or mobile communication as far as possible.

Reply Slip

I/My company would like to receive the RVM Newsletters and other information leaflets by

☐ e-mail / ☐ WhatsApp.

Please provide the relevant contact details based on the above selected means of communication:

E-mail address: _____ WhatsApp: _____

The electronic version of RVM Newsletters is also available at the EMSD website:

https://www.emsd.gov.hk/en/supporting_government_initiatives/registration_scheme_for_vehicle_maintenance/publications_and_circulars/rvm_newsletter/index.html



Latest Updates of Vehicle Maintenance Registration Unit

Five free-of-charge Technical Seminars on Vehicle Maintenance held by the EMSD

Between November and December 2019, the EMSD organised two technical seminars on vehicle maintenance at the Hong Kong Productivity Council. Since then, in view of the severe and volatile epidemic situation, webinars instead of face-to-face seminars have been arranged. Technical webinars on vehicle maintenance were held on the nights of 25 November 2020, 19 December 2020 and 23 January 2021 via ZOOM and YouTube Live Streaming, receiving overwhelming responses with over 600 enrolled participants for each webinar. The webinars were informative and rich in content, covering vehicle maintenance techniques, electric vehicle technology, latest vehicle technology, safety of maintenance workshop and frequently asked questions on the registration schemes.

The VMRU will continue to organise relevant webinars in 2021. We look forward to the continued support from vehicle mechanics!

11. Prize Quiz Issue No.32

Q1. As mentioned in the article, what are the technologies introduced by the Automobile Industry Training Centre of the Vocational Training Council to develop assisted training simulator for trainees?

- A. Virtual Reality (VR)
- B. Augmented Reality (AR)
- C. Artificial Intelligence (AI)
- D. Both A and B

Q2. Referring to the above question, what is/are the benefit(s) of the training simulator?

- A. Stimulating trainees' interest and motivation for learning
- B. Strengthening occupational safety
- C. Minimising related risks
- D. All of the above

Q3. What is the total number of airport emergency response vehicles that the Fire Services Department commissioned the Electrical and Mechanical Services Trading Fund to procure for two new fire stations to tie in with the Three-runway System project?

- A. 13
- B. 14
- C. 15
- D. 16

Q4. As mentioned in the article, there are four types of airport emergency response vehicles. Among them, the RIV, CFT and HRET will be engaged in firefighting operations. In terms of performance and safety level, which requirement of the American National Standard shall they meet?

- A. NPFA 409
- B. NPFA 410
- C. NPFA 412
- D. NPFA 414

Q5. As mentioned in the article, what are the stringent tests that the RIV, CFT and HRET have to undergo in order to ensure that the emergency response vehicles can reach the scene promptly and safely?

- A. Tests on acceleration and deceleration
- B. Tests on cornering and evasive manoeuvres
- C. Tests on tilting
- D. All of the above

How to participate (Issue No.32)

Please scan the QR code and submit the answers directly on the following website <https://forms.gle/uf4Z1GgYVNkJTiN1A>. Vehicle mechanics may also complete the form below, circle the correct answers, and send it to the VMRU by fax or e-mail (fax no.: 3968 7646; e-mail address: vmru@emsd.gov.hk).

Deadline: 30 April 2021

Question	Answer			
1	A.	B.	C.	D.
2	A.	B.	C.	D.
3	A.	B.	C.	D.
4	A.	B.	C.	D.
5	A.	B.	C.	D.



Name: _____

Vehicle Mechanic Registration No.: VM_____

E-mail Address: _____









Contact Tel. No.: _____

- Participants who answer all the questions correctly will earn one CPD hour and be notified by the VMRU individually.
- Only registered vehicle mechanics with valid registration may participate, each not more than once in each quiz.
- If there are duplicate submissions, only the last answers submitted before the deadline will be accepted.
- The decision of the VMRU on the quiz will be final.
- The correct answers will be announced in the next issue of the RVM Newsletter.

The answers for RVM Newsletter Issue No. 31 are as follows:

Question	1.	2.	3.	4.	5.
Answer	C	A	B	A	C

12. Training Institutes Providing Continuing Professional Development Courses for Vehicle Mechanics (in random order)

Name of Training Institute	Website/Contents	Enquiry Tel. No.	QR Code
Traffic Services Employees Association	http://www.facebook.com/tseahk	2575 5544	
Pro-Act Training and Development Centre (Automobile)	http://www.pro-act.edu.hk/automobile Certificate in Vehicle Mechanical Repair#, a programme run by the Pro-Act Training and Development Centre (Automobile) may serve as another means for qualifying as registered vehicle mechanics. Mechanics who are interested in enrolling in the above programme may visit the Centre's website. # For details and latest developments of the programme, the information issued by the Pro-Act Training and Development Centre shall prevail.	2449 1310	
The Institute of the Motor Industry Hong Kong	http://www.hkimi.org.hk The Institute of the Motor Industry Hong Kong (IMIHK), formerly known as the Institute of the Motor Industry (IMI) - Hong Kong Branch, brings the mission and vision of the IMI to the Hong Kong automobile industry. After the reunification in 1997, the IMI - Hong Kong Branch applied to be renamed the IMIHK in Hong Kong. Eligible members of the trade are welcome to join the IMIHK or enroll in its courses or talks.	2625 5903	
Hong Kong Vehicle Repair Merchants Association Limited	https://www.facebook.com/HKVRMA/	2399 7977	
Hong Kong Vehicle Repairing Industry Employee General Union	http://www.vrunion.hk	2393 9955	
Occupational Safety and Health Council	http://www.oshc.org.hk The course of Safe Handling of Chemicals aims to provide employees with basic knowledge of the safe handling of chemicals. The course content includes hazards of chemicals, labelling of chemicals, safety precautions, personal protective equipment, emergency procedures, etc. For more course details, please contact the Occupational Safety and Health Training Centre.	2311 3322	
The Society of Operations Engineers (Hong Kong Region)	http://www.soe.org.hk	2617 0311	
Qualifications Framework recognised courses	http://www.hkqr.gov.hk	2836 1700	

Gentle Reminder

The contents in each issue help you catch up on the development of the registration schemes and enhance the quality of service. Please stay tuned!

Each issue is available for downloading on the EMSD website:



http://www.emsd.gov.hk/en/supporting_government_initiatives/registration_scheme_for_vehicle_maintenance/publications_and_circulars/rvm_newsletter/index.html

For enquiries on the contents of the RVM Newsletter, please contact the VMRU of the EMSD.

Fax No.: 3968 7646

E-mail Address: vmru@emsd.gov.hk

Tel. No.: 2808 3545

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