

New ways of working to improve Workplace Safety and Health in Singapore

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Vision:

***A Healthy Workforce in Safe Workplaces;
A Country Renowned for Best Practices in
Workplace Safety and Health***

Mission:

***To Prevent All Work-related Death, Injury
& Ill-health***



Ensuring Workplace Safety and Health @ Work

Occupational Safety And Health Division (MOM)



REGULATOR
 Legislation, Policies & Enforcement










SOLUTIONING
 Data Insights, WSH Assessment Tools, WSH technology solutions

Workplace Safety and Health Council



INDUSTRY PARTNER
 Educate & Engage Stakeholders, Set Standards, Promote WSH

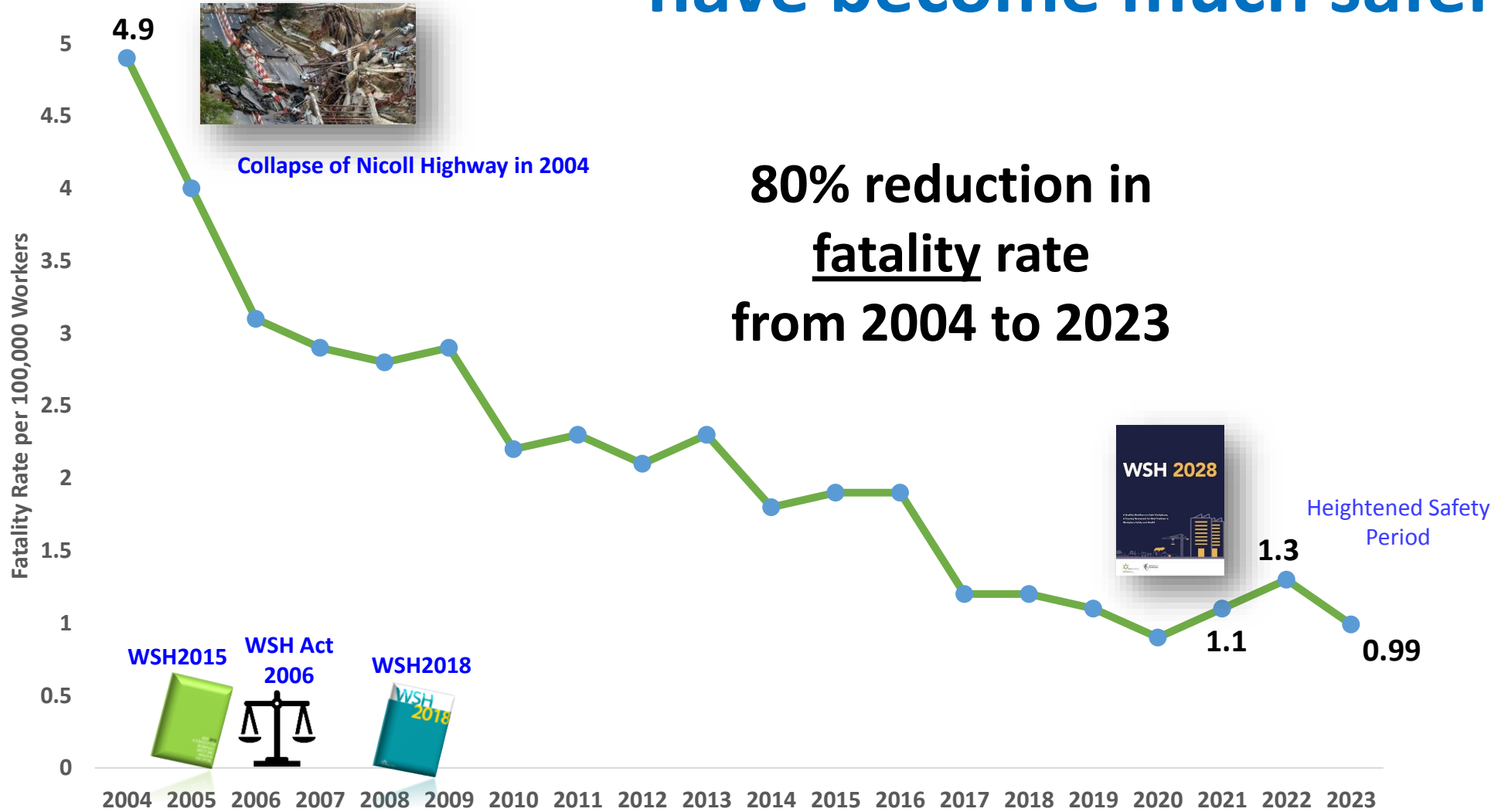
Key WSH Milestones

2005	2006	2008	2009	2011	2014	2016	2017	2018	2019	2020 to present
<p>Launch of WSH Framework</p> <ul style="list-style-type: none"> - Reduce risk at source - Greater industry ownership - Higher penalties for poor safety management 	<p>Workplace Health & Safety Act</p> <ul style="list-style-type: none"> - Prescriptive to outcome-based - Greater legal obligation on individuals - Higher penalties 	<p>Formation of WSH Council</p> <ul style="list-style-type: none"> - Tripartite representation - Building greater industry ownership over best practices & WSH promotion 	<p>WSH2018 Plan</p> 	<p>Formation of WSH Institute</p> <p>Research & sensing on emerging WSH risks</p> 	<p>Launch of Total WSH</p> <p>Integrated approach for safety, health & worker well-being</p>	<p>WSH2018+ PLAN</p> <p>Set out the plan to bring Singapore back on track to achieve 2018 target</p> 	<p>Target Refreshed</p> <ul style="list-style-type: none"> - 1.0 fatalities per 100,000 by 2028 	<p>Formation of WSH 2028 Tripartite Strategy Committee</p>	<p>Launch of WSH 2028</p> 	<ul style="list-style-type: none"> • 2020: Amendments to Work Injury Compensation Act • 2021: Scope of WSH expanded to include Safe Management Measures for prevention of infectious diseases • 2022: Heightened Safety Period to tackle spate in accidents. Formation of Multi-Agency Workplace Safety Taskforce (MAST) • 2023: Exit from HSP and transited to SAFE (Safety, Accountability, Focus, Empowerment) measures.
<p>New Target Set</p> <ul style="list-style-type: none"> - 2.5 fatalities per 100,000 by 2015 - 2004 fatality rate: 4.9 	<p>WSH2015 Plan</p> 	<p>WIC Act</p> <p>Work Injury Compensation (WIC) Act replaces the Workmen Compensation Act</p>		<p>WSH Act extended</p> <p>Covers all workplaces</p>	<p>Amendment of WIC Act</p> <p>Revisions to the WIC Act</p>	<p>Established MHD</p> <p>Oversee safety, health & environmental of Major Hazard Installations</p>	<p>Attained</p> <ul style="list-style-type: none"> - 2017 fatality rate: 1.2 	<p>Target Refreshed</p> <ul style="list-style-type: none"> - 1.0 fatalities per 100,000 by 2028 on sustained basis - 2018 fatality rate: 1.2 		
		<p>WIC Act</p> <p>Work Injury Compensation (WIC) Act replaces the Workmen Compensation Act</p>			<p>2015</p>	<p>Launch of Vision Zero</p> <p>Embrace a mindset that all injuries and ill-health at work can be prevented and zero harm is possible</p>				
		<p>Target Refreshed</p> <ul style="list-style-type: none"> - 1.8 fatalities per 100,000 by 2018 - 2008 fatality rate: 2.8 			<p>Total WSH</p> <p>Broaden the awareness of TWSH in workplace</p>					



Singapore's workplaces have become much safer

Our Aim:
Sustain fatal injury rate below 1.0 per 100,000 workers by 2028.

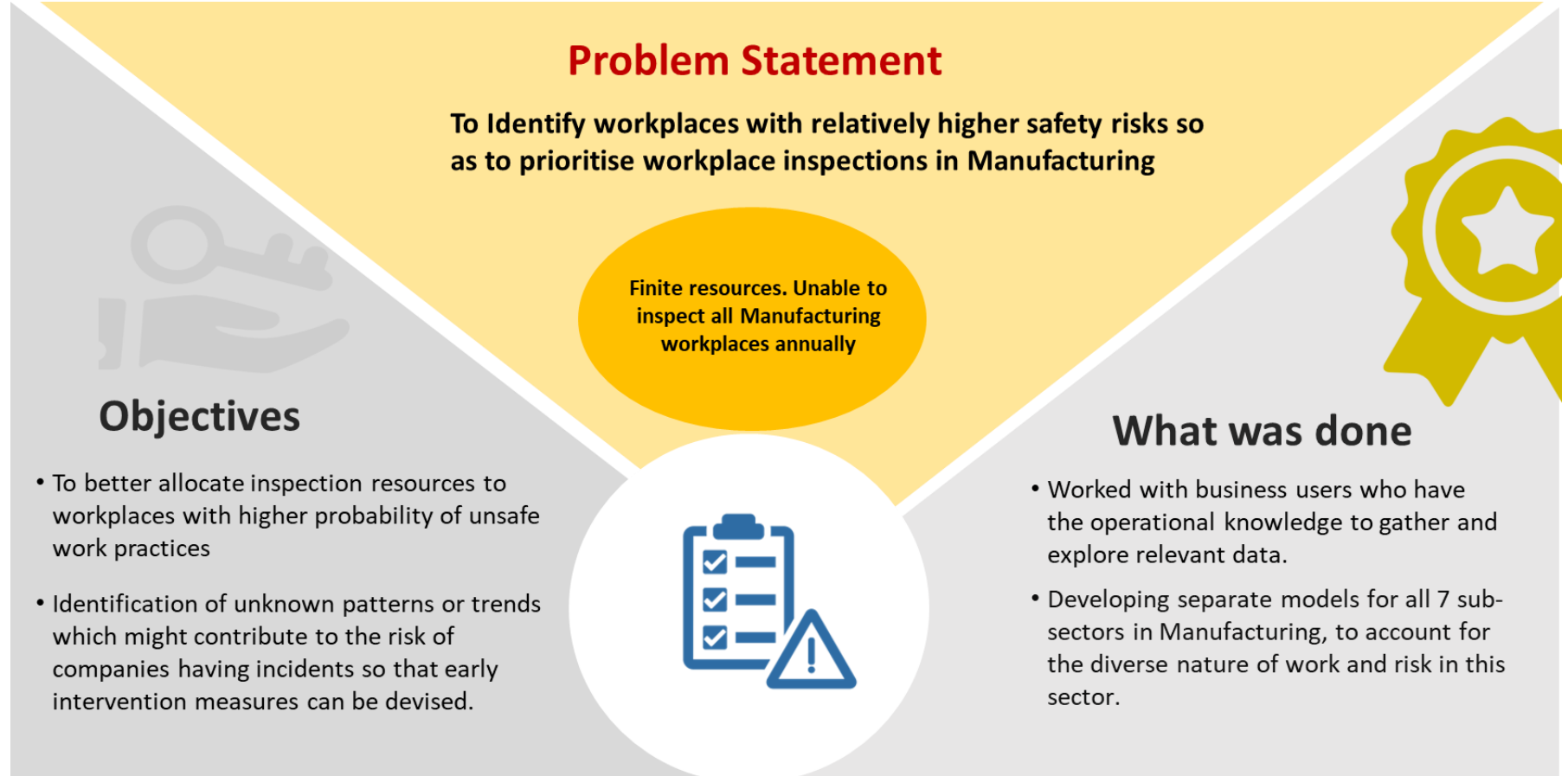


In 2019, WSH2028 was launched to guide our WSH strategies

**VISION: A healthy workforce in safe workplaces;
A country renowned for best practices in workplace safety and health**



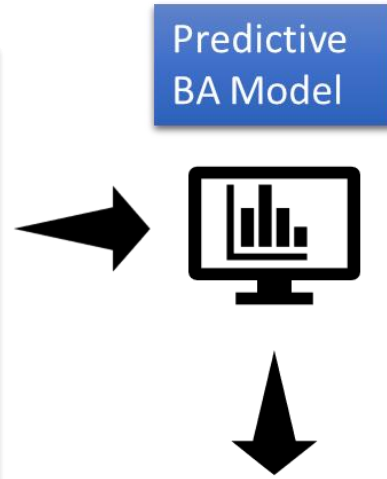
Safety Analytics for Manufacturing (SAMBA), a hitlist model deployed since 2018



Predictive modelling to quantify the risk of each workplace

BA & BI

Model Input



Data Driven Optimization for 7 manufacturing clusters

- Metalworking, Precision
- Food & Beverage
- Chemical, Plastic, Rubber
- Non-Metallic (Concrete, Glass)
- Woodworking
- Transport Equipment
- Other Manufacturing

Model Output

- Based on the data inputs, the model determines the risk score (from 0.0 to 1.0) for each workplace. A higher value indicates a higher risk of serious WSH lapses.
- Companies with higher risk scores are assigned for inspections.

Model Output

Reporting the Model Output - Report Listing

C	RISK_SCORE	WOR
3951	0.9825	250
3959	0.98075	60
8113	0.98	453
0301	0.975	573
0301	0.975	413
3992	0.97475	173
8119	0.971	199
3960	0.96425	16
3959	0.905	300
0301	0.903	219
0301	0.903	19
0302	0.903	60
0302	0.903	32
8119	0.898	12
3959	0.881	90
8111	0.858	20
8113	0.854	12



Behavioural Insights: Revamped Approach to Enforcement

1 Drive companies to self help avenues

Pre-inspection letters and WSH guidelines are sent to companies to inform of possible upcoming inspections

2 Give heads-up to company management prior to inspections

Letters grade companies based on WSH risk level performance bar so as to catch their management's attention and nudge them to take action

3 Easier and immediate follow-up actions by inspected companies

After inspections, debrief forms with suggested follow-up measures help companies understand what they have to do for immediate rectifications

4 Provide a post inspection "performance grade" form in addition to enforcement letter

Post-inspection forms remind that deterioration of WSH standards will lead to stronger enforcement outcomes and severe repercussions

6 MAY 2022

Your company has a very high risk of workplace accidents. MOM may inspect your workplace soon.

Dear Sir/Madam,

Based on our records, your company has a very high risk of workplace accidents.

Your company's workplace safety and health (WSH) risk levels in comparison to all other workplaces in your industry

Very High | High | Moderate | Low

Serious injuries or even fatalities can occur if there are WSH lapses at your workplace. WSH inspectors may inspect your workplace soon to ensure your company complies with the WSH Act and its regulations.

If serious WSH lapses are found, a **Stop Work Order (SWO)** will be issued to stop work activities until the lapses are corrected. In addition, **fines of up to \$5,000 or prosecution in court** may be issued for each WSH lapse.

We seek your continuous support to improve safety and health practices in the workplace.

What you need to do

- Inspect your own workplace(s) and conduct risk assessment to identify and address safety and health hazards in your workplace.
- Correct any WSH lapses immediately.
- Refer to Annex A for examples of unsafe and unhealthy practices, potential consequences, and suggested solutions.
- You may also use it to educate your workers on workplace hazards.
- If you require further assistance, please email com_OSHD@mom.gov.sg

You need to know

From 2019 to 2021, a total of 1,026 fines of up to \$5,000 each were issued to companies in your industry.

Pre-inspection Letter + WSH Guidelines

Each WSH lapse can be fined up to \$5,000 and multiple or serious lapses may result in issuing of Stop Work Order (SWO) to stop works in the workplace.

Common Equipment and Electrical Hazards

Safety Lapse Examples	Consequences	Suggested Solutions
Exposed cutting saw blade	> Amputations	Install guards for cutting blades
Unguarded rotating parts of lathe/drilling machines	> Entanglement leading to death or amputation	Install guards for rotating parts
No guards for mixer machines	> Entanglement leading to death or amputation	Guard with interlock limit switch
Exposed wiring inside DB enclosure	> Death by electrocution	Install intermediate barrier to cover all the wiring
Faulty lifting equipment	> Death or serious injury from falling object/ struck by object being lifted	Good lifting equipment

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WSH Inspection Debrief

The Ministry of Manpower (MOM) visited your workplace and we have identified some lapses you need to address immediately and in the longer term.

Lapses to Address Immediately

To ensure the safety and health of your workers, the following lapses have been identified for you to address immediately:

Safety Lapse	Suggested Follow Up
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

There may also be other findings apart from those listed here. Serious or repeated lapses may lead to further enforcement actions, including fines and prosecution actions. We will send an official response to you once our records are finalised.

ONLINE WSH RESOURCES

For further WSH guidelines to improve your workplace, you can scan the QR code on the right.

Min Melvin Low
Name/designation of company representative | Name of inspector | Inspection Date

Debrief form

WHAT YOUR INSPECTION OUTCOME MEANS

You have received one or more **Composition Fines (CFs)**.

A CF is issued when your safety & health lapse is serious enough to require a strong deterrent. You need to correct it immediately, or your workers' lives may be severely threatened.

A re-inspection may be carried out to ensure rectification had been carried out. A higher penalty will be imposed should further safety & health lapses observed at your workplace.

Notice of Non-Compliance (NNC)

There were one or more lapses found. These are not critically threatening now, but if left unattended, they might be a growing danger leading to a fine.

YOU ARE HERE.

Composition Fine (CF)

Your safety & health lapses are serious enough to warrant a monetary fine.

Correct your lapses now to avoid further negative impact to your business. Speak to your workers and ensure they comply with all safety regulations.

Stop Work Order (SWO)

Your company has to stop all operations because any further work will endanger your workers' lives and well-being.

Court Action and Further Penalties

Your company could be prosecuted if your workplace poses grave danger to your workers, or the lapses are persistent. Your business could also be placed under surveillance.

Your business, reputation, and workers' lives will be severely threatened if your lapses warrant any of these outcomes.

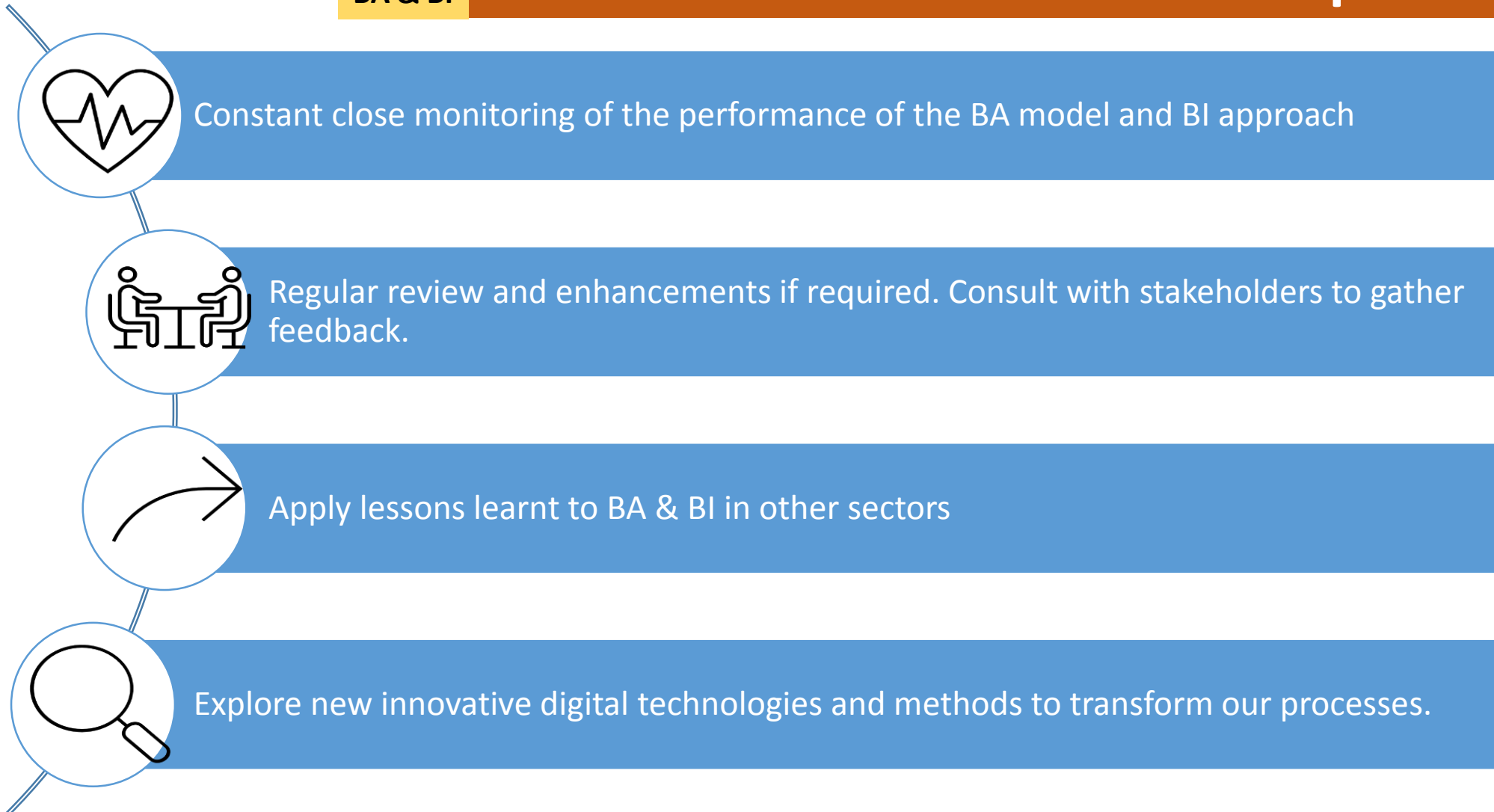
Increasing Penalty

Post-inspection form



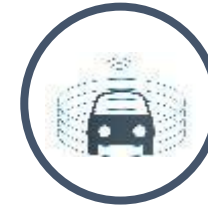
Next Steps: Constant reviews and assessments for improvement

BA & BI



Suitably deployed WSH technology is one key enabler to further improve WSH

Technology can improve WSH by



<p>Remove workers from risky activities</p>	<p>Detect risky conditions</p>	<p>Deter risky behaviours</p>	<p>Improve situational awareness; reduce human error</p>	<p>Assess and alert on ill health that may increase risk of work accidents</p>
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e.g. drones for facade inspection

e.g. smart site inspection with 360 cams

e.g. video surveillance system with AI

e.g. vehicle proximity alert system

e.g. wearables for health monitoring

There is immense potential for industry to tap on effective market-ready WSH solutions to disrupt unsafe / labour-intensive processes and value create by changing how traditional risky work is carried out.



Vehicular safety tech improves driver's situational awareness and monitors signs of fatigue or distraction



Forward collision warning



Driver status monitoring

Source of images: Netradyne, RiderDome

Video Surveillance System with AI can detect unsafe workplace conditions and worker behaviour



Smoke and fire



Worker under lifted load



Geofencing

Source of images: Ailytics, Invigilo

Drones can replace humans in high risk work activities



Aerial drones for WAH activities



Drones for underwater inspections



Drones for confined space

Source of images: BeeX, Viscoy

Wearables to monitor and enhance WSH



Health monitoring and injury prevention



Real time location tracing and communication



Exoskeletons for lifting assistance and support

Source of images: Vulcan AI, Damstra, Weston Robot

But industry adoption of WSH technology is not straightforward

WSH Technology

- Businesses tend to focus on productivity improvement when adopting technology
- Businesses cite cost as a barrier, especially when the return on investment for WSH technology as risk control solutions can be difficult to measure



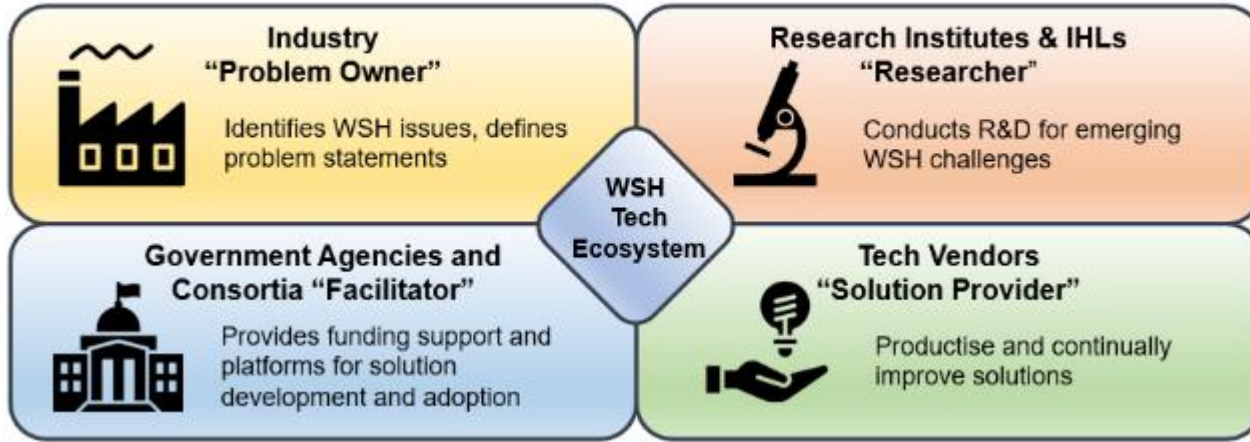
- Businesses see adoption of technology as a difficult process that involves a change in system and change management among users
- Lack of support from top management
- Lack of awareness for suitable technology solutions as risk control measure



Partnering key stakeholders to grow WSH technology ecosystem

WSH Technology

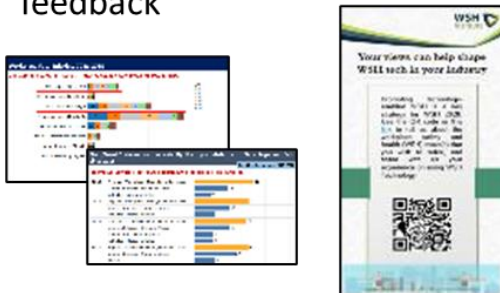
Network of players championing different areas



Works with various stakeholders in the technology ecosystem to grow WSH tech in Singapore and through demand-side and supply-side strategies

1. Identify WSH issues and tech solutions

Through data analytics and industry feedback



2. Scale adoption of mature solutions

Using both regulatory levers and incentives



3. Ensure continual innovations

Through tech challenges and R&D



Calibrated approach to integrate WSH into the tech ecosystem

WSH Technology

- We work with our partners and sector leads to scale adoption by incorporating WSH technology as requirements (e.g., in tender specifications) as well as incentivising and encouraging adoption (e.g. through grants).
- We support pilot testing via sector leads' innovation platform
- We leverage on Research Institutes and Institutes of Higher Learning to conduct research & development



TRL = Technology readiness level



Include WSH in Industry Digital Plans

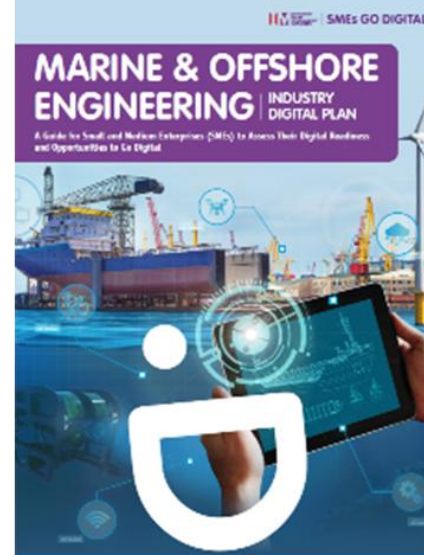
WSH Technology






-  **Digital Wearables for Workers' Health and Safety**
-  **e-Permit-to-work (e-PTW)**
-  **Integrated and Smart Worksite Monitoring and Inspection**



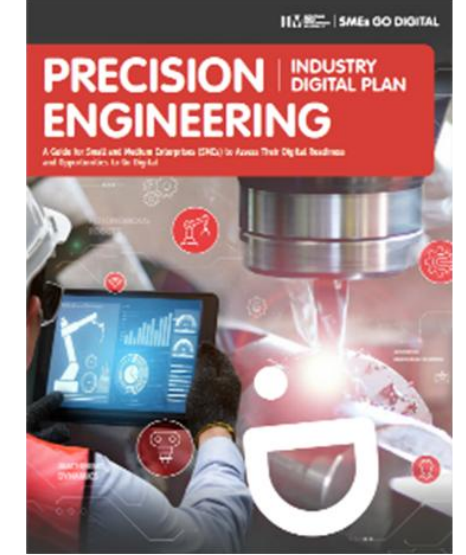
-  **Fleet Safety Management**






-  **e-Permit-to-work (e-PTW)**
-  **Centralised Platform with Data Analytics**
-  **Autonomous Robots & Drones for Operations**



-  **Digital Wearables for Workers' Health and Safety**
-  **e-Permit-to-work (e-PTW)**
-  **Field Management**
-  **Integrated Inspection System**
-  **Semi-Automated Robots**



-  **Manufacturing Operations Management**
-  **Production Resource Planning**
-  **3D Visualisation and Simulation**
-  **Augmented/Visual Reality**
-  **Autonomous Robots**

Source: [IMDA](https://www.imda.gov.sg)

2017, 2020

2021, 2022



2017
MOM launched WSH Tech Challenge to seek solutions for tech to improve vehicular safety.

2020
WSHI launched industry challenge on BEAMP/OIP platform to seek Slips, Trips and Falls (STF) prevention solutions for the Facilities Management (FM) sector.

2021
WSHI partnered Association of Singapore Marine Industries (ASMI) in the PIER71 Smart Port Challenge to seek solutions for fall prevention and worker health monitoring in the Marine and Offshore sector.

2022
WSHI partnered Singapore Contractors Association Ltd (SCAL) in the Open Innovation Platform (OIP) by IMDA to seek solutions to tackle Slips, Trips and Falls (STF), Fall from Heights (FFH) in the Construction sector.



Vulcan AI's wearable for STF



Flexosense's smart insole for STF



Eupnoos's lung health screening app



Temus's smart tags for STF



Invigilo's VA for hook status



Tagvance's safety harness sensor



WSH Technology

Industry associations

Eg. Specialists Trade Alliance of Singapore (STAS) – low cost project management, smart inspection and worksite surveillance solutions for SME members



Join us to know more about how WSH Technology can support your company's roofing works

Highlights
Sharing & Dialogue with STAS and WSHI

Tech Sharing by Novade, Open Space and Ailytics

- Novade Lite**
Safety supervision across multiple sites/ locations is easier with ePTW and field management
- OPENSACE**
360 Reality Capture Technology to Improve Job Site Inspection documentation and accountability through an interactive 360 map of your site
- Ailytics**
Automatic Roof Site Works monitoring and hazards detection by CCTV with AI

Why should you attend?
Be the first to know that STAS has arranged special SME packages with Novade, Openspace and Ailytics for our RAS SME members.

Building Construction And Timber Industries Employees' Union (BATU) – Slips, Trips and Falls (STF) solutions for Facilities Management

WORKPLACE SAFETY AND HEALTH (WSH)-TECH SOLUTION TO DETECT AND PREVENT FALLS FROM

WHAT ARE WE LOOKING FOR?
Workplace Safety and Health Institute

A scalable prototype solution that can be deployed, quickly and economically, in a dynamic construction site environment. It should automatically detect and alert authorized personnel of FFH and STF hazards, incidents, near misses.

\$5,00,000

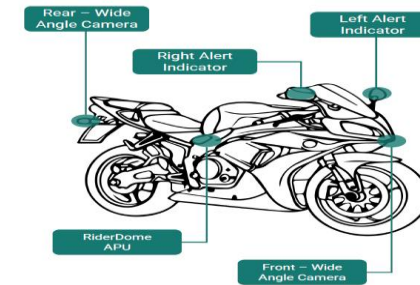
Association of Singapore Marine Industries (ASMI) – fall prevention and health monitoring for marine and offshore companies

ASMI **HAFNIA**
PSA MARINE **UNBOXED** **WSH Institute**

Monitor, Detect and Improve Workforce Physical and Mental Health in Maritime and Marine & Offshore

Companies

Deliveroo – rider safety tech



Source of image: Rider Dome

Teambuild – ice slurry to mitigate heat stress



A healthy workforce in safe workplaces



COSH
2024
24th CONFERENCE AND
EXHIBITION ON
OCCUPATIONAL
SAFETY AND HEALTH

SCICOSH
6th SCIENTIFIC CONFERENCE ON OCCUPATIONAL SAFETY AND HEALTH

THANK YOU

Email me at woon_cheng_peng@wshi.gov.sg if you have any questions