

Work-at-Height Safety & MEWP Safety Features Introduction

Glenn Ho

Chairman

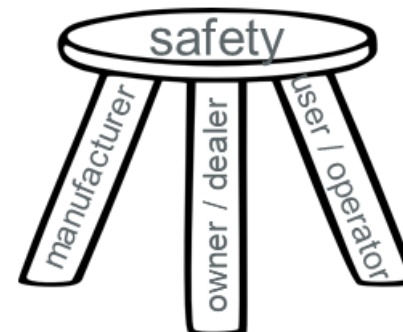
Hong Kong Mobile Aerial
Work Platform Association

28 Apr 2025



Roles & Responsibilities

- Having established and clearly defined responsibilities of all entities involved in Mobile Elevating Work Platforms (MEWP) helps ensure operator safety
 - Manufacturer
 - Owner / Dealer
 - User (Employer) / Operator



Manufacturer's Responsibilities

- Produce safe designs
- Comply with the standard(s)
- Information on safe use
- What does a safe product mean
 - Machines designed to withstand intended use
 - Operator's safety #1



Manufacturer's Responsibilities

How MEWP manufacturer achieves safe designs ...

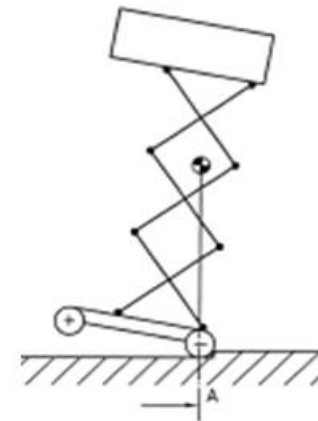
- Know how the product is used
- Design and test machines per the standards
- Goal of standards is to prevent accidents



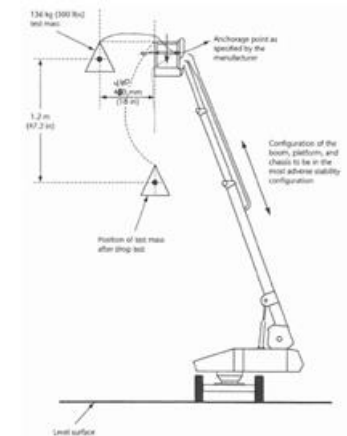
CSA
Group



中华人民共和国国家标准



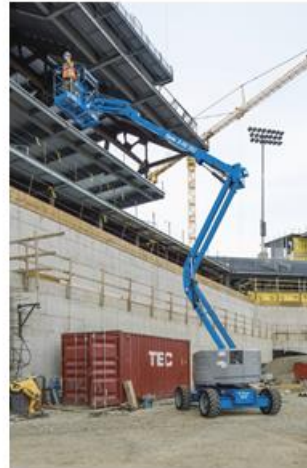
Curb / Depression Test



Fall Arrest Overturning Test

Owner / Dealer's Responsibilities

- Perform maintenance / inspections, including mandatory safety notices
- Offer training to users
- Familiarization upon delivery



Review of Manuals: on board / in basket



Review of control functions

Review of safety features specific to model being delivered



User / Operator's Responsibilities



• User

- OSHA defines the user as the employer
- Ensures all operators are properly trained (and familiarized!)
- Directs only authorized personnel to operate MEWPs

Operator

- Has a responsibility to be trained and be familiar with the aerial platform to be operated
- Adheres to the information contained on the MEWP
 - Safety signs
 - Instructions

Safety Features ... Scissors

- **Anti-pinch handrail design** protects operator's hands when sliding out / in the extension deck



- **Diamond plate deck** provides superior slip resistance during operation

- **Safety arm** protects service staff from link stack incidental falling while performing repair or maintenance



- **Load sense system** detects real-time payload on platform and alerts when overloaded

- **Descent alarm** calls attention when platform is lowering in either platform mode or ground control mode

- **Motion lockout while charging** cuts off driving function when charging the batteries

- **Pothole protection** ensures driving safety

Safety Features ... Booms



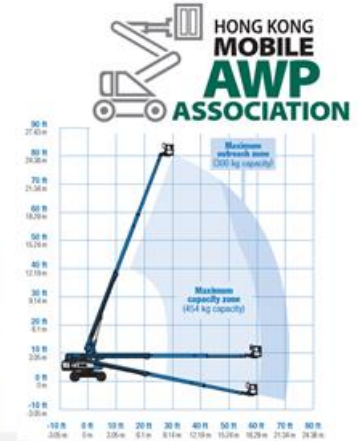
- **Drive Enable** (toggle switch) reminds operator to double confirm the driving direction (forward or backward) when the turntable rotates



- **Contact alarm** stops boom functions and alerts ground personnel when an operator makes contact with the activation cable



- **Load sense system** detects the payload on platform in real time and triggers alarm when overloaded. It also enables XC (extra capacity) machines to achieve automatic envelope control



- **Active oscillating axle** ensures four-wheel contact with ground while driving, providing superior operation experience and safety

- **Auxiliary power unit** enables ground personnel to get operator on platform back to ground or a safer position in case that the normal operation system doesn't function

Safety Enhancement Options ... 1/3



Auxiliary Rail

The auxiliary top rail platform accessory is an additional railing system that can be quickly and easily mounted on the outside of a Genie boom's standard platform rails. This railing system adds an extra measure of security for the operator when working at height.



Fall Arrest Bar

The Genie Fall Arrest Bar has a sliding track, which is designed to allow the operator to be anchored with a fall arrest lanyard while providing them the ability to move freely on an adjacent structure while outside of the platform. Attaches quickly and easily for fast setup and removal. Track assembly de-rates the maximum platform capacity by 50 lb (22.68 kg).

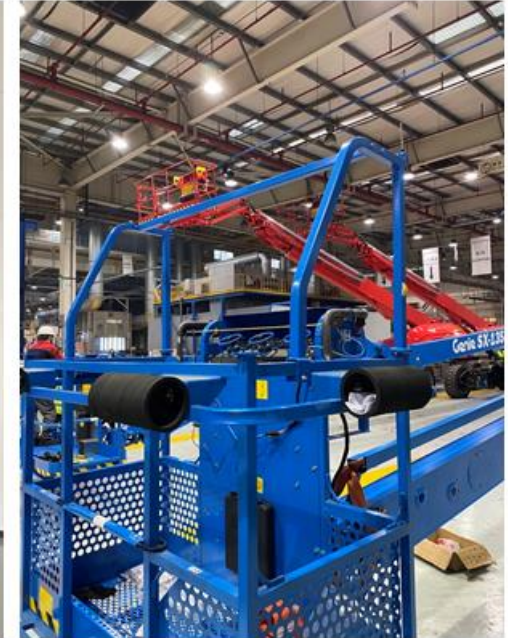


Operator Protective Structure (OPS)

Bolting directly to the platform, this secondary guarding device helps provide additional protection to the operator from overhead obstacles on a work site. The Genie OPS is made of high strength tubular steel and allows for excellent visibility and work range.

Safety Enhancement Options ... 2/3

Secondary Guarding System (Ultrasonic, Whiskers and Overhead Operator Protection Structure)



Safety Enhancement Options ... 3/3

Wind Speed Monitoring System



Remote Control System



Zone Light



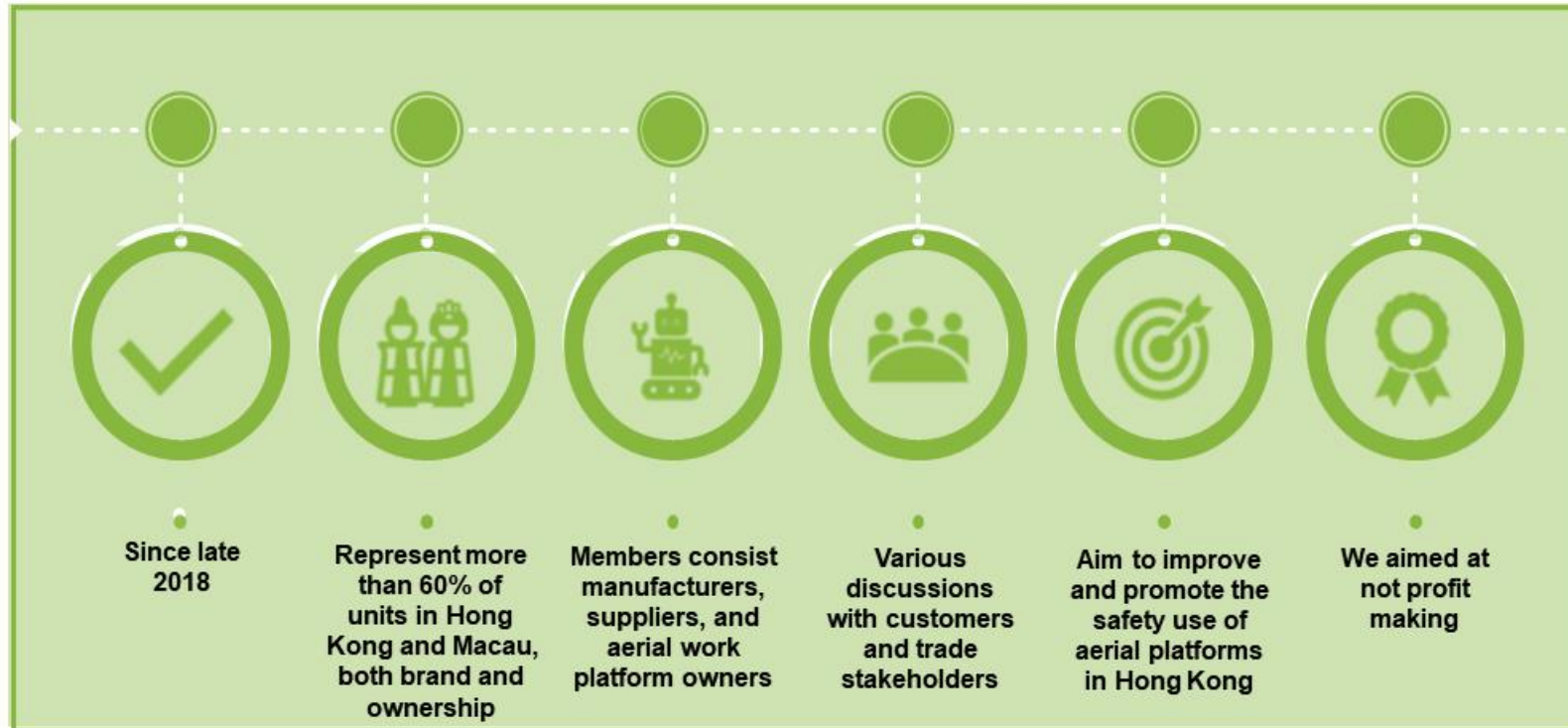
Operation and Safety Training for MEWP

Hong Kong Mobile Aerial Work Platform association

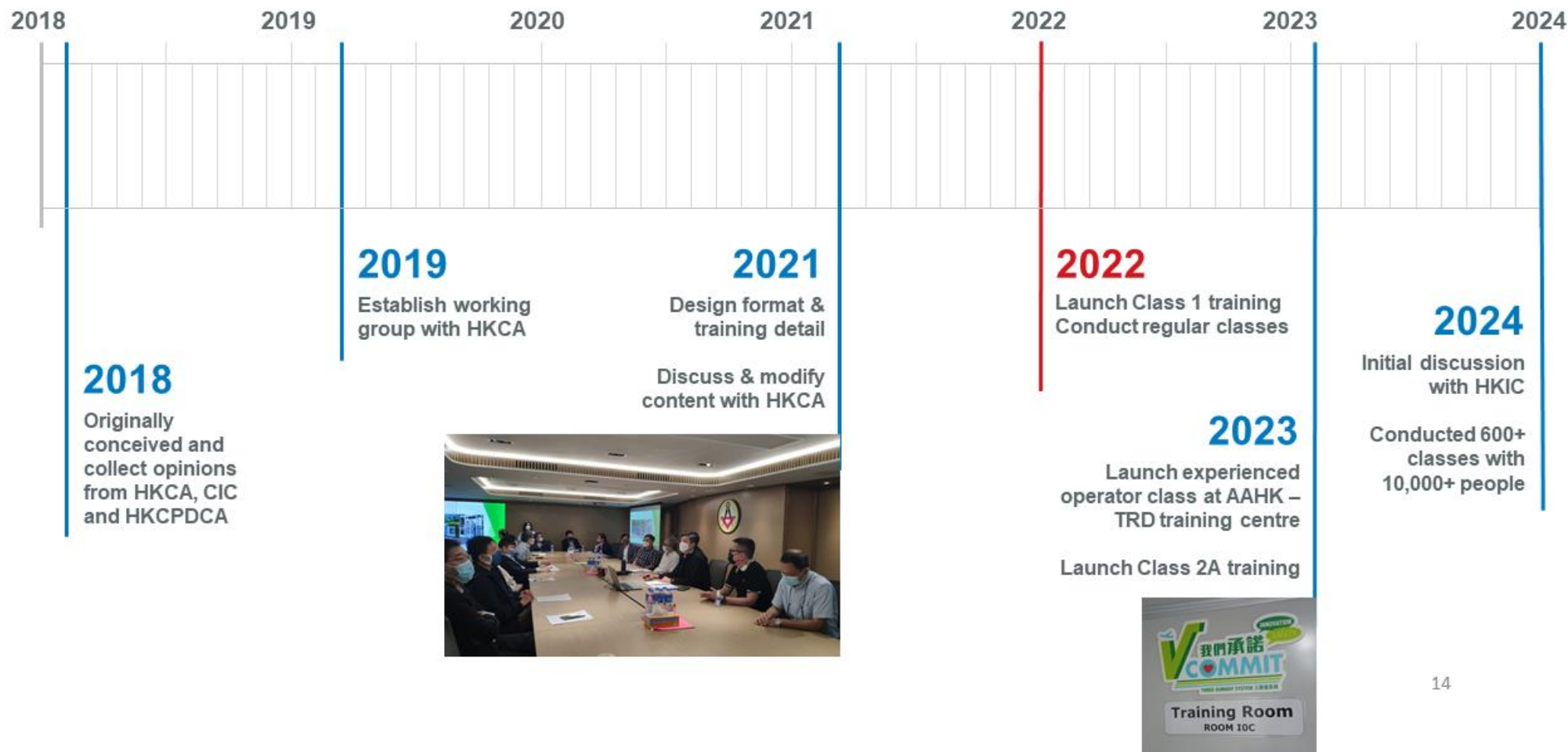


三跑道系統
Three Runway System
「我們承諾」推廣計劃
"We Commit" Safety Promotion Programme

HK Mobile AWP Association

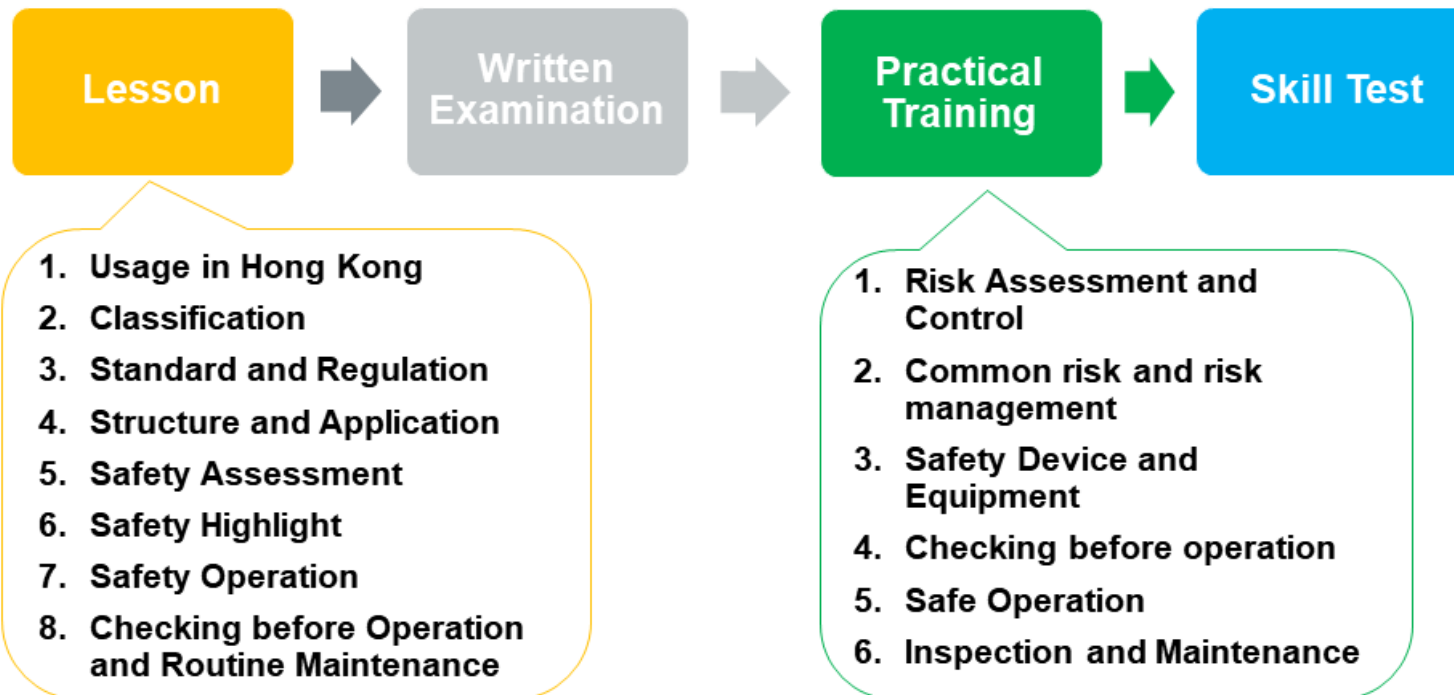


Roadmap of MEWP Training Course



Training Course Structure

Standardized Mobile Elevated Working Platform Training Course





Full Day Programme

- Background of Aerial Platform safety training
- Categorization of Aerial Platforms
- Laws, Regulations, and Standards
- General introduction to Class 1 Type Aerial Platforms
- Different types and characteristics of Class 1
- Safety equipment
- Risk assessment and mitigation
- Inspections and Maintenance
- Safety Operation

Half Day Programme (Experienced Operator)

- Categorizing
- Standards and legislation
- Structures and applications
- Assessment of work environment
- Safety features
- Pre-operation inspections and regular maintenance



Practical

- Walk around inspection
- Functional test
- Safety operation



MEWP Training

- Classes on different machine types
- 6 standardized centres
- Standardized bilingual classes Lecture, Practical, and Tests
- 1 day course with 5 years validity including Safety Operation, Inspection, simple maintenance



MEWP Training Form

Name: _____

Mobile AWP Association

1. Which of the following is not a safety rule?

1. Do not use the platform as a work platform.
2. Do not use the platform as a work platform.
3. Do not use the platform as a work platform.
4. Do not use the platform as a work platform.

2. Which of the following is not a safety rule?

1. Do not use the platform as a work platform.
2. Do not use the platform as a work platform.
3. Do not use the platform as a work platform.
4. Do not use the platform as a work platform.

3. Which of the following is not a safety rule?

1. Do not use the platform as a work platform.
2. Do not use the platform as a work platform.
3. Do not use the platform as a work platform.
4. Do not use the platform as a work platform.

4. Which of the following is not a safety rule?

1. Do not use the platform as a work platform.
2. Do not use the platform as a work platform.
3. Do not use the platform as a work platform.
4. Do not use the platform as a work platform.



MEWP Training Form

Name: _____

Mobile AWP Association

1. Which of the following is not a safety rule?

1. Do not use the platform as a work platform.
2. Do not use the platform as a work platform.
3. Do not use the platform as a work platform.
4. Do not use the platform as a work platform.

2. Which of the following is not a safety rule?

1. Do not use the platform as a work platform.
2. Do not use the platform as a work platform.
3. Do not use the platform as a work platform.
4. Do not use the platform as a work platform.

3. Which of the following is not a safety rule?

1. Do not use the platform as a work platform.
2. Do not use the platform as a work platform.
3. Do not use the platform as a work platform.
4. Do not use the platform as a work platform.

4. Which of the following is not a safety rule?

1. Do not use the platform as a work platform.
2. Do not use the platform as a work platform.
3. Do not use the platform as a work platform.
4. Do not use the platform as a work platform.



This is a clip from the 28 April 2025 recording of the
Hong Kong Housing Authority
“Site Safety Seminar for Capital Works New Works Contracts”
The speaker on stage is Mr Glenn HO
Chairman of Hong Kong Mobile Aerial Work Platform Association
His topic is
“Safety and Training of Mobile Elevating Work Platform“

(00:23)

Good afternoon, everyone
First of all, I would like to thank the Housing Department for the invitation
for giving our Association the opportunity to share with you today
As you all know, Mobile Elevating Work Platforms (MEWPs)
are becoming increasingly common in Hong Kong
and their applications are becoming increasingly wide-ranging
They are not limited to construction sites
Sometimes, in places such as shopping malls
you may also see MEWPs parked nearby
Some works may be carried out at night,
so you may not see how they are operated
But this type of MEWP
has indeed become increasingly common and widely used
At the same time
over the past few years, we have also noticed that
some accidents have occurred
Some operators were involved in accidents while operating MEWPs
resulting in injuries or even fatalities
So today, on behalf of the Association
I will share two parts with you
The first part
is about how to operate MEWPs safely

and the safety devices on MEWPs

In the second part

I will introduce to you

a safety operation training course for MEWPs

which the Association is currently promoting in Hong Kong

First, let us talk about

the safety concepts behind MEWP operation

In the picture, you can see a chair with three legs

Each leg represents a different stakeholder

To achieve safe operation

all three legs are indispensable

If one leg is missing, the chair will fall over

So, which stakeholders do these three legs represent?

The first is the MEWP manufacturer

The second is the owner of the MEWP

such as a rental company

which owns these MEWPs and rents them out

for use on construction sites

or a building owner

who purchases MEWPs for daily use

The third stakeholder

is the user of these MEWPs

including project contractors, property management companies

and their employees, meaning the actual operators

For MEWP manufacturers, what responsibilities do they have?

First, they have to produce safe equipment

So, what standards are these machines manufactured according to?

Of course, international standards,

because different places have different standards

I will briefly explain this later

Apart from producing the equipment

manufacturers also need to provide relevant information so that operators know how to use the equipment safely
What does a safe product actually mean?

First, when designing the product the manufacturer has already defined the intended use of the product and how it should be applied

At the same time, they put the safety of operators first
As mentioned just now, there are different standards
You can look at the bottom of this picture where you will see standards from different regions

For example, on the far left is ISO, the International Organization for Standardization which is commonly adopted in Europe

Then there is ANSI, the American National Standards Institute which is the safety standard for North America
There is also CSA, the Canadian Standards Association which is the Canadian standard

As for GB, the national standard shown on the far right I believe its importance is becoming increasingly high
It refers to the national standard of the People's Republic of China

In fact, apart from these standards other countries, such as Japan and Australia also have their own standards for MEWPs

Many of these standards are broadly similar but there are also differences

depending on local usage conditions or actual needs

In any case, the ultimate purpose of establishing these standards is to prevent accidents from happening

Therefore, when MEWP manufacturers design their products they have to carry out different tests according to the relevant standards including load tests and stability tests

If a factory wants to sell its machines
to Mainland China or the United States
it has to carry out tests according to the corresponding local standards
Only after confirming that the machines comply with local standards
can they be sold to that region

After talking about the responsibilities of manufacturers,
let us look at owners

Owners mainly fall into two categories

The first category is equipment rental companies

They own MEWPs

and rent them out for use on construction sites

The second category may be building owners

who purchase MEWPs themselves

for example, for replacing light fittings,

carrying out inspections or maintenance works

For building owners or rental companies, what are their responsibilities?

They need to carry out regular inspection and maintenance of MEWPs

according to the manufacturer's instructions

At the same time, whenever the manufacturer

issues equipment updates or safety notices

owners also have the responsibility to follow and comply with them

In addition, building owners or rental companies

also have the responsibility to provide training for users

and teach users how to operate the machines safely

There is one more point that the operating method of each MEWP

and the design of each brand may be different

Simply speaking

the control panels may be different

and the positions of the control levers or buttons may be different too

Therefore, building owners or rental companies

also have the responsibility

to ensure that their staff, customers or users
are familiar with the operation of these machines

The final part, which is the third part, is the user
Project contractors or property management companies
can both be classified as users
In other words, they use these machines
even if they may not operate them personally

Their responsibility
is to ensure that the personnel under their management
who actually operate the MEWPs
know how to operate the machines, and have received training

In addition, they must also know
the differences between each machine,
and where the operating positions are

As for the workers who actually operate the machines,
they also have responsibilities
They should not think that because the employer has responsibilities
they themselves can be exempted from responsibility, which is not
correct

Operators also have their own responsibilities
They must make sure they have received proper training
and are familiar with the MEWP they are going to operate
including how the controls work

Apart from understanding the key operating points of the machine
operators also need to understand the various markings on the MEWP
such as the stickers on the machine body
or the operating manual inside the manual box
They also need to clearly understand what these markings mean
what warning signs there are, what must not be done
and what is included in the operating instructions
All these are things that operators have the responsibility to know

After discussing the responsibilities of different stakeholders
let us now look at how MEWP manufacturers
take safety into account when designing their products
In fact, they have incorporated many different safety functions
into their designs
to ensure safe use

As shown in this picture, you can see a scissor type MEWP

At the bottom of the platform of scissor type MEWP
there is an overload protection system

There is also a descent alarm

This means that when the MEWP descends from height
the system will sound an alarm

Its purpose is to remind people near the machine
that the machinery is moving and descending
and that they should take extra care

In addition, at the bottom of the scissor lift
between the two tyres, which is marked by a red circle in the picture
you can see a skirt-like device

The design purpose is that when the platform is raised
the skirt will fold down

reducing the distance between the machine body and the ground

What is the function of this design?

When the platform has been raised

if the MEWP still needs to travel

and there happens to be a hole in the ground ahead

once the tyre drops into the hole

if there is no skirting

the higher the ground clearance, the greater the tilt of the machine body
and there may even be a risk of overturning

If this skirt function is available

the distance between the machine body
and the ground will be greatly reduced

Even if the tyre drops into a hole,
the tilting movement of the machine body will be limited
This is also a protective measure

In addition, on the left side of the picture
you can see that guardrails are installed around the working platform
to protect workers while they are working on the platform
At the very bottom of the picture, at the scissor arm position
you can also see a red supporting bar
If the machine needs to be inspected or maintained
this safety support can be used to hold the scissor arms in place
to prevent the platform from sliding down by itself
in the event of machine failure, or a problem with the hydraulic system

After looking at the scissor type MEWP
let us now look at the boom type MEWP
Some safety devices are the same as those on scissor type

For example, in the upper right corner, there is an overload alarm
For boom lifts, the situation is more complicated
because the boom can be raised, or extended outwards

Therefore, depending on the area to which the platform is extended
the machine will limit the load that the platform can carry at that time
These calculations are carried out by the computer system
of the MEWP itself

If an overload situation occurs
the system will issue an alarm and stop the relevant functions
In other words, the machine will not continue to move
so as to avoid the risk of overturning

If you look at the picture on the left
you can see a yellow device in the middle that looks like a rope
In fact, it is a metal cable, fixed by a magnet on the far left
What is its function?

In the past, there were cases in factories

where workers operating MEWPs at height

failed to notice what was above them

After the platform was raised, it was pressed against an overhead beam

and the worker was pushed forward as a result

In this situation

the worker may lose consciousness due to the pressure

and be unable to stop the machine immediately or lower it

In the past, quite a number of such accidents occurred overseas

and workers were trapped and fatally injured as a result

Therefore, in recent years, many MEWP manufacturers

have added devices similar to this metal cable

If a worker becomes trapped

and their body presses against this metal cable

it will detach once pressure is applied

because it is only held in place by a magnet

First, the machine will stop moving immediately

Second, the system will sound an alarm

Third, a flashing light will also be activated

Its purpose is to alert people nearby

that there may be a problem with this machine

and that the worker on the platform may need assistance

This type of safety device

has now basically become standard equipment on MEWPs

Apart from the scissor lifts

or boom lifts mentioned just now

manufacturers also provide various other devices

according to different needs

For example, in the picture on the left, you can see

an additional guardrail installed outside the original guardrail

If the work scenario requires extra guardrail protection

the original manufacturer can also provide this type of device

As for the middle picture, you can see a yellow horizontal bar
We call it a fall-arrest horizontal bar
This bar has an anchorage point for attaching a safety harness
and this anchorage point can move back and forth
along the yellow horizontal bar

In some work situations, workers need to leave the MEWP
and work outside the platform

Under normal operation
the safety harness is usually attached
to the designated point inside the platform guardrail
But if the worker needs to work outside the platform,
this will create restrictions

With this horizontal bar
the safety harness can be attached to the anchorage point
on the yellow horizontal bar
and can move back and forth

Workers can then work within a certain range after leaving the platform
One application scenario, for example, is aircraft maintenance
After workers are raised to a position near the aircraft wing
they need to leave the platform and carry out inspection at the wing area
This is when this type of safety device would be used

The picture on the right shows a raised frame
which belongs to an earlier design
Its purpose is to protect workers when they raise the work platform
so that even if they have not paid attention to the overhead space,
the risk of collision can still be reduced

This frame provides an additional form of protection for workers

This picture may be of particular interest to everyone
because the Development Bureau
has also recently issued documents mentioning
auxiliary guarding systems, also known as secondary guarding devices
For future new works contracts

the MEWPs used will be required to be fitted
with a secondary guarding device system
At present, the concept of a secondary guarding device system
is still relatively unclear
because the relevant requirements have not yet been clearly defined
including how it should be applied, or what form should be adopted

So you can see, starting from the right side
there is a raised metal frame
which is also a form of auxiliary guarding

As for the two pictures in the middle
they are applied respectively to scissor type and boom type MEWPs
It is not just an extra bar
At the top of the bar
there is actually a device called a limit switch
It is connected to the machine system through wiring
When the platform is raised upwards
if the limit switch touches an obstruction and is compressed
it will send a signal to the machine
letting the system know that it has encountered an obstruction
The machine will then stop operating
Some manufacturers' designs
will also include an alarm or flashing light as a warning

As for the left
this is also a type of secondary guarding device system
but it uses ultrasonic technology
Its advantage is that it does not require the installation of a bar
because in some site environments
having a bar may sometimes affect
the machine's ability to reach the designated position
But if an ultrasonic device is used, it can detect the overhead height
and can be set and adjusted according to needs,

making construction work more convenient

Of course, the cost of this type of device will also be relatively higher

In terms of application

because MEWPs have been used

in more and more new scenarios in recent years

both manufacturers and the market

are continuously developing different safety devices

For example, on the far left, there is an anemometer

MEWPs are often used outdoors

such as on external walls or steel structures

One major outdoor risk is strong wind

because wind force can affect the stability of the machine

In fact, MEWP manufacturers also provide relevant guidance

on the use of MEWPs

under different wind speeds

including when work can continue

and when the platform should no longer be raised for operation

That is why this type of design is available

so operators can see the actual wind speed on site in real time

because wind speed itself can be quite abstract

With an anemometer showing the actual reading

operators can judge more clearly

whether the current environment is suitable for work

and whether work should be suspended

As for the picture in the middle,

it shows a device similar to a remote control

In the past, this type of device

may have been more commonly seen on cranes

but in recent years, it has gradually been developed for use on MEWPs

These devices are usually used in special scenarios

For example, in some shipyards in Mainland China
work platforms need to be raised inside dry docks
so that workers can carry out sandblasting work on the ship body
Blasting is considered a relatively harsh working environment
The sand particles are hot
and it is difficult to provide good protection for workers

Therefore, remote-control operation systems
have gradually been developed
The purpose is that workers do not need to
stand on the platform personally to carry out the work
but the required work can still be completed

For example, a platform can be raised
with blasting equipment or high-pressure water jets installed on it
to carry out the relevant processes

As for the far right
this is a device known as a warning zone light
What is its application concept?

You can see
a strip of light is projected in front of and to the side of the MEWP
and it moves together with the machine
Its purpose is to remind other personnel on the same site
a nearby MEWP is moving
and approaching them
In the past, the common practice
may have been to place traffic cones as a warning
But if the machine keeps moving
the traffic cones have to be moved continuously
to match the position of the machine
Therefore, this type of safety device has gradually been developed
Having said that
manufacturers can indeed produce many safety devices

to meet different needs and market changes
But does having more safety devices
mean the machine is definitely safe
and that accidents will definitely be reduced during use?
Actually, I think this concept is very similar to driving

Nowadays, cars have many safety devices
and have even developed to the point where they can assist driving
and automatically control steering, acceleration and braking
But does having these devices
mean that you can completely ignore safety?
From the perspective of manufacturers or the Association
the most important factor is always people
that is, the personnel who actually operate the MEWPs
They must have safety awareness
and this is the most important point
No matter how many safety devices there are,
they are only auxiliary measures
If workers or operators
already have sufficient safety awareness
they may not need to rely on so many devices

So in the next part
I will briefly introduce the operation and safety training
launched by the Association

First, let me briefly introduce the
Hong Kong Mobile Aerial Work Platform Association
We were established in 2018
and our members are mainly divided into three groups
The first group consists of MEWP manufacturers
including manufacturers from
the United States, Europe and Mainland China
The second group consists of rental companies

which rent out equipment for use on construction sites

The third group consists of suppliers of parts related to MEWPs

Among our current members

the number of machines available for rental by rental companies

accounts for around 50 to 60 percent of

the total in Hong Kong, which is more than half

The purpose of establishing the Association

is to educate the public on the safer use of MEWPs

through training and promotion

After the Association was established

we also met with different stakeholders and industry practitioners

for discussion and exchange

The Association itself is also operated on a non-profit basis

As for the safety training courses provided by the Association

since our establishment in 2018

we have started discussions with the Hong Kong Construction

Association, the Construction Industry Council

and the Hong Kong Construction Industry

Mechanical Plant Management Association

By 2019, we had set up a working group with

the Hong Kong Construction Association

to jointly study how to design this course

Why did we design this course?

Some people may know that

when MEWPs are rented for use on construction sites

rental companies generally send staff to the site

to explain how to use the machines

But very often, because the site environment is noisy

and the space may not be sufficient

sometimes the machine has to be explained immediately

once it is delivered to the site

There may be only one person giving the explanation
while twenty people are listening nearby
Whether everyone can really hear it, we may not know
Whether everyone can really hear it clearly, we may not know either

In addition, if different rental companies explain things in different ways
the content may not be consistent

For operators, this can create confusion

One person may say that it should be done this way
while another company may say that
another button should be pressed first

So what exactly should be done?

Therefore, one of the purposes behind our idea
of setting up this training course
is to establish a unified standard

We also hope that after trainees complete the course once
they will not need to repeatedly attend training
provided by different companies

In fact, this is beneficial to rental companies, contractors
and users alike

because everyone does not need to spend extra time
repeating the same process

Moreover, once the standard is unified
the recognition of this training course will also be higher

So since 2019

after setting up the working group with
the Hong Kong Construction Association

we spent nearly two to three years
holding many rounds of discussion

and made many revisions to the course content

By 2022, we officially launched

the course for the first category of MEWPs

that is, the vertical-type MEWP course

By 2023, we also began working with the Airport Authority

At that time, the focus was mainly on the Three-runway System construction site at the airport

We assisted them in setting up a training centre

At the same time, they also stipulated

that workers who needed to operate MEWPs

on the Three-runway System construction site

must attend these courses

In 2023, we also launched Category 2A

namely the boom-type MEWP course

By the end of last year

we also started different discussions with

the Hong Kong Institute of Construction

with the same direction of unifying safety training courses

As at the end of 2024

more than 600 classes had been conducted

and more than 10,000 people had enrolled in this course

How is this course arranged?

You can see that it is divided into four parts

The first part is classroom instruction

In the classroom, we explain the classification of MEWPs

relevant regulations, basic theories, and safety precautions

After completing the classroom instruction, there is a written test

After passing the written test

trainees will move on to practical operation training

In this part, apart from teaching how to operate MEWPs

we also explain what needs to be done before operation

including what inspections need to be carried out

how to check whether the machine has any problems

and how to assess the site environment before use
to see whether there are any potential risks

The final part is the skills test

Trainees need to complete some specified tasks
such as operating the MEWP to different positions
and carrying out the relevant movements

In fact, the concept is like taking a driving test

There is a written test as well as a practical test

In other words, both parts must be passed

before the training can truly be regarded as completed

In addition, we also arrange different types of courses
according to actual situations

For example, for some workers

who have never come into contact with MEWPs before
the course duration will be longer, generally lasting one day
and it will include the four parts mentioned just now

But for personnel who already have experience
and have operated MEWPs before

with a certain level of understanding of MEWPs

we also provide a half-day course

commonly known as an experienced operator course

It also includes the four parts mentioned just now

Whether it is a beginner course or an experienced operator course

there will be practical operation training and testing

to ensure that the trainees have truly mastered the operating methods
and understand the key safety points

At present, the training courses provided by the Association
are available at six training centres in Hong Kong

In addition, the courses are currently available

in Cantonese, Putonghua and English

to meet the needs of different construction sites

After trainees complete the written test and skills test
and achieve a passing result
we will issue a certificate card
As shown in the picture below
the card will record the trainee's name, training date
and the category of course completed
It is valid for five years

We hope that the market can adopt a unified course as far as possible
so that both operators and supervisors
will not need to repeatedly arrange for staff
to attend courses and receive training
That is roughly the introduction to the course
This concludes my sharing

Thank you everyone

Thank you for watching

(34:22)