improving
workplace
health
management in Singapore

WSH COUNCIL

WSH
2018

CONTENT

INTRODUCTION

1.1 A Focus on Workplace Health

In 2005, Singapore adopted a new framework for workplace safety and health (WSH) to improve WSH standards and safety outcomes. The framework is based on three key principles:

a. Reducing risks at source by requiring all stakeholders to eliminate or minimise the risks they create;

b. Engendering greater industry ownership of WSH outcomes; and

c. Preventing accidents through higher penalties for poor safety management.

Under the new framework, the Ministry of Manpower (MOM) has worked with the WSH Council and other industry partners to improve WSH through a combination of capability building, an enhanced regulatory framework and greater industry engagement.

In the past, the main focus was on improving the management of workplace safety, lapses which have an immediate and tangible impact in terms of injuries or fatalities. But even as we continue to improve our management of workplace safety, it is important that our management of workplace health (WH) issues keeps apace. The impact of failures in WH management lapses is more insidious, but no less severe than that stemming from workplace safety lapses.

Indeed, in developed economies, the cost of WH problems often outstrips that of workplace safety issues. We therefore need a sensible approach to manage the risks from WH hazards that balances employees' safety and health with business needs.

In Singapore, there are 31 occupational diseases that are reportable under the Third Schedule of the Workplace Safety and Health Act.

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1.2 Workplace Health in Singapore — Where We Stand

In 2008, there were 855 confirmed cases of Occupational diseases (ODs), of which 94.6% were cases of noise induced deafness (NID) and occupational skin diseases. This translates to an incidence rate of 36.2 per 100,000 employees.

ODs are illnesses directly caused by physical, chemical or biological hazards in the workplace. In Singapore, there are 31 ODs that are reportable under the Third Schedule of the WSH Act. It is contracted as a result of exposures over a period of time to risk factors arising from work activity.

While our WH statistics appear fairly modest relative to those in most of the developed countries, they may not reflect an entirely accurate picture of the state of WH in Singapore. Under-reporting arising from the general lack of awareness on ODs in Singapore is likely to be a major contributing factor. Other factors include methodological differences in how countries define ODs and their reporting requirements for such diseases. (Singapore has 31 prescribed ODs under the Third Schedule of the WSH Act as ODs while other developed countries such as the UK, US and Nordic countries have a much broader definition of workplace illness.)

Table 1: Number of confirmed occupational disease cases from 2006–2008

Type of occupational diseases	2008	2007	2006
Total	**855**	**602**	**657**
Noise-induced deafness	743	490	535
Occupational skin diseases	66	59	89
Work-related musculoskeletal disorder	5	25	8
Barotrauma	5	17	5
Excessive absorption of chemicals	11	3	5
Occupational lung disease	5	3	2
Compressed air illness	7	2	3
Chemical poisoning	8	–	–
Mesothelioma	4	–	–
Other occupational diseases	1	3	10

SINGAPORE'S**WORKPLACE**
HEALTH**FRAMEWORK**

SINGAPORE'S**WORKPLACE** HEALTH**FRAMEWORK**

2.1 The Legislative Framework

The Workplace Safety and Health Act

Enacted in 2006, the WSH Act provides the main legislative framework under which WSH matters are regulated. It introduces a performance-based regime that requires stakeholders to proactively identify and mitigate WSH risks. The Act recognises that safety is not the sole duty of the occupier and defines general duties of care for a range of stakeholders including employers, principals and employees.

In addition, subsidiary legislation under the WSH Act regulates the management of WH in the following areas:

a. **Risk Management:** Employers are required to carry out safety and health risk assessments under the WSH (Risk Management) Regulations.

b. **Reporting:** All workplaces are required to report work-related accidents, dangerous occurrences and ODs under the WSH (Incident Reporting) Regulations. Doctors who diagnose any employee with an OD are also required to report it. A total of 31 ODs are reportable under the WSH Act, as detailed in Table 2.

Where an employee suffers from an OD, a registered medical practitioner diagnosing the OD and the employer is required to submit a report to MOM within 10 days of the diagnosis.

c. **Monitoring and Surveillance:** Regulations are in place to ensure that the health of workers is not compromised by excessive exposure to WH hazards such as noise and chemical agents. The WSH (General Provisions) Regulations require workplaces to ensure that the exposure levels of over 600 toxic substances do not exceed the prescribed permissible exposure levels (PELs).

Workplaces with excessive chemical exposure (above 10% of the PEL) are to conduct chemical monitoring at least once a year. For noisy workplaces with 10 or more workers exposed to noise of more than 85dBA over 8 hours, monitoring is required. All these monitoring results are to be submitted to MOM.

Furthermore, MOM's in-plant monitoring programme places higher-risk factories, identified through our inspections and OD statistics, under surveillance to monitor the exposure levels of hazardous chemicals present in the workplace. Similarly, the Factories (Noise) Regulations require factories to ensure that workers are not exposed to noise levels exceeding the prescribed PELs.

Table 2: List of reportable occupational diseases

No.	Reportable Occupational Diseases	No.	Reportable Occupational Diseases
1.	Aniline poisoning	16.	Hydrogen sulphide poisoning
2.	Anthrax	17.	Occupational skin diseases
3.	Arsenical poisoning	18.	Lead poisoning
4.	Asbestosis	19.	Liver angiosarcoma
5.	Barotrauma	20.	Manganese poisoning
6.	Beryllium poisoning	21.	Mercurial poisoning
7.	Byssinosis	22.	Mesothelioma
8.	Cadmium poisoning	23.	Noise-induced deafness
9.	Carbamate poisoning	24.	Occupational asthma
10.	Carbon bisulphide poisoning	25.	Organophosphate poisoning
11.	Chrome ulceration	26.	Phosphorous poisoning
12.	Chronic benzene poisoning	27.	Poisoning from halogen derivatives of hydrocarbon compounds
13.	Compressed air illness	28.	Repetitive strain disorder of the upper limb
14.	Cyanide poisoning	29.	Silicosis
15.	Epitheliomatous ulceration (due to tar, pitch, bitumen, mineral oil or paraffin or any compound, product or residue of any such substance)	30.	Toxic anaemia
		31.	Toxic hepatitis

In addition, under the Factories (Medical Examinations) Regulations, workers in occupations involving exposure to 19 health hazards must be certified fit for the occupation by a designated factory doctor and undergo periodic medical examinations thereafter. Depending on the hazards, these examinations include hearing tests, liver function tests, chest X-rays and tests for chemical exposure levels in the blood or urine. In 2008, some 106,000 workers were monitored under the Factories (Medical Examinations) Regulations.

Data from the various monitoring and surveillance programmes are sent to MOM and kept in a national repository. This enables MOM to identify the higher-risk workplaces, analyse OD trends and make interventions where necessary.

Other Legislation, Singapore Standards, Codes of Practice and Guidelines

Apart from the WSH Act and its subsidiary legislation, there are other pieces of legislation regulating the management of specific WH hazards. The Ministry of Health (MOH) regulates the use of biological agents under the Biological Agents and Toxins Act. The National Environment Agency (NEA) regulates the handling of certain hazardous substances under the Environmental Protection and Management Act.

Various Singapore Standards (SS), Codes of Practice (CP) and guidelines developed by SPRING Singapore, the WSH Council and other government agencies supplement and support these pieces of legislation, by providing the industry with guidance on dealing with specific WH hazards. These are summarised in Table 3.

Table 3: List of relevant subsidiary legislation, Singapore Standards, Codes of Practice and Guidelines

Scope of Coverage	Legislation	Codes of Practice / Guidelines
Asbestos	• Environmental Protection and Management Act • Factories (Asbestos) Regulations	• Guidelines on the Removal of Asbestos Materials in Buildings • Guidelines on the Handling of Asbestos Materials
Biological	• Infectious Disease Act • Biological Agents and Toxins Act	• Singapore Biosafety Guidelines for Research on Genetically Modified Organisms (GMOs) • School Science Laboratory Safety Regulations
Chemical Hazards	• WSH (General Provisions) Regulations • WSH (Abrasive Blasting) Regulations • Environmental Protection and Management Act	• Guidelines on Prevention and Control of Chemical Hazards • Guidelines on Risk Assessment for Occupational Exposure to Harmful Chemicals • Guidelines on Solvent Degreasing • CP 61: 1994 Packaging and Containers for Hazardous Substances • SS 586 on Specification for Hazard Communication for Hazardous Chemicals and Dangerous Goods • Guidebook on the Globally Harmonised System of Classification and Labelling of Chemicals • SS 548 : 2009 CP for Selection, Use and Maintenance of Respiratory Protection Devices
Confined Work Space	• WSH (General Provisions) Regulations	• Technical Advisory on Working Safely in Confined Spaces
Compressed air Illness	–	• Prevention of Compressed Air Illness and Barotrauma in Tunnel Construction
Diving	–	• SS511: CP on Diving at Work • Technical Advisory for Inland/Inshore Commercial Diving Safety and Health
Ergonomics and Lighting	–	• SS 514: CP for Office Ergonomics • SS 92: CP on Manual Handling • SS 531 CP for Lighting of Work Places
Indoor Air Quality	–	• SS 554 : 2009 CP for Indoor Air Quality for Air-Conditioned Buildings
First Aid	• WSH (First Aid) Regulations	• Guidelines on First Aid Requirements
Medical Examinations	• Factories (Medical Examinations) Regulations	• Guidelines for Designated Factory Doctors
Noise and Vibration	• Factories (Noise) Regulations	• Hearing Conservation Programme Guidelines • Guidelines on Noise Labelling • CP99: 2003 CP for Industrial Noise Control • SS 549 : 2009 CP for the Selection, Use, Care and Maintenance of Hearing Protectors

Providing services ranging from the monitoring, evaluation and control of WH hazards, to the conduct of medical examinations and the management of work-related diseases and injuries, these professionals and competent persons include occupational physicians, noise control officers and occupational hygienists.

2.2 Key Stakeholders

Industry

This is a diverse group that includes employers and their associations (such as the Singapore National Employers Federation, the Singapore Business Federation and the Association of Small and Medium Enterprises), trade associations (such as Singapore Chemical Industry Council and Singapore Manufacturers Association), and broader industry-led bodies such as the WSH Council. Given its understanding and experience of the operating conditions at the workplace and the work processes employed, industry is an important partner in developing effective tools and solutions to manage WH hazards. Industry also plays a critical role in raising awareness of WH issues, which are typically less well understood compared to more traditional safety risks.

WSH Professionals

WSH professionals such as WSH auditors, officers and coordinators are trained to advise employers on the measures they should take to improve their overall management of WSH. There are other professionals and competent persons providing support to employers specifically in the area of managing WH hazards. Providing services ranging from the monitoring, evaluation and control of WH hazards, to the conduct of medical examinations and the management of work-related diseases and injuries, these professionals and competent persons include occupational physicians, noise control officers and occupational hygienists (details in Table 4).

Table 4: Number of professionals and competent persons involved in managing WH

Professional and Competent Persons	Estimated Number as of 2009
Competent persons for management of hazardous substances	1511
Competent persons for sampling and monitoring of airborne contaminants	390
Safety assessors (confined space)	4330
Designated factory doctors	670
Noise control officers	350
Noise monitoring officers	1000
Occupational health nurses	200
Occupational hygiene practitioners	20
Ergonomics practitioners	80
Occupational health physicians	30
Occupational physiotherapists	500
Occupational therapists	320
Workplace safety and health auditors	160
Workplace safety and health coordinators	2040
Workplace safety and health officers	1580

By providing continuing education and training to their members, the professional bodies for WH professionals and competent persons play an active role in supporting efforts to improve WH management. Table 5 lists some of these professional bodies.

Table 5: Professional institutions and societies and the composition of their members involved in WH

Professional Institutions and Societies	Professional and Competent Persons
Association of Safety Auditing Firms	Workplace safety and health auditors
Chapter of Public Health and Occupational Physicians Academy of Medicine Singapore	Occupational physicians
Environmental and Occupational Dermatology Society	Dermatologists Occupational physicians
Ergonomics Society of Singapore	Human factors professionals
Institution of Engineers Singapore (IES)	Safety engineers including workplace safety and health officers
Occupational and Environmental Health Society (OEHS)	Occupational physicians Occupational hygienists Workplace safety and health officers
Singapore Institution of Safety Officers (SISO)	Workplace safety and health officers
Singapore Medical Association / College of Family Physicians Singapore	Doctors including designated factory doctors
Singapore Society of Occupational Health Nurses	Occupational health nurses

Note: There are overlaps in membership composition.

Institutions such as research bodies, training providers, WSH consultancies and our tertiary educational institutions help support efforts to improve WH management in Singapore.

Employees

Employees bear the brunt of the consequences when safety and health lapses occur at the workplace. While their employers play an important role in providing a safe and healthy work environment, employees must also take personal responsibility for their safety and be provided with adequate training to understand the importance of WSH and how to take precautions to protect themselves at the workplace.

Government

The Government's primary role is to oversee the general direction of WSH through its policy making, as well as regulate and ensure compliance with the relevant legislation. Agencies such as MOM, MOH and NEA play a regulatory role on the WH front, dealing with issues such as the handling of hazardous substances at the workplace. Other agencies such as the Health Promotion Board (HPB) play an important role in working with employers to provide a workplace environment and workplace policies that support the health and well-being of their employees. Meanwhile, the Workforce Development Agency (WDA) provides skills training and upgrading for workers, including WSH competencies.

Other Supporting Institutions

Institutions such as research bodies, training providers, WSH consultancies and our tertiary educational institutions help support efforts to improve WH management in Singapore. Research institutions, training providers and WSH consultancies provide training and expert advice to improve WH outcomes. The tertiary educational institutions also provide WSH training — at the pre-employment stage and through continuing education — and also conduct research into WSH issues. The Council is working with educational institutions to integrate WSH into the academic syllabuses of relevant courses such as engineering and nursing at the diploma, undergraduate and post-graduate levels.

CHALLENGES**TO**WORKPLACE
HEALTH**MANAGEMENT**

CHALLENGES**TO**WORKPLACE HEALTH**MANAGEMENT**

Unique nature of WH hazards and ODs

One of the key challenges in identifying appropriate approaches to tackle WH issues is the unique nature of WH hazards and ODs. Whereas the consequences of failures in workplace safety are immediately obvious and manifest as injuries or fatalities, the consequences of failures in WH hazard management may only become apparent many years later. Because many ODs have a long latency period, the onset of an OD may occur long after exposure to the WH hazard in question (such as a chemical agent) has ceased. Moreover, some ODs such as musculoskeletal disorders and chronic obstructive lung disease may be caused by both work and non-work factors. These make it difficult for employers to internalise the costs stemming from poor WH management. Businesses may therefore lack incentives to invest in WH, particularly if they take a short term view.

The long latency period for ODs also presents challenges on the enforcement front, given that it would be difficult to assess whether at the time of exposure, "reasonably practicable" measures were undertaken at the workplace to mitigate exposure risks. With most workers today likely to work for multiple employers in their lifetime, it may be difficult to determine when he was exposed to the WH hazard that led to the OD.

Lack of awareness and capability to manage WH hazards

Partly because the nature of WH hazards and ODs make it difficult for employers to measure and internalise the cost of poor WH management, the focus of industry efforts has been on tackling workplace safety lapses that could lead to accidents, rather than WH hazards. There is a general lack of awareness amongst both businesses and workers concerning WH issues in comparison to general safety matters, which garner publicity each time there is a major workplace accident. Capabilities to effectively manage WH hazards are also relatively weak. This is particularly so with the newer sectors covered under the WSH Act as well as the Small and Medium Enterprises (SMEs).

Inadequate information on the state of WH

Another challenge we face is our lack of a comprehensive and in-depth picture of the state of WH in Singapore. This would impact our ability to identify and effectively tackle WH problems. Under-reporting is one of the contributing factors. The relatively limited scope of our WH data is another contributing factor, given that our data on WH is largely drawn from the statistics on reported ODs and the exposure data of those workplaces on our monitoring programmes. To enhance our management of WH and raise WH standards, it is essential that the action plans we develop address these three challenges, while bearing in mind the guiding principles of the overall WSH framework.

We need a **broadened data collection approach** *which will enable us to develop better picture of the key WH risks facing the population and to calibrate our efforts accordingly. It would also allow us to better assess and proactively respond to the emergence of any new WH risks.*

3.1 Targeted Outcomes

The aim of the WH strategy is to help stakeholders recognise the importance of a healthy workplace and take proactive measures to improve their management of WH hazards. The section below summarises the outcomes we will work towards:

20% overall reduction
in OD incidence rate

Our efforts should lead to an overall improvement in the state of WH management and in turn, the health outcomes of employees. We should observe a reduction in the overall OD incidence rate. We aim to reduce the OD incidence rate by 20%, from the 3-year average of 32.4 cases per 100,000 employed persons (from 2006 to 2008) to less than 25.9 cases per 100,000 by 2018. Part of our strategy to improve WH outcomes is to tackle the leading causes of reported ODs in Singapore, namely noise, chemical exposure and work in confined spaces (which lead to ODs such as chemical poisoning). These three hazards account for around 95% of reported ODs in Singapore. Apart from working towards a reduction in the overall OD incidence rate, we therefore also aim to reduce the incidence rate of ODs arising from these specific WH hazards by 20%.

20% reduction in incidence
of (i) NID; and (ii) chemical-related illnesses or diseases

We aim to reduce the incidence rate for NID by 20%, from the 3-year average of 590 cases per 100,000 employed persons (from 2006 to 2008). For chemical-related illnesses or diseases[1] , including those resulting from exposure to asbestos and chemicals in confined spaces, we aim to reduce the incidence rate by 20% from the 3-year average of 85 cases per 100,000 employed persons (from 2006 to 2008). While OD incidence serves as a useful gauge of the state of WH, it is nonetheless a downstream measure of that state. We should also have upstream measures on the state of WH management.

One such measure is the compliance rate of workplaces with their WH legislative obligations. In addition to focusing on WH legislative requirements pertaining to noise, chemical exposure and work in confined spaces, we will also assess compliance with legislative requirements for asbestos work. Asbestos, while no longer used extensively in industry, nonetheless still poses a significant public health risk during work processes like renovation work given its presence in older plants and buildings.

95% of workplaces inspected
have implemented WH hazard management programmes in compliance with legislative requirements

We aim to have 95% of workplaces inspected in compliance with our key WH legislative requirements by 2018, that is, the implementation of (i) a hearing conservation programme; (ii) a chemical management programme; (iiii) a confined space management programme; and (iv) asbestos work-related legislative requirements.

[1] *These chemical-related ODs include occupational dermatitis, chemical poisoning and excessive absorption, lung diseases and mesthothelioma.*

APPROACHES
ANDSTRATEGIES

APPROACHES
AND**STRATEGIES**

This section outlines the approaches and strategies we will employ to tackle WH issues.

4.1 Approaches to Managing Workplace Health

The unique challenges posed by the nature of WH hazards require the adoption of a modified approach from that used to manage safety hazards.

A compliance-based regulatory framework

The enactment of the WSH Act marked a shift from a prescriptive legislative regime to a performance-based one. Rather than prescribe in detail what stakeholders are expected to do to ensure safety outcomes, the WSH Act lays out general duties of care for the various stakeholders, requiring them to take "reasonably practicable" measures to ensure worker safety.

However, it may not be easy to effect this principle for WH issues, given the long latency period of many ODs. For instance, should a worker be diagnosed with an OD with a long latency period, it is a challenge to establish whether his employer at the time of probable exposure had undertaken "reasonably practicable" measures to minimise the worker's risk of exposure. This is further complicated by the fact that the worker's condition may be exacerbated by non-work factors as well. Unlike workplace accidents, it can be more challenging establishing the circumstances contributing to the development of the OD and hence, provide guidance on the "reasonably practicable" measures

that may be undertaken to prevent the OD. Given these considerations, it may be necessary for the WH regulatory framework to adopt a more prescriptive approach in order to provide stakeholders with greater guidance on their obligations to ensure WH outcomes. For instance, the regulatory framework should prescribe specific measures that stakeholders should put in place and specific standards, including PELs, that stakeholders should comply with, rather than outline general duties of care.

Greater focus on eliminating or reducing exposures to WH hazards

But while it is important and necessary to prescribe PELs and other suitable indicators for specific hazards through legislation, compliance with such indicators does not imply the complete elimination of risk. PELs merely set the minimum acceptable standards that industry should comply with in terms of managing WH hazards. Moreover, the process of setting appropriate PELs is often complex and long-drawn and PELs have yet to be established for many chemicals and biological agents.

A more progressive and proactive approach to driving improvements in WH management and raising WH standards would be for regulators and industry to focus on eliminating or incrementally reducing exposure to WH hazards to as low a level as possible, whether or not PELs have been established. This approach can be supported by the application of research to develop cost-effective solutions and the sharing and promotion of best industry practices in managing WH hazards.

4.2 Different Strategies for Different Types of Workplace Health Hazards

WH hazards refer to physical or psychosocial factors, and chemical or biological agents at the workplace which have a potentially adverse impact on health. These hazards can be broadly classified into three categories:

a. **Established hazards** where the relationship between the OD and hazard is well-understood. There are two subgroups within this category:

- Established hazards where a direct causal link to the OD can be proven. Such hazards include noise (which can cause permanent loss of hearing), chemicals (which can cause poisoning) and infectious agents (e.g., hepatitis and HIV from needle-stick injuries).

- Established hazards that are contributing factors to the OD. For example, poor workplace ergonomics are among the factors that collectively can lead to musculoskeletal disorder.

b. **Emerging hazards** whose health effects and impact are still being studied. Examples include nano-materials and the contribution of work stress to cardiovascular and other chronic diseases.

c. **Unknown hazards.** These are new hazards which may emerge as new work processes, chemical, biological and infectious agents are introduced at the workplace.

Given the different nature and characteristics of established, emerging and unknown hazards, we cannot adopt a uniform approach or strategy for tackling all three categories of hazards. Rather, a differentiated approach for each category of hazard is required. Table 6 summarises the various combinations of strategies we will employ to deal with established, emerging and unknown hazards respectively. An overview of the WH Strategy is in Appendix 1. An Action Plan with details on how we intend to implement the various strategies can be found in Appendix 2.

Table 6: Summary of strategies for managing WH hazards

Established WH Hazards		Emerging Hazards	Unknown Hazards
Direct Causal Link	**Contributing Factor**		
Targeted intervention programmes			
	Monitoring and intelligence gathering		
Research and standards development			
	Promotion of good practices		

Strategy 1
Implementing Targeted Intervention Programmes

We will put in place targeted intervention programmes to tackle established ODs. These ODs stem from established WH hazards where a direct causal link to the OD can be proven. Given the nature of these WH hazards, our intervention programmes can systematically eliminate or mitigate these hazards by:

Developing and prescribing appropriate standards

In collaboration with industry, we will develop appropriate standards to minimise the risk of exposure to the targeted hazards. As our regulatory framework for WH will have a stronger focus on compliance, we must ensure that the prescribed standards, procedures and control measures are robust and effective. This can be done through regular reviews, monitoring the extent of adoption of the standards and by benchmarking our practices against standards established by international organisations.

Providing compliance assistance

To provide industry with guidance as to what constitutes "reasonably practicable" measures to minimise the targeted WH hazards, we will develop compliance assistance materials such as technical guidelines, codes of practice and checklists. Industry access to such materials will be enhanced by improving the content and accessibility of existing electronic databases on good practices on WH hazards control. As SMEs may require additional assistance to manage short term compliance costs, we will explore leveraging on existing programmes such as the Risk Management Assistance Fund (RMAF) to do so.

Deepening capabilities to monitor and control hazards

We will review and enhance the current training framework to ensure that stakeholders — from employers to WSH professionals to workers on the ground — are equipped with the necessary competencies to manage the WH hazards. WSH professionals and specialists should have the technical skills to assist employers and occupiers in minimising worker exposure to the targeted hazards. Generic WSH courses targeted at workers and supervisors should incorporate modules designed to raise awareness of these hazards and basic risk management measures.

Educating and engaging employees

While employers will remain an important target audience for outreach efforts, greater emphasis should be placed on reaching out to employees directly to educate them on protecting themselves from the targeted WH hazards. Apart from regular outreach events at workplaces and foreign worker dormitories, we can work with the healthcare professionals to facilitate the dissemination of information during workers' periodic medical examinations.

Targeted enforcement

To complement our engagement efforts, we will also step up enforcement efforts in the targeted intervention areas by focusing on specific hazards and industry.

Intervention programmes targeting leading causes of reported ODs in Singapore will be implemented in phases — noise, chemicals exposure and work in confined spaces — as well as asbestos work, which pose a significant public health risk during work processes like renovation work, given the presence of asbestos in older plants and buildings. In addition, there would also be stepped up enforcement programmes in certain high risk sectors such as shipyards and metal working industry. New focus areas may be identified in the future, should new priorities emerge. Details on the four targeted intervention programmes are described on the next page.

a. Work involving noisy processes

NID is the leading OD in Singapore, accounting for over 80% of all ODs. There is a need to continue targeting noise hazards, particularly in the manufacturing, shipbuilding/ship-repairing and construction sectors, which accounted for 84.9% of the NID cases reported in 2008.

Some key initiatives under this programme include strengthening legislative requirements, identifying noisy workplaces for surveillance and control, managing noise hazards at workplaces through the implementation of Hearing Conservation Programme (HCP), raising awareness and building capability in noise hazard management. The key elements of the in-plant HCP include noise monitoring, noise control, hearing protection, audiometric examinations and health education.

b. Work in confined spaces

In the past and recent years, workers have died after being exposed to toxic levels of chemical vapours and gases, or were asphyxiated from a lack of oxygen, as a result from work in confined spaces. Many incidents had occurred inside ISO tankers, storage or ballast tanks, silos, ship compartments and manholes. There is a need to strengthen the regulatory framework. Accordingly, new regulations for confined space work have been introduced to ensure that systematic processes are put in place for workplaces to identify potential confined spaces and implement safe work procedures for entry and work in confined spaces. Concurrently, we

will enhance the awareness and capability of the industry to deal with the risks involved in work in confined spaces.

Companies carrying out work in confined spaces will be required to implement a confined space management programme consisting of these elements: hazard identification, evaluation and control, entry-permit system, atmospheric testing and monitoring, ventilation and emergency response.

c. Work involving asbestos

Asbestos is a human carcinogen that can cause fatal cancers such as mesothelioma and lung cancer. While asbestos is no longer used extensively in industry, workers involved in asbestos removal work in ships and plants, or demolition or renovation works face a high risk of exposure. The public may also be exposed when asbestos removal works are poorly managed. We need to strengthen current legislation to put in place more stringent controls on asbestos management and asbestos removal work, including introducing a licensing scheme for asbestos removal contractors and duties on building owners. There is also a need for greater awareness, particularly among workers, of the health effects of asbestos exposure and workers and supervisors need to be better trained in managing the release of asbestos fibres.

Worksites with work involving asbestos will be required to comply with existing legislative requirements for asbestos works. This includes

implementing safe removal methods for asbestos containing materials, providing appropriate shower facilities and PPE, and proper storage and disposal of asbestos waste.
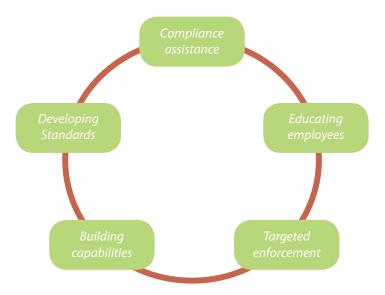
d. Work involving known hazardous chemicals
There are over 600 prescribed chemicals under the WSH (General Provisions) Regulations. When chemicals are poorly managed, they can cause many ODs including occupational skin diseases, poisoning and occupational lung diseases. A comprehensive and effective monitoring programme for workplaces using hazardous chemicals is necessary for early risk detection and intervention. Raising awareness of chemical hazards and strengthening capabilities in proper chemical management monitoring and control are key activities of this programme. As hazardous chemicals are regulated by different authorities in Singapore, a whole-of-government approach would be needed in terms of monitoring, intelligence gathering, and enforcement.

Workplaces are required to implement an in-plant chemical management programme consisting of these key elements: hazard communication (labelling and safety data sheet), training and education, hazard assessment and control (with respect to storage, handling and disposal of chemicals), PPE, workplace monitoring, medical surveillance, and emergency response.

Results of regular exposure monitoring will be required to be submitted to MOM and captured in our chemical exposure database.

Targeted Intervention Programmes

- Compliance assistance
- Educating employees
- Targeted enforcement
- Building capabilities
- Developing Standards

There is a need to put in place a robust reporting system to
(i) prioritise our efforts to better tackle established WH hazards; and
(ii) identify new and emerging WH hazards to which we need to
*   develop a response.*

Strategy 2
Monitoring and Intelligence Gathering

There is a need to put in place a robust reporting system to (i) prioritise our efforts to better tackle established WH hazards; and (ii) identify new and emerging WH hazards to which we need to develop a response. A robust reporting system should enable us to obtain reliable and comprehensive data on OD incidence and exposure to WH hazards in a timely fashion.

The current reporting system would be improved. In terms of comprehensiveness, the scope of currently collected data is fairly limited. Our data on OD incidence is currently restricted to the 31 reportable ODs prescribed under the Third Schedule of the WSH Act. Meanwhile, we only collect exposure data from workplaces under our monitoring programmes, which constitute only a fraction of workplaces where the WH hazards in question are present. In terms of reliability, our WH statistics may not provide an entirely representative picture of the WH landscape in Singapore, due to under-reporting and a general lack of awareness on ODs.

To improve the quality of our WH data, we will enhance our WH reporting and monitoring mechanisms and our intelligence gathering capabilities through the following avenues:

a. **Engaging doctors**
    Doctors are often the first point of contact for workers with potential work-related diseases and are best placed to help identify the emergence of WH trends and disease clusters. Enhancing doctors' awareness and knowledge of work-related diseases will help facilitate accurate diagnoses and reporting. Meanwhile, simplifying the reporting process for doctors and establishing better information-sharing platforms will facilitate the prompt reporting of work-related diseases. Doctors should also be encouraged to report potential new ODs. MOM and the WSH Council will work closely with MOH, the healthcare industry and the relevant professional associations on these efforts.

b. **Exploring new mechanisms for data collection**
    To complement WH data collected from our existing reporting and monitoring systems, we will explore the use of surveys as an alternative source of data. Surveys can help us better understand the driving forces behind WH trends, deepen our understanding of work-related diseases beyond the 31 reportable ODs and gain insights into new and emerging WH hazards that workers on the ground may face. As an alternative source of data, surveys could also help address the issue of under-reporting.

c. Enhancing and expanding monitoring programmes
To broaden the scope of exposure data collected, we will expand the range of WH hazards and workplaces covered by our exposure monitoring programmes.

For instance, new sectors covered under the WSH Act could be included in these programmes. We would also strengthen the capability of WH professionals such as occupational hygienists and designated factory doctors and other stakeholders involved in recognising, monitoring and evaluating WH issues.

d. Enhancing links between existing databases
To deepen our understanding of ODs and their contributing factors, we will work with other government agencies such as MOH to link their disease registers with data from our exposure monitoring programmes. This will facilitate the mitigation of WH risks upstream.

e. Strengthening links with WSH-related organisations
Strengthening our information sharing links with our foreign counterparts on WSH and international organisations such as the International Labour Organization (ILO) and WHO will enhance our ability to keep abreast of international developments on WSH, including the emergence of new WH hazards. Apart from participating in regional and international conferences, we will also explore joint collaborations with international and national WSH bodies.

The broad nature of WH issues, from exposure to chemical and biological agents, to air quality issues and work stress, is wide ranging. It requires close coordination both within the government and with the industry.

Strategy 3
Research and Standards Development

Along with monitoring and intelligence gathering, research and standards development can help inform our efforts to better tackle established WH hazards, as well as new and emerging ones. The traditional focus of WH research has been on deepening our understanding of ODs and their contributing factors and establishing the exposure level beyond which these factors are likely to result in disease. This research, which provides the basis for the setting of PELs, is still relevant, as it can help to calibrate our efforts to manage WH hazards.

However, our research efforts should also support our adoption of a more progressive and proactive approach to managing WH that places a greater emphasis on eliminating or incrementally reducing exposure to WH hazards to as low a level as possible, whether or not PELs have been established. This will entail close collaboration with industry to develop cost-effective tools and solutions to manage WH hazards.

a. **Established WH hazards**
   For this category of hazards, we will continue to review existing exposure standards to ensure that they remain in line with international best practices, and that they do not impose unreasonable compliance costs on industry and are relevant to the local workforce.

However, our research efforts on established WH hazards will move beyond setting appropriate exposure standards, to include working with industry to develop improved tools and processes to minimise exposure to workers.

b. **Emerging WH hazards**
   With the establishment of new growth sectors such as nanotechnology in Singapore, workplace hazards whose health effects and impact are still not well understood may emerge. For this category of hazards, our focus will be on working with industry and the relevant economic agencies such as Ministry of Trade and Industry (MTI) and Economic Development Board (EDB) to better understand the work processes and exposure situations related to such hazards. This will enable us to develop appropriate standards and control solutions that balance safety and health considerations with business concerns.

Strategy 4
Promotion of Good Practices

There are limitations to using a purely regulatory approach to tackle WH issues. For certain WH issues such as office ergonomics and indoor air quality and emerging health hazards where the causal link with OD incidence is not well-established, it is more appropriate to adopt a promotional approach encouraging the adoption of good WH practices.

The broad nature of WH issues, from exposure to chemical and biological agents, to air quality issues and work stress, is wide-ranging. It requires close coordination both within the government and with the industry. Within the government, we will strengthen collaboration between the various agencies such as MOM, MOH, HPB and NEA, as well as with industry bodies such as the WSH Council.

We should adopt holistic approach for our promotional efforts, to ensure that the messaging on WH is coherent and coordinated across the various agencies. Our outreach efforts will centre on:

a. **Creating a business case for employers**
   Creating a business case for strengthening the management of WH provides a powerful tool to encourage and motivate employers to improve WH standards. We can identify and highlight employers that have benefited from putting in place good WH practices. Employers should also be encouraged to adopt best practices developed by established WSH research centres locally and abroad. They can be further recognised for their efforts through the annual WSH Awards.

b. **Encouraging employees to take personal responsibility for their health at work**
   Parallel to our efforts to develop a business case for employers to strengthen the management of WH, we will reach out to workers to encourage them to take greater responsibility for their health. For instance, workers should be made aware of how certain ODs can be triggered by both work and non-work factors and they are taught to exercise due care both in and out of the workplace.

CONCLUSION

CONCLUSION

WH is an important factor for sustainable growth and development. At the national level, it can help preserve and enhance the productive capacity of the workforce. For employers and businesses, strong WH management can be a means of gaining a competitive edge. A healthy workplace gives both employees and investors confidence in the company. It can create business opportunities by sending a signal of an employer's commitment to sustainable and progressive business practices. It can also be a significant advantage in attracting and retaining talent and preserving the well-being of that talent.

This approach to improving WH management will complement the national WSH strategy, WSH 2018, and accelerate our progress towards a safety and healthy workplace for everyone in Singapore and making Singapore a country renowned for best practices in WSH.

APPENDIX**1**

WORKPLACE**HEALTH** STRATEGY

Overview of Workplace Health Strategy

4 STRATEGIES

Implementing Targeted Intervention Programmes	**Monitoring and Intelligence Gathering**	**Research and Standards Development**	**Promotion of Good Practices**
Areas of Work	**Areas of Work**	**Areas of Work**	**Areas of Work**
Four key programmes (i) noisy work (ii) hazardous chemicals (iii) asbestos (iv) confined space • Developing and prescribing appropriate standards • Providing compliance assistance • Deepening capabilities to monitor and control hazards • Educating and engaging employees • Targeted enforcement	• Engaging doctors • Exploring new mechanisms for data collection • Enhancing and expanding monitoring programmes • Enhancing links between existing databases • Strengthening links with WSH-related organisations	Established hazards • Review existing exposure standards • Develop improved tools and processes to minimise exposure to workers Emerging hazards • Working with industry and relevant economic agencies to develop appropriate standards and control solutions	• Holistic approach towards workplace health promotion • Creating a business case for employers • Encouraging employees to take personal responsibility for their health at work

APPENDIX**2**

WORKPLACE**HEALTH** **ACTION**PLANS

Strategy 1 — Implementing Targeted Intervention Programmes

No.	Action Plan
1.	**Noise Induced Deafness Prevention Programme (NIDPP)** The objective of the NID Prevention Programme is to reduce the incidence of NID. In addition to targeted enforcement, the other components of the programme will consist of: **Developing and prescribing appropriate standards** • Reviewing current legislative requirements on noise management to take into account international best practices. **Providing compliance assistance** • Providing technical assistance in the form of guidelines and checklists to employers in developing and implementing an effective Hearing Conservation Programme (HCP) to manage noise hazards. The programme would involve identifying noise hazards through noise monitoring, instituting appropriate noise control measures, raising awareness through health education, providing for hearing protectors and detecting early hearing loss through medical examinations. **Deepening capabilities to monitor and control hazards** • Reviewing and expanding the current coverage of workplaces and workers under monitoring. • Strengthening the capabilities of noise monitoring and/or noise control officers to identify noisy work processes and mitigate noise hazards. • Targeting occupiers and employers through seminars and dissemination of collaterals to raise awareness of workplace noise hazards and their prevention. **Educating and engaging employees** • Raising awareness of the hazards of noise and the preventive measures through WSH newsletters and other outreach activities such as dormitory roadshows.

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No.	Action Plan
2.	**Confined Space Management Programme** The programme aims to enhance confined space hazard management in targeted workplaces to prevent deaths from chemical poisoning and asphyxiation during confined space work and rescue operations. In addition to targeted enforcement, the other initiatives would include: **Developing and prescribing appropriate standards** • Introducing new regulations for confined space work to strengthen enforcement efforts. **Providing compliance assistance** • Providing technical assistance such as technical advisory and checklists to help the industry implement effective in-plant confined space programmes. The programmes will institute a systematic approach in managing confined space hazards through conducting proper risk assessments, setting up an effective entry-permit system, developing proper procedures for atmospheric testing and monitoring, ensuring adequate ventilation and emergency response. **Deepening capabilities to monitor and control hazards** • Encouraging companies to review and improve their standard operating procedures for entry into and working in confined spaces through engagement activities. • Sharing of accident case studies through internet platforms and seminars. **Educating and engaging employees** • Stronger emphasis on the dangers of confined spaces and the precautionary measures in current worker safety orientation/ instruction courses.
3.	**National Asbestos Control Programme** The programme aims to eliminate asbestos-related diseases over the long term. In addition to targeted enforcement, the initiatives would include: **Developing and prescribing appropriate standards** • Strengthening legislative requirements to put in place more stringent controls on asbestos management and asbestos removal works, for example, introducing a licensing scheme for asbestos removal contractors. **Providing compliance assistance** • Developing guidelines based on international best practices to aid industry in mitigating asbestos exposure risks. • Improving awareness of asbestos-related support services such as asbestos identification services and asbestos removal contractors through publicity during seminars and the Internet. **Deepening capabilities to monitor and control hazards** • Working with NEA to review and strengthen existing courses to focus on a competency-based approach towards ensuring proper asbestos management including asbestos identification. • Strengthening internal inspectors' capabilities to identify and address asbestos issues through training. • Raising awareness among building owners on the dangers of asbestos through dissemination of collaterals and WSH bulletin. **Educating and engaging employees** • Stronger emphasis on the hazards of asbestos and the preventive measures in the courses for supervisors in the construction and marine industries.

No.	Action Plan
4.	**Management of Hazardous Chemicals Programme** The programme aims to prevent and control chemical hazards and protect persons at work against such hazards. In addition to targeted enforcement, the other initiatives would include: **Developing and prescribing appropriate standards** • Reviewing existing requirements and introducing new regulations for chemical safety management to strengthen enforcement efforts. • Reviewing current exposure limits to be in line with international levels. • Reviewing WSH standards for hazards communication, classification and labelling of chemicals and preparation of Safety Data Sheets (SDS) to be in line with the Globally Harmonized System (GHS). • Reviewing existing guidelines on Prevention and Control of Chemical Hazards. • Reviewing guidelines on Statutory Medical Examinations for workers involved in the use and handling of hazardous chemicals. • Identifying major hazard factories, that is, workplaces with hazardous chemicals that pose severe consequences, for monitoring and surveillance including ensuring the proper implementation of occupational safety and health management systems. **Providing compliance assistance** • Conduct GHS briefing sessions for chemical manufacturers and suppliers. • Developing WSH guidance material for use and handling of high risk chemicals. • Reaching out to SMEs to raise awareness on chemical hazards through WSHC's outreach platforms, for example, seminars, WSH bulletins. **Deepening capabilities to monitor and control hazards** • Reviewing training courses on Management of Hazardous Substances and Air Sampling & Monitoring of Airborne Contaminants. • Expanding the current coverage of workplaces and workers under chemical monitoring. **Educating and engaging employees** • Stronger emphasis on hazard communication for workers who handle or use chemicals in the relevant training courses. • Developing educational leaflets on hazard communication.

Strategy 2 — Monitoring and Intelligence Gathering

No.	Action Plan
1.	**Engaging doctors to facilitate the diagnosis, management and reporting of work-related diseases** Initiatives could include: • Working with National University of Singapore (NUS) and MOH to equip medical students and trainee doctors with basic knowledge of WH issues. • Incorporating occupational health topics into the continuing medical education (CME) programme for designated factory doctors, primary health care physicians and specialists. • Establishing regular WH information sharing platforms such as seminars or workshops with doctors. • Initiating regular dialogues with relevant associations such as the Singapore Medical Association to exchange information on prevailing and emerging WH concerns. • Establishing information sharing platforms and electronic linkages to facilitate reporting by doctors. • Encouraging non-mandatory reporting of possible work-related diseases by doctors in MOM and MOH's outreach efforts. • Facilitating the establishment of occupational health services to which workers and companies can access in Singapore, thereby improving access to occupational health services and consolidate our presence in the various polyclinics and restructured hospitals. • Facilitating diagnosis of OD with clear and consistent guidelines to enable doctors to recognise ODs effectively.
2.	**Exploring new mechanisms for data collection** Initiatives could include: • Collecting comprehensive information on WH (e.g., exposures to risks and diseases) by leveraging on existing survey mechanisms or commissioning new industry-wide surveys to deepen our understanding of the nature and extent of WH risks faced by workers. Surveillance studies on specific industry and worker groups could be conducted to collect information on WH hazards in the workplace and to identify high risk industry and the hazards faced by specific worker groups. • Leveraging on the licensing database of other agencies to identify workplaces for inclusion in hygiene and medical monitoring. • Encouraging HR practitioners, WSH professionals, and employees to report WH problems and other poor practices through the MOM Safety Hotline or other channels.
3.	**Enhancing and expanding monitoring programmes** Initiatives could include: • Reviewing the current monitoring requirements and range of hazards and workplaces monitored to take into account international practices, local OD patterns and trends. New hazards and sectors may be included for monitoring to provide a more comprehensive overview of the state of WH in Singapore. This could entail expanding our mandatory reporting requirements by reviewing the list of the reportable ODs under the WSH Act. • Identifying new health indicators for more effective monitoring of employees by reviewing international practices and local conditions, and evaluating the cost-effectiveness of these indicators.

No.	Action Plan
4.	**Enhancing links between existing databases** Initiatives could include: • Working with MOH and HPB to facilitate sharing of information to identify possible work-related cancers and infectious diseases, including exploring possible linkages with relevant disease registers. Systems could be enhanced to link selected WH risk exposure (employees and workplaces) databases with relevant disease registries to identify trends and possible work-related disease clusters. • Improving the accessibility and user-friendliness of the electronic reporting system for doctors and others to report ODs.
5.	**Strengthening links with WSH-related organisations** Initiatives could include: • Inviting eminent experts on WH to share their experiences with the local industry. • Exploring joint collaborations with leading WH organisations in the areas of WH information sharing and dissemination. • Encouraging local WSH professional bodies to collaborate with regional and international counterparts so as to increase sharing in WH knowledge and experience.

Strategy 3 — Research and Standards Development

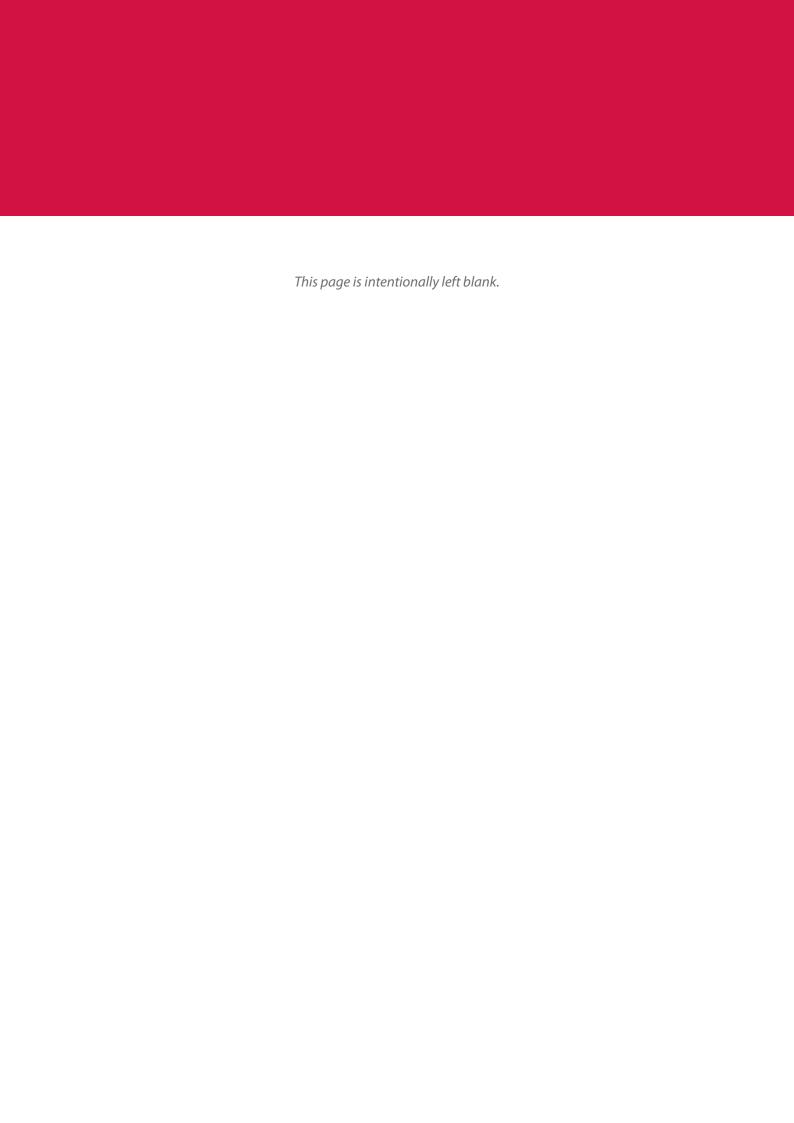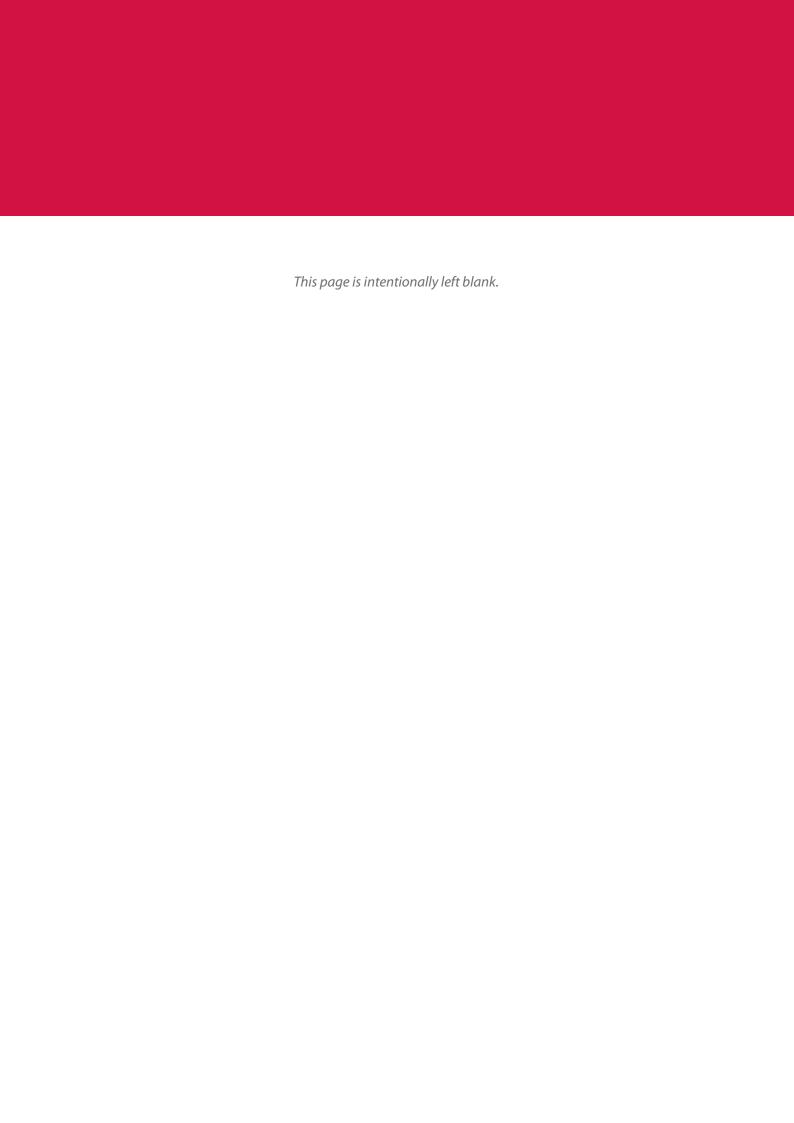| No.	Action Plan
1.	Initiatives could include: • Research into international best practices in existing and emerging WH issues, covering areas such as risk and hazard analysis, technical and systems risk controls. • Reviewing existing guidelines and codes of practices on measures for protecting workers against hazardous working conditions to ensure that they are in line with international best practices. • Initiating regular dialogue between researchers and other stakeholders such as government agencies and the industry associations to discuss WH research priorities and share research progress. • Developing a scheme or process to link companies looking for WH solutions with researchers who can conceptualise and test-bed ideas. • Publishing information on the research solutions on the Internet or disseminating information on the new tools through industry associations to increase awareness of new tools available to improve WH conditions. • Developing suitable platforms for researchers to network and interact with prominent international WH experts and local industry leaders and collaborate with international research centres. • Conducting regular site visits and dialogues with industry representatives from new growth areas and economic agencies to understand work processes and exposure situations. • Initiating regular publication of international scans of emerging WH issues and responses.

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Strategy 4 — Promotion of Good Practices

No.	Action Plan
1.	**Initiatives could include:**
	• Integration of promotional efforts by MOM, MOH, HPB, NEA and relevant industry bodies such as the WSH Council when WH issues are involved, such as publishing of joint guidelines, educational materials in various languages and holding joint seminars, programmes and campaigns. Such promotional efforts could target workplaces as well as educational institutions.
	• Promoting awareness of WH hazards and the measures that workers can take to protect themselves through various channels such as the WSH professionals, unions, employer organisations and Community Development Councils (CDCs).
	• Developing an online database of case studies illustrating good WH practices which can be shared with the industry.
	• Reviewing and expanding the WSH best practices award scheme to include a wider range of WH hazards (e.g., control of biological hazards) to encourage greater participation from the industry, particularly from the new sectors.
	• Increased sharing of WH topics through WSH alert and newsletters.
	• Providing assistance for SMEs to adopt control solutions to manage WH hazards, e.g., practical and low-cost solutions; sharing of best practices; financial funding schemes.
	• Encouraging companies to put in place various platforms to enhance their awareness of workplace health issues such as (i) orientation programmes for new staff; (ii) incorporating information on WH in companies' regular internal newsletters or HR announcements; and (iii) special programmes organised as part of staff welfare by leveraging on various promotional platforms.
	• Encouraging HR professionals and line supervisors to participate in training courses and educational seminars organised to strengthen their knowledge and awareness of WH issues.
	• Leveraging on the work of the National Tripartite Committee on WH to encouraging the adoption of a more holistic approach to WH. This is achieved by reviewing existing strategies and formulating new ones to make the workplace an important platform for enhancing the health and productivity of employees significantly.
	• Developing, in partnership with HPB and the industry, a Code of Practice on Workplace Health Promotion to provide practical guidance on implementation of health screening and health programmes in workplaces.

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