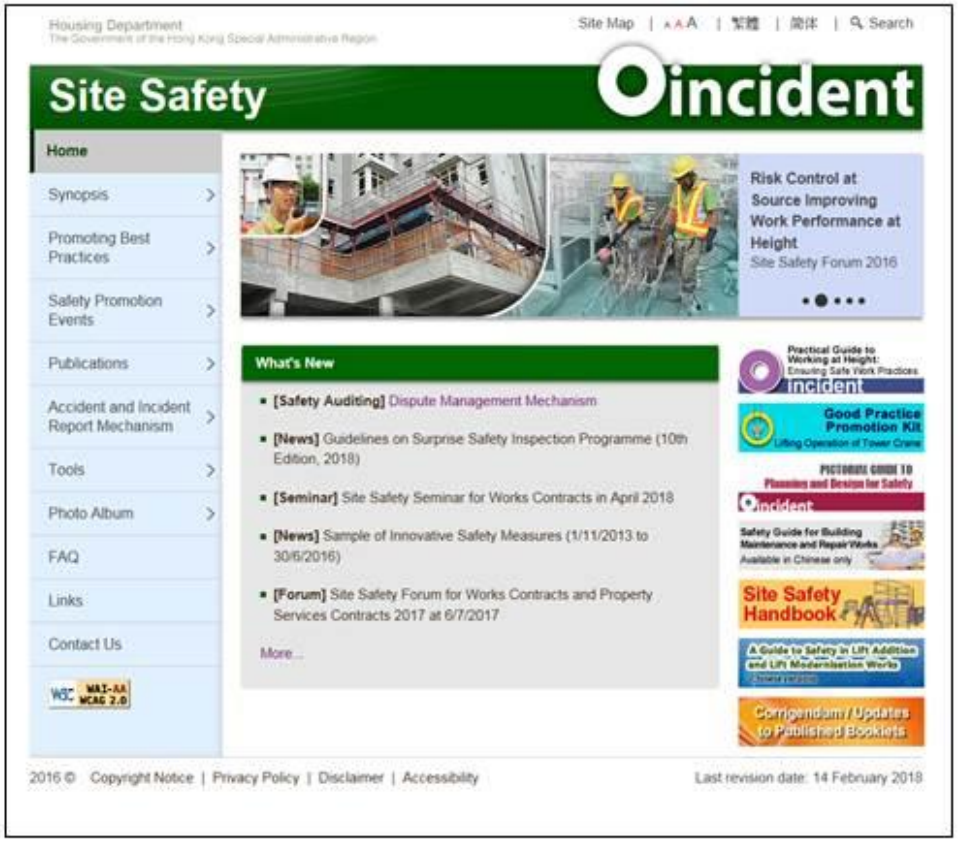
Safety Management for Safe Work Practice in High Risk Activities



Site Safety Forum 2018

Session A – New Works

3 July 2018

關愛由心做 安全無煩惱
Caring from the Heart Safety Habits at Ease

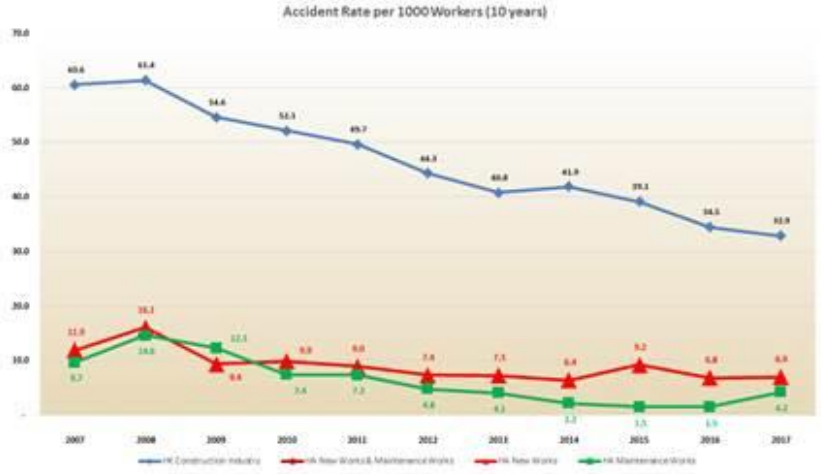
香港房屋委員會 Hong Kong Housing Authority

職業安全健康局 Occupational Safety & Health Council

Accident Statistics in Construction (2007-2017)

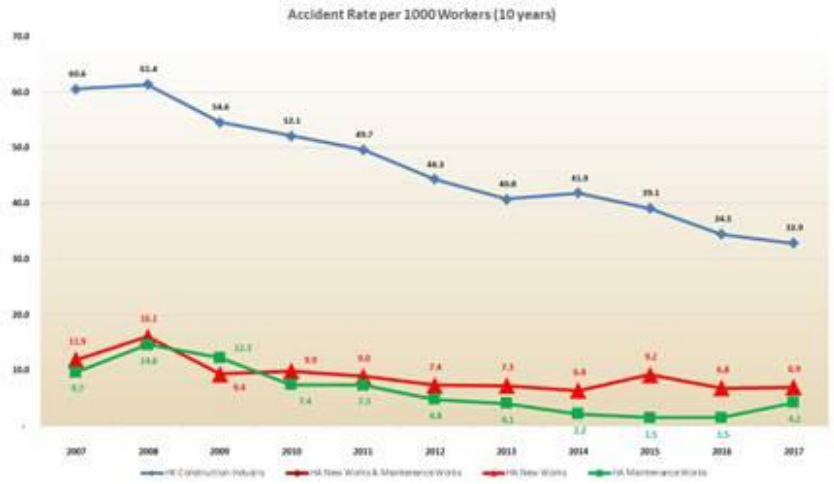
Accident in 2017

	No. of accidents	Average employment	Frequency rate
HA New Works	93	13386	6.9
HK Construction Industry	3902	118674	32.9



Comparison between 2016 & 2017

	Frequency rate 2016	Frequency rate 2017	% change
HA New Works	6.8	6.9	+1.5%
HK Construction Industry	34.5	32.9	-4.6%



Definitions of Accident

- Kenneth Andrews defined, "Every accident, no matter how minor, is a failure of organizational management."

- Leplat defined, "Accident is an undesirable and unplanned consequence of system malfunctioning."

A Turning Point

- Roben's Report (1972, UK) criticized the then regulations lapsed behind changes in era
- Encourage self-regulation by industry
- Safety responsibility rests on those who create the risk and those who work with the risk
- Consultation paper by EMB (1995, HK) recommended the motion of SMS
- Introduction of HASAS 1.0 by HA, Dec 1996
- Enactment of F&IU (SM) Regulation, 1999

Concept of Safety Management System (SMS)

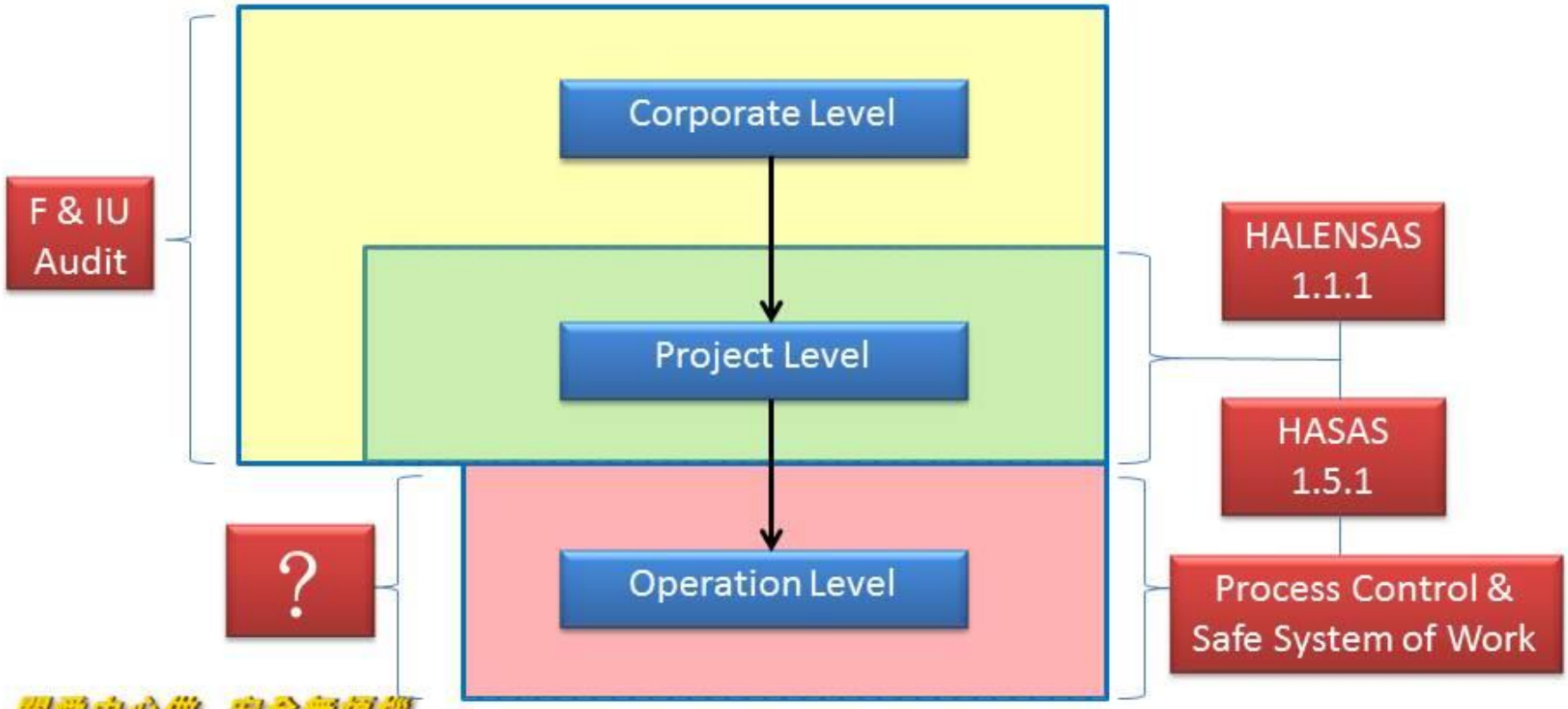
A management concept by integrating S&H into:

- The operations
- The decision-making of the business
- Needs maintenance seeking for continual improvement

SAFETY IS OUR CORE VALUE

Maintaining Effectiveness of SMS

- Existing protocols:



Operational Level Audit

To examine the effectiveness of a safe system of work on:

- How well do local procedures conform to local standard?
- How well do people understand local procedures?
- How relevant are local procedures to local circumstances?
- How well are local procedures being compiled?

Advantages of Operational Level Audit

- Examination of local procedures, working team and all necessary are in place,
- Ensure local procedures relevant to the local circumstances
- Ensure understanding of local procedures by work team
- Identify deficiencies of the work system before the commence to avoid realization of accident.

Housing Authority Safety Auditing System HASAS 1.5.1

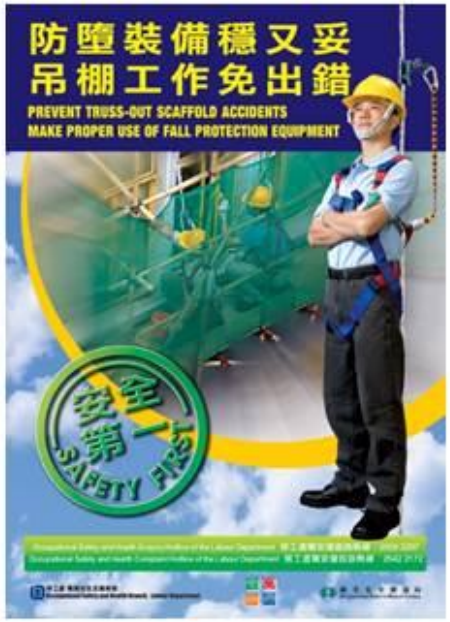
- Introduce new audit criteria of process control & safe system of work
- Require critical pass in Job Hazard Analysis
- Require critical pass in High Risk subsections

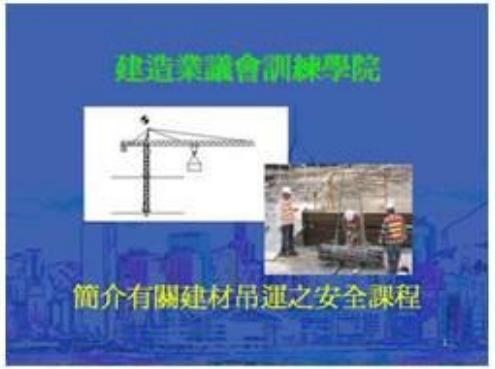
HASAS (New Works)Version 1.5.1

- Revise audit questions criteria of HASAS 1.5
- Streamline audit criteria of HASAS 1.5 by adjusting the focus of the safety audit on high risk activities
- Direct appropriate resources on activities that warrant more attention

High Risk Subsections

- Working at height
- Housekeeping
- Falling objects
- Lifting operation
- Electrical supply system
- Tower crane
- Mobile crane





The Tragic Incident (20.10.2017)

一名燒焊工人在裕東路地盤工作時，被一支吊起的工字鐵擊中頭部昏迷，延至凌晨不治。

Source: Housing Authority

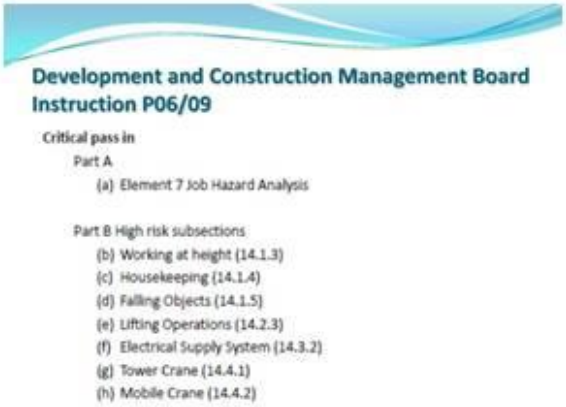
The Tragic Incident (9.12.2017)

當時死者及其他工友，正焊接一個巨型金屬三角型狗臂架，期間需要借助天秤，將約一噸重的三角型狗臂架工字鐵吊起轉向，惟被吊起離地的工字鐵突然墜下，撞擊死者的頭部，令死者頭、肩及背部重創流血倒地，工友報警。

Source: http://hk.on.cc/hk/bkn/cnt/news/20171209/bkn-20171209140508572-1209_00822_001.html

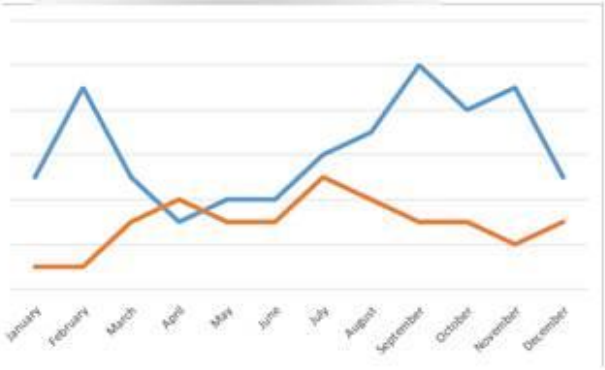
HASAS Critical Pass Item

- Lifting operation is a critical pass item
- Failure in a quarter may trigger respective Contract Manager to issue alert
- Failure in consecutive quarters may alert Contractors Review Committee on Contractor's safety performance



Monitoring Tool – Control Chart

- A statistically valid and visually simple technique
- To measure whether the degree of variation is within defined boundary
- Indicate whether achievement of improvement / declination is significant

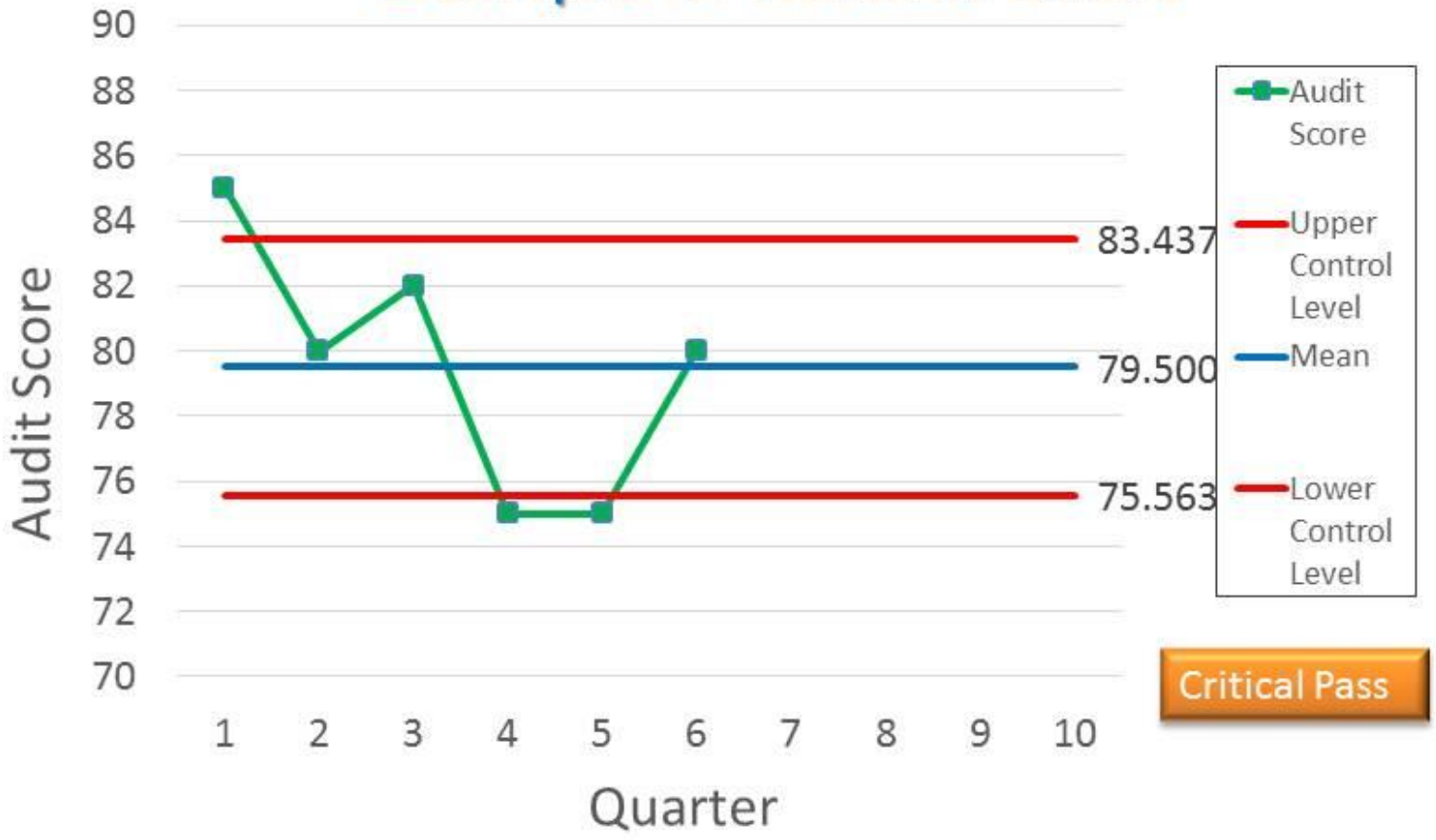


Example of Collected Audit Scores

Quarter	1	2	3	4	5	6	7	8	9	10
Score	85	80	82	75	75	80				

Total	= 477
Mean	= 79.5
Standard Deviation (σ)	= 3.937
Upper Control Level	= 79.5 + σ = 83.437
Lower Control Level	= 79.5 - σ = 75.563

Example of Control Chart

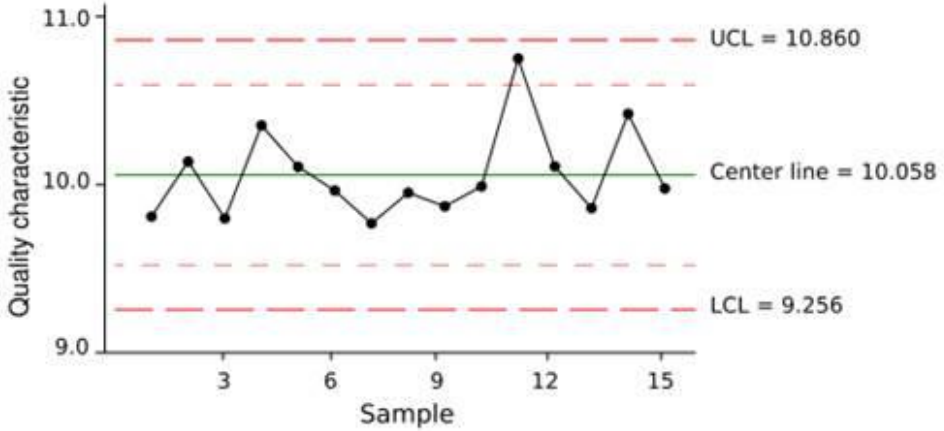


Critical Pass

Application of Control Chart

As a management tool that can be applied to:

- Audit scoring
- Inspection scoring
- Accident figures



- Any discrete data which varies with time.

Safety begins with US

Thank You

關愛由心做 安全無煩惱
Caring from the Heart Safety Habits at Ease

Here is the footage of
Site Safety Forum 2018 for Works Contracts and Property Services Contracts
which was held on 3 July 2018
The speaker is Mr. Alvin Yu Yiu-kwong
His topic is
Safety Management of Site Practice in High Risk Activities

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(00:23)
It's finally my turn after waiting for so long
I want to share with you
on the safety aspects of the construction industry
I will not explain the detail on performance monitoring
As Ms YEUNG
the Deputy Director of the Housing Department
has presented the results
I will try to analyze the accident statistics
from another point of view

We can see the safety performance in
the Housing Department new works
and the construction industry
the accident rates are 6.9 and 32.9
per thousand workers respectively in 2017
The result looks really good
However, when we compare the accident statistics
between the Housing Department
and the construction industry in 2016 and 2017
You would note a few problems
First, in the construction industry
The accident rate per thousand workers fell by 4.6%
The accident rate of Housing Department
has increased slightly

We should consider what has happened
Through the following slides
I would try to analyze
what is an accident from another angle

There are two professors
the first is Professor Kenneth Andrews
of Harvard University, he said
“Every accident, no matter how minor
is a failure of organizational management.”
Another professor, Leplat also pointed out that
“An accident is an undesirable
and unplanned consequence of system malfunctioning”
Why did these two professors say this?
In 1972, there was a turning point
in the safety and health field of the world
There was a report issued by a committee in UK in 1972
The report was written by the committee
led by the Judge Roben
He had many suggestions in the report
One of the suggestions said
At that time
the safety regulations was lagging behind
the evolution of society
including industrial technology
He raised in this report that
safety should be self-regulated by the industry
Dealing with problems in a self-regulatory mode
Why did he say this?
Because the safety responsibility
rests on those who create the risk
and those who work with the risk
rests on those who create the risk
and those who work with the risk
Why?

Because they know the problem the best
It can't be handled by the government

In July 1995, the former
Education and Manpower Bureau in Hong Kong
launched a White Paper (Consultation Paper)
This Paper explained the future direction
of industrial safety in Hong Kong
The report suggested that
safety management should be adopted in Hong Kong
Legislation took time, so first of all
In December 1996, the Housing Department launched
the Housing Authority Safety Audit System version 1.0
The contract required contractors
to establish a safety management system
and have regular safety audits
Until 1999, we finally had the first
Factories and Industrial Undertakings
(Safety Management) Regulation in Hong Kong
What is safety management system?
Simply speaking, it made use of management skills
to integrate the concept of safety and health
into all the operations
and decision-making of the business
These safety management systems
can't be done overnight
It needs to be maintained continuously
including audits to pursue perfection

I try to analyze the current safety management system
I briefly divide it into three levels
The first is the corporate level
The second is the project level
The third is on the operational level
On your left-hand side

The Factories and Industrial Undertakings Ordinance
in Hong Kong
covers two levels
the corporate level and the project level
There are clear requirements for contractors
to establish a safety management system
at these two levels and to conduct audit regularly
As for the operational level
it is blank in the laws of Hong Kong at the moment
Let's look at the right hand side again
In the Housing Department
Just now I mentioned that
the Housing Department started the implementation of
the first HASAS Version 1.0 in December 1996
After continuous improvement
The latest version of the HASAS 1.5.1
is in operation at the moment
and for the lifts and escalators
There is another system
the Housing Authority Lift and Escalator Nominated
Sub-contracts Safety Auditing System (HALENSAS)
specifically designed for audits of lifts and escalators
This is version 1.1.1
What have been added in HASAS 1.5.1?
It established new audit criteria
on process control & safe system of work
in responding to the general duties under
the Factories and Industrial Undertakings Ordinance
because of time limit, I can't share in depth with you
on the audits at operational level
However, due to time limit
I can only briefly introduce
Hoping that I will have the opportunity
to talk about this issue next time

Operational level audit, for the time being
it is not required in the laws of Hong Kong
What is it?
Basically, this auditing system is capable of
examining the effectiveness of a safe system of work
How well does the construction method conform
to the statutory requirements of Hong Kong?
What is the similarity?
Second, how well do construction personnel
understand construction method?
Third, the most important item
Is the construction method completely matching
with actual working environment?
Finally
how much is the construction method complied with?
Hoping to share more on this issue later

Why do I recommend this operational level audit to you?
This is because it has advantages
It can ensure that the construction method
working team and
all mechanical equipment are in place
Second, it can ensure construction method
is suitable for the actual working environment
Third, it also ensures understanding of
construction method by the working team
Most importantly the audit identifies
deficiencies of the construction method
and points out suggestions of remedial measures
before work commencement
and therefore a number of issues can be avoided

Back to the HASAS 1.5.1
As mentioned in the HASAS 1.5.1
it introduces new audit criteria of

process control & safe system of work
The auditor will ask questions
according to the audit criteria
It also established critical pass items for projects
There are two types
The first is Job Hazard Analysis
The second is High Risk Subsections
What is High Risk Subsections?
It was clearly explained under 1.5.1
High Risk Subsections cover some high risk activities
And you must ensure you pass in
all critical pass items in audits
Otherwise, you will have consequences

Let me introduce these seven high risk activities
working at height
housekeeping
falling objects
lifting operation, this is our highlight today
In addition, electrical supply system
Tower crane and mobile crane
The audits for these operations
should be conducted strictly
Let's see that there were two tragic accidents
We don't want to see these
Whenever I saw these accidents
my voice trembled
The cases are as follows
There were two accidents in 2017, last year
A welder was hit at the head by an I-beam during lifting
He passed away at last
Another accident involved
the lifting of a giant triangular steel frame
the worker’s head was struck by the frame
Finally, he also passed away

I have seen numerous similar accidents
The deceased had left
However how about the families of the deceased
They are miserable

Let's review the critical pass items
What are the requirements
for critical pass items in 1.5.1?
As shown
For high-risk activities
lifting operation is a critical pass item
The contractor must pass this item
If you fail in the critical pass item in a quarterly audit
you will receive an alert letter from the contract manager
If you fail in two consecutive quarters
Your safety performance would be reviewed by
the Contractors Review Committee
They will review your performance
Regarding the result, it all depends on
whether you could provide reasonable explanation

So before your score of critical pass items
fall below 70
I would like to introduce a monitoring tool
This is a Control Chart
This control chart can alert you
before the critical pass score reaches the alert line
This control chart is
a statistically valid and simple technique
a visually simple method
to allow you to measure
the safety performance of the organisation
You can set figures and define the boundary
It would warn you in advance
when there is any irregularity in the statistics

Moreover, during the work process
it can indicate whether there is any improvement
or deterioration in performance
It seems very complicated
Let me show you an example
Here is the case
The contractor conducted audits for six months
The audit scores in the six months are shown here
the total score is 477
The mean is 79.5
The standard deviation is 3.937
What's the meaning of these numbers?
These numbers help setting
the upper and lower control levels
The upper control limit is
adding the standard deviation to the mean
The lower limit is the mean minus the standard deviation

Look at this chart
recording the six audits of the contractor
The scores fall below 75
i.e. lower than the lower control limit
The contractor was immediately alerted
They identified the problem at once
and followed up with improvement
The score rose immediately in the sixth quarter
Better than when?
An alert warning
if you touch the orange alert level
The mean score provides an alert limit
on the performance of the company
This monitoring chart
could be adopted on different aspects
as long as there are discrete data
These data would change over time

You can apply this control chart
for example, audit scoring,
inspection scoring, even for accident figures
to set a warning signal
That is all my sharing

Thank you, Mr. Yu
Before leaving, Mr. Yu
We come to the Q&A session
Please ask questions, Mr. Yu
I applied for two quotas
Let me ask now
See if you all remember what I said just now

First question
I would like to ask the HASAS 1.5.1.
Failure in critical pass item will trigger an alert
Then why do we need to have a control chart?
As I might have critical pass items
touching the lower control limit
I already know that it was lower than score 70
Then why do I still need to have a control chart?
Do I need to repeat three times?
Please answer
You should make corrections first
before receiving an alert
Correct
Thank you, staff
There is one more quota

One more question
In the HASAS 1.5.1
What are the high risk subsections?
high risk subsections
There are seven high risk activities

The falling object from height
Correct

Thank you for watching

(14:12)