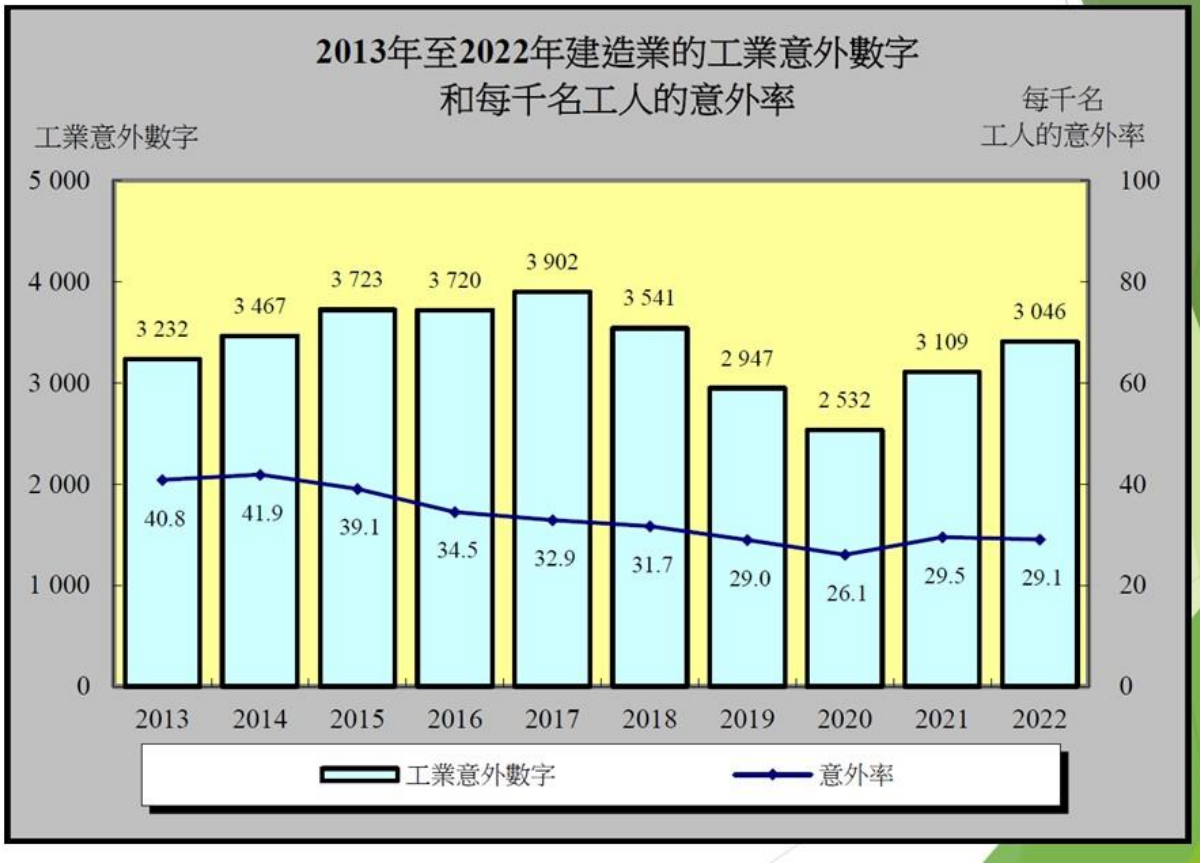
活用創新科技
強化工地管理

勞工處
Labour Department

背景


2013年至2022年建造業的工業意外數字
和每千名工人的意外率
工業意外數字
每千名
工人的意外率
5 000
4 000
3 000
2 000
1 000
0
100
80
60
40
20
0
3 232
3 467
3 723
3 720
3 902
3 541
2 947
2 532
3 109
3 046
40.8
41.9
39.1
34.5
32.9
31.7
29.0
26.1
29.5
29.1
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
工業意外數字
意外率

背景

建造業2.0

- 通過一系列措施推動建造業變革

✓「創新」
✓「專業化」
✓「年青化」

創新科技

創新科技

- **加強安全管理**
  - 資料搜尋 / 安全巡查系統 (手機應用程式)
  - 電子工作許可證
  - 智能安全帽
  - 虛擬實境 (VR)

圖片來源：建造業創新及科技應用中心

創新科技

- **加強風險控制**
  - 無線射頻識別 (RFID)
  - 自動化機械裝置

圖片來源：發展局、房屋署

加強安全管理

資料搜尋手機應用程式

- 拍攝照片或輸入關鍵詞
- 快速獲取物料相關資料

安全巡查手機應用程式

- 以列表及拍攝照片作紀錄
- 記錄和跟進安全事宜

圖片來源：房屋署

《優化版「職安健 2.0」流動應用程式》

下載職安應用程式
提升工作安全意識

加強安全管理

電子工作許可證

- 電子化和圖像化
- 清晰地顯示工作許可證詳情
- 方便跟進安全事宜

圖片來源：建造業創新及科技應用中心

加強安全管理

智能安全帽

- 物聯網技術(IoT)
- 有關數據即時傳送
- 實時監測功能
- 溫度、心跳、定位

圖片來源：建造業創新及科技應用中心

加強安全管理

虛擬實境 (Virtual Reality, VR)

- 身臨其境的環境模擬體驗
- 識別危害
- 安全培訓

圖片來源：建造業創新及科技應用中心

加強風險控制 - 無線射頻識別 (RFID)

吊運危險區域警報系統

- 吊鉤上安裝RFID標籤
- 在吊運區安裝處理器
- RFID標籤進入信號的覆蓋範圍時會發出警報

圖片來源：房屋署

加強風險控制 - 無線射頻識別 (RFID)

移動機械警報系統

- 安裝RFID接收器在移動機械及安全帽上
- 當有人進入危險區域，裝置發出訊號提醒操作員/工人

圖片來源：發展局、房屋署

加強風險控制 - 自動化機械裝置

自動化無人機

- 攝影 / 測量無人機
- 以遙距感應技術測量和紀錄
- 避免離地工作

圖片來源：建造業創新及科技應用中心

加強風險控制 - 自動化機械裝置

連身機械人

- 電池推動
- 當準備提起重物時，裝備能感應動作
- 承托背部
- 有效減少背部拉扯和腰背受傷的風險

圖片來源：房屋署

創新科技的安全隱患

- 識別及消除新危害 (例如：無人機失控)
- 考慮潛在風險 (例如：警報系統失效)
- 設置故障保險系統 (Fail-safe System)
- 提供合適及足夠的資料、指導、訓練及監督

總結

多謝各位

This is a clip from the 31 July 2024 recording of the

Hong Kong Housing Authority

“Safety Forum 2024 for Works and Property Management Services”

The speaker on stage is Mr. Chan Chi Leung,

Senior Divisional Occupational Safety Officer of Labour Department

His topic is

“Strengthening Site Management with Innovative Technology”

Permanent Secretary Law, Chairman Mong, Chairman Ho

Distinguished guests and online friends, hello everyone

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(00:23)

I am very pleased to attend today’s safety forum

co-organised by the Housing Authority the Occupational Safety and Health Council and the Construction Industry Council

Today I will be sharing on the topic

Strengthening Site Management with Innovative Technology

The Labour Department places great emphasis on the OSH for employees

and is dedicated to harness legislation, enforcement, promotion campaigns and training programmes

to ensure the risks to workplace safety are properly controlled

With the concerted efforts of employers, employees, contractors, safety personnel, business chambers, trade unions

related organisations and government departments

Hong Kong’s OSH performance in construction

has steadily improved from 2013 to 2022

As shown in the chart the accident rate per thousand workers in the construction industry

has dropped by about 30%

from 40.8 in 2013 to 29.1 in 2022

In the latest financial budget, it can be seen that

the government's basic infrastructure spending has increased from an average of $76 billion over the past five years

to $85 billion in 2023 to 2024

The huge volume of works and workforce

brings new challenges for maintaining site safety

Through a series of measures, the government is promoting

the transformation to Construction 2.0

encouraging Innovation, Professionalisation and Revitalisation

For instance, through mandating the adoption of digital site management, and Building Information Modelling

to strengthen construction supervision and quality assurance, among other measures

These measures aim to improve work practices and OSH performance

to realise the benefits of Construction 2.0

Meanwhile the government is accelerating smart site safety

promoting comprehensive adoption of Smart Site Safety Systems

Currently all public works contracts over $30 million

have widely adopted such systems

and the government also funding private sector projects through

the Construction Innovation and Technology Fund to widely apply they system

Digitalisation, information technology, IoT and mechanisation

These innovative technologies serve primarily two key purposes

to enhance general safety management

and strengthen targeted risk control

with the ultimate goal of zero incident

Examples of enhancing general safety management include

mobile apps for safety inspection and monitoring

Electronic permit-to-work

Smart Safety Helmets

and Virtual Reality technologies

In enhancing targeted risk control

technologies such as Radio Frequency Identification (RFID) will be utilised

For example, there will be Danger zone Alert Sensoring System

and mobile machinery sensing devices

Examples of automated machinery include drone surveying and

and exoskeleton robots

By using mobile applications, users can quickly search for information

by taking photos and entering keywords

to swiftly obtain relevant data on materials

such as safety data sheets

responsible personnel and construction plans

On the other hand, mobile applications can

assist with safety inspections, site patrols

record findings through lists, photos, and videos

These can be sent immediately via email and SMS

to site management and relevant personnel

facilitating quick follow-up on safety issues

To align with the industry's widespread use of mobile applications

In March this year, the Labour Department

launched an enhanced OSH mobile app

The app includes new features such as

OSH warning animations

OSH training

and systematic safety alerts

The app aims to provide the latest OSH information

to raise awareness among stakeholders

The industry is encouraged to download and use the app

Electronic permit-to-work

involves converting details of high-risk work permits

into a digitised and visualised format

to clearly indicating specific work locations

the number of workers and validity periods

in order to ensure site safety management and improve efficiency of surprise inspections

Smart Safety Helmets use IoT technology

with sensors embedded in the helmet as shown in the diagram

to instantly transmit data to a central server

for real-time monitoring of workers' temperature, heart rate and location

allowing site management personnel to take effective action in real time

to prevent accidents from occurring

Virtual Reality provides immersive simulation experiences

that support design quality and project optimisation

These technologies can be applied to hazard identification, site logistics management

and safety training

Utilise wireless RFID technology to establish

safety-hazard zone alert systems

by installing wireless RFID tags and antennas on lifting hooks

and processors in lifting zones

When workers enter these zones

the system instantly triggers an alarm and cuts power

preventing unauthorised entry

and avoiding accidents from occurring

Another example of using wireless RFID technology

is for setting up a mobile machinery alert system

Installing RFID receivers

on mobile machinery and safety helmets

allows the system to emit signals to alert

employees and operators when someone enters a danger area

The example of Automated machinery that enhances risk control includes

automated photogrammetry / surveying drones

These drones use remote sensing technology for measurements and documentation

helping to avoid elevated work

and thereby improving site safety

This technology is widely applied in land surveying and site inspections

The exoskeleton robots are battery-powered

When a worker prepares to lift heavy objects

the equipment can sense the worker's movements

and provide back support

effectively reducing strain and the risk of back injuries

To ensure innovative technologies bring real benefits

we must fully assess

whether they introduce new hazards

When a new technology system fails

can the system still remains safe

To avoid the above situations

we need corresponding countermeasures

including identifying and eliminating new hazards

It is also essential to consider potential risks

while ensuring the system has fail-safe mechanisms in place

and it is important to provide employees with appropriate and sufficient information

instruction, training and supervision

to ensure they have adequate capabilities to respond to the above situations

Finally I hope that through collaboration among all stakeholders in the industry

we can innovate actively in engineering design

and promote the adoption of innovative technologies

and promote the adoption of innovative technologies

to jointly create a safer and healthier working environment

and thereby achieve the goal of zero incident

Thank you all

Thank you for watching

(07:21)