



50

—
ONE VISION
TRANSFORMING
SINGAPORE INTO A
NATION OF WSH
EXCELLENCE
—

YEARS

50 YEARS, ONE VISION: TRANSFORMING SINGAPORE INTO A NATION OF WSH EXCELLENCE



The National Archives of Singapore (NAS) is the official custodian of public records of national or historical significance including documents, photographs, plans, maps, oral histories and audio-visual recordings. The archives presented by NAS allow current and future generations to see, hear and remember the decisions, actions and memories of Singapore, its government and the people. Discover more archives at Archives Online: <http://www.nas.gov.sg/archivesonline/>.

Published by:
The Occupational Safety and Health Division (OSHD)
of the Ministry Of Manpower

Design and Production by Silicon+

No part of this book may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the written permission of the publisher. All rights reserved.

©Copyright 2016
The Occupational Safety and Health Division

Printed and bound in Singapore

ISBN: 978-981-09-8707-7

02	— Foreword by Prime Minister, Mr. Lee Hsien Loong
04	— Foreword by Minister for Manpower, Mr. Lim Swee Say
06	— Foreword by Commissioner for Workplace Safety and Health, Er. Ho Siong Hin
08	— Introduction
10	— A Young Nation Rises to Challenges (1965–1974)
32	— Growing to Meet Industry and Population Needs (1975–1984)
54	— Evolving Alongside the Industry (1985–1994)
74	— Staying Adaptive in the New Millennium (1995–2004)
98	— Reforming Our Workplace Safety and Health Landscape (2005–2014)
126	— Championing Workplace Safety and Health Standards on an International Scale (2015–Future)
138	— The Resounding Voices of WSH
148	— Closing Words
150	— Editorial Team
151	— Acknowledgements
152	— References



The Occupational Safety and Health Division (OSHD) is a division under the Ministry of Manpower that promotes Occupational Safety and Health at the national level. OSHD assists employers, employees and all other stakeholders to identify, assess, and manage Workplace Safety and Health risks so as to eliminate death, injury and ill-health. OSHD is also the World Health Organization Collaborating Centre for Occupational Health, and the International Labour Organization-CIS National Centre for Singapore.

FOREWORD BY PRIME MINISTER

In just 50 years, Singapore's economy has grown into one of the most developed and vibrant in the region. Singaporeans today can pursue fulfilling and rewarding careers in many industries – from banking and finance, retail and hospitality, and even energy and chemicals.

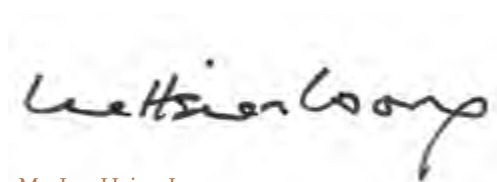
But economic progress must not come at the cost of our workers' safety and health. Over the past five decades, Workplace Safety and Health (WSH) in Singapore has improved in step with our economy. Our approach to safety and health, be it enforcement or engagement, has evolved over the years. Many of these changes were deliberate and planned; but a few, unfortunately, were spurred by tragic accidents.

This book tells the Singapore WSH journey. It is a journey made possible only because of a strong tripartite partnership – Government, employers and workers, coming together to keep every worker safe and healthy, so that we can all enjoy the fruits of our labour. We can celebrate the milestones in our journey. For example, we set up the industry-led WSH Council in 2008, which now plays a key role in promoting awareness of good WSH systems and practices, setting standards and building capabilities of companies. We established the WSH Institute in 2011. It provides

evidence for WSH policies, solutions for businesses to manage safety and health issues at their workplaces, as well as anticipate new and emerging WSH trends. These efforts have made our workplaces safer, and reduced workplace injuries and fatalities.

However, we are far from as good as we should be. Many other countries have better workplace safety records. Each time I read of a workplace accident, I ask myself whether that was preventable, and if so, why we allowed it to happen.

Even one injury is still one too many. I am glad that our tripartite partners have committed themselves to the Vision Zero movement. We must continue to improve WSH to safeguard the well-being of our workers. I urge everyone to do our part and strive towards a culture of prevention to make Vision Zero a reality for every worker, in every workplace.



Mr. Lee Hsien Loong
Prime Minister

“Economic progress must not come at the cost of our workers' safety and health. Over the past five decades, WSH in Singapore has improved in step with our economy and we must continue to improve WSH to safeguard the well-being of our workers.”



FOREWORD BY MINISTER FOR MANPOWER

Just over 10 years ago, Singapore had a high workplace fatality rate of 4.9 per 100,000 employed persons in 2004. With the strong support of our tripartite partners, we brought it down to 1.9 in 2015. It is a big improvement. However, the journey towards excellence in Workplace Safety and Health (WSH) will never end, because every life is precious, and every fatality is one too many.

We launched the Vision Zero movement in 2015, which aims to develop a mind set that all injuries and ill-health due to work can be prevented. Some had challenged us that Vision Zero is not realistic. They reminded us that zero fatality had not been and will never be achieved by any country, including Singapore, at the national level. They are probably correct. However, while it may not be possible at the national level, it is certainly possible to achieve Vision Zero at the enterprise level, even at the industry level, if we all work hard and are committed to the cause.

This is why we are determined to spread the Vision Zero movement on the ground. Imagine, if many more enterprises and industries can make their workplaces accident-free, the sum total of these Vision Zero enterprises and industries must mean

safer workplaces and fewer accidents at the national level, bringing us a step closer to this improbable vision of zero fatality in our nation.

This book tells the journey of safeguarding the lives of our workers over the last 50 years, and the story of the passionate people behind this shared cause. Their tireless efforts have ensured that fewer lives were lost at work and more workers were able to go home safely to their families at the end of each working day.

Let us build on the foundation of these pioneers, and strive for Vision Zero to create safer and healthier workplaces for all workers in Singapore.



Mr. Lim Swee Say
Minister for Manpower

“It is certainly possible to achieve Vision Zero at the enterprise level, even at the industry level, if we all work hard and are committed to the cause.”



FOREWORD BY COMMISSIONER FOR WORKPLACE SAFETY AND HEALTH

This commemorative book is aptly titled “50 Years, One Vision: Transforming Singapore Into a Nation of WSH Excellence”. The chapters capture the shared spirit of our Workplace Safety and Health (WSH) stalwarts and the rigorous journey they went through together. With their efforts, Singapore has emerged as a nation renowned for its best practices in WSH.

Over the years, we have improved our WSH performance. This was no mean feat; employers and unions worked as one to build WSH capabilities, enhance regulatory frameworks, and reach out to a range of stakeholders. The immense contributions from our colleagues and the unwavering support of our tripartite partners have made safe and healthy workplaces a reality today. This book is a fitting tribute to them.

But having come so far, we cannot afford to be complacent. We must look ahead and chart our future as we continue our pursuit of WSH excellence. Tomorrow’s WSH landscape, together with changing a demography and new technology, will pose a different set of risks to an ageing but higher skilled workforce.

The Ministry of Manpower’s Occupational Safety and Health Division (OSHD) has been at the forefront

of these changes, launching industry-driven initiatives such as Total WSH and Vision Zero, together with the WSH Council and the WSH Institute. These two bodies offer updated solutions while retaining expertise in addressing existing risks. Their partnerships with industries will continue to keep companies and WSH practitioners at the heart of our WSH developments, just like the last 50 years.

The journey towards WSH excellence has been a meaningful and worthwhile one for us at OSHD, and we will soldier on with relentless passion and determination. We hope our readers will enjoy this book as much as we enjoyed sharing our story. More importantly, we hope this book will provide the inspiration for others to write new chapters of our WSH story as we move towards the vision of “A Healthy Workforce in a Safe Workplace”.



Er. Ho Siong Hin
Commissioner for Workplace Safety and Health
and Divisional Director of the Occupational
Safety and Health Division

“The journey towards WSH excellence has been a meaningful and worthwhile one for us at OSHD, and we will soldier on with relentless passion and determination.”





TOP:
Samsui women laboured in construction sectors as early as the 1930s, contributing significantly to Singapore's building foundation.

INTRODUCTION

To a young nation, Workplace Safety and Health (WSH), or the area concerning the safety, health and welfare of workers, had not always been a priority. Indeed, the journey to inculcate WSH in Singapore was defined by long, winding turns and no shortage of challenges.

Preceding Singapore's independence, regulations for occupational safety and workmen's compensation had already been established as early as the 1920s. Modelled after British labour laws, these ordinances became the starting point in the nation's wide-ranging efforts to make safety and health integral to every workplace.

With every new decade thereafter, the WSH landscape grew by leaps and bounds, adapting to the challenges of each time period. New strategies and initiatives were drawn to transform Singapore into a Nation of WSH Excellence.

The road was a voyage of many threads. It was paved by a multitude of people, voices and perspectives. The first strides were made by the nation-builders who pioneered the foundations of industrial safety and health while the nation was still in its infancy.

They were not alone. Gradually, various governmental departments, industry stakeholders, educators, professional associations and public interest groups came to play their part. It was their combined efforts that allowed Singapore to achieve one WSH milestone after another.

It took a span of almost 50 years and a string of inter-departmental evolutions before our Division – the Occupational Safety and Health Division (OSHD) under the Ministry of Manpower – took its present form. Conceived at the turn of the millennium prior to the introduction of the new WSH framework in 2005, OSHD now promotes WSH at a national level. We work closely with employers, employees and other stakeholders to identify, assess and manage WSH risks, and push for higher WSH standards in Singapore.

On top of working together with all entities within the WSH ecosystem, we also adopted a systemic and proactive approach to achieve four strategic outcomes – reducing workplace fatality and injury rates, advancing safety and health as an integral part of business, developing Singapore into a centre of excellence for WSH and inculcating a progressive and pervasive safety and health culture in Singapore.

Kindling all these efforts are a deep and shared belief that WSH is not only advantageous, but also an essential partner in the growth of Singapore. If industrial development was the engine that propelled Singapore into an economic success story, WSH is the backbone that protects the nation's workers amidst the breakneck pace of growth that has turned humble shacks into skyscrapers and muddy roads into highways.

The social and economic benefits of advancing WSH are abundantly clear. From an economic standpoint, the widespread adoption of good WSH practices has resulted in greater productivity and fewer

man-hours lost to injuries. Maintaining an excellent safety record also reflects well on businesses and adds to their competitiveness.

Our success in reducing the number of industrial accidents has inspired confidence among investors and made Singapore a more attractive place for businesses. This in turn delivers better jobs and economic opportunities to the reach of workers in Singapore.

We also believe that a safer and healthier working environment is a social imperative. Every individual in our workforce deserves to work in a safe environment and in good health, and to return home to his or her waiting families every day, regardless of choice of industry or profession.

Thus, it falls on each and every person to ensure that safety and health remains the top priority at any given moment. Prime Minister Mr. Lee Hsien Loong eloquently conveyed this message at the launch of the National WSH Campaign 2013: "Let us maintain the focus on improving workplace safety. Human beings matter to us. Human capital is our only resource. Never trade off workers' safety for cost or for time. Because every life counts and every worker matters."

Today, this call to action has reverberated in many ways. We have reduced our fatality rate to 1.8 per 100,000 employed persons earlier in 2014. A growing number of companies have made it their mission to integrate WSH into every aspect of their business. More individuals have also come aboard to take up the role of safety champions and to inculcate a progressive safety culture within their own work environments. This is the hallmark of our achievement.

With such an extensive WSH history, we turn the clock to the early days of Singapore's independence in 1965 and retrace the many steps that have brought us to where we are today.

A YOUNG NATION RISES TO CHALLENGES

(1965–1974)





TOP & RIGHT:
Yang di-Pertuan Negara
Mr. Yusof Ishak, former Prime
Minister Mr. Lee Kuan Yew and
officials surveying the Jurong
Industrial Estate (top), followed
by the group touring the
Estate (right).

TAKING THE FIRST STRIDES AS A YOUNG ECONOMY

In the 1960s, Singapore embarked on its first chapter as an independent nation. Economic survival was an urgent imperative in these early years, and industrialisation its key engine. Then a third-world nation with a modest domestic capital and poor infrastructure, the young nation stood against staggering odds as it vied to become a self-sustaining economy. Providing enough jobs for the growing population became its chief challenge.

To provide more jobs and spur economic growth, the Government embarked on a massive industrialisation programme. The development plan that was drawn up sought to transform the nation into a thriving industrial hub. From the success of the first industrial estate in Jurong, the momentum of industrial progress grew rapidly. More and bigger factories were built,

ushering rapid advances of modern technology and drawing many workers to labour-driven industrial jobs.

“Opportunities were plenty, especially in the oil and gas and marine sectors. There was never a lull moment. Welders, fitters and those involved in engineering works were in high demand,” recalls Mr. Leong Yee Hong, a pioneering businessman who took advantage of the vibrant economic climate to start his own business.

While the rapid pace of industrialisation helped drive the economy forward, it also gave rise to new challenges, particularly in the area of Workplace Safety and Health (WSH).

“

In the 1960s, workers and bosses [paid] little attention to health and safety issues as these cost money and time. People were working at elevated heights without proper safety gear. Tank erectors, riggers, welders were walking [or] working on roof rafters of storage tanks with canvas shoes and without harnesses or safety belts. They wore straw hats rather than hard hats. They felt the safety gears were more of a nuisance and restricted their abilities [or] movements.

”

Mr. Leong Yee Hong,
former Chairman and
Managing Director,
Meng Fatt Company Pte. Ltd.

RESPONDING TO THE WARNING SIGNS OF THE INDUSTRY

Some of these early challenges stemmed from the fact that WSH was not yet widely known. Many workers were unaware that they were engaging in unsafe working practices. The advancement of technologies employed in factories during this period also presented a steep learning curve. Workers who lacked prior training were left unequipped to operate sophisticated machineries and suffered serious accidents as a result. Between 1963 and 1970, the number of fatalities increased by about three-fold while the number of accidents increased nearly seven-fold.

In addition to hazardous working conditions, unhealthy working environments in these early days also took a serious toll on the labourers who spent most of their days toiling in enclosed spaces such as mining quarries or underground construction worksites. Respiratory occupational diseases such as silicosis, later dubbed the “number one industrial killer” in Singapore, became increasingly prevalent. In 1965, a radiological survey of 1,188 granite quarry workers revealed that 8 per cent of workers surveyed had silicosis.

This finding, as well as other industrial health issues that had begun to crop up at the time, prompted the Government to look into the matter more closely.



RIGHT:
Granite quarries were a common sight in the 1960s – 1990s.

RALLYING THE SUPPORT OF WSH AFFILIATES

In the following years, the beginnings of WSH in Singapore began to take shape, as different institutions came together to pave the way for better industrial safety and health practices.

In March 1966, the Government called upon the services of an industrial health expert from the International Labour Organization (ILO) to help conduct a study on occupational health problems in Singapore. A few months later, factory inspectors from the Ministry of Labour (MOL), along with health officers from the Ministry of Health (MOH), conducted factory visits during which they provided factory managers with industrial health information and held safety workshops. Following the factory visits, a mass X-ray examination of granite quarry workers in Singapore was organised with the aim of detecting cases of silicosis.

While there was a greater emphasis on monitoring and enforcement of laws in these industrial years, the Government also understood that engaging and educating the workforce was just as important. Hence, factories were encouraged to display safety posters, while bigger factories were required to set up safety committees in their factories.



TOP: Former Minister for the Interior and Defence, Dr. Goh Keng Swee, inaugurating the National Safety First Council at Victoria Theatre.

Furthering the engagement effort, the National Safety First Council convened the first-ever public seminar on occupational safety in Singapore, marking a milestone in Singapore's WSH history. Inaugurated on 1 July 1966, the Council was first set up to focus only on road safety, but had since expanded to include all manners of safety promotion, including occupational safety.

Established in the same year, the Society of Occupational Medicine also proved to be a major ally and advocate in the push for greater occupational health standards. Through its public meetings, seminars, talks, conferences and introductory courses in occupational health, the Society helped educate the general public and industry members on the importance of adhering to health practices at workplaces.

In 1969, the push toward safer and healthier working conditions gained further momentum when the Occupational Safety and Health Committee was formed in the National Trades Union Congress. Led by Members of Parliament, the Committee took part in public discussions and provided in-house training courses for union leaders.

Their ardent participation helped galvanise a greater sense of consciousness of WSH among the public and general body of workers.

“

It's important because once you form [the Industrial Health Unit], there's a focus and concern about the industrial health problems in the country. So the first important thing on my part was to get the organisation going. You must start with the law [...] My first duty was to revise the Factories Act [to ensure it was] more up to date for that time. Once you do the legal framework, then okay – staff was important. You needed nurses, inspectors, engineers and the clerical staff. The beginning was slow, but we started to build up.”

”

Dr. Chew Pin Kee, former Chief Medical Adviser of the Industrial Health Unit, Ministry of Labour



TOP: Former Minister for Labour, Mr. Jek Yeun Thing, opening the first Industrial Safety Seminar at the Mobil Oil Refinery in Jurong.

ASSEMBLING A CAPABLE INDUSTRIAL HEALTH TEAM

With so much work ahead and to streamline WSH-related efforts between different departments and stakeholders, MOL decided that a specialised department was needed.

The Industrial Health Unit (IHU) was set up in conjunction with MOH in 1967. At the helm of this pioneering team was Dr. Chew Pin Kee, who headed the Unit on a part-time basis before taking a full-time role as Chief Medical Adviser.

Working from its office at Halifax Road, IHU conducted investigations relating to reportable occupational diseases, provided advice on health and environmental problems to factory management, and engaged in training and research. Under the leadership of Dr. Chew, the Unit identified silicosis, Noise-induced

Deafness, industrial dermatitis and compressed air illness as major industrial illnesses of concern.

During the first half of 1968, Dr. Cressall, an occupational health specialist assigned from ILO, also assisted IHU in conducting surveys to assess the occupational health conditions in Singapore. Following up on previous studies on silicosis, the Unit also conducted a survey of 27 granite quarries in Singapore. The silicate dust count in these surveyed sites was found to be much higher than the maximum permissible exposure limits set by international standards. To mitigate the issue, the granite quarry occupiers were instructed to provide means to suppress dust in these working sites.

Two years later, on 15 December 1971, MOL took over IHU from MOH, consolidating the Government's occupational safety and health efforts under one Ministry.

BOTTOM: Dr. Goh Keng Swee receiving a silk banner at the inauguration ceremony of the National Safety First Council.



PIONEER PROFILE

Stories of the Early Years: Hurdles, Camaraderie and the Labours of Love

MR. CHOY CHAN PONG

“Being young, we were fearless. We believed we could do everything and solve every problem.”

*Former Director of the Shipyards
Branch, Ministry of Labour*



Mr. Choy Chan Pong looks back at his time in the Ministry with much fondness. His journey began in 1972, when Mr. Choy joined the Ministry as a mechanical engineer, working as a team alongside other young engineers. Then called the Factory Inspectorate, the team was newly set up by the Ministry to focus on checking and regulating worksites with occupational hazards.

As the nation's early gears of industrialisation began to pick up momentum in the 70s, the team had to grapple with many things unknown to them. “We had to learn about silicosis, asbestosis – all these terms, we learnt from scratch,” Mr. Choy says. The Factory Inspectorate also took it upon themselves to understand the different manufacturing industries – all of which were new grounds to them – in a comprehensive manner.

Mr. Choy alludes to the period as one that was both exciting and dynamic. “Being young, we were fearless. We believed we could do everything and solve every problem.”

This can-do spirit soon became a shared culture amongst the team. Mr. Choy described the rapport between him and his colleagues as one that was tight-knit and highly comradely. “I always make the effort to have lunch together. We would talk about the issues we had and the solutions.” The team's closeness extended beyond office hours – Mr. Choy recalls many a day when they could be found at the office up till 8 o'clock playing carom. “To us then, the Ministry of Labour was like our second home.”

“We [would] just lose track of time. We could be playing carom or badminton, go for a run or even a swim. So, when you have this kind of seamless work-life balance [...] whether it's work [or] play – you don't feel the stress. You can take on any problem.”

However, it was not all fun and games. The early industrialisation days saw newspapers headlined with tragedies that resulted in numerous fatalities, especially in the shipyards. It was a challenge for the hard-working pioneers to keep up with and respond to each case quickly, always ready for the next move.

“There is a lot of pressure in doing a lot of things very quickly – to understand the shipyards, to intensify enforcement [...] because while you try to improve things, it takes time. You can introduce a procedure but the workers still do not obey it. And the system can still fail. It involves training, promotion, persuasion, coercion and finally, enforcement before we progressed,” Mr. Choy contends.

Amidst the hustle and bustle of work, a surprising turn of events also came in the form of a serendipitous encounter for Mr. Choy. It was at the Ministry of Labour (MOL) that Mr. Choy met his wife, now Mrs. Maria Choy, the Head of Workers' Compensation at the time. The two had the chance to work together in the Recreational Committee at MOL.

“I married my wife at the Ministry of Labour – one of the romantic successes,” he says with a twinkle in his eye. Talk about being married to one's work!

Mr. Choy left the Occupational Safety and Health Division to take on a completely new challenge at the Urban Redevelopment Authority (URA) in 1990. Once again, he plunged head-on into a new area of work – government land sales and property market policy making. He retired in 2000, but continues to work as a Senior Adviser in URA. His main focus is in documenting all the experience and knowledge that URA has accumulated over the decades for future learning and reference.

IMPROVING THROUGH REGULATIONS

The effort to curb industrial illnesses, with silicosis being one particular focus, began to make inroads as more industrial health regulations came into force.

The enactment of the Sand and Granite Quarries Regulations in 1971 played a pivotal role in combating silicosis. It required licensees of any quarry to install dust extraction systems, provide dust masks and organise annual chest X-ray examinations for all quarry workers. Mandating industry-sponsored chest X-ray examinations was a big step in protecting workers' health as it allowed early detection of silicosis before the affected worker's health deteriorated, without burdening workers with the cost of these medical screenings. In 1972, silicosis was also declared

a compensable occupational disease under the Workmen's Compensation Act.

Another key legislation, enacted in 1974, also proved to be an effective measure against silicosis. The Abrasive Blasting Regulations prohibited the use of sand as an abrasive for blasting. Since its enactment, there has been only very few cases of silicosis among sandblasters in Singapore.

A slew of measures aimed to protect the safety and health of workers in other ways were also released. One such measure was the Building Operations and Works of Engineering Construction Regulations introduced in 1971. Focusing on the health, safety and welfare of construction industry workers, the legislation provided MOL with the framework to regulate unsafe work activities that led to high accident rates between 1963 and 1970.

BOTTOM:
Unsafe working conditions in the 1960s often led to dangerous accidents at worksites.



LEFT:
The shipyard industry drew the highest accident rates in the 1970s, prompting increased safety measures, legislation and public education.

“
During our time, the 1970s and 1980s, employers were not so safety conscious, not so aware. Everything was new. I mean, the shipbuilding industry just boomed like that [...] It was a very rapid pace of industrialisation. You superimpose that with the transitional work site, the height, the heavy equipment. So it was just ripe for big accidents to happen. And workers were also not trained.

Everything [was also done] in a hurry. The shipyards [were] under pressure all the time to work. I mean, my father was a shipyard worker when I was a boy. Very often, he came home at 6 a.m. [...] He worked in a tanker overnight then came back in the morning. So the pressure of work, the tight deadline, the ad hoc nature of work – all these [added together], then you will have a very unsafe industry.

”
Mr. Choy Chan Pong,
former Director of the Shipyards
Branch, Ministry of Labour

“
I am of the view that programmes on safety and health in shipyards did not keep pace with the rapid growth of the industry in the 60s and 70s. Neither were they adequate in the face of pressure imposed by contracts to complete goals quickly. Priority [at that time] was given to skills development and productivity.

In the industry where activities were diversified and wide-ranging, and where hot works in potentially explosive and flammable environment [were] a normal daily operation, shipyards in fact faced a deterioration in occupational safety and health conditions because of the rapid expansion of the industry, influx of new workers, and new processes and activities.

”
Prof. Ang How Ghee, former Member of the Commission of Inquiry of Fatal Accidents in Shipyard and Chairman of the Committee on Accident Prevention in the Shipbuilding and Repairing Industry, Ministry of Labour

TAKING A CLOSER LOOK AT SINGAPORE'S SHIPYARD INDUSTRY

While regulations and enforcement provided the necessary momentum for change, the Government knew that Singapore's WSH journey had barely begun. Many aspects of Singapore's industrial safety had yet to be addressed.

To gain more insight on these matters and decide the way forward, the Study Group on Accident Prevention in Shipyards was convened in 1973. Spanning two years, the study culminated with a four-volume report which was submitted to MOL in March 1975.

The report revealed that between 1971 and 1975, occupational accident levels were highest in the shipyard industry since 1971. It also recommended, amongst other things, more preventive safety measures, further safety legislation, a code of practice, safety education and a standardised accident reporting system in shipyards.

An Advisory Committee was subsequently formed in May 1975 to advise and assist in the implementation of the report.



PIONEER PROFILE

The Humble Visionary Who Started It All

Still waters run deep. No man embodies this proverb better than Dr. Chew Pin Kee.

Even as he sits down to recount his role as an industrial health pioneer, the affable Dr. Chew modestly deflects the spotlight away from his own achievements. For Dr. Chew, the work has always been more important than any accolade received.

And his legacy speaks for itself. Without Dr. Chew's tenacious efforts, Singapore's first chapter in industrial health would never have been written. This chapter started in the early 1960s, when the birth and rise of industrialisation in Singapore became the key driver in the growing concern for workers' well-being.

Those years were certainly not easy for Singapore's working population. This was especially true for blue-collar workers who had to cope with unsafe or unsanitary working conditions. As industry development was still new back then, there was almost no system to regulate workplace practices, and it was the workers who suffered the cost of this neglect.

The Ministry of Health (MOH) decided then that something needed to be done. However, there was one problem: the field of industrial health was still virtually unknown in Singapore.

As part of the Public Health Division, Dr. Chew was sent to the United Kingdom to study Occupational Medicine. Upon his return, he began to look into the matter of industrial health with MOH. However, it was apparent that the enormous work at hand could not be undertaken by a single person. The idea of creating an Industrial Health Unit (IHU) within MOH was then initiated.

Henceforth, the responsibility of leading this new unit fell on Dr. Chew's shoulders. From the very first day, Dr. Chew was keenly aware of the challenges to come. But he was equally optimistic of the possibilities that lay ahead.

The first hurdle, Dr. Chew recounts, was putting together the right team. "The beginning was slow. There were less than 10 people in the unit, but gradually we started to build up."

His determination paid off. Under the leadership of Dr. Chew, IHU managed to tackle the more pressing issues immediately. Addressing silicosis was one of their first priorities.

He recalls leading the team to conduct X-ray examinations for Singapore's granite quarry workers. "We used a mobile X-ray van to go to the granite quarries because it was very difficult for the workers to come out and go to Tan Tock Seng Hospital," explains Dr. Chew.

The partnership with Tan Tock Seng Hospital was something Dr. Chew welcomed with enthusiasm. "The hospital's chest physicians were very interested in learning more about these diseases. They also got the necessary treatment and facilities for follow-ups."

His open-mindedness proved crucial in 1971, when the Unit was transferred to its new home under the Ministry of Labour (MOL). For Dr. Chew, the transition was significant.

Having worked with MOH for a good part of his career, he had to quickly adapt to a new working environment. Being the leader, he needed to ensure that his team was able to adjust to their new 'home' smoothly.

In this time of rapid change, Dr. Chew remained a perceptive thinker, keeping his eyes on the big picture. Rather than dwelling on the challenges, he saw the move to MOL as a golden opportunity, providing the Unit with the capacity to carry out their role more effectively.

Looking back, what would he consider as his proudest achievements? Dr. Chew ponders this question with an earnest smile. "Well, I think the most important thing is I have trained doctors, nurses, inspectors, and the staff. That's what I think is important. Of course I also laid the infrastructure and laws."

Dr. Chew also beams with pride as he recalled the book that he had written during his time with the Unit – *A Guide to the Assessment of Traumatic Injuries for Workmen's Compensation*. "At the time, we had the law set up. However, there was no guide," Dr. Chew says. The development of the guide was of paramount importance to him. "I will always remember what my teacher told me: You have to set the standards first."

Speaking of the state of WSH in Singapore today, Dr. Chew expresses his delight at the progress that has been made. However, true to his forward-looking mindset, he prefers to set his sights on the future. "The new generation will face different challenges but they must continue to improve the health of workers," he says.

"Train staff to become skilled. Public education is also important to build awareness. Provide the services. Lastly, there is research. You must track the progress in stages; then if there is a lag, you will know why."

More than thirty years after leaving MOL in 1980, Dr. Chew remains active. He now juggles his time between helping out at his eldest son's family clinic, and studying and preparing for Sunday's bible study class at his church. Together with his wife, he also enjoys occasional travels, and minding and caring for their three grandchildren.

DR. CHEW PIN KEE

"The new generation will face different challenges but they must continue to improve the health of workers."

Former Chief Medical Adviser of the Industrial Health Unit, Ministry of Labour



INCULCATING SHARED OWNERSHIP AND BUILDING CAPABILITIES

The beginning of the 1970s also marked a gradual shift towards a more nuanced approach to inculcating WSH. There was greater emphasis on shared ownership, self-regulation and empowering all stakeholders to take part in the WSH journey.

One example was the launch of the first National Industrial Safety & Health Campaign in 1972, followed by a series of targeted campaigns for critical, injury-prone industries such as construction and shipbuilding and repairing. A campaign on silicosis with mobile exhibits was also launched in 1973 to educate workers and factory operators on the disease and what could be done to prevent it.

MOL also produced a monthly newsletter, *The New Worker*, to help workers stay in touch with the latest in occupational safety and health news.

The Ministry also tapped on the expert insights of an ILO representative to design a formal training programme to groom people to be safety officers champions in the industry. The Safety Officers Training Course (SOTC) was officially launched in 1973.

Over the years, the initiative bore fruition as more companies saw the benefits of safety training. Subsequently, SOTC evolved into a relevant avenue for the training of WSH professionals today.



Capability building is the foundation of WSH in all workplaces. It is unlikely to achieve a high standard of WSH in all workplaces in Singapore without building up a sound and solid foundation.

Every individual in the industry – the employers, the workforce and the governing authority – must be well-equipped with the required WSH capabilities such as knowledge, positive mindset, good safety behaviour and practices, [and] sound technical knowhow in WSH, through proper training and well-designed continuous WSH education programmes.



Mr. Ang Tick Bing, former Administrator of the Safety Officer Training Course, Ministry of Labour

LEFT: Former Minister of State for Labour, Mr. Sia Kah Hui, at the opening of the Industrial Safety Exhibition in 1972.



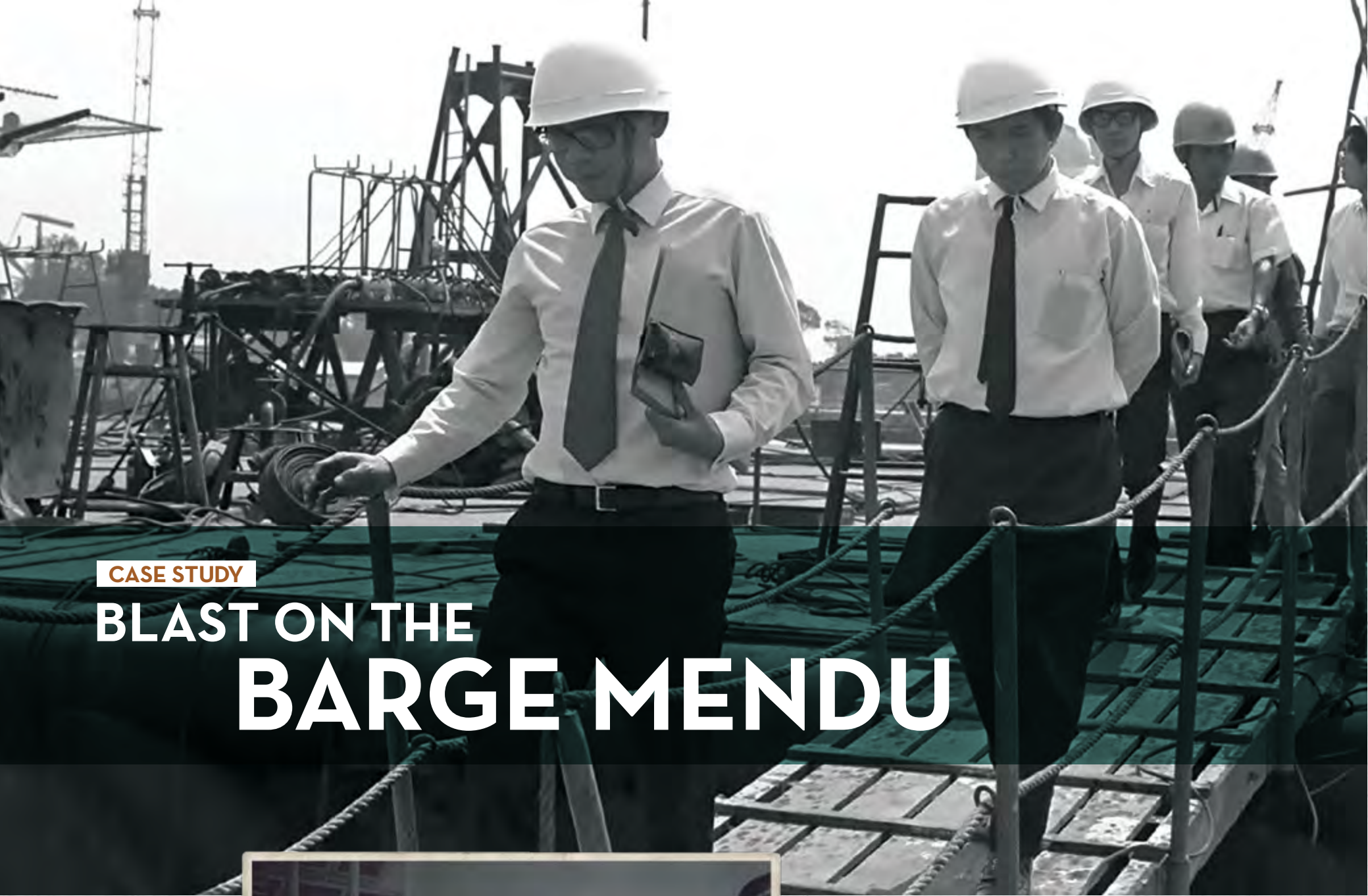
CONTINUING A DECADE-LONG JOURNEY

MOL's multi-front efforts were relatively successful. Dust levels in granite quarries and silicosis cases in Singapore fell sharply after 1973. Furthermore, IHU recorded a 35 per cent decrease in notifiable occupational diseases in 1977. More industry stakeholders had taken up greater responsibilities to inculcate safety culture among their peers.

By the end of Singapore's first decade of independence, the foundation of occupational safety and health in Singapore had already been firmly put in place. However, high industrial accident numbers served as a powerful reminder that there was much work left to do and plenty of improvements to be made.

TOP: Former Minister for Labour, Mr. Ong Pang Boon, visits the exhibition at the launch of the Building Construction Safety and Health Campaign at the Subordinate Law Court Complex Worksite in 1974.

BOTTOM: The exhibition received an enthusiastic response, drawing huge crowds to its premises.



CASE STUDY

BLAST ON THE BARGE MENDU



TOP: Five days after the tragic blast on Mendu, First Magistrate Mr. Tan Teow Yeow leads his inquiry team at Jurong Shipyard to investigate the explosion.

RIGHT: Extending sympathies: Former Minister for Labour, Mr. Ong Pang Boon, visits injured workers of the blast at Outram Hospital.

An ordinary day at Jurong Shipyard was rocked by a catastrophic blast on the vessel Mendu. With five men killed and three seriously injured, the incident was a wake-up call for the shipyard industry.

On the morning of 5 March 1972, 10 workers were aboard the unfinished vessel Mendu, working on a series of painting and construction operations. Painting works in particular were being carried out at the bottom deck of the ship. The paint's highly flammable vapour and the lack of ventilation created a highly volatile environment, akin to that of a gas chamber.



TOP: The inquiry into the Mendu blast revealed various levels of negligence.



RIGHT: An official of Jurong Shipyard presenting a donation to families of the victims.

However, a trainee hull fitter who was working near the opening of the lower deck was unaware of the danger brewing beneath him. The risk of combustion did not enter his mind as he lit his arc welder, igniting an explosion that ripped through the bottom deck. The catastrophic incident resulted in five deaths (including that of the hull fitter) and three other seriously injured workers.

In the wake of the accident, a Committee of Inquiry was immediately formed to ascertain the cause of the accident and make recommendations to prevent similar incidents. The three-man inquiry panel was helmed by the First Magistrate, Mr. Tan Teow Yeow and two other assessors, Dr. Lee Kum Tatt and Dr. Pang Eng Fong.

Over a span of three weeks, the Committee found a series of probable causes that contributed to the blast. The first cause was attributed to the fact that no checks were carried out for flammable substances on deck before welding works were instructed.

The lack of communication between various parties – namely, the yard manager, workmen, supervisors, foremen and section chiefs – was also identified as a contributing cause. As a safety measure, no welding work was supposed to be carried out simultaneously

with painting work. However, due to the lack of work coordination, the hull fitter had been given instructions to do welding work, which resulted in the blast.

Lastly, the Committee was alarmed to find that no ventilation had been provided for where the painting works were being carried out.

Sections 14 and 35(3) of the Factories Act (Cap. 123, 1970 Ed.) were found to be breached. The former section required all workrooms onboard the vessel to be well-ventilated to prevent the build-up of vapour or other gases in the work area. The second section required that all explosive or flammable substances were to be rendered non-flammable before any welding operations were carried out. Otherwise, these substances could not be brought onto a ship if welding operations were taking place.

Subsequently, the shipyard was found guilty of negligence and fined a sum of S\$900 on account of breaching the Factories Act.

The danger posed by flammable substances and hot work sparked another tragedy two years later, when the bulk vessel Iron Parkgate was engulfed in flames due to regrettable acts of negligence.

CASE STUDY

A TRAGEDY AT THE GRAVING DOCK



LEFT:
One of the perished victims of the deadly fire being carried away.

RIGHT:
The engine room aboard Iron Parkgate where the flash fire occurred.

Thirteen lives were lost after shipyard workers failed to observe safety measures aboard the bulk vessel Iron Parkgate. It remains as one of the worst disasters in Singapore's early industrialisation period.

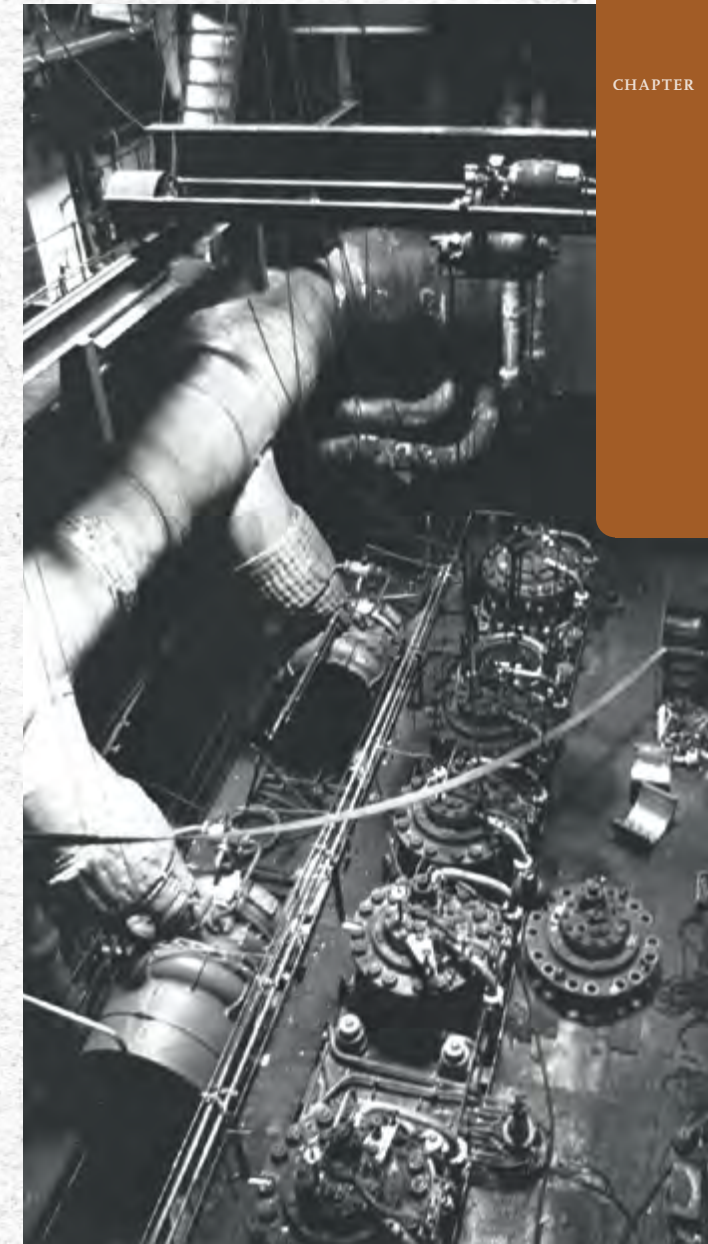
10 December 1974 will forever be remembered as a day of tragedy by the families of 14 workers after a series of negligent acts ignited a fire aboard Iron Parkgate – a bulk vessel undergoing dry docking survey and repair works at Jurong Shipyard. The incident took the lives of 13 workers and left another victim with critical injuries, shocking many in the industry.

In the aftermath of the incident, a Committee of Inquiry was appointed to inquire into the accident. Headed by district judge Mr. S. Chandra Mohan, the Committee submitted an 11-page report to then Minister for Labour, Mr. Ong Pang Boon. The findings determined that the fire was due to an ignition of flammable oil in the engine room, as opposed to an electrical fault. The shipyard was found to have violated Sections 14 and 35(4) of the Factories Act, No. 6 of 1973, as it failed to maintain adequate ventilation and to remove the flammable oil in the engine room while welding work was carried out.

A machinery engineer in charge of works done to the vessel was also found guilty of negligence as he had not ensured that a fireman was stationed at the work area while hot work was in progress, a requirement under the Act. Furthermore, despite the presence of flammable oil in the vessel's bilges, no steps were taken to remove the oil or render it non-flammable before the welding operations commenced. Had all these safety precautions been followed, the oil would not have been ignited and the accident would have been prevented.

While sharing their findings, the Committee pointed out the importance of maintaining a vigilant attitude to work safety. The Committee found that small fires had previously broken out aboard the vessel, and were quickly put out without any casualties. This might have led those working in the shipyard to underestimate the potential impact of such an occurrence.

In its report, the Committee proposed several recommendations. Enforcement of provisions contained in the Factories Act needed to be more stringent. Before hot work was carried out in any ship, the officer-in-charge must provide those supervising safety with a copy of the daily work schedule, as well as information on the nature and



location of the hot work. Adequate ventilation and safety measures should also be made a priority, and a fireman or workers trained in fire safety had to be present during the duration of the work. Educating workers was also seen as a way forward.

Heeding the Committee's recommendations, campaigns and educational programmes were subsequently introduced for workers of all levels, especially in the industries most vulnerable to injuries, namely construction and shipbuilding and repairing.

FEATURE

Establishing the Path of Worker's Protection and Compensation

From raising standards to looking after the safety and health aspects of every worker, regulations have always been an integral part of Singapore's WSH development. The genesis of these regulations can be traced back to the 1920s, when laws were established to protect workers in their course of employment, and provide them or their dependents with due compensation in the event of a work-related injury or death.

Over the decades, both the WSH Act and the Work Injury Compensation Act (WICA) have provided much headway in the course of its evolution. The laws are constantly reviewed, discussed and revised to service the nation's continually changing vocational environment. Today, these regulations continue to endorse Singapore's commitment to safeguard workers and their rights to a safe and healthy workplace.

WORKERS' PROTECTION

1920

THE MACHINERY ORDINANCE AND PROTECTION OF WORKERS ORDINANCE



- Enacted to safeguard the welfare of workers.
- However, the law became inadequate as factory working conditions changed with the advent of new technology.

1960

THE FACTORIES ORDINANCE



- Modelled after the Factories Act of 1937 and 1948 of the United Kingdom.
- Followed the recommendations set by the International Labour Organization convention, but with changes to suit Singapore's factory conditions.

1973

THE FACTORIES ACT



- Contained provisions to allow authorities to combat industrial pollution.
- Certain classes of factories were required to employ full-time safety officers to exercise general supervision and promote safe work conduct.
- Factories employing 50 or more persons were required to set up safety committees to promote safety, health and welfare in their establishments.

2006

THE WSH ACT



- The WSH Act moves away from taking a prescriptive stance under the former legislation and introduces a performance-based regime. It has four key features:
1. It places the responsibility for workplace safety on all stakeholders along lines of control at the workplace.
 2. It focuses on WSH systems and outcomes, rather than compliance.
 3. It facilitates effective enforcement through the issuance of remedial orders.
 4. It imposes higher penalties for non-compliance and risky behaviour.

WORKERS' COMPENSATION

1932



THE WORKMEN'S COMPENSATION ORDINANCE

Provided payment of compensation to injured workmen or, in the event of their death, to their dependents for personal injury arising out of or in the course of employment.

1955



THE WORKMEN'S COMPENSATION ORDINANCE (AMENDED)

Employers could be prosecuted for not complying with the provisions, such as failing to send reports of accidents to their workmen within 10 days of their occurrence or neglecting to appear before the Commissioner on being summoned for an enquiry.

1971



THE WORKMEN'S COMPENSATION ACT

- Increased the quantum of workmen's compensation payable three-fold.
- Provided for a more detailed list of injuries for a more accurate assessment of compensation.
- Included silicosis and asbestosis as compensable occupational diseases.
- Provided for the establishment of medical boards and panels to determine matters relating to medical evidence.

1975



THE WORKMEN'S COMPENSATION ACT (AMENDED)

- Streamlined administration and enforcement.
- Accelerated payment to injured workmen.
- Increased compensation amounts.
- Included Noise-induced Deafness and industrial dermatitis as notifiable and compensable diseases.

2008



THE WORK INJURY COMPENSATION ACT

- Extended coverage to almost all employees*.
- Increased compensation limit.
- Enhanced system to provide a quicker and more efficient way to process claims.
- Offered workers a capped compensation without involving a long drawn civil suit.

2012



THE WORK INJURY COMPENSATION ACT (AMENDED)

- Increased compensation limits to account for the change in nominal median wages and healthcare costs.
- Expanded the scope of compensable diseases.

* Officers from the Singapore Armed Forces, Home Team and domestic workers are excluded from coverage of WICA.

While the journey towards a safer and healthier workforce was still in its infancy, the early milestones and successes showed that the Government was on the right track.

1966

- The Ministry of Labour invited an expert from the International Labour Organization to conduct a study on occupational health problems in Singapore.
- The National Safety First Council was founded by then Interior and Defence Minister Dr. Goh Keng Swee.
- The first-ever public seminar on industrial safety was held by the National Safety First Council.
- The Society of Occupational Medicine was established.
- Accompanied by a health officer from the Ministry of Health, the Factory Inspectors conducted factory visits, provided advice on industrial health to factory occupiers and conducted a mass X-ray examination of granite quarry workers.



1968

- The Industrial Health Unit looked into various industrial hazards such as silicosis, asbestosis and dermatitis.
- Dr. Cressall from the International Labour Organization conducted surveys to assess the occupational health conditions in Singapore.
- After surveying 27 granite quarries in Singapore, the Industrial Health Unit discovered that the dust count in these quarries was in excess of permissible limits set by international standards. Afterwards, granite occupiers were instructed to control their dust levels.

1972

- The National Productivity Board was founded under the purview of the Ministry of Labour.
- The first National Industrial Safety & Health campaign took off. More campaigns followed suit, each focused on a specific industry.

1973

- The launch of the Safety Officers Training Course marked the advent of formal WSH training in Singapore.
- *The New Worker*, a monthly newsletter produced by the Ministry of Labour, was published for the first time.
- A campaign on silicosis, which included a mobile exhibition visit to 25 quarries, was launched.
- The Factories Act 1973 was enacted to raise the standards of safety, health and welfare among industrial workers.

1960

- The Factories Ordinance, which was introduced in the Legislative Assembly in 1958, came into effect.

1967

- An International Labour Organization expert in Industrial Health assisted the Ministry of Labour in organising an Occupational Health Service for six months.
- The Industrial Health Unit was established under the Ministry of Health.

1971

- The Building Operation and Works of Engineering Construction Regulations and Sand and Granite Quarries Regulations were enacted.

- The Workmen's Compensation Ordinance was amended and renamed the Workmen's Compensation Act 1971.
- The Ministry of Labour took over the Industrial Health Unit from the Ministry of Health on 15 December 1971.

1974

- The Abrasive Blasting Regulations was enacted, effectively nipping silicosis cases among industrial sandblasters.

GROWING TO MEET INDUSTRY AND POPULATION NEEDS

(1975-1984)





TOP:
Balloons being released at Sembawang Shipyard's new S\$50 million 400,000-ton dry dock during its official opening by former Prime Minister Mr. Lee Kuan Yew.

CONTENDING WITH INDUSTRIAL PROGRESS

Singapore's first decade of independence saw the city-state changing rapidly. Modern housing flats replaced unhygienic squatter settlements. Infrastructure and industries grew by leaps and bounds, further transforming the former colonial post into a vibrant city that offered plenty of opportunities for the hardworking. The decade between 1975 and 1984 saw industrial workforce numbers doubling from 257,300 workers in 1975 to nearly 408,700 in 1982.

Amid the industrial hustle and bustle that kept the nation on its feet, occupational accident and fatality rates in shipyards remained a red-hot cause for concern. The findings of the government-appointed Study Group on Accident Prevention in Shipyards showed that the shipbuilding and repairing industry was responsible for the highest number of accidents. Specifically, the industry recorded 1,142 accidents, or 30 per cent of the total accidents that occurred in 1975.

Many of these incidents could have been prevented with a more mindful and systematic approach to safety, which was sorely lacking at the time. Mr. Heng Chiang Gnee, former Chairman of Sembawang Shipyard and Chairman of the Workplace Safety and Health Council, recalls that "a lot of shipyards did not really have a comprehensive system in place" in the 1970s.

Faced with these challenging circumstances, the Government was further convinced that regulations alone were not enough to inspire change. To be fully effective, enforcement must be paired with engagement, and regulations with outreach.

“

I guess those days, the shipyards were deemed as hazardous, dirty and dangerous. But today actually they're very different. If you look at the reputation, the image has changed tremendously. [The improvement] is something very positive if you want to compare the differences and it is not an overnight thing. It is sort of a progressive kind of development [achieved] through a lot of measures, effort and initiative at many levels both government, industry – the customers, the suppliers – [and] everybody.

”

Mr. Heng Chiang Gnee, Chairman, Workplace Safety and Health Council and former Chairman, Sembawang Shipyard

ENGAGING ON A NATIONAL LEVEL

Acknowledging the need for greater engagement, the Government ramped up efforts to reach out to workers on a nation-wide scale. Campaigns were rolled out to bring about awareness to workers in injury-prone industries and bring lesser-known aspects of occupational safety to public attention.

The first of such campaigns was launched on 24 September 1975 by then Minister for Labour, Mr. Ong Pang Boon. Spanning three days, the campaign reached out to over 26,000 shipyard workers. Supervisors, management staff and industry stakeholders were also invited to attend.

The centrepiece of the campaign was a mobile exhibition that toured 21 shipyards operating in Singapore. It featured photographs of safe and unsafe work practices, as well as remedial actions to be taken in case of accidents. Attendees were shown a list of

safety do's and don'ts in various sections of the ship. Graphics, scale models and a slide presentation were among the items displayed.

The campaign also engaged audiences through a television (TV) forum on Accident Prevention in Shipyards, TV interviews with shipyard and Ministry of Labour (MOL) officials, safety films, as well as a poster and slogan competition.

Additionally, the Ministry organised a three-day safety orientation course to help workers familiarise themselves with the permit-to-work systems in shipyards and the safety measures that must be taken to protect them from accidents.

By tapping into as many channels of communication as possible, the Government ensured that the message of Workplace Safety and Health (WSH) would be heard by many, from those at the top levels of business to every last worker on the ground.

BOTTOM:
Former Minister for Labour, Mr. Ong Pang Boon, seen standing at the lectern, addressing guests at a dinner reception held in Penthouse Negara, in which he was to receive the report on Accident Prevention in the Shipbuilding and Repairing Industry.



“

The Housing & Development Board (HDB), being the largest developer in Singapore, took the lead in reducing the number of worksite accidents. HDB then laid the infrastructure for a four-pronged strategy to evolve and take shape in reducing worksite accidents from occurring. [This entailed] the promotion of safety consciousness among workers, supervisors and contractors, including the formation of worksite safety committees, the introduction of better safety measures and provisions, the enforcement of safety rules and provisions at the worksites and conducting research on accidents.

”

Er. Lau Joo Ming, former President, Professional Engineers Board and Senior Advisor, Housing & Development Board



LEFT:
Prof. Ang
How Ghee was
awarded the
Friend of Labour
gold medal by the
National Trades
Union Congress.

To reaffirm their commitment, shipyard contractors were also encouraged to sign an agreement to take necessary safety precautions against workplace accidents. By November 1977, a total of 237 out of 250 shipyard contractors had already taken the pledge.

The forming of Advisory Committees was not limited to the shipbuilding and repairing industry. In the construction industry, where a sharp rise in accidents from 786 in 1979 to 927 in 1980 was recorded, an Advisory Committee was similarly formed. Working alongside the Factory Inspectorate, the Committee conducted safety orientation courses for supervisors, construction workers and students of vocational institutes.

In partnership with MOL, the Committee also helped organise a workshop on Safety and Construction. Launched by Mr. Ong Pang Boon in March 1980, the workshop saw 160 participants of diverse professions in attendance, including engineers, architects, contractors and supervisors.

Thanks to the multi-pronged efforts of these Safety Committees, a growing number of industry members were able to gain a greater understanding on how to improve the standards of safety and health in their working environments. This, in turn, encouraged them to take the step forward from being passive participants to becoming active WSH champions.

HELPING INDUSTRIES IMPROVE THEIR SAFETY RECORDS

In addition to educating the workforce through educational campaigns, the Government also saw a need to work with the industry more closely. With this objective in mind, an Advisory Committee was set up in 1975. The Committee was tasked with assisting the shipbuilding and repairing industry in its safety journey. Chaired by Prof. Ang How Ghee and 14 other members, its task was to advise and assist on the implementation of the report submitted by the Study Group on Accident Prevention in Shipyards.

Several interventions were recommended, and a Management Workshop on Safety in the Shipyards was launched in March 1976. Highlighted in this workshop were the dangers of confined spaces and preventive measures to take. Inspired by what they learnt, shipyard representatives were committed to adopt initiatives such as safety policies, self-regulating permit-to-work systems and the provision of basic safety facilities.

Six months later, the Advisory Committee formed a Safety Consultancy Group with two main objectives. The first was to provide shipyards with consultancy services on WSH. The other was to assist shipyards in implementing recommendations proposed by the Advisory Committee.

SAFEGUARDING THE WELL-BEING OF OUR WORKERS

While staying in touch with workers and industry leaders, the Government also kept pace with the standards required to safeguard the well-being of its workforce. To ensure that WSH remained robust and relevant to current operating conditions, MOL was committed to reviewing WSH legislation regularly.

The push towards self-regulation in WSH was evident in the enactment of the Factories (Safety Committee) Regulations, introduced in 1975. Under this piece of legislation, factories with 50 or more employees were required to set up a safety committee, and each committee was to consist of representatives from both appointed management staff and elected employees.

The regulations set forth a wide range of activities the committee must attend to. These included monthly WSH meetings, regular plant inspections, on-site accident investigations, and the promotion of safe work practices in the factory. By incorporating the perspectives of both management and employees in the discussions of safety issues, the regulations set the path towards more productive and inclusive communication channels. Close communication would also be conducive in preventing accidents as overlooked slights and errant behaviour could be identified and addressed more promptly.

Also introduced in 1975, The Factories (Qualifications and Training of Safety Officers) Notification clarified in detail the wide-ranging duties of a safety officer, from carrying out factory inspections to investigating accidents and organising safety campaigns.

Both regulations further deepened the involvement of employers and the workforce in the push for higher WSH standards.

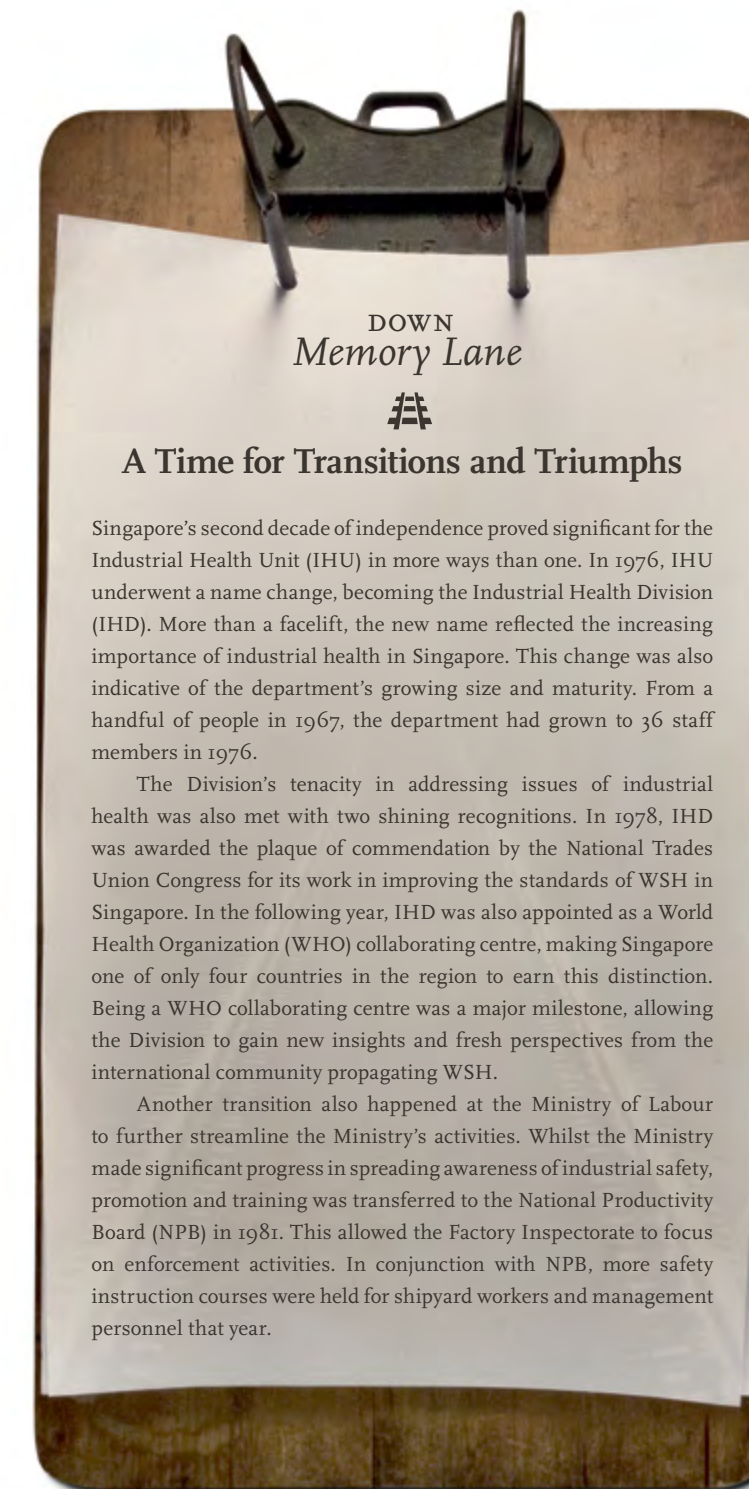
“

Many occupiers of factories [at the time] did not know how to comply with the law and there were no [on-site] safety consultants for them to turn to. On the positive side, as the occupiers were not so knowledgeable, they [were] more willing to take the advice of the inspectors. They were more respectful of the authority and less contentious.

”

Mr. Low Wong Fook, former Chief Inspector of Factories and Director of Industrial Safety and Divisional Labour Welfare, Ministry of Labour

LEFT:
Former Minister for Social Affairs,
Mr. Othman Bin Wok, visits the
Thye Hong Biscuit Factory.



DOWN
Memory Lane



A Time for Transitions and Triumphs

Singapore's second decade of independence proved significant for the Industrial Health Unit (IHU) in more ways than one. In 1976, IHU underwent a name change, becoming the Industrial Health Division (IHD). More than a facelift, the new name reflected the increasing importance of industrial health in Singapore. This change was also indicative of the department's growing size and maturity. From a handful of people in 1967, the department had grown to 36 staff members in 1976.

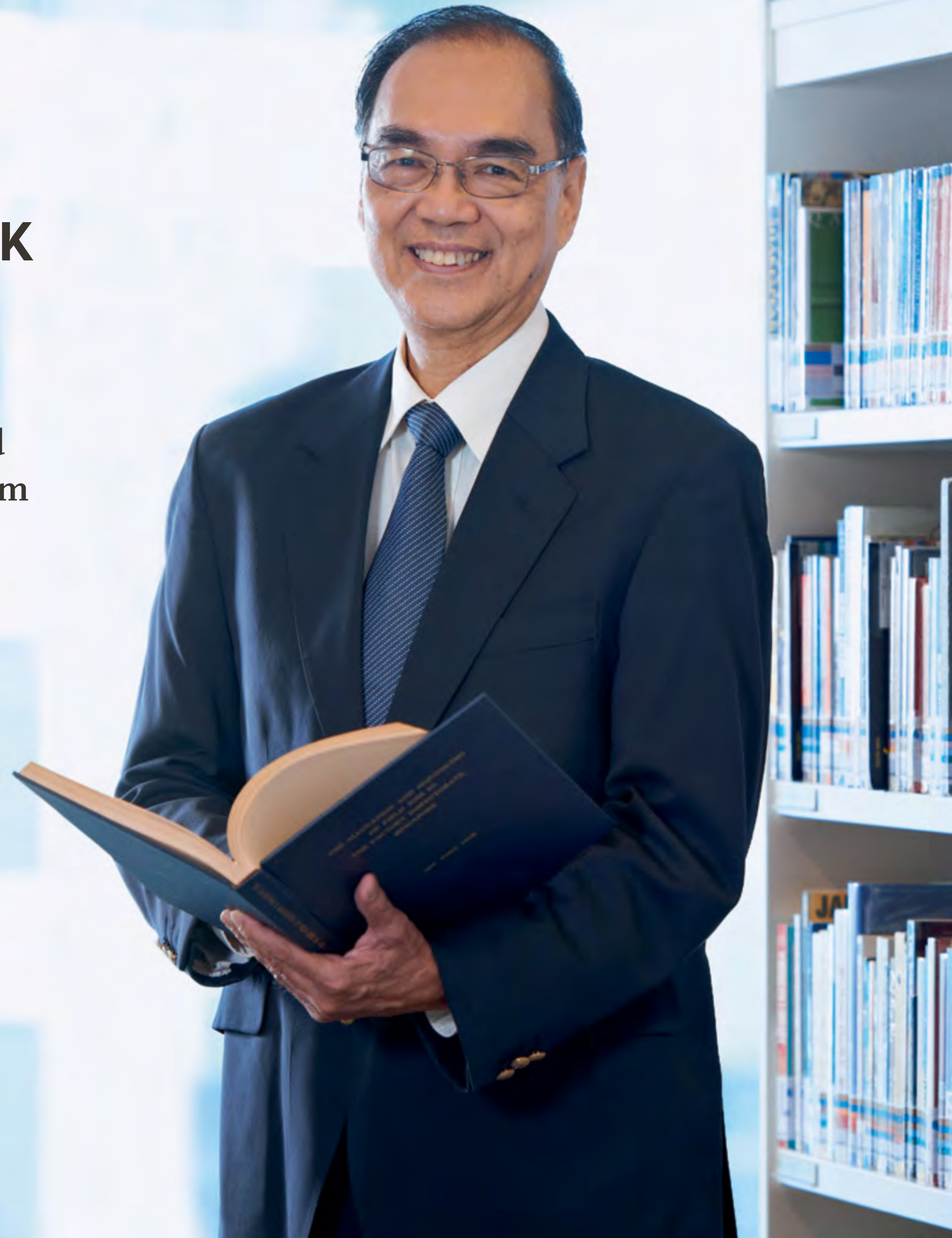
The Division's tenacity in addressing issues of industrial health was also met with two shining recognitions. In 1978, IHD was awarded the plaque of commendation by the National Trades Union Congress for its work in improving the standards of WSH in Singapore. In the following year, IHD was also appointed as a World Health Organization (WHO) collaborating centre, making Singapore one of only four countries in the region to earn this distinction. Being a WHO collaborating centre was a major milestone, allowing the Division to gain new insights and fresh perspectives from the international community propagating WSH.

Another transition also happened at the Ministry of Labour to further streamline the Ministry's activities. Whilst the Ministry made significant progress in spreading awareness of industrial safety, promotion and training was transferred to the National Productivity Board (NPB) in 1981. This allowed the Factory Inspectorate to focus on enforcement activities. In conjunction with NPB, more safety instruction courses were held for shipyard workers and management personnel that year.

MR. LOW WONG FOOK

“We had to learn how to deal with industrial safety and health problems from scratch at all levels: worker, supervisor and managerial.”

*Former Chief Inspector of Factories,
Director of Industrial Safety and
Divisional Director of Labour Welfare,
Ministry of Labour*



PIONEER PROFILE

Facing All Odds With a Leader's Fortitude

Ask his colleagues to describe Mr. Low Wong Fook, and the phrase “calm under pressure” might have been uttered.

Not one to buckle in the face of unfamiliar challenges, Mr. Low proved his fortitude at the dawn of his career while he was still a young engineer. His mettle was first tested in 1974, when he took the reins as the youngest Chief Inspector of the Factory Inspectorate at the age of 27, a job which put him in charge of administering and enforcing safety and health laws in factories, construction worksites and shipyards in Singapore.

The lack of safety awareness was not the only challenge in store for Mr. Low. As the Chief Inspector, Mr. Low also had to be the “jack of all trades”. In addition to staying in tune with the development of technologies in factories, Mr. Low and his team had to master the fundamentals of the law in order to carry out their regulatory and law enforcement duties. Sometimes, this meant prosecuting offenders in the then Magistrate's or District Court.

Mr. Low adds, “We had to learn how to deal with industrial safety and health problems from scratch at all levels: worker, supervisor and managerial.”

Mr. Low is quick to admit that he could not have faced these challenges on his own. In the face of a steep learning curve, Mr. Low feels lucky to have had a strong team that he could rely on through thick and thin. With a proud smile, he attributes his success to a good team, and a kind mentor.

“I was very fortunate that my old chief was very willing to teach and was very nice to me [... and] that I had a good and energetic team with very good problem-solving skills,” Mr. Low reminisces. “In the Ministry, we were learning on the job from our seniors and from anyone who could offer assistance.”

Those industrious years taught him a lot and instilled in him one powerful insight. That is, those who are involved in the promotion and management of Workplace Safety and Health (WSH) would do well if they know how to apply the ancient Chinese concept of ‘Yin’ and ‘Yang’ to their advantage at different stages of WSH development.

Mr. Low explains: “In the 70s, the law was there but there were inadequacies. Compliance was low. Under the circumstances, we needed to adopt a very interventionist ‘Yang’ approach. Measures taken include prescribing and legislating WSH requirements and enforcing these requirements to ensure compliance. That formed the bulk of the Factory Inspectorate's work, which I did while wearing the hat of Chief Inspector of Factories.

There was some improvement but the accident rates soon hit a plateau. So the ‘Yang’ approach alone could not be sustained [...] We realised that we had to change tack and began to complement the ‘Yang’ approach with the ‘Yin’ approach of building WSH capability through training and education, promoting WSH through organising industry-wide WSH campaigns in collaboration with employers and unions, managing change from within factories through requiring the appointment of safety officers and formation of safety committees. And, when I engaged in this kind of ‘Yin’ work, I had to drop the title of Chief Inspector of Factories, which could be repulsive to our industry partners, and wear a new hat, bearing the title of Director of Industrial Safety!”

The move to complement ‘Yang’ with ‘Yin’ paid off and yielded some good results.

“So from the 80s onward, we adopted different approaches in dealing with different factory occupiers and different situations,” Mr. Low explains. “With recalcitrant defaulters, bordering on being incorrigible – we still needed to take stern measures to modify their behaviours.” Or, as Mr. Low calls it, the extreme ‘Yang’ approach.

However, Mr. Low notes that a soft approach is often more effective in changing mindsets. This is where training and promoting a culture of WSH comes in. “Changing people's mindset from the inside – that was our ‘Yin’ approach to convert the unconverted.”

Mr. Low sums it up neatly: “Enforcement is ‘Yang’. Promotion is ‘Yin’.” Although they may seem to be polar opposites, both approaches are of equal importance, asserts Mr. Low.

While reminiscing on his long career, Mr. Low also takes some time to contemplate the string of tragedies that marred the pre-2000s. As the person who oversaw the investigations of many major accidents that warranted the appointment of Committees of Inquiry such the Spyros and Ginza Plaza disasters, Mr. Low knows just how emotionally shattering these tragedies were – both to the victims and their loved ones, as well as those who have dedicated their lives to improving workplace safety.

“The disaster could have easily been avoided had someone not committed certain unsafe acts just before the accident. All these thoughts tend to get repeated over and over again [and it] could be very emotionally sapping,” Mr. Low points out.

In spite of these setbacks, Mr. Low acknowledges that incidents that occurred should be seen as important lessons, and a galvanising call to do better. “We must adopt a set of core values and build a desired safety culture that is self-perpetuating and self-sustaining,” Mr. Low advises.

Mr. Low's drive to make a difference and bring about higher standards is not limited to the issue of WSH. After leaving the Ministry, Mr. Low joined Singapore Polytechnic as its Principal in 1996 and retired after 12 years. He then served as Director on the boards of Singapore Polytechnic International Pte. Ltd., the National University Health System Pte. Ltd. and Jurong Health Services Pte. Ltd. He still serves as Director on the board of the Society for the Physically Disabled today.

TRANSFORMING TRAGEDIES INTO AN IMPETUS FOR CHANGE

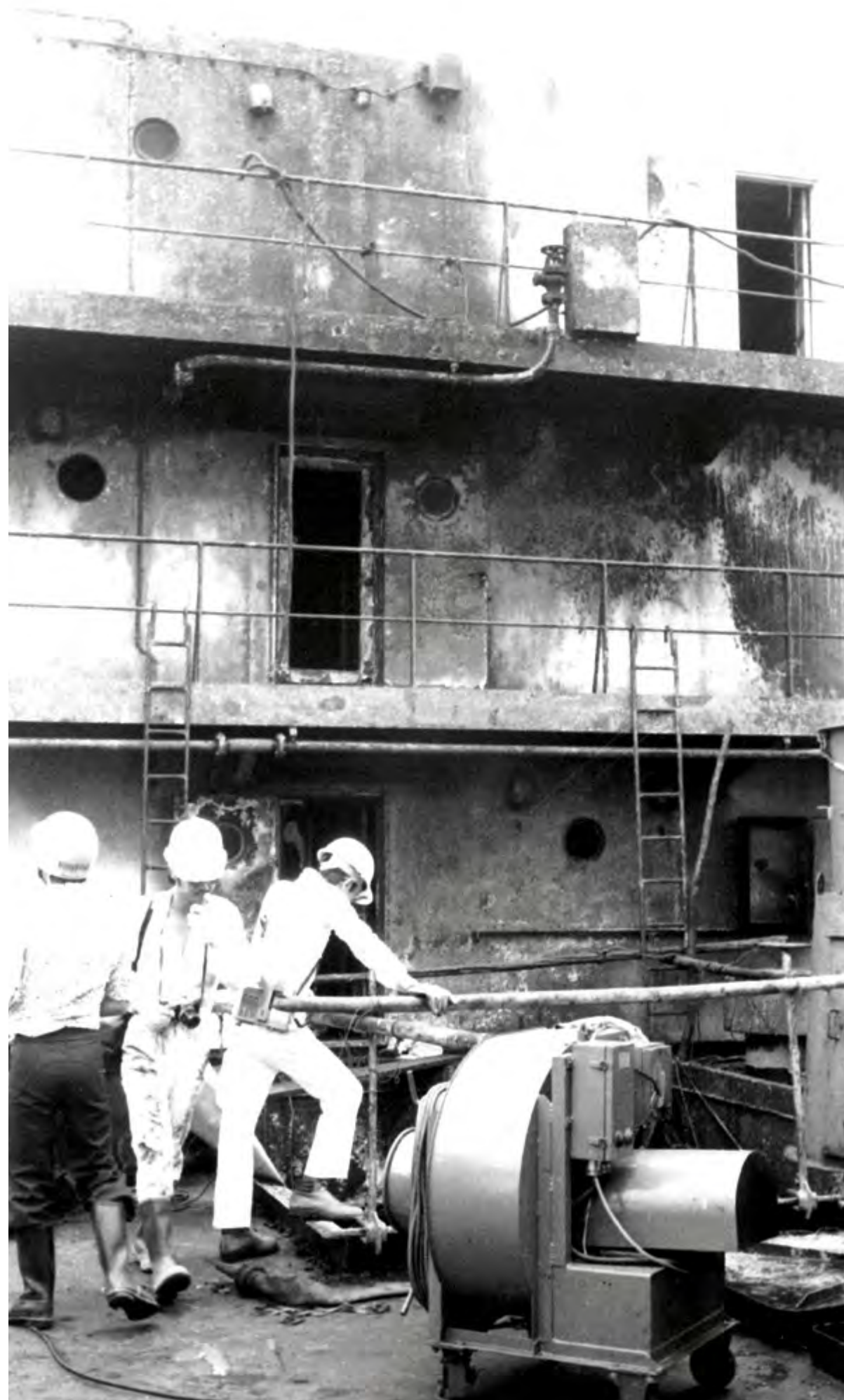
While many positive strides had taken the WSH journey to the next level, the decade also saw the rise in industrial accident numbers, with more than a 300 per cent rise in industrial accidents recorded between 1971 and 1980. The majority of these cases came from the shipbuilding and repairing industry.

Perhaps no industrial disaster left a more indelible mark on the course of Singapore's industrial history than the explosion aboard the Greek oil tanker, *Spyros*, which occurred in 1978. Till today, the headline-generating accident remains as one of the worst industrial accidents in Singapore's post-war history.

Seventy-six lives perished and many more were injured by the blast that resulted in a flash fire, prompting strong outrage and calls for Singapore's shipyards to improve their safety practices.

This tragedy, as well as other high-profile industrial accidents such as the Pulau Bukom refinery fire in 1981 added fuel to the calls for reformation of industrial safety and health in Singapore.

RIGHT:
An on-site investigation was carried out by the Factory Inspectorate with specialist assistance from the Department of Scientific Services and Department of Pathology following the *Spyros* disaster.



LEFT:
Singapore petrochemical complex
Pulau Ayer Merbau in 1985.



Even with the best technology and the stringent enforcement of deterrent legislation, the prevention of accidents in the industry can only go that far without the key ingredient of the will and commitment of management and workers to make the environment a safe one.



Mr. Ong Pang Boon, former
Minister for Labour

MOVING FROM REACTIVE TO PROACTIVE

The decade also saw a profound transition in mindset. While early WSH efforts were largely focused on responding to existing problems, the rising tide of accidents encouraged the Government to take an anticipatory approach to safety and health. Problems were identified and addressed at the earliest possible stage, and safety risks were nipped in the bud before they could escalate to fatal accidents.

This new mindset was put into action in the Industrial Hygiene Monitoring Programme. Launched in 1983, the programme saw a transition from previous practices where factory inspections were only done on an ad hoc basis after problems arose, to one with regular monitoring.

Under this monitoring programme, high-risk worksites were identified for inspection checks, to be carried out once every three months by the Industrial

Health Division (IHD). Factories subjected to inspections encompassed granite quarries, asbestos factories, petrochemical complexes such as the one situated at Pulau Ayer Merbau, and the underground tunnelling work of Singapore's Mass Rapid Transit (MRT).

Worksites were also obligated to keep a record of WSH control measures they had implemented and to keep tabs on the effectiveness of these measures. Protecting the health of workers who worked in hazardous environments was another priority. Mandatory health examinations were organised to detect the occurrence of illnesses at preventable stages.

MOL also cast a closer eye on the construction industry by conducting special enforcement operations to weed out negligent contractors. Contractors found disregarding proper procedures, such as the disposal of materials and engaging in unsafe practices including the usage of undersized timber for scaffolds, had strict enforcement actions taken against them. A total of 122 offenders were also either prosecuted or required to pay composition fines. In 1980, 48 stop work orders were issued to contractors whose sites were extremely unsafe.

Stop work orders proved to be a persuasive deterrent for errant contractors. Mr. Ameer Ali Abdeali, former General Manager of the Occupational Safety and Health Training Centre, explained that contractors often did not feel the pinch of being fined. A stop work order was another matter, as it would cost extra time and money. “You can fine them. They are not afraid,” he shared with a knowing smile. “They can even work it into their budget. But, when you stop their work, they really feel it.”

By combining education and engagement with stringent and anticipatory measures, the Government was able to stay vigilant and combat safety negligence more effectively.



RIGHT:
Former Minister for Labour, Mr. Ong Pang Boon, urges shipyards to introduce additional safety measures and apply modern management techniques at the opening of the Second Management Workshop on Safety in Shipyards at Shangri-La Hotel.

“

Over the years, the number of members has grown with the growing awareness of the need for good WSH management and practices in various high risk industries. Following the few high profile accidents in recent years, the requirement and need for WSH officers became more evident and necessary.

”

Mr. Andrew H.S. Tan,
Secretary, Singapore Institution
of Safety Officers

BUILDING SAFETY CAPABILITIES ACROSS SECTORS

Raising capabilities was another essential priority on the WSH agenda. At the time, there was a gap in upskilling and professional growth opportunities in the WSH profession. Responding to this need, the Singapore Institution of Safety Officers (SISO) was established in 1975.

SISO served as an organisation providing representation, promotion and support for members engaged in the practices of WSH. Under SISO, the pioneering safety officers held a large scope of responsibilities, including helping their employers to enforce safety regulations and using personal protective equipment to protect workers.

These safety officers were also in charge of developing safety procedures and rules pertinent to

operations. To bring about a safety-ready workforce, SISO made the learning of safety more accessible through wide-ranging avenues. This included training sessions, toolbox meetings, safety committee meetings and safety promotions.

Today, SISO remains a vital part of Singapore's safety ecosystem, providing its members with an invaluable resource as a leading institution for WSH professionals. Through multiple workshops, seminars and courses, the enterprise has been steadfast in its mission to elevate the standards of the safety profession to new heights.

Growing steadily from strength to strength, SISO now boasts a membership of more than 1,000 safety officers and specialists in occupational health.

MAKING SAFETY THE TOP PRIORITY IN MRT CONSTRUCTION

The first half of the 1980s also saw the commencement of an important project – the construction of the MRT tunnels. As the massive project was set into motion, efforts were taken to ensure that the project would be carried out with the workers' safety in mind.

Mr. Winston Yew, an engineer with the Occupational Safety and Health (Training and Promotion) Centre, was sent to Japan in 1984 to learn about safety measures associated with MRT works. A working committee was subsequently convened to develop occupational safety and health training courses for the various levels of personnel involved in tunnelling works. These included supervisors and workers handling compressed air works in tunnels as well as attendants of medical-locks and man-locks. The primary goal was to ensure the safety and health of all personnel involved in the construction of the MRT tunnels.

This sub-committee included representatives from various government bodies, such as the Singapore Fire Services, the Public Utilities Board, IHD and the Factory Inspectorate. To make sure that everyone involved in the

project was on the same page, two separate safety guides were published and distributed. One was intended for MRT contractors, while the other was distributed to MRT construction workers.

When tunnelling works started in October 1984, the MRT Construction Hygiene Monitoring Programme was launched. The programme included the preparation of guidelines, appraisal of control design, regular site inspections and the monitoring of the work environment. In addition, the programme helped ensure appropriate preventive measures were taken to minimise potential health risks. To accomplish this objective, IHD met the contractors before the start of construction to inform them of the health requirements in tunnelling work.

To increase awareness of WSH among contractors, a safety competition was also initiated. The competition was the brainchild of then MRT Corporation safety advisor, Mr. Arthur Scott-Norman, who helped organise and judge the competition alongside safety officers Mr. H.H. Ho and Mr. K.S. Lee.

Under this scheme, any MRT contractor who managed three consecutive accident-free months would receive an award. Among factors considered were the number of accidents per month, the amount of man-hours lost and the quality of public safety. At the end of each month, points were tallied and the contractor with the highest points took the prize. Even though not all contractors could emerge as the top champion, everyone was considered a winner in terms of gaining safety knowledge.

BOTTOM:
The proposed site for the
Tiong Bahru Mass Rapid
Transit station.



TAKING STOCK AND LOOKING AHEAD

Throughout Singapore's second decade of independence, there was a gradual and conscious shift towards proactive policing and enforcement. Coupled with a new focus on inculcating a sense of self-ownership and industry-wide awareness-raising initiatives, Singapore succeeded in reversing the trend of rising industrial accident numbers.

“

I join my officers in the Ministry in being happy that the safety situation in the shipbuilding and repairing industry in Singapore is changing for the better. Workers in shipyards today use safety equipment more readily now than ever before, and management is more conscious of the importance of a safe workplace [... The] shipbuilding and repairing industry has become one of the most safety conscious in Singapore.

”

Mr. Eugene Yap, then Parliamentary Secretary (Labour), speech at the launching ceremony of the Singapore Association of Shipbuilders and Repairers' mobile safety campaign on 3 December 1983

RIGHT: Participants viewing exhibits during the opening of the Management Workshop on Safety in Shipyards at Shangri-La Hotel.



CASE STUDY

A BOLT OF LIGHTNING SPARKED DISASTER AT PULAU BUKOM



TOP: General view of the Shell Refinery at Pulau Bukom.

BOTTOM: Opening Ceremony of the Shell Refinery at Pulau Bukom – Arrival of former Minister for Finance Dr. Goh Keng Swee.

In the early hours of 18 April 1981, Pulau Bukom's sleepy neighbourhood was roused from its slumber when a massive fire broke out at the Shell Bukom oil refinery. The incident was ignited amidst rolling thunderstorm when a bolt of lightning pierced the rubberised rim protector of a 50,000 cubic metre tank containing combustible gasoline.

In an instant, the tank burst into flames that ravaged the tank and raged on for more than 15 hours. It was up to Shell Bukom's 40-man firefighting crew to tame the flames and keep it from reaching nearby tanks. Braving heavy downpour and extreme heat, the men fought bravely, but the task ultimately proved too arduous for the small team to handle on their own.

Soon, the Singapore Fire Service was tapped to help. More than 100 men – armed with foam and water jets, as well as a fire engine, were ferried over to the island to battle the blaze. Rescue boats also took to the waters to pluck civilians who were not involved in the firefighting operation to the safety of the main land.

At about 5.45 p.m., the flames were finally extinguished. However, the damage was not without its costs. A Shell spokesman estimated that the incident was likely to cost the giant oil company millions of dollars. Perhaps one silver lining was the absence of casualties.

CASE STUDY

A BLAST THAT SHOOK THE NATION



To this day, the Spyros tragedy remains a visceral reminder of the bleakest days in Singapore's industrial history, and a cautionary tale of the dangers of taking safety for granted.

A SCENE OF ANGUISH

In the late afternoon of 12 October 1978, a shipyard worker aboard Greek oil tanker Spyros was lighting up a cutting torch for a repair work when a loud blast shook the vessel to the core. The force of the blast tore off huge chunks from the tanker, sending metal debris flying to a nearby vessel.

A flash fire broke out immediately, sweeping through the engine and boiler rooms and trapping workers who had just returned from their lunch break. Dockside workers who witnessed the horrific scene attempted to rescue their co-workers, but were held back by the fire.

Eight fire engines, aided by firefighting tugboats, rushed to the scene. The fire was put out quickly; however, the flood of scalding oil and water in the

“
We must not take safety at the workplace for granted. We must be vigilant and be aware of unsafe practices that could lead to dangerous outcome[s].

”
Mr. Leong Sai Chue, Photographer for the Spyros Investigation, Ministry of Labour

boiler room hampered rescue efforts to free the victims trapped inside. Victims were immediately ferried to the Singapore General Hospital and Alexandra Hospital by ambulances and helicopters. Seventy-six workers perished, while 69 others were injured.

Once news of the incident hit the headlines, the public responded with an outpouring of generosity. People turned up in record numbers to donate their blood to the victims. Medical staff at the hospitals also rose to the call of duty. Many volunteered their services and worked overtime out of their own volition to tend to the injured.

Two days after the incident, Jurong Shipyard pledged to provide compensation to the bereaved families and next-of-kin of the victims, and a special committee was established to collect donations from employees. Various organisations, including the Ministry of Labour, the Singapore Labour Foundation and local newspaper companies also pitched in and set up relief funds. By 1 November 1978, donations reached almost S\$4 million in total.



LEFT:
The tanker Spyros in the aftermath of the blast.

TOP:
The Spyros incident left a lingering reminder that complacency came at a heavy cost.



LEFT:
The oil tanker Spyros suffered significant damages as a result of the blast.



LEFT:
A scene from the on-site investigation into the Spyros disaster.

RIGHT:
A view of the top deck aboard Spyros.

Other recommendations included appointing a coordinator to ensure that all safety measures would be adhered to before the start of any repair work, limiting the number of people allowed to work in an engine room, and providing adequate means of escape from an engine room in case of emergencies.

The incident served as a painful and costly lesson in safety complacency. While families of the victims grieved, the Ministry was determined to make safety the first priority in every sector. Many in the industry, who were determined to ensure that these horrors would not be repeated, shared the same commitment.

The Spyros tragedy also proved to be a life-defining moment for one pioneering Ministry of Manpower officer who had witnessed the scene in person.

"I remembered Spyros very well," Mr. Ameerli Abdeali recalls. "A team of us went there to Jurong Shipyard, and we saw the rescue in progress. But, to see for yourself, I tell you, it's a wake-up call and it reinforced my passion for safety, and I told myself that my whole life would be about promoting safety, and making people understand the importance of safety. And I've kept that promise to myself."

RIGHT:
Family members of injured victims.



LESSONS LEARNT

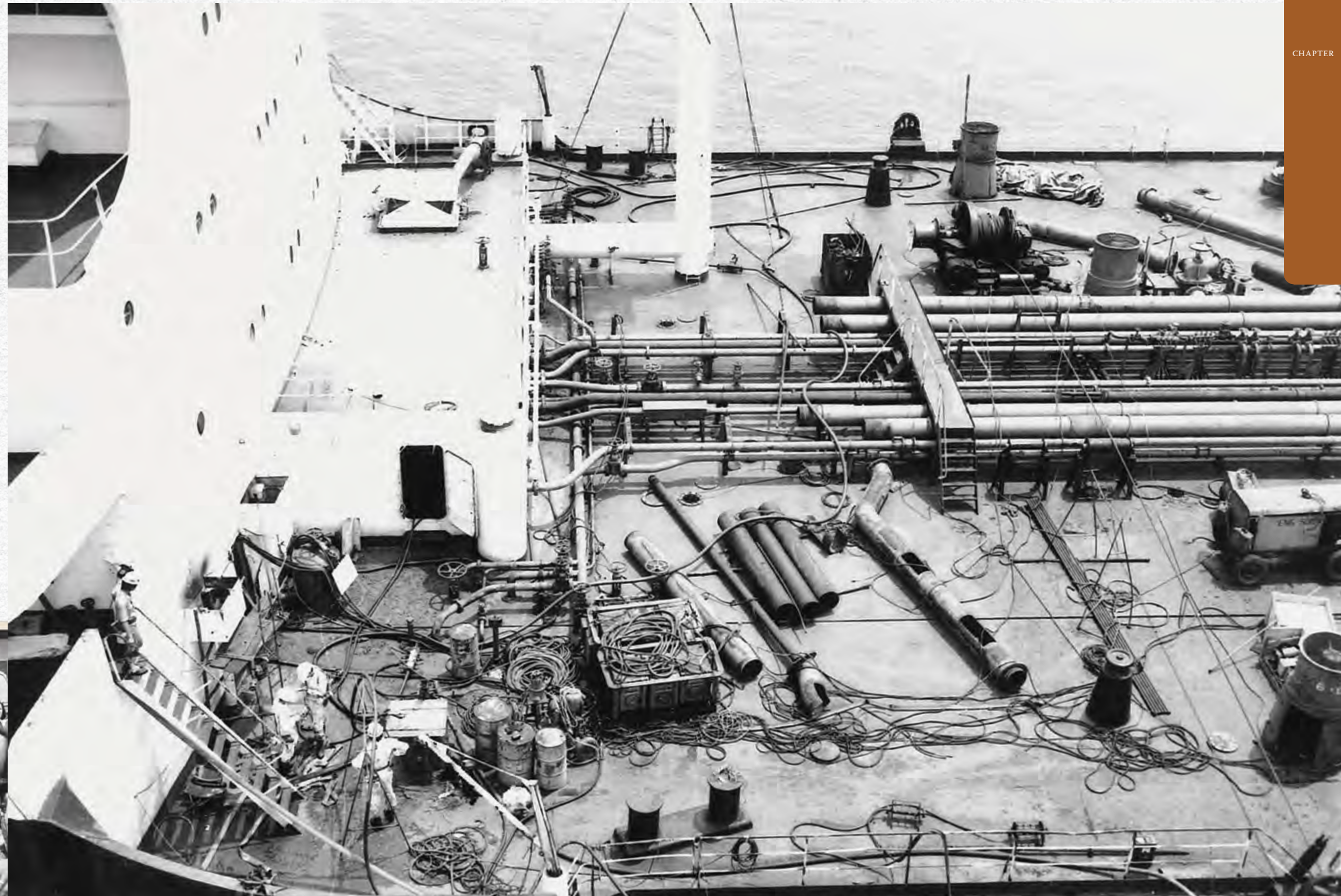
Then NTUC Secretary General Mr. C.V. Devan Nair led the charge in calling for punishment of those responsible. The sentiment was echoed by then Senior Parliamentary Secretary to the Ministry of Labour, Mr. Fong Sip Chee, who reiterated the Government's push for more stringent workplace safety regulations. There was a general consensus that a reform was critical to ensure that the incident would not happen again.

In July 1979, Jurong Shipyard implemented a new safety code for workers. Under the code, regular workers would be suspended or dismissed, while sub-contractors would be fined or barred from the shipyard, if they were found to have broken safety rules. It also set the precedent toward greater accountability for the shipyard industry in Singapore.

A Committee of Inquiry was set up to investigate the cause of the accident. After 20 days of hearing during which 87 people testified, it was found that the explosion and fire were caused by a series of safety lapses on Jurong Shipyard, the presence of explosive vapour on board Spyros and the contamination of the fuel oil. The hot work carried out using a cutting torch during the repair process was concluded to be the source of ignition that resulted in the blast and fire.

In light of these findings, the Committee put together a list of recommendations.

One suggestion was to prohibit the use of cutting torches on board vessels under repair, and to restrict the use of torches to specific jobs only. The Committee also advised the shipyard to carry out a thorough review of its safety system.

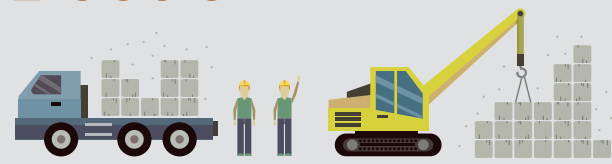


FEATURE

Building the Bedrock of Occupational Health

As Singapore embarked on a rapid industrialisation journey following its post-independence in the late 1960s, factories, shipyards and worksites laboured extensively to keep up with this transformation. Long-term occupational diseases such as silicosis, asbestosis, Noise-induced Deafness and cancer were main afflictions that plagued workers during the nation's early years. Recognising the problem, the Government sought to tackle these ailments head-on, starting with the number one "industrial killer", silicosis.

SILICOSIS



In the 1960s-1990s...
Silicosis was especially prevalent in granite factories that populated the island.

Hence, in 1971...



Legislation was introduced, starting with the Sand and Granite Quarries Regulations of 1971 that measured and controlled dust levels, on top of providing annual chest X-ray examinations to employees.



Subsequently...

Silicosis was listed under the Workmen's Compensation Act in the same year.



Additionally...

Public education was also carried out to promulgate the disease's causes, prevention and management.

Today...



While the disease is no longer a significant problem in Singapore, many in the industry remember it as being a long-drawn battle of occupational health management.

Over the years...

The cases of silicosis decreased as granite quarries in Singapore ceased to exist.

ASBESTOSIS



1960s-1980s

Asbestos was widely used in Singapore for building construction and thermal insulation.

1971

Asbestosis was added to the Workmen's Compensation Act.

1973

Asbestosis was classified as a notifiable disease under the Factories Act.

1980s

Subsequently, the use and import of raw asbestos was banned, decreasing the cases of asbestosis significantly.

Today

Notification of the use of any materials containing asbestos is mandatory under the Workplace Safety and Health (Asbestos) Regulations.



NOISE-INDUCED DEAFNESS (NID)

1975

- NID was listed as a notifiable and compensable disease under the Factories Act and Workmen's Compensation Act.
- A Hearing Conservation Programme was launched, emphasising the importance on the preservation of the hearing capacity of workers.

1985

The Factories (Medical Examinations) Regulations of 1985 made statutory medical examinations compulsory for workers exposed to specific health hazards, including noise hazards.

1996

- Noise-induced Deafness (NID) became the leading occupational disease in Singapore.
- The Factories (Noise) Regulations were introduced to control noise hazards in factories and safeguard the hearing of workers.

2011

- The Workplace Safety and Health (Noise) Regulations were introduced to replace the Factories (Noise) Regulations.
- With the revised Regulations, a new set of Hearing Conservation Programme guidelines was developed to reflect the changes.
- The guidelines provided guidance on proper methods of conducting noise monitoring at the workplace, as well as preparation and submission of Noise Monitoring Reports.

CANCER



In 1978, The Industrial Health Department launched the Occupational Cancer Prevention Programme to control and prevent the disease amongst workers.

The emphasis of the programme was to reduce contact between workers and carcinogens, and introduce periodic medical examinations.

Factories using asbestos, benzene, arsenic and vinyl chloride monomer (VCM) were also placed under an industrial hygiene-monitoring programme to ensure hazards were kept under control.

While no less insidious, the containment and management of these work-related diseases have improved significantly over the years through legislation, promotion and education. Despite the overall downward trend in reported ailments, there is still much to be done.

Pertinent to the progression of occupational health, both employees and employers have to stay vigilant in their line of work to ensure that health is never compromised. Together with other workplace safety and health stakeholders, the Division continues to advocate and work towards their goal of ensuring that workers value and prioritise their health as much as their safety in their workplaces.



Our world has changed. Granite quarries have given way to highly sophisticated manufacturing plants and the fast-paced service industry [...] Today we are faced with issues affecting the whole nation: stress, musculoskeletal disorders, ageing population, rise in chronic diseases, environmental haze, highly contagious diseases such as MERS, etc.



Dr. Lee Hock Siang, Senior Consultant, Occupational Safety and Health Specialist Department of the Occupational Safety and Health Division, Ministry of Manpower

Continuing the momentum of the previous decades' WSH efforts, the Ministry of Labour and its departments worked to counter rising accident numbers and shared the responsibilities of WSH with stakeholders.

1976

- A significant uptake in use of hearing protection devices among shipyard workers was seen, from 25.8 per cent in early 1976 to 56.4 per cent after the commencement of the Hearing Conservation Programme was launched.
- The Management Workshop on Safety in the Shipyards was launched.
- The Industrial Health Unit was renamed the Industrial Health Division.

1979

- The Industrial Health Division was officially appointed by the World Health Organization as a collaborating centre of Occupational Safety and Health.
- Jurong Shipyard implemented a new safety code suspending or dismissing workers and fining or barring sub-contractors if they were found to have broken safety rules.

1981

- Promotion and training was transferred from the Ministry of Labour to the National Productivity Board.

1984

- Mr. Winston Yew, a former engineer with the Occupational Safety and Health (Training & Promotion) Centre, was sent to Japan to learn about safety measures that Singapore may adopt.
- Mass Rapid Transit (MRT) tunnelling works started and the MRT Construction Hygiene Monitoring Programme and safety competition for contractors were initiated.



1975

- The Shipyard Safety and Health Campaign was initiated.
- The Hearing Conservation Programme was launched.
- The Industrial Health Department carried out a study confirming the presence of carcinogenic materials in Singapore's industrial landscape.
- The Workmen's Compensation Act (1975) was established.
- The Factories (Qualifications and Training of Safety Officers) Notification and Factories (Safety Committee) Regulations were rolled out.
- The Advisory Committee for the shipbuilding and repairing industry was formed.
- The Singapore Institution of Safety Officers was created.
- Dust levels and silicosis rates among industrial workers decreased sharply after 1975.

1978

- The Occupational Cancer Prevention Programme was launched.
- Thanks to proactive occupational illness preventive programmes such as the silicosis, hearing conservation and cancer prevention programmes, the number of notifiable industrial diseases in Singapore decreased from 1,123 confirmed cases in 1976 to 734 cases in 1977, and a further drop of 31 per cent to 505 cases in 1978.
- The explosion aboard the Greek oil tanker Spyros shook the nation, becoming one of the worst industrial disasters in Singapore history.

1980

- A workshop on Safety in Construction was launched at the Shangri-La Hotel by the Ministry of Labour and its advisory committee for the construction industry.

1982

- The Occupational Cancer Programme marked its fourth year with an expansion of coverage to include Vinyl Chloride Monomer.
- *The New Worker* newsletter was renamed and relaunched as the *Singapore Safety News*.

EVOLVING ALONGSIDE THE INDUSTRY

(1985-1994)





As the vocational landscape began to flourish towards the 1990s, industries became increasingly diversified with technologically-advanced sectors yielding more jobs for the population. Sunrise industries began to emerge and the nation's industrial sector began attracting bigger and more complex projects. As a result, the demand for sophisticated equipments increased.

Due to the increased Workplace Safety and Health (WSH) risks that followed the introduction of these new equipments, the Government sought appropriate measures to ensure that the machineries were safe for usage.

The late 1980s was also a time when the Government started building the nation's key infrastructures. The fundamental development in the nation's transportation network first took shape in 1983 at Shan Road, where tunnels were built between what is today known as the Toa Payoh and Novena Mass Rapid Transit (MRT) stations. Construction of the MRT tunnels spanned four years before the first stations were opened in 1987.

Amidst the trend of change, the period between 1992 and 1994 also saw a series of tragic fire and explosion cases in shipyards which led to multiple workplace deaths and casualties. These sombre tragedies served as an impetus for increased caution and a push for higher standards in WSH management. On top of a host of regulations and amendments to previous orders, an alternative approach of leveraging on self-regulation and industry engagement was further encouraged among stakeholders in a bid to spur WSH momentum.

LEFT:
Mass Rapid Transit construction
works at Raffles Place in 1987.

The Evolution of the Occupational Safety and Health Departments

The Occupational Safety and Health departments underwent several key changes as the scope and nature of industrial health and activities took on new directions. In 1985, the Industrial Health Division was renamed the Department of Industrial Health.

A year later, the Ministry of Labour (MOL) took over the running of the Occupational Safety and Health (Training and Promotion) function from the National Productivity Board.

In 1985, the Factory Inspectorate was renamed the Department of Industrial Safety (DIS) and in 1990, the Occupational Safety and Health (Training and Promotion) Centre which existed as a separate department before, was subsumed under DIS.

During the same period in 1990, DIS, together with other departments of MOL, moved into its new premises at 18 Havelock Road. Previously operating from different locations, the departments were housed together in the new building to foster a sense of unity and facilitate closer working relations.

BOTTOM:
The Ministry of Labour Headquarters Building at Havelock Road in 1985.



LEFT:
To facilitate larger and more complex projects, the 1980s saw lifting equipment such as cranes sprouting up in the industrial landscape.

“

Last time, construction was very manual. We still have people physically carrying things up the stairs [...] Then government say ‘mechanise’. The government [gave] grants to mechanise. Then suddenly you find a lot of cranes. Mobile cranes start coming in. Tower cranes start coming in. Overnight you see cranes everywhere, until, if people ask you, ‘What is the national bird of Singapore?’ You would say, ‘Crane’.

”

Er. Hashim Mansoor, former Senior Assistant Director of the Department of Industrial Safety, Ministry of Manpower

“

The pressure vessel industry today has all procedures in place to design and manufacture safe pressure vessels. They also have qualified welders and personnel to ensure that the pressure vessels manufactured are safe to use. All that remains is to educate and ensure owners and users of pressure vessels are aware of their safety and health responsibilities and that the pressure vessels they use in their workplace are safe, well-maintained and regularly inspected.”

”

Er. Leong Shui Hung, former Senior Assistant Director (Engineering Branch) of the Department of Industrial Safety, Ministry of Manpower

KEEPING UP WITH THE ENGINES OF INDUSTRY

As the nation’s industrial projects began to evolve in nature, so did the machines that were used, with pressure vessels and lifting equipments being introduced. Pressure vessels are containers that hold substances that need to be contained under pressure. Malfunctioning vessels could lead to injuries or death of workers working in the vicinity. Hence, it was important that the design, fabrication and usage of pressure vessels be stringently controlled. Lifting equipment, on the other hand, included a variety of machineries, spanning from cranes, lifts, gondolas to piling frames that helped transport and lift loads.

Inevitably, the risks involved with these equipments were higher. According to Er. Leong Shui Hung, former Senior Assistant Director (Engineering Branch) of the

Department of Industrial Safety (DIS), Ministry of Manpower, pressure vessel accidents were caused by several factors, including the lack of proper design, design code knowledge and qualified welders.

To mitigate the risks, the Ministry introduced legislation to make it compulsory for these equipments to be inspected prior to usage by authorised inspectors. To allow companies to engage authorised inspectors with ease and autonomy, DIS began leveraging on technology and put in place computerised systems. In 1990, the Televue System was set up, allowing the public to gain access to information of authorised inspectors so that they could be engaged to inspect pressure vessels, lifting equipment and other machinery used in factories.

In 1992, the Department put into operation an on-line computerised system for pressure vessels. With this system, the private authorised boiler

inspectors could enter, retrieve and update inspection records of pressure vessels from their officers using personal computers.

Other provisions included the Factories (Crane Drivers and Operators) Regulations of 1993 which took effect on 1 January 1994. The Regulation required all operators of mobile and tower cranes to be trained to observe the necessary safety measures. The Regulations also provided for the appointment of a lifting supervisor to co-ordinate lifting operations. The Safety Instruction Course for lifting supervisors was also introduced to train lifting supervisors responsible for all lifting operations.

KEEPING MRT CONSTRUCTION ON THE RIGHT TRACK

Another large project that drew watchful eyes from the Government was the construction of the MRT tunnels. Spearheaded by the Mass Rapid Transit Corporation (MRTC) in 1983, the first section of the MRT railways opened up in November 1987.

Safety at MRT construction sites was accorded high priority for all parties involved and was a key performance indicator for the Project Director as well as for the staff at various levels. Near-misses were closely monitored, and the lessons learnt were always shared with the workers to ensure that the same mistakes did not occur again.

To bring about a framework of structured accountability, a full-time Safety Manager was also employed by the MRTC. The safety officer had the extensive responsibility of following a sturdy framework and reporting directly to relevant Project Directors. This essential check and balance method ensured that safety was never compromised to fast track construction progress.

With a diverse team made up of both local and foreign workers, working cultures differed and finding common ground was often a challenge. In light of this, the management worked to establish a consistent safety framework encompassing all levels of workers. This strengthened the synergy and teamwork between project and safety teams.



RIGHT: Mass Rapid Transit tunnels works being carried out in 1985.

“
The criticality of the tunnelling works and the need to proceed with caution created an appreciation of how the works and safety incidents in relation thereto will contribute to loss of ground and potential safety hazards to the environment. As they say, there is nothing like a common threat to galvanise teamwork and effort.
 ”

Mr. Low Tien Sio,
 former Executive Director,
 Mass Rapid Transit Corporation

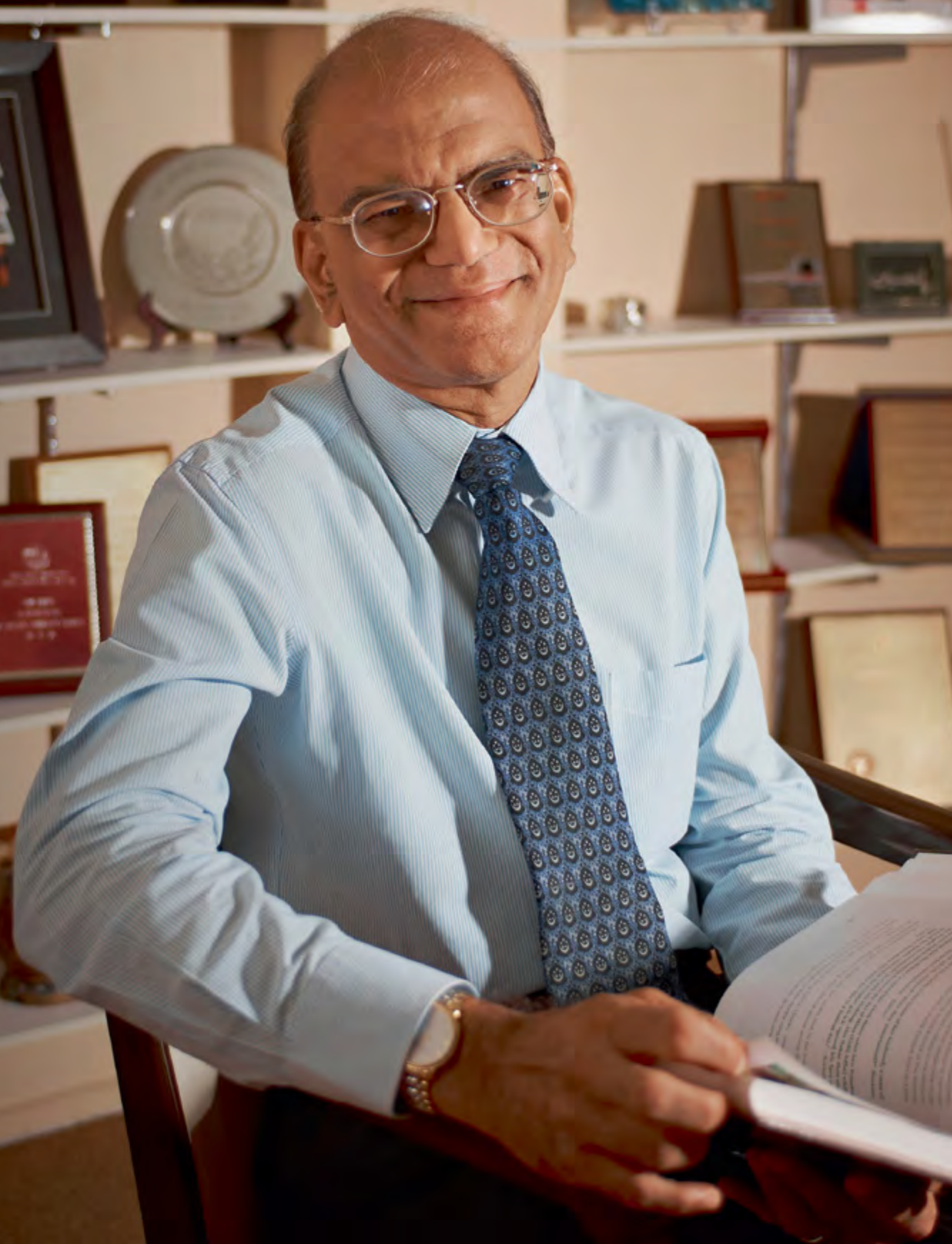
TOP:
 Steel beams and pillars provided the sturdy foundation for the Mass Rapid Transit tunnels.

LEFT:
 Workers at the construction of the Dhoby Ghaut Mass Rapid Transit Station in 1986.

MR. AMEERALI ABDEALI

“We must never forget that victims of workplace accidents are human beings with hopes and aspirations.”

*Former General Manager,
Occupational Safety and Health
(Training and Promotion) Centre
and Deputy Director of the
Occupational Safety and Health
Division, Ministry of Manpower*



PIONEER PROFILE

Championing Safety With Heart, Mind and Soul

For Mr. Ameerali Abdeali, enjoying one’s retirement years does not mean slowing down.

More than a decade after retiring from his post as Deputy Director of the Occupational Safety and Health Division at the Ministry of Manpower (MOM), the eloquent, sharp-witted gentleman remains heavily involved in his community, always ready to lend a helping hand or a listening ear to those in need. The spirit of public service that distinguishes his career continues to shine as he balances his time between various causes close to his heart, from mediating at the Family Court and fostering interfaith dialogue to providing support to kidney patients and the less fortunate members of our community.

Yet, no single cause resonates as deeply as that of workplace safety with Mr. Ameerali. To this former civil servant, championing safety is more than a job; it is a calling. This steadfast dedication was cemented early on in his career. As a safety inspector, he had witnessed firsthand how workplace accidents can tear workers away from their loved ones, or diminish a bright future.

One memorable highlight of his career happened in 1978, when Mr. Ameerali had the opportunity to serve as Secretary of the Committee of Inquiry that inquired into the Spyros disaster. Claiming the lives of 76 workers with many others suffering serious injury, the incident left an indelible impression on Mr. Ameerali.

“I remember Spyros vividly,” recalls Mr. Ameerali. “Mr. Low Wong Fook, then Chief Inspector of Factories called me and said, ‘Ameer, let’s go!’ A team of us went there to Jurong Shipyard, and we saw the rescue in progress. The scene was unforgettable and one has to be there to truly appreciate the devastating impact of accidents. It was a wake-up call to industry to take safety seriously and it reinforced my commitment for safety,” he shares vividly.

The experience strengthened Mr. Ameerali’s resolve to dedicate his life to promoting safety and work together with like-minded people to ensure that such tragedies would never happen again.

These sobering encounters set him on a journey to make safety a top priority in workplaces. Says Mr. Ameerali, “We must never forget that victims

of workplace accidents are human beings with hopes and aspirations who, as a result of accidents in the workplace, tragically lost their lives or ended up being permanently crippled or psychologically damaged.”

Mr. Ameerali firmly believes that every effort must be made to prevent accidents in the workplace. This should be done not just by the regulating authorities and employers, but by every person at all levels of the workforce. “There is no room for complacency as far as safety is concerned,” stresses the staunch safety advocate. “It is imperative to keep abreast with the fast pace of change taking place in industry which can introduce new hazards. Hence, safety professionals must keep on learning so that the appropriate safety measures can be put in place proactively and not as a reaction to accidents.”

This piece of wisdom was something Mr. Ameerali picked up on his personal journey with MOM – a journey that spanned more than three decades. When he started out as a young Factory Inspector in 1974, safety was still largely an afterthought in most industries. The government had to work hard to create awareness and enforce safety regulations in factories.

Gradually, as efforts to inculcate safety shifted from a prescriptive approach to one based on goal setting and the building of a strong culture, Mr. Ameerali was put in charge of the Ministry’s Occupational Safety and Health (Training and Promotion) Centre (OSHTC).

As General Manager of OSHTC, Mr. Ameerali became more sensitised to the importance of inculcating the fundamentals of safety among workers.

It was not a role he took lightly. “I took that as a very important responsibility and I personally inspected these classes to ensure that the instructors were imparting the right messages and spoke to the participants myself on the importance of observing safety rules and using the right personal protective equipment.”

As his participation in WSH training and promotion increased, Mr. Ameerali gained a deeper understanding on what it truly takes to build a deep-rooted safety culture. “I was impressed by the motto ‘Leadership Saves Lives’ which I saw when I gave a talk at a military base. Ultimately safety is about sincere and committed leadership.” Says Mr. Ameerali, “If the top management merely provides lip service to safety and believes that accidents are inevitable, then they need to have a change of mindset. With the right mindset, they will be able to bring about a strong culture where everybody is serious about safety and will not only look after themselves but also look after one another.”

Such precious insights are invaluable to Mr. Ameerali, who looks back on his time with MOM with a deep sense of satisfaction. “I’ll always value and cherish my 32 years there because it was a great environment where everybody was encouraged to learn and develop to one’s full potential.”

Forty years on, safety remains a lifelong passion for Mr. Ameerali. He is currently the President of the National Safety Council of Singapore, and represents Singapore as a Full Member of the Asia Pacific Occupational Safety and Health Organisation. To this day, he is regularly invited to deliver papers and present talks at workshops and conferences both locally and in the region, a duty he is always happy to oblige.



TOP:
Former Minister for Labour,
Mr. Lee Yock Suan, launches the
Construction Safety Campaign
at the Lum Chang Building
Contractors worksite in 1990.

IMPLEMENTING SAFETY AND HEALTH MANAGEMENT SYSTEMS AT WORKPLACES

The Ministry also paid close attention to the safety and health conditions of workers in other sectors. A common concern shared among the staff of the Ministry was the lack of safety and health awareness among workers and management.

To address this issue, the Department of Industrial Health sought to establish a legislation concerning statutory medical examinations of workers by designated factory doctors. Under this legislation, workers who had to carry out jobs encompassing certain hazards were required to undergo medical examinations.

These mandatory examinations ensured that these workers were medically fit to carry out the work. Workers who suffered from overexposure to hazards also had their ailments detected at an early stage. This helped prevent the development of overt occupational diseases.

After the Factories (Medical Examinations) Regulations was set in motion in 1985, 749 more cases were detected that year compared to the previous year.

In 1991, DIS continued to make headway in reducing dangerous working conditions by rolling out the requirement for all factories to be registered with the Department before commencing operations. In addition, DIS implemented a safety management programme encouraging companies to prioritise safety as they would for other aspects of the company's operations. Companies were also encouraged to budget and plan their safety promotional activities and measure safety performances.

Three years later, the Factories (Building Operation and Works of Engineering Construction) Regulations were further amended. The Regulations spelt out requirements for contractors to employ part-time and full-time safety supervisors, and to appoint independent safety auditors to tighten the standards of worksite safety.

The Ministry was well aware that this prescriptive approach of WSH management alone was not enough to fully prevent accidents. Workers had to learn to be accountable for their own safety and of those around them. With that in mind, the Ministry began introducing training courses. By enrolling in these courses, employers and employees gained greater awareness of their role and abilities to prevent accidents.

“

From very early days when we hit a plateau in our efforts to reduce the accident rates, we realised that beyond addressing the problem of unsafe environment through engineering solutions (like the guarding of unsafe parts of equipment), we had to address human behavioural issues.

”

Mr. Low Wong Fook,
former Chief Inspector of Factories, Ministry of Labour

“

To the foreign workers, my message to them is: 'You have come here; we value you.' We want you to be safe. We care about you and we want you to go home to your family [with] good savings so that you can build a future for yourself and your children. Don't go home in a coffin. Don't break your parents' heart. Take care of yourself.

”

Mr. Ameer Ali Abdeali, former
General Manager of the
Occupational Safety and Health
(Training and Promotion)
Centre, Ministry of Manpower

TRAINING FOR A SAFER CULTURE

In 1991, Safety Orientation Courses (SOC) were rolled out for workers in the oil and petrochemical industries. Workers labouring in manholes and other confined spaces were also required to attend the courses due to the hazardous conditions of their work.

Designed to familiarise workers with the hazards in their respective industries, the SOC also trained participants to prevent accidents. More importantly, the courses also encouraged workers to develop a culture of looking out for their fellow workers in terms of WSH.

To bridge the gap of different working cultures, the SOC regime was extended to the construction sector where foreign construction workers were required to complete the SOC before they could be issued work permits in 1993. Courses were conducted in various languages to ensure that participants were able to comprehend the curriculum.

Also made mandatory were the refresher courses. These workers had to attend these courses every two years

to have their work permit renewed. All these measures ensured that workers were kept up-to-date with the latest WSH practices.

The Occupational Safety and Health (Training and Promotion) Centre (OSHTC) also conducted numerous WSH courses for managers, supervisors and professionals. Courses were tailored to provide participants with practical knowledge on ways to identify and evaluate safety and health hazards, and develop safety management systems to control accidents and diseases in the workplace. In 1991, a total of 86,903 persons were trained in various courses conducted by OSHTC. This number was double that of the previous year.

BOTTOM:
Workers dealing with hazardous working conditions were required to attend Safety Orientation Courses in 1991.



PUSHING FOR BETTER STANDARDS IN SAFETY AND HEALTH

The 1980s and 1990s saw a major shift in WSH standards as awareness on the subject took off to new heights.

The string of major tragedies spanning from 1992 to 1994 also left a lasting impression on the industry. The impact was deeply felt in the shipyard industry in particular. Those within the industry developed a stronger sense of ownership of WSH, and saw the need to reform safety and health standards.

Additionally, safety and health began to present itself as a decisive element that would determine if shipyards would be contracted by prospective clients for shipbuilding and ship repairing jobs. According to Mr. Heng Chiang Gnee, former Chairman of Sembawang Shipyard, “[The] 90s was a big change for the shipyards because on the owner side, the demand on [the] safety system within the shipyard was elevated to a different level, principally because these customers have got their own safety demand. It has become a reputation and image of the company that they started addressing in the 80s, but in the 90s, it was brought up to a different level all together.”

With a rapidly changing vocational landscape and a sequence of major external crises, the next decade would shore up a new wave of challenges. Despite its circumstances, the Ministry would continue to strive towards building a robust WSH framework, with self-regulation as the driving force.

BOTTOM:
Despite the leaps in WSH standards over the decades, there was still much to contend with in many areas, with shipyards emerging as a distinct sector.



CASE STUDY

HARROWING TIMES CALLED FOR OVERHAUL IN SAFETY STANDARDS

TOP:
The aftermath of the fire onboard the M.T. Stolt Spur in July 1992.

The period spanning from 1992 to 1994 saw a series of five major tragedies that claimed multiple lives and fragmented many families. The disasters prompted a serious and comprehensive examination of the existing safety and health practices at the affected worksites.

The first accident occurred onboard the tanker M.T. Stolt Spur in July 1992 at Sembawang Shipyard. The cause of the fire was attributed to the flame from hotwork being carried out in contact with flammable liquids – blowing up the boiler flat level of the ship. Six lives perished and a total of 61 others were injured.

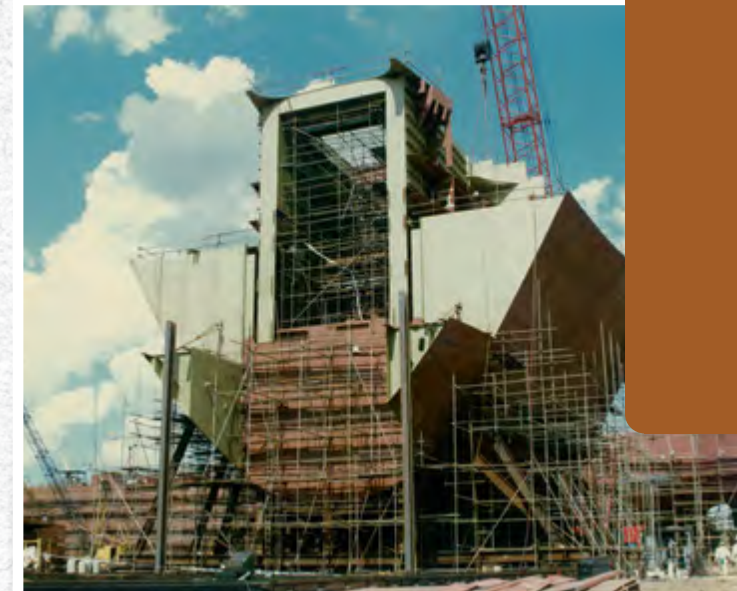
The second fire and explosion occurred at the uncompleted shopping centre Ginza Plaza in August 1992. The explosion that tore through the mall was caused by a build-up of flammable town gas that was ignited by the sparks from the welding work carried out by a gas pipe fitter. Four lives were taken while 61 others were injured.

The third fire erupted aboard another tanker docked at Sembawang Shipyard in November 1992. The Indiana oil tanker was undergoing repairs when an explosion ruptured on the deckhead level of the vessel. A worker was carrying out hotwork when the flame



LEFT:
The collapsed and charred remains of the uncompleted Ginza Plaza in August 1992.

RIGHT:
The explosion at Sembawang Bethlehem claimed five lives and injured eight others.



heated up residual sludge, which burst into flames. A total of eight workers died and 14 others were injured from the blast.

The fourth tragedy occurred onboard the British Adventure – a vessel docked at Jurong Shipyard in February 1994. Welding work was being carried out around flammable vapour, which caused a fire to engulf the deck of the ship. The fire claimed 10 lives.

Lastly, Sembawang Bethlehem, a shipbuilding yard, suffered from a fire and explosion in August 1994 that was caused by unauthorised spray-painting work. Sparked off by the use of non-flameproof equipment where flammable vapour was present, the fire left five people dead and eight others injured in its wake.

With the period between each disaster so distressingly close, the call for better safety standards was pressing.

For each incident, a Committee of Inquiry was formed to discuss the factors that contributed to the accident. After investigations were carried out,

measures and recommendations were drawn to address the issues. Recurrent themes emerged with each report. Negligence, a lack of WSH training, weakness in safety and health management systems, and the absence of proper supervision surfaced as contributors to the accidents.

Mr. Lee Kah Bee, former Assistant Director (Legislation) of the Occupational Safety and Health Division, Ministry of Manpower, who was part of the teams investigating the fires at the four shipyard accidents, shed light on the slippery slope of complacency. “Very often, the industry becomes complacent when there is no major accident after a period of time. They start to bypass or overlook safety measures [and] procedures, thinking that nothing would happen.”

These findings were not taken for granted. Based on the facts gathered, the Committee managed to ground out several recommendations, which were promptly set into legislation over the next few years. These included making WSH training compulsory for various classes of personnel, implementing permit-to-work systems for selected hazardous works and imposing statutory duties on competent persons.



LEFT:
Ten people lost their lives in the fire aboard the British Adventure in February 1994.

TOP:
After the fire aboard the British Adventure, much of the items in the steering gear room (where the fire occurred) was covered in soot.

RIGHT:
The path of the fire onboard the British Adventure.



“

These recommendations made a huge impact and changed the entire safety landscape for the shipbuilding and repairing industry. They targeted on [the] safety mindset and culture of the stakeholders and various aspects of the safety management system for the shipbuilding industry.

”

Mr. Go Heng Huat, Secretary to the Committee of Inquiry for the accident at Sembawang Bethlehem

FEATURE

Encouraging Greater Participation Through Awards and Recognition



The earliest iteration of the WSH Awards in Singapore dated back to the 1980s with the introduction of the Safety Awards scheme during the Safety Month of the manufacturing industry in June 1984. Within the same year, a safety competition for MRT contractors was also initiated.

In May 1986, an occupational safety and health promotion campaign with the theme 'Let's Zero In' was launched to encourage greater participation in WSH efforts, and the Accident-Free Awards scheme was introduced to help fulfil this objective.

Reflecting an emphasis toward safety management, the scheme was renamed the Annual Safety Performance Awards (ASPA) in 1990. The new name made clear that safety management systems would be the key determinant in how a company's safety performance should be assessed. The ASPA ceremony was held annually to honour companies with a laudable safety performance.

ASPA also provided an opportunity for knowledge sharing among members of industry. Those who had previously won the Gold Award at ASPA were invited to present their safety management systems at workshops organised by the OSHTC.

By 2005, participation levels had grown by leaps and bounds. The 2005 ASPA saw a record high of 382 participants, while its annual ceremony drew close to 1,200 guests. A year later, the WSH Awards was launched.

In subsequent years, the qualifying criteria of the Awards were raised to account for Singapore's improving WSH performance. Since its inception, the WSH Awards have also broadened the number of categories from one to seven. The expansion saw a growing number of roles being recognised – further driving the message that WSH is a matter of teamwork.

In his speech during the 2015 WSH Awards ceremony, Mr. Lim Swee Say, Minister for Manpower, spoke of the need to recognise companies who have done well and spur others to higher standards. Mr. Lim also mentioned the inclusion of an "X factor" in the criteria "to assess if the WSH mindset is rooted within the company, and how it integrates WSH into its operations."

Other award schemes, introduced intermittently, have also contributed to creating better work environments. Among them was the Noise Control Awards, which addressed the prevailing issue of Noise-induced Deafness by recognising the efforts of factories in reducing their noise levels.

We will continue to recognise and feature exemplary employers and workers who demonstrate good WSH practices and behaviours, and share their experiences with industry. Such sharing of best practices will further encourage cross-learning and facilitate an environment of continuous improvement. This will help build a strong safety and health culture and eventually elevate Singapore's state of WSH development.

OUR WSH AWARDS JOURNEY

To instil the culture of WSH in Singapore, there was a need to engage the heart and mind of the industry. Award schemes with a focus on WSH were thus put in place, and have since evolved with the passing decades.



WHAT'S NEXT ?



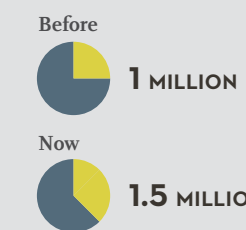
By promoting higher standards of WSH management, we will continue to:

- Encourage companies to raise their WSH performance
- Recognise WSH-conscious employers and workers
- Facilitate sharing and learning of best practices
- Build a strong safety and health culture in Singapore

RAISING THE BAR

In 2006, the WSH Awards was launched. Reflecting the improvement of WSH performance in Singapore, the requirements to qualify for the Performance Awards were made more stringent.

Man-Hours



Category

- From 1 to 7 categories
- More roles are recognised
- This underscores teamwork in WSH efforts!

2006

Award scheme participation levels went up by leaps and bounds!



BY 2005

REWARDING CONSISTENT WSH PERFORMANCE

- The Accident-Free Awards Scheme was renamed the Annual Safety Performance Awards
- The Gold Safety Performance Awards was given to factories with exceptional safety performance
- Certificates of Recommendation were given to companies with 1,000,000 accident-free man-hours
- The Occupational Safety and Health Excellence Award was given to factories that earned the Gold Award for three or more consecutive years



THE EARLY STEPS

To encourage more companies to take up WSH, two award initiatives were introduced.



The Safety Awards Scheme for Metalworking & Woodworking Factories



The Safety Competition for MRT Contractors

INDUSTRY-WIDE ENGAGEMENT

The 'Let's Zero In' campaign and Accident-Free Awards Scheme were rolled out.



THE BEGINNING OF THE WSH AWARDS

1980

1986

STAYING ADAPTIVE IN THE NEW MILLENNIUM

(1995-2004)





TOP:
Construction work
along Robertson Quay.

The mid-1990s hailed the era of digitisation as developing countries all over the world began investing heavily in information technology. Singapore was no different. As the city-state crossed into the millennium, new challenges and progressions began to unfold for the young economy. Globalisation, together with increasingly integrated economies and the introduction of higher and more sophisticated technology, paved the way for numerous changes ahead.

Additionally, Singapore experienced several major setbacks during this decade. Two substantial recessions and two viral outbreaks – Severe Acute Respiratory Syndrome (SARS) and subsequently Avian Influenza – tested the country's capabilities as a developing nation at that time.

Parallel to its economic developments, Singapore's workforce also saw a shift towards more highly-skilled and better-paid occupations. There was a higher concentration of workers in service-oriented industries, with the business and finance sector seeing a steady rise in workers.

While the manufacturing sector saw a decline in workers in 2000, injury and fatality rates remained concentrated in this sector, and the Government continued to tackle these problem areas to ensure the safety and health of workers at work.

MANAGING PERENNIAL ISSUES WITH APTITUDE

Building on previous decades' efforts in propagating Workplace Safety and Health (WSH), the Ministry of Manpower (MOM) began to focus its efforts on resolving recurrent issues in sectors registering high accident and fatality rates. Incentives and enforcement schemes were implemented with the goal of nipping transgressions in the bud.

In 1998, the Department of Industrial Health (DIH) collaborated with the Ministry of Finance (MOF) in introducing the Tax Incentive Scheme for Noise and Chemical Hazard Control for factories. The scheme was intended to ease the financial burden of implementing measures to control noise and chemical hazards in factories.

Companies under the scheme could claim a 100 per cent depreciation allowance in the first year for expenditures on such measures. Conferences were held to promote the tax incentive scheme and seminars were held to inform participants of solvent hazards controls, noise control awards, as well as associated safety and health concerns at work. Various visual display units illustrating safety and health safety practices in confined spaces were also exhibited at the seminars.

(See how Epson Industrial utilised the tax incentive scheme to improve its working conditions on page 93.)

Another recurrent cause of concern for the Ministry was construction companies with poor safety records. In April 2000, MOM introduced the Debarment Scheme, aimed at improving safety standards in the construction industry. Under the scheme, a Demerit Points System (DPS) was used to identify contractors with poor safety work practices. Contractors with bad safety records would subsequently be debarred from employing foreign workers. Over the years, DPS has undergone numerous reviews and it remains relevant in enhancing WSH standards in the construction industry today.

After extensive consultations with the construction industry, including the WSH Council's Construction and Landscape Committee and the Singapore Contractors Association Limited, the latest enhancements were finalised and came into effect on 1 July 2015. Broadly, there were four key changes made to the DPS:

- It was simplified to a single-stage system where the accumulation of demerit points would trigger the debarment of foreign workers.
- The number of demerit points had been calibrated to deter employers from putting their workers at unnecessary risks at work.
- The validity period of the demerit points was extended from 12 to 18 months to bring about sustained adherence to good WSH practices.
- The demerit points would be accumulated on a company-wide basis and debarment of a contractor's access to foreign workers would apply to the entire company instead of by contract.

The enhancements aim to drive contractors to make greater efforts in improving workplace safety to safeguard the lives and limbs of workers.

At the forefront of curbing occupational hazards, the Division released a series of enforcement and promotional efforts in 2001. These initiatives were aimed at reducing the cases of over-absorption of chemicals in industries dealing with particularly high quantities of hazardous chemicals. Three high-risk

industries – printing, ink and plastic manufacturing – were given particular attention. In that year, the Division's efforts paid off and cases of workers with over-absorption of chemicals saw a dip to 12, compared to the previous year of 36.

As a multitude of promotional, preventive and enforcement efforts were rolled out, outstanding issues were being tackled head on. With much to accomplish, the Division was also fully aware of the economic terrain that surrounded the industry. Careful to navigate the tricky financial waters that swept the industry early in the millennium, it was important for the Division to carry out its affairs with tact and dexterity.

BOTTOM:
The 1990s saw the Ministry focusing
on the construction sector to improve
safety conditions at worksites.



PIONEER PROFILE

A Tireless Champion of Safety

Smart, eloquent and full of gusto, Mr. Harry K.C. Wong proves that age is just a number. Despite having retired for 10 years, the charismatic speaker still holds strong and passionate views about Workplace Safety and Health (WSH) issues. It is this tangible passion that has made Mr. Wong a highly revered figure in the eyes of many of his peers and ex-colleagues.

Mr. Wong's role in improving Singapore's safety landscape spanned three decades. Having laid the foundations of today's exceptional standards for WSH, he paved the way for legislations and policies concerning WSH promotion, training and workmen's compensation from the 1970s to the early 2000s. Brimming with personal maxims, Mr. Wong imparts how this journey started, and the wisdoms he learnt along the way.

In 1972, Mr. Wong began his career at the then Ministry of Labour (MOL) after completing his undergraduate training at the University of Tasmania. After 18 months of serving as the understudy to the World Health Organization expert who was posted in Singapore, Mr. Wong set up the Industrial Hygiene Section in 1973. This section was then operating under the Industrial Health Unit. He was later posted to the Factory Inspectorate, where he worked in various roles until his retirement in 2005 as Deputy Divisional Director of Policy, Training and Work Injury Compensation.

Mr. Wong looks upon those early years as an uphill but necessary battle for him and his team. "In those days in the 70s, even up to 1978, we had to fight tooth and nail for everything that we needed to promote safety," he recalls.

When Singapore was still developing its economic infrastructure by investing heavily in the industrial revolution, many did not prioritise safety, but the Ministry did. "The challenge then was that a lot of employers had very little safety knowledge, or the feel of how to protect workers," Mr. Wong remarks.

Promotion was therefore crucial to ensure that both employers and employees were informed and trained on WSH legislation and policies. "It takes at least three to four years for [legislation] to be internalised, for it to be accepted in the industry – that's why we need promotion," Mr. Wong explains.

However, promotion was costly, and it proved arduous to acquire funding. With a light-hearted chuckle, Mr. Wong recalls the moments when he had to roll up his sleeves and work twice as hard to get the funding required for promotional and educational work.

"As the saying goes – we have to be innovative," he says with a knowing smile. In the 1980s, Mr. Wong began setting up exhibition and seminar committees that would source funding from the industries to package exhibitions and safety orientation programmes for manufacturing industries.

At the height of the Ministry's promotional activities, Mr. Wong recalls providing safety orientation programmes for 120,000 workers and 20,000 to 25,000 supervisors a year – a valiant feat for MOL at the time.

Mr. Wong's efforts did not sail by without results. After several years of staging mobile exhibitions, MOL succeeded in setting up a proper Occupational Safety and Health Training Centre in 1991 with the aid of the Ministry of Finance. "That's really my pride and joy – that we finally had a place." Mr. Wong beams.

Besides being admired for his tenacity, Mr. Wong was also known to throw hardballs to curb all sorts of WSH offences.

"I was not the most popular person back in the day," he reminisced. "Every few years, I would up the penalty," he says, referring to the legislation in shipbuilding, ship repairing, and construction industries.

This forthright attitude was already evident in his younger years. Concerned by the lack of control on silica dust in sand and granite quarries and related worksites, the then fledgling engineer penned a robust and candid letter to a major construction agency and followed through with other measures to ensure that the department understood the gravity of the problem.

Simply put, Mr. Wong was not afraid of ruffling feathers if it helped to get the message across and put others on the right track to safety. He sums up this principle with an old Chinese saying, "有理走天下 (yǒu lǐ zǒu tiān xià)."

"It means, [if] you feel that you're right, you go for it all the way!" Mr. Wong says triumphantly.

At the heart of Mr. Wong's dedication is an understanding that good WSH could help save lives and improve the well-being of many. This human aspect of promoting WSH was what inspired him to go the extra mile everyday.

After Mr. Wong left the Ministry, he went on an extended trip to complete his personal projects. He later teamed up with a group of friends to engage in charity work in Singapore. Today, Mr. Wong continues to offer advice and guidance on WSH matters on a pro bono basis.

MR. HARRY K.C. WONG

"The challenge then was that a lot of employers had very little safety knowledge, or the feel of how to protect workers."

Former Deputy Divisional Director of Policy, Training, Work Injury Compensation, Ministry of Manpower



PIONEER PROFILE

DR. MAGDALENE CHAN

“I felt this was interesting work that I could make a contribution to.”

Former Director of the Occupational Health Department, Ministry of Manpower

Helming the Fort With Passion and Commitment

Sometimes we find our life’s mission in the most unexpected places. Dr. Magdalene Chan was just a young medical student when she found her calling amidst the arid grind of granite quarries and an asbestos factory. And she had another pioneer in occupational health to thank for it.

The realisation came to her when she took part in field trips conducted by Dr. Chew Pin Kee, then Director of the Industrial Health Unit. Witnessing in person the health risks that workers had to cope with at the time sparked her desire to make a difference. “I felt this was interesting work that I could make a contribution to,” Dr. Chan recalls.

Upon joining the Ministry of Labour in 1973 as Medical Advisor, Dr. Chan quickly immersed herself in the subject of occupational health. Fatal and debilitating diseases such as silicosis, asbestosis and occupational cancer became common terms in her lexicon as she set her mind on learning about and tackling these diseases head-on. Sharing her passion in this mission was a multidisciplinary group of occupational health professionals, including doctors, nurses and industrial hygiene and inspectorate staff.

Following in the footsteps of Dr. Chew Pin Kee and Dr. Phoon Wai Hoong, her eminent predecessors, Dr. Chan became Director of the Occupational Health Department in 2001. “By [then], we had an experienced team of occupational health specialists,” she notes with pride.

Helming the Department was an enriching experience for Dr. Chan, who always embraced new opportunities to learn and grow. In her capacity as Director, she oversaw the wide-ranging scope of work that the Department engaged in, which included standard-setting, research, training and promotion.

However, the beginning of the new millennium was not without its share of challenges. Among them was the slew of health crises that rocked Singapore in the early 2000s. “Singapore was as unprepared as the rest of the world for the new threats of SARS and Avian Influenza,” Dr. Chan recalls.

These proved to be a massive test for the Ministry and other government agencies involved. Dr. Chan was among those in the thick of the action, and she recounts the tenacity with which every individual pulled together to curb the potential epidemics, each committed to do his or her best.

“[It was] a coordinated national effort with prompt and decisive action and the support of the community – particularly in compliance with stringent quarantine and infection control measures.”

Dr. Chan also played a significant role in shaping the backbone of the Occupational Safety and Health Division (OSHD). “I was fortunate to be involved in reforming the now much strengthened OSHD under the stewardship of Er. Ho Siong Hin,” she says.

She also helped see through the OSH Framework in 2005, which served as a personal milestone for her. “My involvement in this initial journey was a rewarding experience,” she attests.

Yet the crowning reward for Dr. Chan’s hard work might be the encouraging changes she has seen in the current WSH landscape. “There has been a shift in attitudes from stakeholders – particularly [in] employers,” she affirms. “WSH is not merely seen as a cost associated with regulatory compliance [anymore], but [also] good for business.”

Dr. Chan is equally heartened to see the impact that OSHD has made on the international stage.

“Despite our small size, Singapore is recognised internationally for its efforts and contributions in the area of Workplace Safety and Health (WSH). OSHD is now a World Health Organization Collaborating Centre for Occupational Health and the International Labour Organization-CIS National Centre for Singapore,” she shares.

Looking towards the future of WSH, what does Dr. Chan hope to see? “Continued success in Singapore’s WSH activities and international recognition of the efforts of OSHD, the WSH Council and [its] stakeholders,” she replies.

After her retirement in 2006, Dr. Chan continues to enrich her life with new experiences. This means setting her sights on matters beyond WSH. While enjoying her pleasant duties as a doting grandparent, she finds time to appreciate what Singapore and the world have to offer in terms of leisure and learning. She also volunteers as a member on the Research Committee of the Singapore Children’s Society, which conducts research to help identify social trends and issues related to children, youths and families in Singapore.

PIONEER PROFILE

Leading the Way Through Dialogue and Action

Having dedicated much of his life to advocating Workplace Safety and Health (WSH), it is fair to say that Mr. Tan Pui Guan has seen it all. From Singapore's early chapters of industrialisation to its vibrant and multifaceted economy today, Mr. Tan has been entrenched in the thick of the WSH landscape since the beginning of his career.

Like some of his fellow pioneers, Mr. Tan's early role echoes the most urgent WSH challenge in newly-industrialised Singapore. Starting out as a Factory Inspector, Mr. Tan inspected machineries that powered Singapore's rapidly growing industries back then, from pressure vessels to cranes and other lifting equipments.

He reflected on the steep learning curve involved in monitoring safety amid this tumultuous period. "In the 1960s, Singapore just started industrialisation, so our industry was not very safe. There were not many inspectors at the time and all of us were very new. In early 1970s the Ministry engaged an expert from the International Labour Organization to teach us. We realised then that we needed to learn [the] best practices from leading countries."

His keen insight and resilience continued to follow him as his career progressed. These qualities made him the perfect fit to helm the newly burgeoning Occupational Safety and Health Division (OSHD) in its early years.

In his new role, Mr. Tan was astute in leveraging on the transitional changes of the decade. The turn of the millennium saw Singapore embracing a new wave of technologies as computerisation became increasingly prevalent in workplaces. Seeing its potential, Mr. Tan nudged OSHD to adopt this new technology, a move that greatly improved its efficiency.

The switch to online computerised systems proved especially useful when it came to dispensing work permits. "Initially, the construction workers were issued with [a] block permit," Mr. Tan explains. "In a block permit, the names of 20 to 30 persons working in a company were written on one sheet of paper. Each work permit holder was then given a photocopy. I changed the system so that each individual would get a hard copy with a photograph. This [allowed] the enforcer to check the identity of the work permit holder," Mr. Tan adds proudly. While processing used to take many days, the online computerised system ensured the permits could be dispensed between one to two days.

In addition to keeping up with the times, Mr. Tan tirelessly led the efforts to engage industries to better regulate themselves. "The industries needed the knowledge of [safety management]. The Ministry had to help them acquaint with knowledge on how to improve [their safety records]. This was where lectures, training and promotion came in," he says. "We set the standards for them to follow. We produced publications that were distributed to the industry free of charge to disseminate information and encourage them to improve safety."

As Mr. Tan sees it, promoting safety has to be a two-way process. "We engaged in dialogue sessions with the management." At the time, Mr. Tan recalls, construction and marine were two industries where accident rates were the highest. "So every six months, I had [a] dialogue session with each [of] these two industries. During the dialogue session, the Ministry would brief the industries on past serious incidents. Measures to be taken to improve the safety of workplaces would also be discussed. An action plan would be worked out. Each party had to follow up on the action plan and [provide] feedback in the next dialogue session."

His staunch commitment to improving the industry had not gone unnoticed. In 1998, the Association of Singapore Marine Industries (ASMI) commended Mr. Tan with the ASMI gold award for his invaluable contributions.

The same commitment also saw Mr. Tan and OSHD going the extra mile to help neighbouring countries improve their WSH standards. Working in conjunction with the Ministry of Foreign Affairs, the Division organised Safety Officers' Training Courses for ASEAN countries. Each year, two safety inspectors from each ASEAN country were sponsored to attend the course.

Fondly reminiscing on his career, Mr. Tan shares the thought that has motivated him to stay the course for more than three decades. "The main reason is not money. It's about saving people's lives. I always tell people: no one knows that his life was saved by us, but we know how many lives were saved from the statistics. When you know you've done your job to save people's lives and prevent injuries, you feel happier."

After Mr. Tan retired from the Ministry in 2005, he opened a new chapter in his career. Together with a group of senior officers from the Ministry, Mr. Tan set up a safety and consultancy firm named Team-6 Safety Training and Consultancy (S) Pte. Ltd. to provide safety training and consultancy services to the industries. He was also engaged by Keppel Shipyard Ltd. as a part-time Occupational Safety and Health Consultant to advise the yard on WSH matters. He also served as Alternate Chairman of the Health and Safety Technical Committee at the Institute of Engineers, Singapore. In 2009, he left his lifelong career in WSH to spend more time with his family.

MR. TAN PUI GUAN

"Promoting safety has to be a two-way process."

Former Chief Inspector of Factories and Director for Occupational Safety and Health Division, Ministry of Manpower



The Occupational Safety and Health Division Takes Its First Bow

In April 1998, the Ministry of Labour assumed new responsibilities and embarked on a new mission to provide the necessary leadership for Singapore's manpower. With these new changes, came a new name: the Ministry of Manpower (MOM).

MOM's mission was categorised under three main areas: Content, Context and Connection.

1. **Content** must be one of progression into the future.
2. **Context** must be of the globally competitive environment in which we operate.
3. **Connection** with our stakeholders and partners must be easily translated.

The Ministry's mission was to develop a workforce capable of competing successfully in the global market. It was about fostering a highly favourable workplace environment to achieve sustainable growth for the well-being of all workers.

To better serve stakeholders, MOM also reorganised its Workplace Environment and Welfare business group on 1 May 2000 to establish the Occupational Safety and Health Division.



TOP:
Economic turmoil in the late 1990s and early 2000s sent companies all over scrambling to recover and protect their fiscal assets.

BOTTOM:
The Ministry began persuading contractors to switch to metal scaffolding in the early 2000s to increase the overall safety of worksites.

the longest-drawn recessions of its time. The dotcom bust, falling global demand for electronics and the September 11, 2001 terrorist attacks on New York's World Trade Centre contributed to an economic downturn that lasted two years. In 2001 alone, 79,900 jobs were lost as companies scrambled to recover losses and avoid bankruptcy.

While the nation responded to this challenge with the vigour and resilience that characterised its people, the recession did not pass without leaving a significant impact on the WSH sector.

"Let's be honest about it – [each] of these [incidents] have an impact on the Ministry's work in occupational safety and health," said former MOM Deputy Divisional Director of Policy, Training and Work Injury Compensation, Mr. Harry K.C. Wong.

Due to the underlying belief that WSH meant extra expenses, convincing the industry to institute safety measures during times of economic turmoil proved to be an uphill battle. However, the Ministry was sympathetic to these financial concerns and was careful to manage their policies in a way that would alleviate the costs attached to them.

In a pertinent example, Mr. Wong quoted the transition of wooden scaffolding to metal scaffolding in the late 1980s. Prior to the 1980s, contractors would employ wooden scaffolding imported from Batam. However, as the construction industry advanced, wooden scaffolds were no longer adequate to withstand heavier and more complex structures. These wooden scaffolds were bordering on becoming hazardous fixtures, endangering the safety of workers.

Aware of these impending dangers, the Ministry began to formulate new legislations of replacing wooden scaffolding with metal scaffolding at worksites. The introduction of metal scaffolding was not without a hefty price tag, however. The overall expenditure was going to cost the construction industry approximately S\$200 to S\$250 million, and the Ministry knew that this was going to be met with resistance from contractors who would bear these costs.

"The contractors in those days are big firms. They're not going to spend aggregately S\$200 million to improve your scaffolding, and probably another S\$50 to S\$60 million to change from wooden platforms to system platforms, which we have been pushing in terms of technology [and] mechanisation," Mr. Wong explained.

Despite the daunting cost and potential contention from contractors, the Ministry still had a responsibility to implement their WSH duties. The shift to metal scaffolding was crucial in ensuring safer working conditions and to prepare the industry adequately for the future.

With that in mind, MOM worked fastidiously with MOF and the Ministry of National Development. The three Ministries endeavoured to implement the pricey legislation in a way that would take into consideration the challenges facing the industry.

"The Ministry is not unfeeling," Mr. Wong reasoned. "We were not going to bring this [legislation] in at the height of the Asian Financial Crisis in 2001, or even two years down the road in 2003."

And so the Ministries adopted the strategy to incentivise the shift of wooden scaffolds to metal scaffolds by amortising the payment in three years instead of five. This arrangement not only allowed contractors to clear payments in a shorter time, but it also prevented them from spending on interest that would have accompanied a longer payment period.

Gradually, contractors came on board to install metal scaffolding in replacement of wooden ones. This success was regarded as one of the Ministry's biggest victories. The empathetic style heralded MOM's new approach to policymaking. Instead of a purely aggressive push, the Ministry sought to engage industries with an encouraging nudge in the right direction.

This method of incentivising costly rollouts was also applied to future systems later on, such as that of the gondola – a system of hanging scaffolding used commonly in construction sites and shipyards.

On top of keeping the economy afloat, the beginning of the millennium also saw the nation overcoming the threat of two major global epidemics.



STAYING THE COURSE THROUGH FINANCIAL CRISES

In 1997, Asia was hit by a massive economic crisis caused by plunging currencies all across Asia. Despite not taking a direct hit, close economic ties to Singapore's neighbours brought forth the spill over effects that seeped into Singapore's financial landscape.

Singapore's export and regional demand dropped dramatically and its banks were weakened by the economies in third-country markets. Many companies went bankrupt and many others turned to cost-cutting measures such as downsizing and retrenchment.

Shortly after, Singapore was hit by yet another recession in 2001 – this time registering as one of

“

A coordinated national effort through prompt and decisive action, with the support of the community, particularly in compliance with stringent quarantine and infection control measures, is important to limit the consequences [of] such outbreaks.”

”

Dr. Magdalene Chan, former Director of the Occupational Health Department, Ministry of Manpower

BOTTOM: Quick to take action: Former Deputy Prime Minister and Minister for Finance Mr. Lee Hsien Loong, Former Prime Minister Mr. Goh Chok Tong, Former Minister for Home Affairs Mr. Wong Kan Seng and Former Minister for Health and Second Minister for Finance Mr. Lim Hng Kiang discussing the issue of SARS with grassroots leaders at the Kallang Theatre in May 2003.



STEERING THROUGH TROUBLED WATERS

In March 2003, trouble brewed when a young Singaporean woman returned from Hong Kong with the first case of Severe Acute Respiratory Syndrome (SARS). The virus claimed 33 lives within four months before SARS was officially eradicated on 16 July 2003.

MOM was swift to take precautionary measures when news of the global epidemic reached Singapore's shores. Together with the Ministry of Health (MOH), MOM took the first step by managing manpower-related issues, with the objectives of preventing and containing the outbreak of SARS, ensuring business continuity, as well as educating and helping companies to manage the outbreak.

Foreign workers arriving from SARS-hit countries were required to be quarantined in dormitories for 10 days. Infected workers were admitted to the hospital for treatment. Workers who showed no symptoms of the infection were allowed to start work. Those that did were sent to Tan Tock Seng Hospital for examination. Even if examination results showed that workers were not infected, these workers were still placed in isolation away from other workers until their symptoms subsided.

The Occupational Safety and Health Division (OSHD) also conducted briefings to employers on SARS and workplace-related issues, including how to minimise the risk of SARS at the workplace. Advisories were prepared, in the form of posters and pamphlets, and given to foreign workers and their employers to educate them on precautionary measures to safeguard their health and prevent the spread of SARS. To bridge the language barrier, advisories were produced in different languages such as English, Mandarin, Malay, Tamil and the various languages of the foreign workers. The advisories could also be conveniently found on the MOM website. An important part of Singapore's national effort to contain the SARS outbreak, was to trace the contacts of a person who had probably contracted SARS, and quarantining them if necessary. OSHD was part of the multi-ministry effort to do contact tracing.

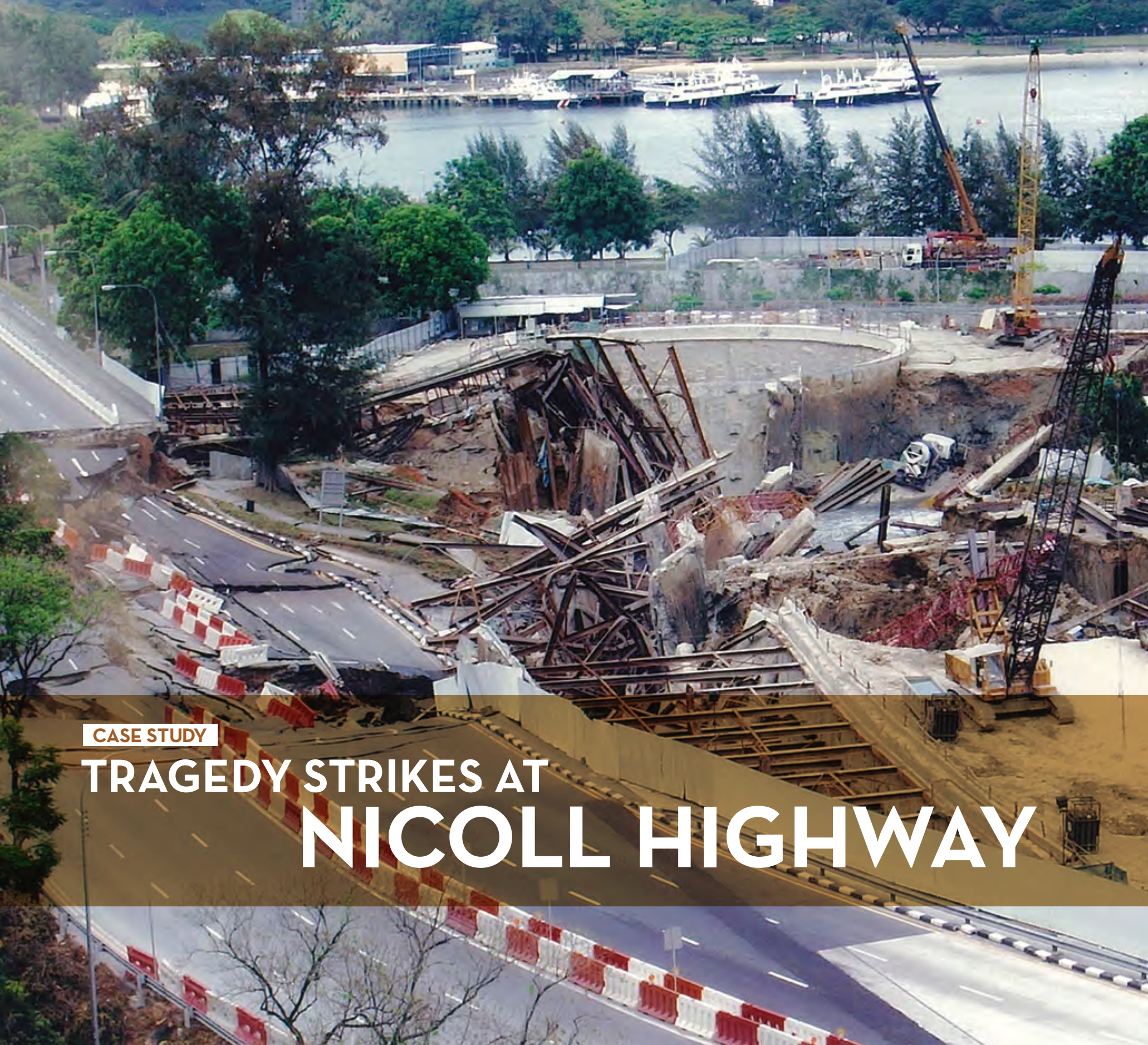
As a result of the intensive public health measures undertaken by the Whole of Government, the SARS outbreak in Singapore was contained within two months. On 31 May 2003, Singapore was declared free from SARS by the World Health Organization (WHO). WHO subsequently declared that SARS outbreaks had been contained worldwide in July 2003.

APPROACHING THE MILLENNIUM WITH A NEW WSH FRAMEWORK

WSH emerged as a critical area of concern in 2004 with major accidents coming under public scrutiny, such as the Nicoll Highway collapse, along with other high-profile accidents such as the Keppel Shipyard flash fire and the collapse of the steel structures at Fusionopolis. Despite overall standards having improved in recent years, this string of devastating accidents served as a grave lesson in the dangers of complacency. Coverage of the event also led to a rise in public expectations for better safety performance, and a decisive turning point in Singapore's safety journey. The call for meaningful WSH change culminated with the reform of the WSH framework in 2005.

BOTTOM: As the decade raised WSH standards to new heights, workers across all sectors were reaping the benefits of a safer and healthier workplace.





CASE STUDY

TRAGEDY STRIKES AT NICOLL HIGHWAY



LEFT:
Inspectors measuring the fallen diaphragm wall that was used to support the structure.

BOTTOM:
Scaffolding and machinery buried under the debris.

RIGHT:
The adjacent road of the worksite that gave way, affecting traffic flow from both sides.



LEFT:
A bird's eye view of the tragic collapse of Nicoll Highway.

On the afternoon of 20 April 2004, adversity struck when a construction tunnel beneath Nicoll Highway gave way, killing four people in its collapse.

The tragedy did not occur in an instant. Omens of the impending cave-in were already showing on the morning of the disaster. As early as 9 a.m., construction workers could hear reverberating noises from the waler beams that supported the tunnel. Upon inspection, it was found that several beams had buckled and sagged, and this anomaly was conveyed back to the project management team.

Believing that the buckling beams were nothing more than minor irregularities, orders were given out to pour cement into various areas of the structure to stabilise the unit. Everyone pitched in to accomplish the order, but as it was later discovered, this was still highly inadequate to hold the structure in place.

At 3 p.m., workers noticed that something was amiss and a sense of panic began to creep in. The previously poured concrete had started to flow out of the structure – an indication that the structure was starting to bend inwards. Additionally, the clanging noises were also becoming more frequent. Workers talked amongst themselves, saying that things were “getting from bad to worse”, and two workers refused to continue working. Cementing works were still being carried out at this point.

At 3.30 p.m., disaster struck. Workers were still working in the excavation pit when the surrounding walls of the structure started to cave in. Joints, metal beams and large cranes began falling into the pit as the earth beneath gave way. Workers scrambled to rush out of the pit – all whilst dodging tumbling scaffolding and falling metal beams through clouds of smoke and dust. While many of the workers survived the ordeal, four lives were lost in the tragic incident.

The tragedy left an indelible mark in Singapore's history. Wrenching tales from survivors and the victims' loved ones poignantly drove home the

BOTTOM:
An unhinged strut, part of the collapsed support assembly.

RIGHT:
The intersection of the fallen structure.



Nicoll Highway opens after \$3m in repairs

AT 1pm yesterday, Nicoll Highway was back in business.

Tourists, construction workers and curious passersby stood on either side of the semi-expressway, cheering as the first vehicle — a white Mercedes-Benz — sped down the newly laid asphalt.

Perhaps because few knew about the re-opening, there were relatively few vehicles on the six-lane highway.

Before parts of it collapsed in April, peak-hour traffic was 2,500 vehicles an hour in each direction.

More than seven months after the tragedy that killed four men, and after a \$3 million reconstruction, SBS Transit driver Ng Hun Chew said it's time for a new chapter.

"It was a tragedy, but we have to let it go now. Let's hope that whatever happens on this highway in future will be positive."



THE SIX-LANE HIGHWAY, which was closed in April, used to have peak-hour traffic of 2,500 vehicles an hour in each direction.

incalculable cost of overlooking safety. While buildings or bridges can be rebuilt, nothing can make up for the loss of a loved one.

The grief and shock soon gave rise to a new sense of urgency, and the wheels of reform turned quickly. Two days after the incident, a Committee of Inquiry was appointed to carry out the investigation. On top of identifying the factors that led to the failure of the excavation work, the Committee was tasked with proposing recommendations to prevent a repeat of this tragic incident. Bestowed with this urgent mission, the Committee worked to gather the facts at a brisk pace.

By 30 August 2004, 103 out of 155 witnesses had spoken at the inquiry. While the inquiry was unfolding, the Committee also prepared an Interim Report. The full document was submitted to the Ministry of Manpower (MOM) on 3 September 2004, ahead of the completion of the hearing. In the official response to the Interim Report, published on 13 September 2004, the Government readily accepted the broad thrusts of the recommendations. This included the necessity of establishing risk management, safety processes and a stronger commitment to safety culture.

To restore public confidence, the response also shared the steps taken to bolster the safety of the Circle Line (CCL) project sites. For example, following the collapse of Nicoll Highway, the Building & Construction Authority (BCA) asked the Land Transport Authority (LTA) to suspend deep excavation works at all CCL Project Sites as a precaution. Subsequently, BCA and LTA's Building Control Unit carried out a comprehensive review of the 14 active CCL project sites.

Where necessary, extra measures were implemented to prevent material overstress. An early warning system was also put in place. This included the establishment of a formalised procedure for taking readings, evaluation of results and reporting. When properly set up, such measures would allow workers to identify foreseeable risks.

Based on the Committee's inputs, contractors would also be held to a higher standard of professionalism. For example, contractors would be required to seek approval from Professional Engineers, Qualified Persons and LTA. The aim was to ensure that only those with the requisite competence would be allowed to undertake specialised construction works.

“

We must act decisively to regain our high safety standards. The fatalities in these six months are a cruel reminder that there is no room for apathy and complacency in your efforts to ensure the safety of your workers [...] I therefore urge all of you to make safety at your workplace a personal priority.”

”

Dr. Ng Eng Hen, former Minister for Manpower, speech at the Annual Safety Performance Awards 2004 on 22 July 2004

LEFT:
Overlooking the depth of the collapse.

TOP:
The reopening of Nicoll Highway was met with cheers by tourists and locals alike.

S'pore's longest public inquiry

THE Nicoll Highway case became Singapore's longest public inquiry, involving 173 witnesses and 20 experts over 88 days of hearings.

Opened last August, the inquiry finally submitted its report, all two volumes and 1,000 pages of it, to Manpower Minister Ng Eng Hen on Wednesday.

There is even a 14-minute DVD, with information on events leading up to the collapse, that comes with the report.

Filled with technical jargon, the inquiry report lays out its findings in complex engineering and legal terms.

Volume one of the inquiry report on the Nicoll Highway case deals with the main issues of the collapse: the conditions in which the accident occurred, the events leading up to it, the collapse itself, the causes of the tragedy, criminal liability and safety.

A whole chapter is also devoted to the inquiry's recommendations and observations on the tragic accident.

At the front of the report, in sobering contrast to the complexity inside, there is a simple message of condolence to the families of the four men killed in the collapse. They

were Land Transport Authority site inspector John Tan Lock Yong, 56; crane operator Vadivil Nadeson, 44; construction worker Liu Rong Quan, 36; and foreman Hong Yeeow Phooow, 40.

Numerous photographs in the report also serve as a reminder of the magnitude of the collapse.

There are aerial views of the disaster site, pictures of the rescue operations and even shots of the support structures buckling under the weight of soil.

Accompanying the inquiry report are also every graph, diagram and chart used to establish the chain of events that led to the tragedy.

An entire second volume of appendices is devoted to supporting documents, including lists and accounts of experts, witnesses and exhibits submitted for the inquiry.

There are even pages given over to recommendations solicited from groups in the construction industry, professional bodies and the media.

The inquiry report into the Nicoll Highway case is available on the Manpower Ministry's website at <http://www.mom.gov.sg>



A MASSIVE BODY OF WORK: The two-volume 1,000-page report of the inquiry probing the Nicoll Highway case was submitted to Dr Ng on Wednesday.

LEFT: A news article recounting the Nicoll Highway incident and the inquiry into its causes.

geotechnical experts, documents, drawings, the technical complexity was simply unprecedented in all past inquiries," he shared. Er. Ismadi remembers getting wind of how the victims' families and co-workers were coping. The recollections resonated deeply with him. "To this day, that footage of [the family and children] attending that wake of one of the deceased foreman is always permanently etched on my mind whenever the subject of Nicoll Highway incident is mentioned."

The tragedy cast a sobering shadow on the nation, but it came with a silver lining. Following the incident, a new WSH reform began to take shape. In 2005, the new WSH Framework was put into place to advocate greater ownership of WSH outcomes. While the gears of change were turning at the Ministry, the industry also took note of the changes that were being rolled out. The following decade became a period of significant progress, as the Ministry worked hand in hand with partners and the industry to take WSH to the next era of excellence.

“ I saw a couple of witnesses broke down and cried on the stand,” (referring to the court proceedings). **“These are colleagues of the deceased [...] so you can see the bosses and supervisors sitting there on the stand. They felt very sorry for their fallen colleagues. So we have seen grown men just crumbled and broke down and this is something that I will remember forever.**

” Er. Mohd Ismadi, Director of Policy, Information and Corporate Services of the Occupational Safety and Health Division, Ministry of Manpower and Secretary to the Committee of Inquiry for the Nicoll Highway Collapse

The FINAL report

When Nicoll Highway collapsed on April 20 last year, the Government appointed a three-man panel to examine the causes of the accident, recommend ways to prevent another such disaster, and determine if there was negligence, including criminal liability.

The report: An excerpt

The cause and contributory causes
 “THE April 20, 2004, Nicoll Highway job site... was owned by Huiyee... It began with two critical design errors. These were the under-design of the diaphragm walls and the under-design of the water connection to the strutting system.
 These design errors resulted... in the failure of the diaphragm wall and water connections together with the inability of the overall temporary retaining wall system to resist the subsurface loads at the next-level strutting level.
 The catastrophic collapse then ensued.
 The collapse did not develop suddenly. A chain of events preceded it.
 Several technical and administrative factors contributed to the collapse. Even the early stages... through to the final collapse, there were failures to demonstrate the necessary level of care.
 Serious human errors were made.
 Warnings of the approaching collapse were present from an early stage but these were not taken seriously. The builder did not adequately deal with excessive morning signs.
 A multiplicity of events led to the present state: design, construction, instrumentation, management and organisational systems used by the builder and their sub-builders failed.
 There were failures in the defence systems: there were no proper and appropriate design reviews. There were inadequate contingency and removal systems.
 Two significant contributory factors are the state of the back analysis... where the collapse took place and the failure to institute a regular, clear and effective monitoring regime.
 The two critical back analyses... were geotechnically flawed. There were repeated breaches of the instrumentation review levels.
 All the experts agreed that on the basis of the second back analysis... work should not have been allowed to proceed in that area.
 The catastrophic collapse was the result of mounting negligence and warnings... over six hours on April 20, 2004, from the hours of the strutting system.
 Time back to last. At 1.30pm... Nicoll Highway collapsed.
 The blame for the collapse falls squarely on the builder, Nishancon-Lian Chang Asia Venture.
 The Nicoll Highway collapse could have been prevented.”

The adequacy of emergency evacuation procedures was another issue raised in the Interim Report. With this concern in mind, MOM conducted its own inspections into LTA's deep excavation sites.

The results revealed ample room for improvement. Although safety evacuation procedures were already established at these sites, there was an absence of clear guidelines. Many were still uncertain about the types of situations that require an evacuation.

To address this, MOM and LTA's safety department summoned all the Registered Safety Officers (RSOs) who were working for the contractors involved in deep excavation projects. During the meeting, all RSOs in attendance were instructed to work with LTA to establish clear criteria on when to activate emergency evacuations.

In addition to the various individual initiatives in place, the Committee stressed the need to think about the bigger picture. To prevent future accidents, a “band aid” approach was not enough. This was a wake-up call that could not be ignored.

One pioneering MOM engineer and Director of Policy, Information & Corporate Services of OSHD, Er. Mohd Ismadi, who was Secretary to the Committee at the time, recalls the incident with much sadness. “The scale of it is quite daunting; the number of witnesses, parties involved, world-class

CASE STUDY

THUMBS-UP FOR EPSON INDUSTRIAL

Singapore Epson Industrial was one of the first companies to benefit from the new Tax Incentive Scheme for Noise Control. The scheme was introduced by the Ministry of Manpower and Ministry of Finance in 1998. Under the scheme, companies with effective measures to reduce noise levels to 83 dBA were entitled to attractive tax incentives from the Year of Assessment

1999. Singapore Epson Industrial invested about S\$120,000 to enclose its 11 stamping machines with special acoustic materials, successfully reducing levels from 90 dBA to below 80 dBA. Through these control measures, the company had created a safer and quieter working environment for some 25 employees.

BOTTOM: Ear protection safeguards workers from high levels of noise in the workplace.



Tapping Into New Technologies to Stay Ahead



The turn of the new millennium brought along an exciting wave of technologies. Ever adaptive to change, OSHD was quick to embrace these new solutions.

Aptly named the Integrated Occupational Safety and Health System (iOSH), the platform serves as a primary processing and transactional system in all matters relating to OSHD. Under iOSH, processes that took longer times in the past, such as incident reporting, could be better streamlined. One example could be found in the introduction of iOSH's one-stop incident reporting system – iReport.

The introduction of iReport in March 2006 accompanied new regulations that expanded the scope of requirement for reporting WSH accidents to include all workplaces. It is also now mandatory to report work-related accidents in which workers are given more than three days of medical certificates, whether consecutive or spread apart.

To overcome the obstacle of mobility, OSHD has also extended the iOSH system for mobile usage. With Mobile iOSH, OSHD inspectors can reduce turnaround time and various costs involved with inspection duties.

Enhanced mobile capabilities also provide OSHD with an opportunity to engage with the public. Snap@MOM, the first mobile application developed by MOM at a national level, allows any witnesses of WSH issues or best practices to report their findings instantly. The issue of occupational health is addressed via ergo@WSH, another app developed by MOM.

The safety and practicality of inspection work is another area OSHD has sought to address. To carry out

enforcement operations, OSHD personnel often have to face various risks and hazards. To mitigate this issue, OSHD is exploring the use of a new technology that has just begun to see wider adoption.

The Unmanned Aerial Vehicle (UAV) represents a potential breakthrough in executing WSH monitoring tasks safely, affordably and efficiently. A proof of concept testing held from January to May 2015 illuminated UAV's potential in assisting with accident investigations.

Despite its massive potential, adopting the nascent technology comes with a few challenges, such as Singapore's weather conditions and stringent air regulations. Fortunately, OSHD is not alone in pushing for the use of UAV. Driven by an initiative by the Ministry of Transport, agencies, regulators and various stakeholders have brainstormed and addressed the issue extensively, after which a UAV Steering Committee was set up. Two workgroups have also been launched – one to look into use cases, and another to attend to matters of policies and technology. In a promising development, OSHD, along with Singapore Civil Defence Force and the Maritime and Port Authority of Singapore, have been granted priority for operating a UAV by the Committee.

Moving forward, OSHD will continue to leverage on new technologies and tools to work more effectively and keep its processes apace with changing work landscapes.

FROM PAPERWORK TO DIGITAL

iOSH

iOSH is an integrated digital platform that serves as the primary processing and transactional system for all matters relating to OSHD. Now also available on mobile, it allows inspectors to access the platform from the inspection site.

iReport

Introduced in 2006, iReport is a one-stop workplace incident reporting system for employers, workplace occupiers and doctors. It accompanied the introduction of the Workplace Safety and Health Act and the Workplace Safety and Health (Incident Regulations) Act.

Snap@MOM

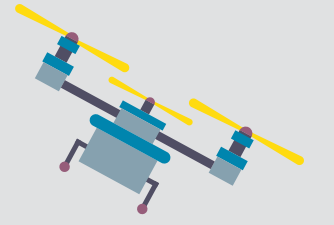
This app helps witnesses of WSH issues report their findings instantly by taking photos of both unsafe and commendable work practices, providing the relevant description and location, and sending the feedback to the workplace occupier to act upon.

ergo@WSH

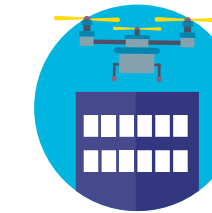
Designed to promote ergonomics in the workplace, this handy app helps the tech-savvy workforce identify ergonomic hazards, improve their postures and maintain musculoskeletal wellness with photo examples, instant posture analysis, and exercise tips.

A NEW TECHNOLOGY TAKES FLIGHT

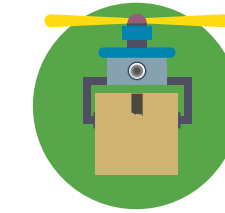
WSH inspectors often have to carry out physically strenuous or risky tasks in the course of their duties. This could mean having to climb up to a great height, or walking along the boom of a tower crane. Fortunately, an innovative technology may be able to provide a solution. As the adoption of UAV gains momentum, OSHD aims to harness this growing technology to make WSH enforcement and monitoring operations safer and more efficient.



WITH AN UNMANNED AERIAL VEHICLE, OPERATORS CAN:



Access hard-to-reach areas.



Carry customisable payload.



Execute tasks too dangerous for humans.

TO GET THIS TECHNOLOGY OFF THE GROUND, OSHD HAS:



Partnered with other government agencies, regulators, and various stakeholders to brainstorm the issue.



Conducted a proof-of-concept testing from January to May 2015.

WHAT'S NEXT?

OSHD, along with the Singapore Civil Defence Force and the Maritime and Port Authority of Singapore, has been granted priority to operate a UAV by the UAV Steering Committee.

With a slew of rapid changes taking place on both an international and local scale, there was much for the Ministry to contend with during the era.



1998

- The Ministry of Labour became the Ministry of Manpower.
- The Tax Incentive Scheme for Noise and Chemical Hazard Control for factories was introduced.

1999

- The first award presentation for the Noise Control Awards scheme was held.

2000

- The Occupational Safety and Health Division was formed.
- The Debarment Scheme and the Demerit Points System was introduced.



2003

- The first case of SARS was detected in February.
- SARS was officially eradicated in July.



2004

- The Avian Influenza outbreak occurred. The Ministry of Manpower subsequently amended the Second Schedule of the Workmen's Compensation Act to include Avian Influenza as a compensable occupational disease.
- Nicoll Highway collapsed.



REFORMING OUR WSH LANDSCAPE

(2005-2014)





TOP:
Government, union and industry leaders attend the launch of the Tripartite Forum on Job Re-Creation at the National Trades Union Congress Centre.

BOTTOM:
Prime Minister Mr. Lee Hsien Loong addressing the issues and strategies of job re-creation at the Forum.

MAKING PROGRESS THROUGH TRIPARTITE PARTNERSHIP

Trade unions affiliated to the National Trades Union Congress (NTUC) were receptive to the call for closer collaboration amongst stakeholders involved in WSH. This led to the building of the spirit of tripartism. Kindled by the continuous dialogue between unions, employers and the Government, the tripartite collaboration brought together partners such as the Ministry of Manpower (MOM), NTUC and the Singapore National Employers Federation (SNEF).

Together, these entities worked to understand the WSH needs of the industry and identify sectoral strengths and gaps to achieve improvements in WSH. Over the years, the tripartite partners addressed a wide range of issues. Among them are the re-creation of jobs, training, upgrading of the workforce, and pushing for fair and progressive employment practices. All of these efforts helped boost Singapore's economic competitiveness and contributed to overall progress in WSH.

By the first decade of the new millennium, Workplace Safety and Health (WSH) in Singapore had already taken a huge leap forward. However, industrial accident frequency rates stagnated at around 2.2 industrial accidents per million man-hours worked. To overcome this hurdle and achieve a breakthrough in WSH performance, a change in strategy was needed.

Hence, a new WSH framework was unveiled. The establishment of the Occupational Safety and Health Division (OSHD), followed by the formation of the WSH Council and WSH Institute, further paved the way toward a more connected and vibrant WSH landscape. Supported by the steady growth in industry ownership and awareness of WSH issues, collaborations between various entities became a source of strength amid this time of rapid change.

MARKING A NEW BEGINNING WITH FRAMEWORK REFORM

The journey toward the new framework reform began in early 2005 with a ministerial study trip to Europe. The purpose of this trip was to understand and get a broader view on the various national-level WSH frameworks in the different countries.

Led by then Minister for Manpower and Second Minister for Defence Dr. Ng Eng Hen, the delegation (comprised of government officials, industry partners and unions), set about studying the various components of these countries' WSH frameworks such as:

1. The role and organisational structure of various government agencies, councils, industry bodies, safety professionals and unions that contribute to ensuring WSH;
2. The self-regulation framework such as the incentives and motivations for the industry to self-regulate; and
3. The structure and processes for the review of safety standards to ensure that they are kept up to date with industrial or technological developments.

Upon their return, members of the delegation convened with their findings, and a new WSH Framework quickly took shape.

Announced by Dr. Ng Eng Hen on 10 March 2005, the new WSH framework became a defining turn in Singapore's WSH journey. While previous WSH legislation was prescriptive and focused on compliance, the new WSH framework advocated for greater industry ownership of WSH outcomes.

The revised framework focuses on three primary principles. First among these is the underlying approach of reducing risks at source by requiring all stakeholders to minimise or eliminate the risks they create.

In line with this principle, the parties who create the risks would be held accountable for managing and reducing those risks. Occupiers, employers, suppliers, manufacturers, designers and persons at work would be held responsible for identifying potential risks and taking appropriate action to mitigate such risks at source.



TOP:
Dr. Ng Eng Hen, pictured above, played an instrumental role in shaping Singapore's new WSH framework.

“

The passing of the Bill will be a tangible expression that we have learnt from past mistakes. This Bill of itself is not the solution – but it will put into place an improved legal framework to get all stakeholders to embed WSH into their daily operations. Although there is a lot more to be done, it is a significant first milestone in our journey towards comprehensive protection for our workers and their loved ones. Together we can make Singapore a safer place to work.

”

Dr. Ng Eng Hen, former Minister for Manpower, speech during the second reading of the Workplace Safety and Health Bill on 17 January 2006



TOP:
Under the revised WSH framework, employees are encouraged to take a greater sense of ownership in WSH outcomes by looking out for their own safety and that of their co-workers.

The second principle requires the industry to take greater ownership of WSH outcomes. Legislation and enforcement would move from its prescriptive orientation to a performance-based one. Managers and workers would be required to develop work and WSH procedures suited to their particular situations in order to achieve the desired WSH outcomes.

The third principle is to prevent accidents through higher penalties for poor safety management. The new framework seeks to impose greater financial disincentives and penalties on workplaces with unsafe WSH practices and systems, even if accidents had not occurred. As a result, this would help to create an environment where all workplaces would find it more cost-effective to improve their safety management systems.

In support of the framework, the WSH Advisory Committee (WSHAC) and MOM co-drafted a national WSH strategy known as WSH 2015. In addition to creating a safe and healthy workplace for everyone, WSH 2015 aimed to transform Singapore into a country renowned for best WSH practices.

This vision is translated into action through three strategic outcomes: reducing occupational fatalities and injuries rate, making WSH an integral part of business,

and positioning Singapore as a centre of excellence for WSH. Close partnerships between the Government and various WSH stakeholders allowed for these strategies to be implemented more effectively.

WSH 2015 supported Singapore's efforts to realise the national target of halving our workplace fatality rate from 4.9 fatalities per 100,000 employed persons in 2004 to 2.5 by 2015. Many in the industry committed wholeheartedly to this challenge, and the result spoke for itself. In a span of just five years, the ambitious proposition was achieved, with the fatality rate registering 2.2 per 100,000 employed persons in 2010.

This achievement was partly owed to the industry's growing willingness to embrace WSH and closer partnerships between the Government and the industries.

“
To achieve better results, we undertook a thorough review of our safety systems, which included a study trip to four European countries to learn [about] occupational safety and health best practices: Sweden, the United Kingdom, France and Germany. In these developed countries, the thinking on occupational safety and health and how to make workplaces safer has advanced dramatically. We spoke not only to regulators, but also to leaders in international construction firms, unionists, academics, and researchers working in private institutions.

”
Er. Ho Siong Hin, Commissioner for Workplace Safety and Health and Divisional Director of the Occupational Safety and Health Division

ENGAGING THE INDUSTRY WITH THE WSH COUNCIL

Within the past decade, more industry leaders have stepped up and taken on greater responsibilities of WSH matters. As advocates and champions of safety, these enterprise leaders took the initiatives to embrace WSH holistically and implement it within their organisations.

The involvement of industry in WSH matters was taken to the next level with the forming of WSHAC in 2005. Comprising 14 industry leaders and four industry-specific committees, WSHAC brought WSH and businesses together in a joint effort to raise WSH standards.

The role of WSHAC was two-fold. Bringing industry insights, the Committee advised MOM on issues concerning WSH standards and regulations. Conversely, the Committee also played a part in securing greater industry support and participation in upholding WSH standards.

The partnership between the Government and the industries was further strengthened in April

2008, when the WSHAC was elevated to a full-fledged council, and renamed the Workplace Safety and Health Council. Today, the Council is made up of leaders across all major industries (including construction, manufacturing, marine industries, petrochemicals and logistics), the Government, unions, and professionals from the legal, insurance and academic fields.

The Council works closely with MOM and government agencies, the industry, unions and professional associations to develop strategies to raise the WSH standards in Singapore.

Through the various initiatives, the Council calls for the promulgation of the mindset that WSH should not only focus on the compliance of regulations but instead inculcate a culture where the value of WSH is deeply internalised and reflected in everyday actions.

BOTTOM:
The National Workplace Safety and Health Campaign in 2013 called for increased efforts in elevating WSH standards on a nationwide scale.



“
It is becoming better understood that good WSH is good business, not only because adverse incidents are avoided but because quality of implementation improves, delivered outcomes are more in line with plans in many other respects, and staff and management are motivated by this good performance.

”
Mr. Lee Tzu Yang, former Chairman, Workplace Safety and Health Council

“

In the real world there will always be people who believe in safety and health and those who don't and some who are just willing to pay lip service. Hence I believed in the strategy of using the 'stick and carrot as well as moral suasion'. But the real wisdom lies in knowing when to use what tool!

”

Mr. Silas Sng, Director, Customer Experience, Policy & Strategy of the Work Pass Division and Work Pass Integrated System Programme Office; and former Senior Assistant Director, Policy, Information and Corporate Services of the Occupational Safety and Health Division, Ministry of Manpower

“

Under the WSH Act 2006 framework, the guiding principles are to reduce risks at the source by requiring all stakeholders to eliminate or minimise the risks they create, instil greater ownership and introduce higher penalties on safety lapses. These principles resonate with the Building & Construction Authority's call for technology adoption to raise productivity at the upstream design stage. Earlier, our main instrument in pushing for adoption of productive technologies was through the buildability framework.

”

Dr. John Keung, Chief Executive Officer, Building & Construction Authority

CHAMPIONING A PROACTIVE APPROACH TO WSH

A year after the launch of the new WSH framework in 2005, the WSH Act, which is a key legal instrument to support the new WSH framework, came into effect. The new WSH Act encourages the adoption of the necessary capabilities to identify and mitigate workplace risks before they occur. Thus, protecting the safety and health of every worker becomes a shared responsibility.

The WSH Act also promotes that good WSH should not fall solely on the shoulders of employers or the WSH officers. In support of this, a wider range of stakeholders, that is, from the workers to suppliers to manufacturers of machineries, to name a few, are encouraged to understand their responsibility spelt out under the WSH Act.

The WSH Act was rolled out in a phased approach. In 2008, six additional sectors came under the ambit of the Act. The coverage of the Act was further expanded in 2011 to cover all workplaces.



LEFT: Under the Work Injury Compensation Act, all workers under a contract of service, regardless of their level of earnings, are entitled to receive compensation for work-related injuries.

BOTTOM: To aid foreign workers' comprehension of the Work Injury Compensation Act, flyers were produced in their native languages explaining the details of the Act.



RIGHT: The WSH framework encourages a proactive attitude in preventing all injuries and ill-health arising from work.

MAKING WORK INJURY COMPENSATION HASSLE-FREE

Another breakthrough in the WSH regulatory landscape came with the introduction of the Work Injury Compensation Act (WICA). Replacing the Workmen's Compensation Act, WICA came into effect in 2008. The enactment of this Act opened a fresh chapter in the continuous effort to refine our injury compensation systems.

In enhancing the WICA framework, MOM conducted extensive consultation with the public, unions as well as businesses. In addition to public feedback, MOM also received feedback from its focus group discussions with NTUC, SNEF, the General Insurance Association of Singapore, the Association of Singapore Marine Industries, the Singapore Contractors Association Limited and the Specialists Trade Alliance of Singapore.

WICA affirms Singapore's commitment to protect every member of its workforce. Under WICA, all

workers under a contract of service, regardless of their level of earnings, are entitled to receive compensation for work-related injuries. This represents a major improvement from the previous Act, where only manual and non-manual workers earning S\$1,600 or less were able to benefit.

On top of that, WICA has also been designed to make the injury compensation process more hassle-free and worker-friendly. With WICA, workers have the alternative to make a claim for compensation up to a capped amount if they do not wish to file a civil suit. This spares the afflicted and their loved ones from the financial and emotional tolls of fighting a protracted legal battle.

Furthermore, most WICA cases now take an average of three to six months to process. The streamlined process ensures that those facing mounting medical bills can receive help as soon as possible. The presence of clearly stated rules and specifications also ensure that employers will not delay paying due compensation to their employees.

“

The 'no fault regime' of the existing work injury compensation scheme assures employees who are injured at work that they would continue to receive their medical leave wages and have their medical expenses paid for while they recover from their injuries, and that they would be adequately compensated for any permanent incapacity they might sustain.

”

Mrs. Roslyn Ten-Kong, Director, Fair Consideration Department and former Director, Work Injury Compensation Department of the Occupational Safety and Health Division, Ministry of Manpower



LEFT:
A two-way conversation:
A Ministry of Manpower
officer conducts a survey
with foreign workers after
a dormitory road show.

MANAGING RISK AT ITS SOURCE

In addition to streamlining the work injury compensation process, efforts were also made to reduce the risks of incurring workplace injuries from the root source.

A cornerstone of the new WSH framework is the concept of risk management (RM). This is an important tool to help in the identification of hazards, assessing of potential risks in the workplace, and implementing measures to control or minimise risks that have been identified. Every workplace should have in place an effective RM system to ensure that employees are working in a safe and healthy environment.

The WSH (Risk Management) Regulations was first introduced in 2006. As part of the Regulations, all employers have to conduct risk assessments and implement control measures to eliminate or reduce risks at the workplace.

In April of the same year, the Risk Management Assistance Fund (RMAF) was also launched as a scheme to help small and medium-sized enterprises (SMEs) defray the consultancy costs involved in implementing RM. Since its rollout, the fund has helped various companies to implement RM. In the span of three years, more than 1,000 companies have benefited from the scheme, with more than S\$6 million disbursed through RMAF.

Other forms of RM support are also made available. These include having trained and competent RM consultants to carry out RM courses, and to help with the conduct of the risk assessments. The Codes of Practice for RM implementation was also published to provide guidance on implementing RM in the workplace.

FACILITATING RETURN TO WORK

Besides ensuring that WICA's payouts remain relevant, it is also important to help injured employees recover and get back to work as quickly as possible. This not only aids their recovery process, but also gives them assurance in terms of job and income security.

For employers, they also benefit when employees return to work early. Hence, in January 2016, treatments facilitating early return to work became claimable under WICA's medical expenses. This would cover charges for physiotherapy and occupational and speech therapy, case management, psychotherapy, functional capacity evaluation and worksite assessment for the purposes of rehabilitating an injured employee back to work, and the cost of medicines, artificial limbs and surgical appliances.



TOP:
Deputy Prime Minister and
former Minister for Finance,
Mr. Tharman Shanmugaratnam,
at the launch of the National
Workplace Safety and Health
Campaign in May 2014.

To help companies better assess risks and hazards at work, MOM, together with the WSH Council enhanced the RM framework and rolled out RM 2.0 in 2014.

- The RM 2.0 framework focuses on three principles:
- A greater focus on actual practice and to ensure that risks are identified and necessary measures are implemented on the ground.
 - Risks should be reduced at source, and upstream control measures should be applied as a first step.

If the risks cannot be reduced at source, other measures must be implemented to ensure the safety and health of the employee.

- Companies should look at how personal risk factors can affect WSH and take a holistic approach by integrating them with traditional WSH risks. These principles ensure that RM is made an integral part of organisational work processes. Employers and businesses are encouraged to regard safety not only as a priority, but also as a core value.

PIONEER PROFILE

Paving the Way for the Future of Workplace Safety and Health

Er. Ho Siong Hin's warm and relaxed demeanour is noticeable from the moment he walks into the room. With a warm smile, he speaks passionately about Workplace Safety and Health (WSH), a subject which is close to his heart and his hopes for the future.

Er. Ho begins by recalling the starting point of his career. He had started out as an Inspector at the then Ministry of Labour, visiting workplaces and conducting safety checks for the Factory Inspectorate. He remembers his first day on the job vividly. "I started in 1982, 1 February," he says. A momentary pause follows. "So today, that's about 400 months," he adds humorously, drawing peals of laughter from the room.

Er. Ho's dedication and commitment saw him working his way up the ranks. Never one to shy away from new challenges, he took on various roles in different departments. In 2005, Er. Ho found himself at the forefront of major WSH developments, including the need for a WSH framework reform. "I was asked to revamp the entire WSH framework, and we had to conduct the Ministerial Study Mission to Europe to better understand their Occupational Safety and Health (OSH) framework and see how we could use these information and insights to completely revamp our framework."

His involvement in the reform of the WSH framework was of major importance, as it set the direction of the Occupational Safety and Health Division (OSHD) at the time. Today, Er. Ho helms the Division's work as the Divisional Director and concurrently as Commissioner for WSH.

Throughout his time with the Division, Er. Ho is heartened to see the WSH landscape improving by leaps and bounds. However, he knows there is more to be done. Er. Ho believes that the workplace fatality rate of less than 1.8 per 100,000 employed persons leaves room for improvement.

"Actually 1.8 [workplace fatality rate] is not very good by today's standard," he opines. "It still translates to 60 deaths last year. And one death is one too many. The question now is: how do you improve further?"

The answer, Er. Ho contends, is in adopting a different mindset, and this is something he believes wholeheartedly. "We hope to aim for everyone to have the mindset that every incident and every ill health arising from work can be prevented."

When asked about the upcoming difficulties of the ageing population and what it might mean for WSH, Er. Ho pauses thoughtfully. "Our demographic is changing, and it's changing rapidly," he offers.

"As you know, as one grows older, there is an increased chance of having some health problems and illness. You may suffer from diabetes, hypertension as well as coping with stress and anxiety due to work. All these make it more challenging. As a result of poor health and well-being, a lot of people may drop out from work. So bearing that in mind, how do [we] address that?"

Ever perceptive, Er. Ho has already set his sights on the challenges and concerns that may crop up in the coming years. "That's why Risk Management [or RM] 2.0 was included in this issue – which calls for a more holistic and pragmatic implementation [of RM]," he says, referring to the newly reformed approach of assessing, reducing and monitoring risks at the workplace.

What other measures can further improve WSH in Singapore? Er. Ho points to the Total WSH approach. "Total WSH looks at the overall health, safety and wellbeing of employees and how these [factors] would have a bearing on each other... it's for a lifetime. This sort of triangular relationship between work, safety and health together – looking at it holistically is important. While that is easy to say, it is not necessarily easy to do."

Despite the challenges ahead, Er. Ho is confident that everyone is committed to work together towards better and improved WSH standards in Singapore.

"We want good safety and health for Singaporeans, so on that note, I think that we are ready to take on the new journey."

Aside from helming OSHD, Er. Ho actively contributes his time and expertise at both national and international levels in various organisations and associations. These include being the incumbent President of the Professional Engineers Board, Singapore, the Executive Director of ASEAN-OSHNET Secretariat as well as the Secretary-General of the Association of Labour Inspectors. He is also an Honorary Vice-President of the Institution of Occupational Safety and Health, United Kingdom.

ER. HO SIONG HIN

"It still translates to 60 deaths last year. And one death is one too many. The question now is: how do you improve further?"

Commissioner for Workplace Safety and Health and Divisional Director of the Occupational Safety and Health Division



STREAMLINING AND EXPANDING ON WSH CAPABILITIES

To help fulfil the new WSH framework, OSHD was restructured in 2005. In addition to WSHAC, the revamped OSHD structure encompassed six different departments, with each department focusing on different aspects, from inspection and monitoring to policies and legislations.

In 2008, the organisational structure was further streamlined into four key departments:

1. **The OSH Policy, Information and Corporate Services Department**
Sets the direction for national WSH efforts. This is done through policy-making, research and analysis of key trends and organisational capability building
2. **The OSH Inspectorate Department**
Upholds the standards of safety in workplaces through enforcement, investigation as well as knowledge-sharing
3. **The OSH Specialist Department**
Provides specialist support, conducts operational research and investigations, develops targeted programmes and strategies, and forges collaborations on a national and international level
4. **The Work Injury Compensation Department**
In charge of administering two systems: the Work Injury Compensation system and the Incident Reporting system
In its wide-ranging capacities, OSHD realises the reformed WSH framework through legislation, policies and industry engagement. It also supports the tripartism approach with the Government, working hand-in-hand with the unions and employers.

RIGHT:
An ongoing inspection at a construction worksite.



BOTTOM:
Public education efforts: Officers from the Occupational Safety and Health Division briefing journalists before a worksite inspection.



LENDING A HAND TO SINGAPORE'S ECONOMIC BACKBONE

Employers who are ready to take greater ownership of WSH outcomes are not left alone in their quests. Various initiatives have been rolled out by the WSH Council to help businesses upgrade their WSH capabilities. Many of these initiatives are designed with the backbone of the Singapore's economy – SMEs – in mind.

SMEs have all along played a critical role in boosting Singapore's WSH standards. Representing 99 per cent of Singapore's enterprises and employing 70 per cent of the workforce, it is important to ensure that these enterprises have the means to access WSH measures in the workplace.

The bizSAFE programme caters to this need. Companies are guided through five levels of progress, starting from top management demonstrating their commitment towards WSH, to acquiring risk assessment capabilities, and to the implementation of a WSH management system. Participating companies are also recognised for their involvement in the programme. To spur further excellence in WSH among local enterprises, the WSH Council has also introduced annual bizSAFE Awards. These awards recognise businesses that have contributed to achieving excellence in WSH.

Besides focusing on building the risk assessment capabilities of companies, the WSH Council has also developed the CultureSAFE programme. The aim of this programme is to help companies build and sustain a progressive and pervasive WSH culture.

The CultureSAFE programme provides a platform for companies to embark on a WSH culture-building journey, focusing on cultivating the right mindset

and attitude where everyone in the organisation takes proactive responsibility for WSH outcomes. Funding is also made available to SMEs on a co-funding basis to defray the costs for engaging external resources in the WSH culture building journey.

Another form of assistance offered by the WSH Council is the Safety Compliance Assistance Visits. This onsite engagement service reaches out to SMEs in educating and building up of WSH capabilities in their workplaces.

Besides assisting the management in improving their standards of workplace safety, the WSH Council also turns its attention towards empowering WSH-conscious individuals in workplaces. Under the WSH Advocate programme, companies are guided to identify suitable employees to become safety advocates in the company. These safety advocates would thus be empowered to bring about a better safety culture by engaging their peers to put WSH into practice in everyday activities.

RIGHT:
Minister of State for Manpower, Mr. Teo Ser Luck, speaking at the bizSAFE Convention 2016.



“Based on my experience engaging with SMEs, I found that often, SMEs are reluctant to make changes to their day-to-day operations. Even when they know it is important, the sense of urgency is lacking. They find it overwhelming to change existing methods and put new systems in place. However, once they overcome these barriers, they realise that the rewards from improving work processes are well worth the effort. I believe this applies to WSH as well.”

”
Mr. Teo Ser Luck, Minister of State, Ministry of Manpower

ENHANCING THE WORKFORCE'S WSH CAPABILITY

Beyond assisting businesses in their adoption of WSH, cultivating a WSH-capable workforce ranks high on the WSH agenda.

With inputs from the industry stakeholders, MOM and the Workforce Development Agency (WDA) co-developed a qualifications framework for WSH professionals. The joint WSH Professionals Workforce Skills Qualifications (WSHP WSQ) framework was launched in April 2008. The framework offers WSH professionals a pathway to improve their capability in managing workplace risks through specially designed training courses.

The move received an enthusiastic response, and many were eager to make the best of the training opportunities offered. WSH professionals were not the only segment of the workforce that benefited from capability-building efforts. From guidelines to new standards, the past decade saw many new initiatives introduced to equip workers in different sectors with WSH skills.

The Marine industry is one particular sector where efforts to enhance WSH competency of its workers took place. In June 2009, 13 trade-specific

competency standards were launched under the WSH for Marine Industry Trade-Specific WSQ Framework. By taking advantage of the training opportunities provided, workers in the Marine sector are able to attain WSH knowledge in a more systematic and structured approach.

Since 2007, companies in the Marine industry are also required to send new foreign workers to attend the Shipyard Safety Instruction Course. Likewise, all new workers in the construction industry had to attend the Construction Safety Orientation Course (CSOC). Undergoing and passing a one-day CSOC was made a pre-requisite condition to receiving work permits.

In 2013, CSOC was enhanced to improve the managing of WSH within the construction sector with in-depth knowledge and skills training. The duration of the Enhanced Construction Safety Orientation Course (ECSOC) was extended from one to two days, and practical components were incorporated into the training. To further acclimatise workers to the work involved in a construction worksite, they would be trained at designated Overseas Training Centres in their home countries, prior to training at MOM's Accredited Training Providers in Singapore.

The emphasis on training and raising capabilities is also high in the agenda for the metalworking industry. In addition to undergoing the Metalworking Safety Orientation Course, all foreign workers are required to pass the Worker Safety and Wellbeing Test to continue their employment as of 1 October 2009.

As training becomes an ever more important aspect of WSH in Singapore, the WSH Council has taken steps to ensure the quality of these training courses. Documents such as the Curriculum Development Advisories for MOM-accredited courses, the Competency Standard and Curriculum Training and Assessment Guide, were developed to provide MOM Approved Training Providers (ATPs) with the instructional design needed for a competency-based training course in WSH. These documents contain key information on the courses to help ATPs facilitate the learning process, deliver effective training, and conduct competency-based training and assessment. With capability-building courses and resources in place, more workers would be equipped with adequate knowledge and capabilities to do their work safely and responsibly.

“

The work of the WSH Institute provides the evidence for policy-making and preventive solutions. The practice of evidence-based WSH policy-making and solutioning makes Singapore a centre of excellence. WSH Institute, being a dedicated WSH research centre, now stands alongside other WSH research centres in the world. Our international Memorandum of Understanding partners include leading research institutes like the Finnish Institute of Occupational Health, HSL, IFA, IRSST, National Institute of Occupational Safety and Health and Occupational Safety and Health Research Institute. Our membership in the exclusive Sheffield Group is also a recognition of our value to the international community.

”

Dr. Gan Siok Lin, Executive Director, WSH Institute

RIGHT:

Dr. Amy Khor, then Senior Minister of State for Health and Manpower, Mr. Khoo Chin Hean, Chairman of the WSH Institute Governing Board and Dr. Gan Siok Lin, Executive Director of the WSH Institute at the launch of the WSH Institute Forum on "Bridging Knowledge, Broadening Horizons" in March 2015.

“

One of the targets for Singapore is to be a 'Centre of Excellence' in Workplace Safety and Health and, indeed, Singapore is already seen today as a highly respected partner in the international fora. Many Asian and global key players are seeking contacts with us. We have close contacts with the International Labour Organization and the World Health Organization at all levels including the top management, we have provided strategic knowledge and reports for them, we work with all key organisations closely – and act as glue and contact point between many of them.

”

Dr. Jukka Takala, Senior Consultant, WSH Institute and Ministry of Manpower

STRENGTHENING WSH RESILIENCE WITH THE WSH INSTITUTE

To become renowned as one of the best WSH leaders in the world, the WSH strategies need to remain relevant not only to today's WSH concerns and issues, but also those well into the future. This poses a timely question: how can Singapore continually identify emerging risks in the industry and take preventive measures?

As part of the WSH 2018 strategy and to put Singapore's WSH performance on par with leading countries in this area, the establishment of a WSH institute was mooted. Drawing from the experiences of leading countries, MOM, in partnership with the WSH Council, set up the WSH Institute in 2011. The Institute aims to build strong WSH capabilities in Singapore, deepen stakeholders' understanding of how current and emerging work environments, work processes and workers' behaviours shape WSH, and use such knowledge to develop solutions and improve WSH practices.



BOTTOM:
The Workforce Development Agency (WDA) is an important stakeholder in the WSH landscape, and was launched in September 2003. Former Minister (Prime Minister's Office) and Secretary-General of the National Trades Union Congress, Mr. Lim Boon Heng, uses a calligraphy brush to spell out the acronym of WDA during its launch at the Singapore Conference Hall.



PIONEER PROFILE

An Unyielding Commitment to Workplace Safety and Health

MR. LEE TZU YANG

“I learnt that to be persistent and demanding is as important as knowledge.”

Former Chairman, Workplace
Safety and Health Council

Experience is the best teacher. This phrase aptly sums up Mr. Lee Tzu Yang's lifelong commitment to Workplace Safety and Health (WSH).

Having worked in the petrochemicals industry for more than three decades, Mr. Lee learnt first-hand the many facets and complexities of managing safety and health. “In Shell, I worked in a range of different environments and roles, which formed my views and approach to health and safety,” said Mr. Lee.

His early career included donning a firefighting suit as an auxiliary firefighter at the refinery. Subsequently, his role included being rostered as a duty officer, which demanded constant vigilance. Elaborating on this, Mr. Lee shares that “there was always the need to understand health and safety issues that might emerge at odd hours.”

Mr. Lee rose up the ranks and eventually became the Chairman of Shell Companies in Singapore. As Chairman, Mr. Lee was determined to ensure that every employee under his leadership would go home safely to their loved ones at the end of each working day. “Progressing in my career, as a manager I worked to ensure that staff were equipped to deal with WSH risks at the plant; as a senior manager I looked at whether our processes including procurement from third parties supported our approach to managing WSH; and as a leader I worked on building a culture that would drive for the best safety and health performance,” he says.

The various roles Mr. Lee had assumed through the years taught him one enduring lesson. To be effective, the call for safety has to be conveyed consistently and relentlessly. “I learnt that to be persistent and demanding is as important as knowledge.”

This insight proved especially apt as the importance of WSH had not caught on at a nation-wide level in industries across Singapore. To raise WSH standards and encourage industry ownership of WSH in Singapore, the WSH Advisory Committee was formed in 2005. The committee was then elevated by law to a full-fledged WSH Council in 2008.

As appointed Chairman of both the WSH Advisory Committee and later the WSH Council, Mr. Lee worked tirelessly to foster collaboration

between the Government, industry and other stakeholders on WSH matters. “We faced a wide range of challenges as well as a lack of awareness in the external environment as to WSH,” recalls Mr. Lee.

Under Mr. Lee's stewardship, the WSH Council has been an effective platform for stakeholders across sectors to come together and work towards the vision of a safe and healthy workplace for everyone.

Mr. Lee is happy to see the positive impact of these collaborative efforts. “We have moved from relative ignorance of issues and acceptance of status quo to becoming more inquiring and seeking better solutions. The wider community now has also higher expectations of WSH, as in many other fields, and now will not accept the WSH outcomes of the past. This is helpful and supportive to making progress,” he says.

Yet this notable progress is no cause for complacency. Mr. Lee has set his sights on future challenges in the WSH landscape.

“As new technologies are deployed in workplaces and the community, we need to understand and manage the risks that new ways of working will introduce. This will require more collaboration between those in business, research and regulation,” he advises.

Singapore's maturing workforce is another issue on Mr. Lee's radar. “Our own demographic change will mean more chronic diseases will manifest in the workplace, and we must learn how to keep an older workforce productive and safe without unfair discrimination. [To address this], the WSH movement will need to build new partnerships and collaborations with emerging interest groups,” Mr. Lee adds.

Mr. Lee is active in a range of areas. Among these, he sits at the helm of The Esplanade Company Ltd., serves as a Justice of the Peace and is also a member of the Council of Presidential Advisers.

Amid this range of responsibilities, his vision for WSH is unwavering: “We must boldly push to make all our activities safe and healthy for all those involved, all the time.”



TOP:
Dr. Amy Khor also chaired the Tripartite Oversight Committee on Workplace Health, which was set up to propagate the Total WSH approach.

ADOPTING A HOLISTIC PERSPECTIVE ON WSH

As Singapore prepares to face emerging and new WSH challenges, a renewed effort was made to address WSH in a more holistic manner.

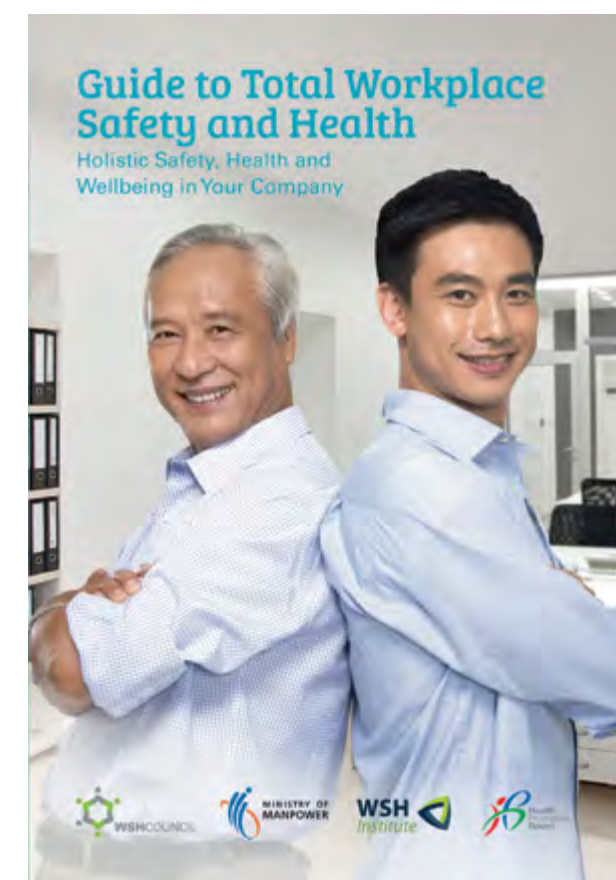
Traditionally, organisations tended to focus more on tackling workplace safety hazards, with workplace health being a secondary priority. Safety and health issues at work were often dealt with separately, instead

of as parts of an interconnected whole. This limited approach is no longer effective as Singapore evolves into a knowledge-based economy and faces a new spectrum of safety and health risks at work. To meet this need, the Total WSH (TWSH) approach was introduced.

Recognising the relationship between how work affects health and vice versa, the TWSH calls for an integrated and comprehensive approach to ensuring the safety, health and well-being of every worker. It encourages health promotion in the workplace to

go hand in hand with other longstanding efforts in improving workplace safety.

In 2012, MOM commissioned a pilot study on TWSH involving 30 companies. Based on the profile of each company, various intervention programmes were held, ranging from office ergonomics to weight management to smoking cessation. The findings of the study revealed that positive benefits could be reaped from comprehensive WSH management measures. Employees of companies where WSH was managed more comprehensively were 7.4 times more likely to be satisfied with their current jobs, 4.4 times more likely to be proud to work for their company, and 1.7 times more likely to report work-life balance.



TOP & RIGHT:
Total WSH was propagated to instil a holistic working environment where employees' safety, health and well-being are considered.

To propagate this approach, the Tripartite Oversight Committee on Workplace Health was formed in 2013. Chaired by then Senior Minister of State for Health and Manpower, Dr. Amy Khor, the Committee calls for raising awareness of TWSH, developing the relevant industry capabilities and incentivising its adoption.

Following this, TWSH was officially launched in 2014. It was first mentioned by Senior Parliamentary Secretary for Health and Manpower, Mr. Hawazi Daipi, during the Committee of Supply 2014. Since then, more initiatives have been carried out to promote TWSH and assist employers in adopting the approach. MOM, the WSH Council, the WSH Institute, the Health Promotion Board, as well as other stakeholders worked hand in hand to develop a guideline on TWSH. Training was also provided to equip WSH professionals with basic competency in workplace health promotion.



“
A healthy and productive workforce in a safe and caring working environment is a critical factor for any successful and sustainable organisation in today's environment. The ability to attract and retain precious human resource is a critical capability. WSH must evolve to be relevant to our lives today for a better tomorrow. We need to work together to build and sustain a healthy workforce that has the ability to continue working for as long as they want or need to. Workplace safety and health issues must be addressed in a more integrated manner. We need to have conversations with employers, workers and all stakeholders to work together to nurture a culture of health, safety and care in our people and organisations.
”

Dr. Lee Hock Siang, Senior Consultant, Occupational Safety and Health Specialist of the Occupational Safety and Health Division, Ministry of Manpower



TOP: Working closely with the Ministry of Manpower, the Workplace Safety and Health Council effectively champions WSH standards through engagement, outreach and capability-building.

SETTING THE WAY FORWARD WITH WSH 2018

In just four years, the WSH 2015 proposition set in 2005 had already been realised. This is in no small part owed to the drive and commitment of everyone within the WSH landscape. The pace in which this breakthrough progress was achieved is also a testament of the commitment by all parties involved.

However, a new resolution was already waiting in the wings. In April 2008, heartened by the progress made, Prime Minister Mr. Lee Hsien Loong announced a new national WSH strategy. Stakeholders were further challenged to lower the rate of workplace fatalities to less than 1.8 per 100,000 employed persons by 2018. This new target would allow Singapore to have one of the best safety records in the world, on par with leading countries like Sweden and the United Kingdom.

“

“If we analyse the incidents which are taking place, we can find many creative and innovative ways to tighten up safety standards and practices, to put right what we are still not doing properly, and to get employers and workers trained and imbued with safety consciousness.”

”

Prime Minister Mr. Lee Hsien Loong, speech at the launch of the WSH Council on 29 April 2008



LEFT: Prime Minister Mr. Lee Hsien Loong at the National WSH Campaign and launch of the WSH Council in April 2008.

BOTTOM: Participants pen their WSH hopes and aspirations at the launch event.

In his speech at the launch of the WSH Council in 2008, the Prime Minister voiced his optimism that Singapore has what it takes to achieve this manifesto. The key is finding new ways to improve the nation's existing WSH standards.

However, an ambitious undertaking is not necessarily easy. To transform Singapore into a leading country in WSH, everyone has to pitch in and be aligned toward the same direction – WSH 2018. Drafted by MOM and the WSH Council and in consultation with the industry, the national strategy took its inspiration from the WSH 2015 framework.

Prior to the announcement of the strategy, the WSH Council invited close to 13,000 stakeholders to provide feedback on the newly drafted WSH 2018. With support from the Singapore Business Federation and NTUC, the WSH Council and MOM also organised a series of consultation sessions. These sessions attracted over 440 registered participants from employer associations, unions, trade associations and relevant professional bodies.

All feedback and comments received were thoroughly considered and deliberated to ensure for a more robust national strategy.

At the heart of WSH 2018 are four strategic outcomes. First, reduction in WSH incident rates remains a steadfast priority. This is followed by the second, yet equally important outcome – making safety and health an integral part of business. Discerning the need for knowledge sharing at an international level, WSH 2018 also seeks to position Singapore as a centre of excellence for WSH.

The fourth outcome sums all these different goals into one overarching imperative – creating a progressive and pervasive WSH culture in Singapore. It is a culture where everyone believes in, lives and breathes WSH. In this paradigm, safety and health will no longer be the responsibility of WSH officers alone. Instead, every member of an organisation, regardless of their rank, duty or age, will be active custodians of safety and health.

“

Yes, Singapore's WSH performance has significantly improved over the last decade. For sure this can be attributed to MOM's relentless initiatives, together with the continued unwavering support and commitment among the engineers in the Institution of Engineers Singapore, both in public service and private organisations.

”

Er. Ong Ser Huan, Honorary Member, Institution of Engineers Singapore Council, Member, Ministry of Manpower's Delegation to the United Kingdom on the Design for Safety Study and Past President of the Institution of Engineers Singapore



TOP: Open and routine communication on safety matters is part of a good WSH culture – depicted, a marine industry supervisor speaking to his team.

Mr. Ameerli, former general manager of the Occupational Safety and Health (Training and Promotion) Centre recalls meeting a Managing Director (MD) from a large company in America, to whom he asked, “how many safety officers do you have?” The MD paused, before replying, “I have 6,000 safety officers.” Mr. Ameerli was impressed – the company must have been sizeable to employ such a large number of safety officers. Intrigued, Mr. Ameerli asked, “how large is your workforce?” to which, the MD replied, “6,000.” The story sent a

clear message: every individual contributes to a safer workplace, and co-workers should actively look out for one another, as safety is a team effort.

Gradually, this way of thinking gained traction, and the numbers speak for themselves. Everyone involved took to the challenge of reducing the industry’s fatality rates with palpable commitment and gusto. In 2014, the fatality rate of 1.8 per 100,000 employed persons was achieved, four years ahead of the target timeline set.

“

In the WSH 2018’s National Strategy for WSH in Singapore, four strategies are identified to strengthen WSH improvements and drive the process towards safer and healthier workplaces. One of them is to implement an effective regulatory framework in which the Occupational Safety and Health Inspectorate plays a pivotal role in engineering the gradual shift from the current regulator-driven one to an effective industry self-regulated model.

”

Mr. Chan Yew Kwong, Director of the Occupational Safety and Health Inspectorate, Ministry of Manpower

LOOKING BACK AND LOOKING BEYOND

Singapore’s WSH record has come a long way. With greater ownership and engagement as the twin driving forces in advancing WSH, Singapore has been able to set and surpass two ambitious national WSH strategies in the past decade. Within this relatively short time frame, the seeds of a WSH-conscious culture have also been planted on a national, organisational and individual level.

However, this does not mean that Singapore’s safety journey has arrived at the finish line. In fact, where improving WSH is concerned, there is no finish line in sight. Whenever one goal has been met, the bar must be set higher. A forward-looking vision will allow the WSH landscape in Singapore to escape the trap of complacency.

As the future dawns, OSHD, in close partnership with the WSH Council and the WSH Institute resolves to continue pushing towards higher standards in WSH as Singapore embarks on the next frontier of WSH excellence.



BOTTOM: During a site visit to the Singapore Sports Hub, international delegates met up with main and sub-contractors in the construction and facilities management industry to learn about the challenges they faced and how Design of Safety helped in their progress.

Engaging Stakeholders to Raise Industry Capability and Awareness

The industry's participation is crucial to the continual progress of WSH in Singapore. Since the past decade, more companies have shown greater interest and ownership of WSH outcomes. Nonetheless, some lack the knowledge and capability to do so. To assist these companies, the WSH Council has rolled out a range of programmes and initiatives.

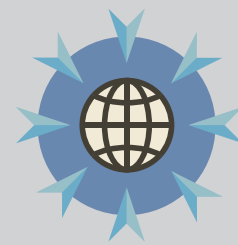
First introduced in 2006, the Programme-based Engagement (ProBE) Plus is a flagship programme of MOM and the WSH Council designed to target areas with poor safety and health records. Comprising three key phases, it aims to achieve better WSH outcomes through greater industry ownership, capability-building efforts and increased engagement and enforcement on the priority areas.

Under ProBE Plus, the WSH Council actively engages the industry to raise WSH competencies and awareness so that stakeholders can better manage the WSH risks in their own workplaces. Thereafter, the MOM will enforce to ensure that appropriate measures have been put in place to improve safety standards in these work areas.

The WSH Council has also been putting in greater focus in building the WSH capabilities of the small and medium-sized enterprises (SMEs). Being the backbone of the Singapore economy, it was important to help these SMEs and hence the bizSAFE programme was put in place. Launched in April 2007, bizSAFE provides a systematic approach to help SMEs build up the WSH capabilities in their organisations.

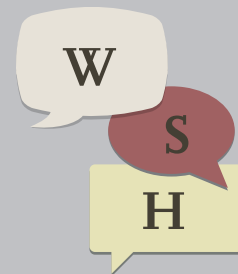
WHAT IS ProBE PLUS?

Introduced in 2006, ProBE Plus is introduced to raise standards in key priority areas where poor health and safety records are identified. Overall, there are three key phases involved:



PHASE 1 INTEL GATHERING

Leveraging on technology and working closely with key partners to identify key ground issues.



PHASE 2 ENGAGEMENT AND COMMUNICATION

Extending engagement efforts to promulgate ProBE initiatives.



PHASE 3 ENFORCEMENT AND MONITORING

Allow review and reinforcement process for ProBE target groups and outcomes.

THE 5 STEPS OF bizSAFE

bizSafe is a WSH programme aimed at helping SMEs, an important pillar of the Singapore economy. Participating enterprises learn how to successfully build up and implement WSH capabilities within their organisations through five comprehensive levels.

- 5** | Deliver Excellence in WSH Management Systems
 To attain a bizSAFE star, the enterprise must obtain the required certifications: SS506 or OHSAS18001 or other equivalents accompanied by an RM Implementation Audit Report by an MOM-approved WSH auditor.
- 4** | Acquire Capability in Managing WSH Systematically
 A Workplace Safety and Health Management System (WSHMS) Lead must be selected to attend a bizSAFE course on the subject, and to devise a WSH Implementation Plan for the enterprise. Completing the WSHMS plan is requisite to applying for Level 4 status.
- 3** | Implement Risk Management
 After gaining the necessary knowledge on RM, he or she has to chart out an RM Implementation Plan. An MOM-approved WSH auditor must then assess the implementation.
- 2** | Acquire Risk Management Capability
 The enterprise must then nominate a Risk Management (RM) champion to attend a bizSAFE course on RM.
- 1** | Demonstrate Top Management Commitment
 First, the top management must sign up for a bizSAFE workshop for Top Management conducted by bizSAFE service providers.



CultureSAFE assists organisations to instil the culture of WSH in every employee. The culture-building journey begins with a one-time kickoff session with the management team, and is followed by a five-step cyclical process.

Besides helping SMEs improve their WSH performance, participation in the bizSAFE also makes business sense. According to a study conducted by the WSH Institute in 2013, of the 1,652 bizSAFE Enterprises, 81 per cent agreed that through participation in the bizSAFE programme, they were better at managing WSH. These companies also expressed their preference to engage bizSAFE enterprises for future projects.

Developed and launched in 2012, CultureSAFE also provides a robust platform for organisations hoping to instil the culture of WSH in every employee. The programme assists companies in measuring and benchmarking their WSH culture through a five-step cyclical approach. A CultureSAFE Model, comprising six organisational attributes, was also developed to serve as a common structured framework in addressing various aspects of WSH culture.

With all these initiatives, the WSH Council continues to work hand in hand with the various stakeholders to bring about greater awareness and capabilities in WSH towards building safer and healthier workplaces.

The first decade of the new millennium ushered a massive wave of change and reforms to the WSH culture, framework, and mindsets. Working together with different industry partners, the Occupational Safety and Health Division continues to strive for higher standards of welfare for workers in Singapore's workforce.



2006

- The WSH Act was introduced.
- The Risk Management Assistance Fund was launched.
- The International Advisory Panel was formed.

2008

- The WSH 2018 strategy was announced.
- The WSH Advisory Committee became the Workplace Safety and Health Council.
- The Occupational Safety and Health Division was organised into the four effective departments: The Occupational Safety and Health Policy, Information and Corporate Services Department; the Occupational Safety and Health Inspectorate Department; the Occupational Safety and Health Specialist Department and the Work Injury Compensation Department.
- The Work Injury Compensation Act came into effect, replacing the Workmen's Compensation Act.
- The WSH Professionals Workforce Skills Qualifications framework was launched.



2009

- Starting 2009, all foreign workers are required to pass the Worker Safety and Wellbeing Test to continue their employment.



2011

- The WSH Institute was formed.



2013

- The WSH Stakeholders' Dialogue on Vision Zero was held.

2005

- The WSH Advisory Committee was set up.
- A study trip to Europe was organised to study the WSH Frameworks of our European counterparts.
- A new WSH framework was introduced to make possible quantum improvements in WSH.

2007

- The bizSAFE programme was rolled out.
- Singapore hosted the 23rd Asia-Pacific Occupational Safety and Health Organisation Conference.

2010

- A fatality rate of 2.2 per 100,000 employed persons was reached.
- Singapore signed the Seoul Declaration on Safety and Health at Work.

2012

- The Ministry of Manpower ratified the International Labour Organization Promotional Framework for the Occupational Safety and Health Convention, C187.

2014

- The WSH 2018 strategy was realised, with fatality rates registering 1.8 per 100,000 employed persons.
- Risk Management 2.0 was rolled out.
- Total WSH was introduced.

CHAMPIONING WSH STANDARDS ON AN INTERNATIONAL SCALE

(2015 – FUTURE)





As Singapore commemorates its 50th year as an independent state, the Occupational Safety and Health Division (OSHD) reflects back on its journey with pride.

Flanked by both challenges and successes, the Division's journey in spearheading Singapore's ever-evolving Workplace Safety and Health (WSH) landscape has been guided by numerous hands – generations of safety champions that carried the Division from one milestone to the next. This has allowed the Division to overcome the many hurdles faced along the way. Despite fielding numerous headwinds, OSHD retains its momentum of aiming for higher and more qualitative standards, at home as well as on the international stage.

From heavy industrialisation to knowledge-driven businesses, the winds of change have transformed Singapore's vocational landscape into a vibrant, multi-sectored terrain. The rise of emerging industries, a diversified workforce and an ageing population also spell the need to cope with new technologies and a more competitive environment.

Amidst these fast-moving times, OSHD remains steadfast to the mission at hand. Regardless of age, nationality or vocation, the belief that everyone has a right to work in a safe and healthy work environment remains a guiding principle. Every individual in Singapore should be able to go home to his or her loved ones – safely and healthily – at the end of the working day. Safeguarding this right is a responsibility that the Division embraces wholeheartedly, and one that has brought about positive change in the WSH landscape.

“

We need to strengthen personal ownership of WSH, where everyone sees WSH as a way of life, taking responsibility for their own safety and health and that of those around them. This is only possible when we believe that every injury and ill-health arising from work is preventable.

”

Er. Ho Siong Hin, Commissioner for Workplace Safety and Health and Divisional Director of the Occupational Safety and Health Division

MOVING TOWARDS INDUSTRY SELF-REGULATION

The shift from a compliance-based to a performance-based approach towards WSH had not been achieved overnight. While some businesses and individuals rose to the occasion without hesitation, some were not fully convinced of the need for WSH.

It took a multi-pronged approach of legislation, policies, education and unfortunately, incidents of devastating tragedies to bring about a culture of shared responsibility. Although it took time and patience, these relentless efforts ultimately produced encouraging results. Under the new paradigm set forth by the WSH reform, OSHD and the industry have been able to make significant progress, reducing fatality rates to 1.8 per 100,000 employed persons in 2014 – four years ahead of the 2018 timeline. Having surpassed that milestone, the Division turned its sights towards a new philosophy: Vision Zero.

LEFT:
The launch of the WSH Campaign 2015 propagated the Vision Zero mindset that all work injuries and ill-health are preventable.

ADOPTING A VISION FOR A HEALTHY AND ACCIDENT-FREE WORKPLACE

On the afternoon of 24 April 2015, then Minister for Manpower Mr. Tan Chuan-Jin revealed a new direction for the WSH movement. Dubbed “Vision Zero”, it seeks to inculcate a mindset that all injuries and ill-health at work are preventable.

The Vision Zero mindset first gained prominence in Sweden in 1997 as part of the road safety policy and has since been adopted internationally to drive

improvements in WSH outcomes. Leading countries began to adopt the vision according to their cultures and practices. All did so with the same aim: to prevent injuries and fatalities in the workplace. Singapore is no different. In charting the path forward, Singapore has emulated the Vision Zero model – taking a more proactive attitude towards the prevention of injuries and ailments in the workplace.

To engage the industry in this new mindset, the WSH Institute initiated the WSH Stakeholders’ Dialogue in April 2013, where more than 150 business leaders gave their views on Vision Zero. The preliminary

BOTTOM:
The fourth International Advisory
Panel meeting in session.



LEFT:
The International Advisory Panel is made up of occupational safety and health officials from different countries, helping to elevate the discussion and nature of WSH on a global scale.

“
Vision Zero does not start with the number as a target. It starts with a mindset and a belief. It starts with you and me as a caring employer and a family member, doing what we can to prevent injuries and keep healthy. I think we owe it to all of us, and we owe it to all our families to do this. All of us must find our own way of developing that mindset. It is about all of us not letting go of our opportunities to prevent any accidents. Because you never know – a simple accident, a simple slip, can result in serious consequences.

”

Mr. Tan Chuan-Jin, former Minister for Manpower, speech at the launch of the National Workplace Safety and Health Campaign on 24 April 2015

findings were encouraging – more than 90 per cent of business leaders agreed that Vision Zero is the right mindset to adopt.

In 2014, during the fourth meeting of the Ministry of Manpower (MOM) International Advisory Panel (IAP) for WSH, IAP offered further key recommendations for Singapore to achieve the Vision Zero mindset. First, the Panel advocated for the importance of leaders as role models in effecting the mindset change. Second, the Panel asserted the need for performance measures to track progress and facilitate regular reviews. Third, early efforts should be focused on achieving support and continued buy-in from the industry by providing a compelling case for Vision Zero. Finally, the benefits of adopting Vision Zero from a moral and economic standpoint should be clearly communicated to the industries.

IAP also drove home an important point: Vision Zero should not be seen as a destination, but rather, a journey. OSHD, together with the WSH Council and the WSH Institute, has begun to develop initiatives to assist industries in turning the Vision Zero mindset into action.

VISION ZERO

“

We all can make Vision Zero a reality. We need to start young – start from preschool. At preschool, you can stress on simple things like traffic safety, put on your helmet when you cycle, cross the road, and you know, don't jaywalk, simple things like that. And then in schools, safety needs to be in-built into the co-curriculum activities. That's where actually I learnt safety from. I was in boy scouts. When I go camping, I was taught about safety. So, [it] becomes real. Then it becomes part and parcel of the way we do things. It becomes our culture.

”

Dr. Peck Thian Guan, Director, Office of Safety, Health & Environment, National University of Singapore



TOP: Minister of State for Prime Minister's Office and Ministry of Manpower, Mr. Sam Tan, at a construction site inspection in December 2015.

AFFIRMING A PATH FOR PROGRESS IN THE CONSTRUCTION SECTOR

In the construction industry, where injury and fatality rates remained high, Vision Zero has become an inspiring call to action. The industry leaders' determination to reduce workplace fatality rates was made clear at the Construction WSH Leadership Summit 2015.

Drawing more than 300 participants, the Summit saw construction industry leaders reaffirming their commitment to reduce the workplace fatality rate to less than 1.8 per 100,000 employed persons by 2018. Achieving this target requires a sustained effort. The industry would need to reduce its workplace fatality rate by 25 per cent every year for the next three years.

To realise this goal and set forth toward Vision Zero, the Construction Industry WSH Action Plans 2015 was put together by the industry. The document outlines a set of commitments and plans toward achieving better WSH performance for the built environment together. Six focus areas spanning the life cycle of construction projects are detailed. This encompasses training, culture and practices, leadership, procurement and Design for Safety (DfS).

Within the document, the leaders expressed their pledge to take personal ownership of WSH, demonstrate leadership, work in partnership with all stakeholders, adopt a mindset that no work is worth compromising WSH for, and focus on finding solutions to prevent injuries and ill-health arising from work.

In support of the industry and to realise the action plans, the WSH (Design for Safety) Regulation was gazetted in August 2015 and is set to come into effect in 2016. The roles and responsibilities of all parties involved in the construction project will be outlined in the Regulations. Additionally, the Regulations would also be made mandatory for projects with a contract worth S\$10 million or above.

Training is another area where support would be provided. To aid in the implementation of DfS, MOM will work with the industry to train 1,000 DfS professionals by 2018. Existing DfS courses will also be reviewed. Also to be piloted is the Developer & Designer Early Engagement programme, which aims to achieve better WSH outcomes by engaging developers and designers at an earlier stage.

The construction industry would be best-placed to achieve its long-term objectives in achieving significant WSH progress through this comprehensive range of initiatives.

BENCHMARKING A MAJOR HAZARD INSTALLATION REGULATORY FRAMEWORK AGAINST ESTABLISHED INTERNATIONAL PRACTICES

Distinctly, the oil refining and petrochemical industry is one of the largest contributors to Singapore's manufacturing output. Many of these investments comprise facilities classified as major hazard installations (MHIs) because they handle large quantities of toxic and flammable substances in a complex operating environment. The likelihood of a major MHI incident is generally low due to the stringent WSH management system in place. Notwithstanding this, their complex operating environment and high concentration of highly hazardous chemicals mean that any accident can potentially result in catastrophic consequences.

Ensuring the integrity of MHIs is paramount, both to our economy as well as the well-being of our workers and the public. To be in line with international best practices, in May 2013, MOM led a multi-agency study mission with representation from MOM, the Singapore

Civil Defence Force (SCDF), the National Environment Agency (NEA), the Economic Development Board (EDB), Jurong Town Corporation (JTC), the WSH Council and the Singapore Chemical Industry Council to countries such as the United Kingdom, Germany and the Netherlands. The purpose of the study mission was to allow the taskforce to study how leading countries in WSH manage their MHIs.

Following the study mission, an Inter-Agency Taskforce was established to review the existing MHI regulatory framework to enable better oversight of safety, health and environment risks in the MHI sector. Involving key government agencies such as NEA, SCDF, EDB and JTC, the Taskforce would be implementing the following changes in support of the safety case regime:

- (i) A set of MHI Regulations targeted for enactment by the first half of 2016;
- (ii) A National MHI Regulatory Office to be established as the single regulatory front for MOM, NEA and SCDF; and
- (iii) The industry will be given a year to prepare and build up capabilities before the new safety case requirements come into effect in 2017.



“
The highlight was the visit to Health and Safety Laboratory testing and experimental facilities. Under controlled laboratory conditions, they witnessed the effects of a live exploding metal drum, a polymerisation process, a chemical runaway reaction and a jet fire impinging on a material that was to be tested for its resistance to thermal radiation. As they said, seeing is believing! The live demonstration really helped to bring to life what can go wrong if a chemical process in an MHI is astray.”

”
Mr. Kok Ping Soon, Deputy Secretary (Development), Ministry of Manpower, led officers from the Occupational Safety and Health Specialists Department on a 3-week attachment to the United Kingdom in October 2015

LEFT: A major hazard installation (MHI) study mission was conducted by an inter-agency team; subsequently, a taskforce was set up to review Singapore's existing MHI framework.



TOP: Singapore is honoured to be hosting the XXI World Congress on Safety and Health at Work in 2017.

BECOMING A MODEL AND PROMOTER OF WSH ON A GLOBAL LEVEL

Beyond achieving WSH progress on a local level, Singapore is also actively involved in the regional WSH landscape. As an advocate of Vision Zero and high WSH practices and standards, Singapore is humbled to be able to help its regional and international partners in furthering their WSH journey.

In 2017, Singapore will host the XXI World Congress on Safety and Health at Work. This would be the first time that the Congress will be held in Southeast Asia. The monumental event will be jointly organised by the International Labour Organization, International Social Security Association and MOM.

The Congress' theme, "A Global Forum for Prevention", aptly reflects the ongoing journey of championing the philosophy of Vision Zero. Over four consecutive days, the Congress will offer a myriad of programmes and activities aimed at cultivating the practices and culture of WSH. Poster presentations,

industrial visits and the International Media Festival for Prevention line the itinerary of the Congress.

Indeed, it will be a moment of pride for Singapore. This event will mark both a milestone of five decades of WSH efforts, as well as the beginning of many more new chapters to come.



It is a special honour and a privilege to be accepted as the host of this world congress. In its long-standing history only countries with a truly successful WSH record and special improvements have been selected as a host. The joint decision of the International Labour Organization and the International Social Security Association to select Singapore for 2017 clearly marks the approval of Singapore's successful work.



Dr. Walter Eichendorf, Vice-President, Research Division, International Social Security Association



EMBRACING THE FUTURE WITH OPEN HANDS

As with many journeys, there is hardly an end in sight. The future remains both a challenge and an opportunity. OSHD will not rest on its laurels – for the pursuit of WSH excellence is not without challenges and expectations. With the newly-adopted philosophy of Vision Zero, the Division will continue working with stakeholders towards a future where sustainable and long-term practices of WSH are deeply rooted in each and every workplace and worker.



TOP: The annual WSH Awards lauds the commendable efforts of companies and individuals for WSH achievements.

BOTTOM: Members of the ASEAN Occupational Safety and Health Network at the ASEAN-OSHNET Policy Dialogue 2016.

FEATURE

Taking Singapore's WSH Journey Onto the International Stage

The promising strides Singapore has achieved in WSH would not have been possible without strong international collaborations. The first thread of this mutual linking of hands was woven in 1978 when the Industrial Health Department (IHD) was appointed a World Health Organization (WHO) collaborating centre. More than three decades later, the partnership between WHO and Singapore remains robust.

Following the OSH framework reform in 2005, MOM saw the need to seek inputs from international experts to take Singapore's WSH performance to new heights. With this in mind, the International Advisory Panel (IAP) was convened in 2006. Hailing from countries with some of the best WSH records in the world, the IAP members shed light on global trends and developments in WSH. The Panel has commended Singapore for the progress it has made and been constructive in providing valuable input.

Beyond drawing the best of minds to Singapore, the island city-state also sets its sights on strengthening partnerships beyond its home turf. Over the years OSHD participated in several international and regional conferences, meetings and training courses as well as hosting visits by various international bodies. On the regional front, Singapore is also proud to be an active participant and the current Secretariat of the ASEAN Occupational Safety and Health Network (ASEAN-OSHNET), Asia's regional OSH centre and collaborative platform.

2015 also proved to be a significant year as the United Kingdom (UK) affirmed its relationship with Singapore with a formal Memorandum of Understanding (MOU) marking a mutual commitment to drive world-class innovation, science and specialist expertise around WSH in both countries.

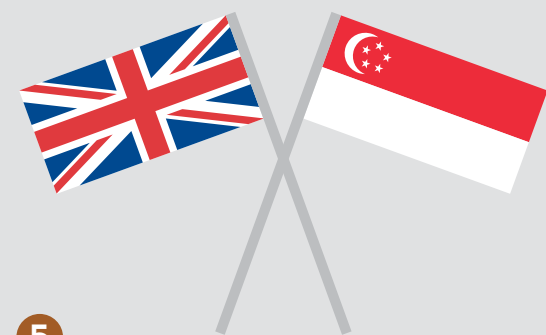
Singapore's heightened participation in these regional and international platforms is reflective of the nation's commitment to work collaboratively with its partners. While learning from the world's best, Singapore will chart the path toward becoming a nation synonymous with safety.

Partnerships have been integral to Singapore's ascending journey as a nation with a forward vision. The same holds true in the field of WSH. International collaborations have enabled us to push the standards of WSH from strength to strength.

1

THE FIRST MILESTONE

Then a young nation, Singapore made its first major stride in weaving an international WSH partnership when the Industrial Health Department (IHD) was appointed the **World Health Organization collaborating centre** in 1978.



5

ONWARD AND UPWARD

In 2015, a formal Memorandum of Understanding marked the partnership between Singapore and the United Kingdom to drive innovation, science and expertise on WSH.

2

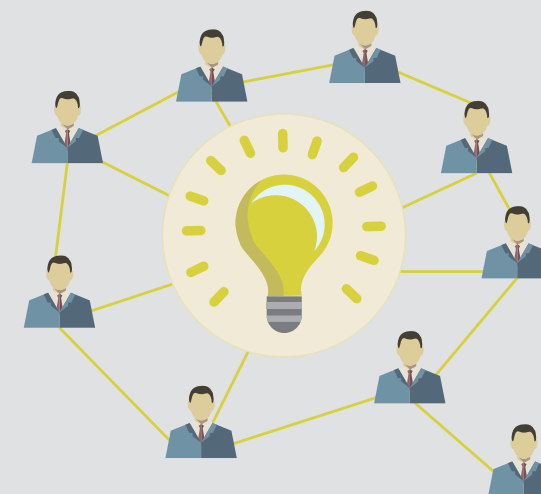
TAPPING ON A WORLD OF INSIGHTS

Following the reform of OSH framework in 2005, Singapore also saw the need to learn from countries that are already ahead in their WSH journey. In 2006, the **International Advisory Panel** was set up to advise Singapore on matters involving WSH policies.



“ This marks the beginning of a long-term partnership in which Singapore and the UK can learn from each other and build world-class knowledge through joint research programmes. ”

Mr. Loh Khum Yean, Permanent Secretary, Ministry of Manpower on the signing of MOU between UK and Singapore to improve WSH



4

A SHINING BEACON IN ASIA

Singapore is also an active participant and the current Secretariat of the ASEAN Occupational Safety and Health Network (ASEAN-OSHNET), Asia's regional OSH centre and collaborative platform. Formed in 2000 with 10 ASEAN member states, the platform allows Singapore the opportunity to engage with our regional neighbours in Asia for the sharing and learning of WSH insights.

3

STEPPING ONTO THE GLOBAL STAGE

From Seoul to Geneva, Singapore has also participated in a number of regional conferences and international WSH events, including:

- 23rd Asia-Pacific Occupational Safety and Health Organisation (APOSHO) Conference (2007).
- Signing of the Seoul Declaration on Safety and Health at Work – a global pledge and blueprint on preventative safety and health culture (2010).
- The ratification of the ILO Promotional Framework for Occupational Safety and Health (OSH) Convention, C187, at the International Labour Conference in Geneva, Switzerland (2012). Member states that ratify C187 are required to establish a framework within which OSH can be promoted.

23RD ASIA-PACIFIC OCCUPATIONAL SAFETY AND HEALTH ORGANISATION (APOSHO) CONFERENCE (2007)

SIGNING OF THE SEUL DECLARATION ON SAFETY AND HEALTH AT WORK

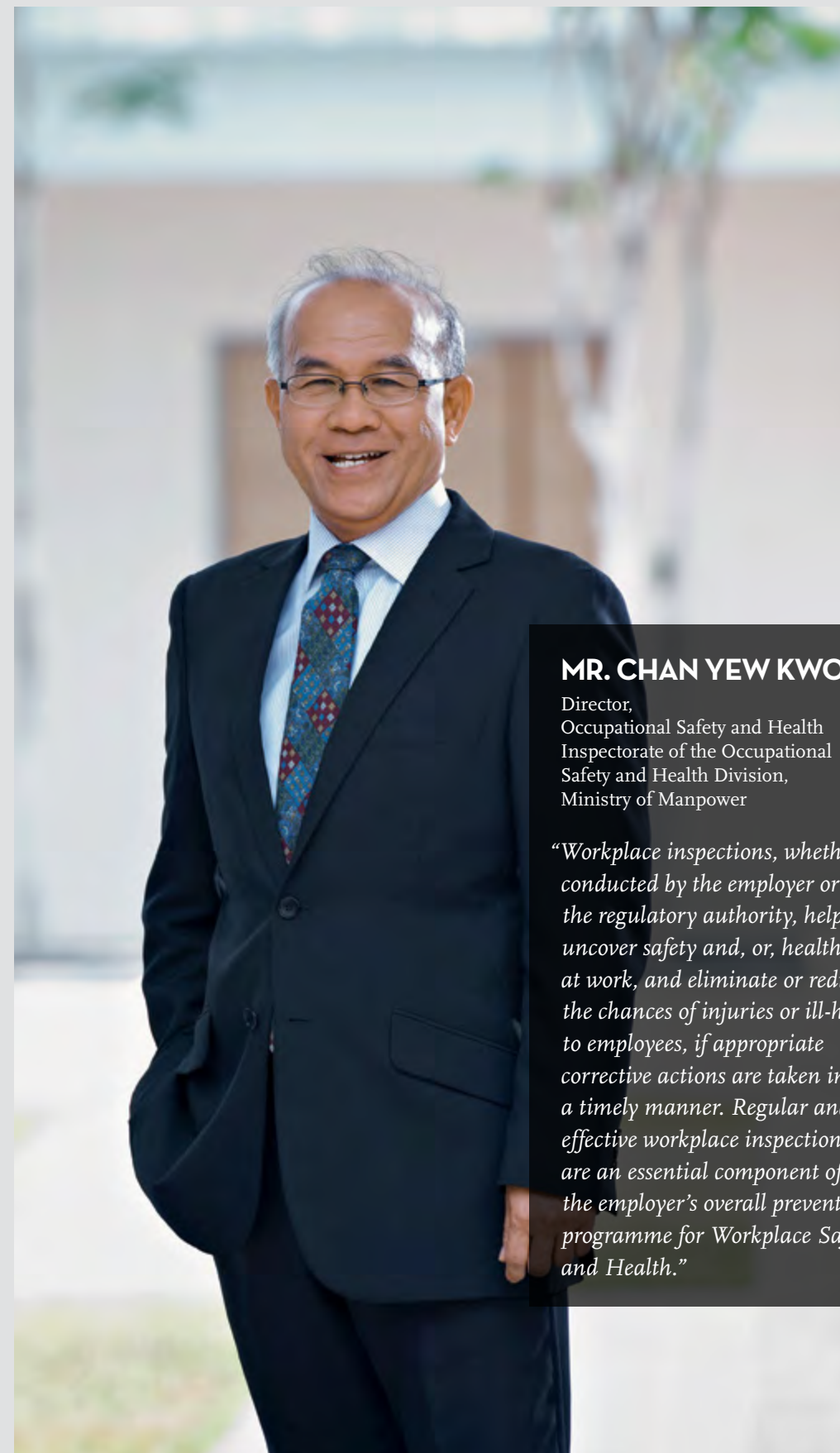
ILO PROMOTIONAL FRAMEWORK FOR OCCUPATIONAL SAFETY AND HEALTH (OSH) CONVENTION, C187



...

THE
**RESOUNDING
 VOICES**
 OF
WSH

...



MR. CHAN YEW KWONG

Director,
 Occupational Safety and Health
 Inspectorate of the Occupational
 Safety and Health Division,
 Ministry of Manpower

“Workplace inspections, whether conducted by the employer or the regulatory authority, help to uncover safety and, or, health risks at work, and eliminate or reduce the chances of injuries or ill-health to employees, if appropriate corrective actions are taken in a timely manner. Regular and effective workplace inspections are an essential component of the employer’s overall prevention programme for Workplace Safety and Health.”

DR. GAN SIOK LIN

Executive Director,
 Workplace Safety and
 Health Institute

“As we continue to improve our WSH fatality rates, the biggest threat is complacency, with stakeholders not putting in adequate resources to maintain the improvement. WSH initiatives need to be ongoing and internalised, with leaders playing a pivotal role in ensuring this. Leaders who are unaware of the importance of WSH can very quickly derail an organisation and change it from being ‘safe’ to being ‘unsafe’.”



**MR. GO HENG HUAT**

Director,
Occupational Safety and Health
Specialist of the Occupational Safety and
Health Division,
Ministry of Manpower

“Singapore has come far since the beginning of our WSH journey. It is heartening to know that companies have learnt to embrace WSH as part of successful business outcomes and propagated this principle [within their network] of companies, creating a multiplier effect. Singapore’s WSH standards would reach greater heights marked with continual improvement only if the workforce makes WSH a way of life synergised by strong tripartite support.”

**MS. HO LAI FUNG**

Director,
Industry Practices,
Sensing & Engagement,
Workplace Safety and
Health Council

“WSH is everyone’s responsibility. But the top management has to set the direction by having a WSH policy and framework in place and providing a conducive WSH environment so that everyone knows how to play his role and be responsible for each other’s safety and health.”

**DR. HO SWEET FAR**

Senior Consultant,
Occupational Safety and Health Specialist of
the Occupational Safety and Health Division,
Ministry of Manpower

“The future of occupational health lies in having a keen interest and curiosity in work-related concerns and addressing them through interdisciplinary efforts.”

**DR. JUKKA TAKALA**

Senior Consultant,
Workplace Safety and Health Institute,
Ministry of Manpower

“Singapore is strategically, culturally, geographically and language-wise in an ideal position where East meets West. [Hence], we can identify solutions that have not yet been introduced in Asia, apply them, disseminate and facilitate the adoption of sensible practices in the Asian context, and the other way around.”

**MS. KEE EE WAH**

Director,
Work Injury Compensation of
the Occupational Safety and
Health Division,
Ministry of Manpower

“I envisage the future state will go beyond work injury compensation to focus on injury management. We want to help injured employees to recover and get back to work as quickly as possible as this will in turn, give them assurance in terms of job and income security.”

**DR. KENNETH CHOY**

Deputy Director
(Occupational Medicine),
Occupational Safety and Health
Specialist of the Occupational
Safety and Health Division,
Ministry of Manpower

“We all know that it is important to report occupational diseases. My vision is for all doctors and health professionals to recognise the link between health and work among their patients as early detection and intervention can prevent or reduce morbidity and disability. Recognising this link can be a part of the disease management process.”

**MR. LAI POON PIAU**

Executive Director,
Workplace Safety and
Health Council

“Safety is not a cost; it’s an investment. This may sound clichéd but it’s totally true. Most efforts to address WSH issues in a business ultimately improve the business’ effectiveness and drive down cost. I believe most businesses also recognise this. However, the real constraint will be the time and attention that [the management of small and medium-sized enterprises] can invest in WSH. This is where the Council’s programmes will help.”

**DR. LEE HOCK SIANG**

Senior Consultant,
Occupational Safety and Health
Specialist of the Occupational
Safety and Health Division,
Ministry of Manpower

“The development of WSH standards and practices should always be a collaborative effort from all relevant parties. It makes sense to not limit such collaborations to Singapore only but to tap on and collaborate with both regional and international partners and organisations. Through our international collaboration efforts, we have worked closely with the International Labour Organization, the World Health Organization, the ASEAN Occupational Safety and Health Network, our International Advisory Panel members and our contacts in the developed countries.”



DR. LUCY LEONG

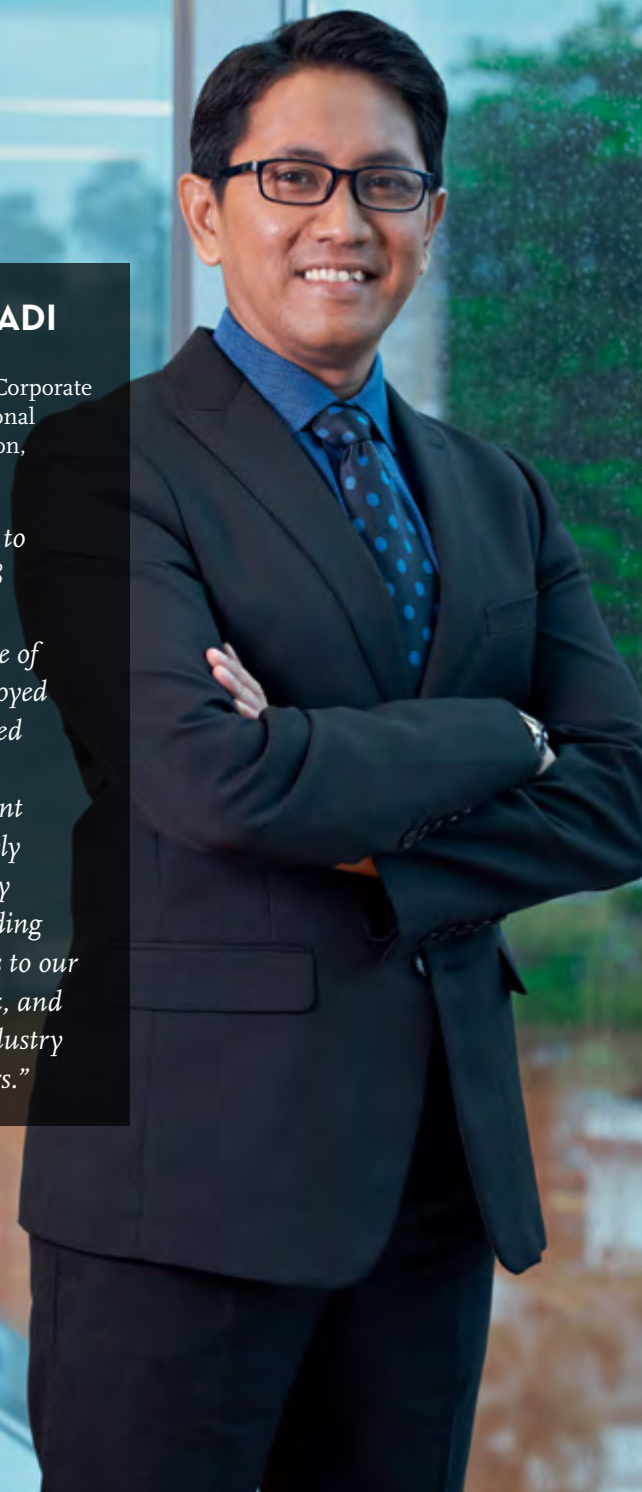
Former Deputy Director,
Research and Solutions,
Workplace Safety and
Health Institute

“As we travel along the WSH journey, we should leave no worker or organisation behind. It’s about levelling up so that all workers are active and able to work healthily and safely for as long as they would like to.”

ER. MOHD ISMADI

Director,
Policy, Information and Corporate
Services of the Occupational
Safety and Health Division,
Ministry of Manpower

“In 2014, we managed to attain our WSH 2018 target of reducing the workplace fatality rate of 1.8 per 100,000 employed persons, a feat achieved four years ahead of time. This achievement is made possible largely through our capability and partnership-building efforts, enhancements to our regulatory framework, and outreach efforts to industry and other stakeholders.”



MR. SEBASTIAN TAN

Deputy Director,
Occupational Safety and
Health Inspectorate of the
Occupational Safety and
Health Division,
Ministry of Manpower

“One of the biggest conundrum facing regulators is getting the industry to embrace the spirit rather than follow the letter of the law. A useful way to rethink this issue is to evolve the way we look at enforcement. Enforcement should not be seen as a cat and mouse game between enforcers and the industry but something more constructive as an enabler for the industry to improve their WSH management. As we continue to make progress in our WSH journey and mature as a society, we look forward to co-creating solutions with the industry for more sustainable WSH improvements.”

ER. TAN KEE CHONG

Deputy Director,
Engineering Safety of
the Occupational Safety
and Health Division,
Ministry of Manpower

“We are working to put in place a development framework to facilitate a structured and progressive development pathway to train young engineers on [both] theory [and practical aspects so as] to help them acquire valuable experience on the job solving engineering challenges. We hope that through such initiatives, all Occupational Safety and Health Division engineers will eventually be Professional Engineers.”



MR. TAN KIA TANG

Senior Consultant,
Occupational Safety and Health
Specialist of the Occupational
Safety and Health Division,
Ministry of Manpower

“In the ‘70s when Singapore started to industrialise, occupational health issues in factories were addressed through factory inspections and registration. Today, occupational health issues at workplaces are addressed through self-regulation. Larger companies implement in-plant occupational health programmes while smaller ones conduct risk assessments to identify workplace hazards and manage the risk. A multi-pronged approach is being taken to manage workplace health hazards at the national level.”

MR. WINSTON YEOW

Deputy Director,
Industry Capability Building,
Workplace Safety and
Health Council

“WSH is a universal value that cuts across nationalities, race, [gender and educational level]. The three key factors to create and sustain positive WSH culture are: strong nurturing leadership (management that walks the talk), effective communication and good fellowship. [When these factors are established], everything should fall into their right places eventually.”

MR. WOON CHENG PENG

Deputy Director,
Knowledge Hub & Planning and
Development,
Workplace Safety and Health Institute

“Given the rate of technological advances and socio-economic changes, the work we do, how we do it and the notion of workplace will be quite different [in the future] compared to today. For example, driverless vehicles are likely to become a reality within the next decade. Other growing trends are telecommuting and freelance workers. This will pose new challenges as to how we manage and sustain our WSH performance.”

• • •

Marked by indelible imprints, the views and insights shared by these stalwart WSH champions reveal a common thread — a lifelong dedication to protecting the safety and health of all workers. Echoed within their words is the vision OSHD has set out for itself: a safe and healthy work environment for everyone, and a country renowned for best practices in WSH.

• • •

CONSTRUCTION WSH LEADERSHIP SUMMIT 2015

Vision Zero - Together, Delivering Excellence in WSH for the Built Environment

Guest-of-Honour

Mr Lim Swee Say
Minister for Manpower



CLOSING WORDS

The accomplishments we have achieved today were made possible by the dedication of our pioneers, as well as generations of Workplace Safety and Health (WSH) champions who have worked relentlessly to push for better WSH standards. Thanks to their selfless efforts through the decades, Singapore can take pride in being a “WSH-conscious nation” with strong tripartite partnerships and clear aspirations for the future.

Yet, this is only the beginning. It will take more than an ambitious vision to maintain the momentum of progress that has carried us this far.

Setting the right mindset will go a long way. Beyond statistical numbers, we need to look at WSH as a mindset that each person should adopt and take to heart every day, from the top of the organisation to every last employee.

It entails building a culture of care where looking out for one another’s safety, health and well-being is a way of life. When this culture is deeply ingrained in every workplace, pledges can be transformed into action, and a true appreciation for safety will permeate the hearts and minds of everyone in the community.

This is the outcome each of us should strive for. The road to good WSH requires constant vigilance and the participation of every individual, and everyone has a part to play.

As we take on the future, the Occupational Safety and Health Division (OSHD) will continue to march on the path paved by our WSH pioneers, while staying steadfast to our mission. The task of transforming Singapore into a nation of WSH excellence will not come without challenges. OSHD is ready to embrace and transcend these challenges with relentless passion and a commitment to protect our workforce.

The journey continues.

“

...these plans will be futile without a firm commitment to improve and a collective action from all parties. In line with this year’s National WSH Campaign, ‘I can prevent all injuries and be healthy at work’, we can start with a mindset that all injuries and ill-health at work can be prevented. By working together, we can play an active role in safeguarding the safety, health and well-being of ourselves and those of our workers.

”

Mr. Sam Tan, Minister of State, Prime Minister’s Office and the Ministry of Manpower, speech at the Crane Safety Symposium on 6 October 2015

LEFT:
Minister for Manpower, Mr. Lim Swee Say, and WSH officials at the Construction WSH Leadership Summit 2015.

EDITORIAL TEAM



1. Ms. Emily Yeo 2. Mr. Choong Chang Thai 3. Mr. Brian Ooi 4. Ms. Geraldine Koh 5. Mr. Leem Seng Kok 6. Ms. Azrina Abdul Azim
7. Ms. Ratna Devi D/O Veerakumar 8. Ms. Ang Pei Yu 9. Mr. Charles Tan 10. Mr. Davin Teo 11. Ms. Christine Chua

PROJECT LEAD

Ms. Ratna Devi D/O Veerakumar
*Policy, Information and Corporate Services Department
Occupational Safety and Health Division*

PROJECT CO-LEADS

Ms. Emily Yeo
*Policy, Information and Corporate Services Department
Occupational Safety and Health Division*

Ms. Geraldine Koh
*Occupational Safety and Health Unit
Workplace Policy and Strategy Division*

TEAM MEMBERS

Ms. Ang Pei Yu
*Work Injury and Compensation Department
Occupational Safety and Health Division*

Ms. Azrina Abdul Azim
*Research and Solutions Department
Workplace Safety and Health Institute*

Mr. Brian Ooi
*Research and Planning Unit
Corporate Communications Department*

Mr. Charles Tan
*Occupational Safety and Health Specialist Department
Occupational Safety and Health Division*

Mr. Choong Chang Thai
*Policy, Information and Corporate Services Department
Occupational Safety and Health Division*

Ms. Christine Chua
*Industry Capability Building Department
Workplace Safety and Health Council*

Mr. Davin Teo
*Marketing Communications and Engagement
Department
Workplace Safety and Health Council*

Mr. Leem Seng Kok
*Occupational Safety and Health Inspectorate
Department
Occupational Safety and Health Division*

ACKNOWLEDGEMENTS

The Editorial Team would like to express its sincere gratitude to Prime Minister Mr. Lee Hsien Loong, Minister for Manpower Mr. Lim Swee Say and Commissioner for Workplace Safety and Health Er. Ho Siong Hin for penning the Forewords. We would also like to thank the National Archives of Singapore and Singapore Press Holdings for their kind permission to reproduce their photographs. Our heartfelt appreciation also goes to the past and present staff of the Occupational Safety and Health Division, as well as all other industry stalwarts who have contributed to the success of this publication.

REFERENCES

A YOUNG NATION RISES TO CHALLENGES (1965–1974)

1. Contextual information have been derived from the following sources:

- “Our History”, Singapore Economic Development Board, <https://www.edb.gov.sg/content/edb/en/about-edb/company-information/our-history.html>
- “Milestones: 1960s”, Ministry of Trade and Industry, <https://www.mti.gov.sg/MTIInsights/Pages/Economic%20Milestones%201960s.aspx>
- George Yeo’s speech, “JTC’s Crucial Role in the Success of Singapore”, 10 December 1998, National Archives of Singapore, <http://www.nas.gov.sg/archivesonline/speeches/view.html?filename=1998121001.htm>

2. Information on silicosis have been derived from “Eradication of the Silicosis Problem in Singapore”, Lee Hock Siang, September 1997, International Labour Organization, <http://www.ilo.org/public/english/region/asro/bangkok/asiaosh/newsletr/silicosi/sian.htm>

3. Information on the Safety Officers Training Course have been derived from “Singapore’s Programmes for OS&H Training and Promotion”, Ameer Ali Abdeali, 1994, International Labour Organization, http://158.132.155.107/posh97/private/Dissertation_resources/Singapore.html

4. Information on the explosion onboard Mendu have been derived from the following sources:

- The *Report of the Inquiry Into Explosion and Fire on board Vessel “Mendu” on 5 Mar 1972*, Ministry of Labour
- “Jurong Barge Blast: Shipyard is fined \$900”, 20 May 1972, *The Straits Times*, <http://eresources.nlb.gov.sg/newspapers/Digitised/Article/straitstimes19720520-1.2.74.aspx?q=mendu+explosion+900&page=1&sort=relevance&token=900%2cexplosion%2cmendu&sessionid=a594fb799a784252831b5da4f12f439e>

5. Information on the fire onboard Iron Parkgate have been derived from the following sources:

- The *Report of the Inquiry Into Explosion and Fire on Board Vessel “Iron Parkgate” on 10 December 1974*, Ministry of Labour
- “Shipyard Engineer to Blame: Iron Parkgate Fire Inquiry”, 28 January 1975, *The Straits Times*, <http://eresources.nlb.gov.sg/newspapers/Digitised/Article/straitstimes19750128-1.2.130.aspx?q=iron+parkgate+ong+pang+boon&page=1&sort=relevance&token=boon%2cpang%2cong%2cparkgate%2ciron&sessionid=7edb58bfdc6746dbbd74806d93373ff67>

GROWING TO MEET INDUSTRY AND POPULATION NEEDS (1975–1984)

1. Information on industrial workforce numbers have been derived from Dr. Wong Kwei Cheong’s speech at the opening of the Third Conference on Epidemiology in Occupation Health, 28 September 1983, National Archives of Singapore, <http://www.nas.gov.sg/archivesonline/data/pdfdoc/wkc19830928s.pdf>

2. Information on nation-wide campaigns on Workplace Safety and Health have been derived from “Safety and health drive for 26,000 shipyard workers”, 7 September 1975, *The Straits Times*, <http://eresources.nlb.gov.sg/newspapers/Digitised/Article/straitstimes19750907-1.2.36.aspx>

3. Information on the safety compliance pact have been derived from “237 Shipyard Contractors Sign Safety Compliance Pact”, 6 November 1977, *The Straits Times*, <http://eresources.nlb.gov.sg/newspapers/Digitised/Article/straitstimes19771106-1.2.53.aspx>

4. Information on the Factories (Safety Committee) Regulations have been derived from “Factories (Safety Committee) Regulations”, Singapore Statutes Online, <http://statutes.agc.gov.sg/aol/search/display/view.w3p;orderBy=date-rev,loadTime;page=0;query=Id%3A306163f6-af0c-4cb4-852b-e14661751834;rec=0;whole=yes>

5. Information on the Factories (Qualifications and Training of Safety Officers) Notification have been derived from the *Textbook of Occupational Medicine Practice, 2nd Edition*, David Koh, Chia Kee Seng, and J. Jeyaratnam, 2001, World Scientific

6. Information on the shipbuilding and repairing industry-related accidents have been derived from “The Development and Recent Trends in Occupational Health in Singapore”, *Proceedings of 10th Asian Conference on Occupational Health, Volume 2*, W.O. Phoon, C.N. Ong, July 1982, Annals Academy of Medicine

7. Information on the Industrial Hygiene Monitoring Programme was derived from “More checks on the high-risk worksite”, 9 November 1983, *The Straits Times*, <http://eresources.nlb.gov.sg/newspapers/Digitised/Article/straitstimes19831109-1.2.54.aspx>

8. Information on the Spyros fire have been derived from the following sources:

- “Spyros accident”, Infopedia, National Library Board Singapore, http://eresources.nlb.gov.sg/infopedia/articles/SIP_806_2004-12-30.html
- “48 Die in Ship Blast Horror”, 13 October 1978, *The Straits Times*, <http://eresources.nlb.gov.sg/newspapers/Digitised/Article/straitstimes19781013-1.2.2.aspx>
- “Spyros Disaster Relief Funds Nearing \$4 Million”, 1 November 1978, *The Straits Times*, <http://eresources.nlb.gov.sg/newspapers/Digitised/Article/straitstimes19781101-1.2.70.aspx>
- “Grief Turns to Anger”, 14 October 1978, *The Straits Times*, <http://eresources.nlb.gov.sg/newspapers/Digitised/Article/straitstimes19781014-1.2.4.aspx>
- “A New Safety Code for Yard”, 3 July 1979, *The Straits Times*, <http://eresources.nlb.gov.sg/newspapers/Digitised/Article/straitstimes19790703-1.2.11.aspx>
- The Explosion and Fire on Board ST Spyros, 12th October 1978: The Inquiry Report*, Ministry of Labour

9. Information on the fire at Pulau Bukom have been derived from “15 hours to Tame Bukom Fire”, 19 April 1981, *The Straits Times*, <http://eresources.nlb.gov.sg/newspapers/Digitised/Article/straitstimes19810419-1.2.2.aspx>

10. Information on decrease of industrial diseases have been derived from “Industrial Diseases Showing Signs of Decline”, 15 February 1979, *The Business Times*, <http://eresources.nlb.gov.sg/newspapers/Digitised/Article/biztimes19790215-1.2.11.6.aspx>

11. Information on hearing protection devices usage have been derived from “More Use Hearing Protectors Now”, 30 August 1977, *The Business Times*, <http://eresources.nlb.gov.sg/newspapers/Digitised/Article/biztimes19770830-1.2.73.aspx>

12. Information on cancer in Singapore’s industrial landscape have been derived from the following sources:

- “Asbestos workers had lung disease: Ministry”, 22 May 1980, *The Straits Times*, <http://eresources.nlb.gov.sg/newspapers/Digitised/Article/straitstimes19800522-1.2.25.aspx>
- Mr. Fong Sip Chee’s speech on the occasion of the launching ceremony for the Occupational Cancer Prevention Programme, 24 November 1978, <http://www.nas.gov.sg/archivesonline/data/pdfdoc/fsc19781124s.pdf>

EVOLVING ALONGSIDE THE INDUSTRY (1985–1994)

1. Contextual information have been derived from the following sources:

- “Our History”, Singapore Economic Development Board, <https://www.edb.gov.sg/content/edb/en/about-edb/company-information/our-history.html>
- Speech by Mr. Ravi Menon at the Singapore Economic Review Conference 2015, 5 August 2015, Monetary Authority of Singapore, <http://www.mas.gov.sg/News-and-Publications/Speeches-and-Monetary-Policy-Statements/Speeches/2015/An-Economic-History-of-Singapore.aspx>

REFERENCES

2. Information on the construction of the Mass Rapid Transit tracks have been derived from:
 - a. “Mass Rapid Transit (MRT) system”, Infopedia, National Library Board, http://eresources.nlb.gov.sg/infopedia/articles/SIP_2013-11-05_131443.html
 - b. “How Well Do You Know the MRT System”, S.U.R.E, National Library Board, 12 February 2014, <http://www.nlb.gov.sg/sure/mrt-system/>
 3. Information on statutory medical examinations have been derived from the Workplace Safety and Health Guidelines, Workplace Safety and Health Council, https://www.wshc.sg/files/wshc/upload/infostop/attachments/2015/IS20150416000000321/WSH_Guidelines_Statutory_Medical_Examinations_2013.pdf
 4. Information on the Ginza Plaza explosion have been derived from the *Report on the Explosion at Ginza Plaza on 7 August 1992 by The Committee of Inquiry*, Ministry of Labour
 5. Information on the fire on board the Indiana have been derived from the *Report on the Fire on Board Indiana on 27 November 1992 at Sembawang Shipyard*, 1993, Ministry of Labour
 6. Information on the Sembawang Bethlehem fire have been derived from the *Report of the Committee of Inquiry, The Fire and Explosion at Sembawang Bethlehem Pte Ltd on 9 August 1994*, Ministry of Labour
 7. Information on the fire on board the British Adventure have been derived from the *Report of the Committee of Inquiry into the Fire on board the British adventure on 8 February 1994 at Jurong Shipyard*, Ministry of Labour
- ### STAYING ADAPTIVE IN THE NEW MILLENNIUM (1995–2004)
1. Statistics on the manufacturing sector have been derived from:
 - a. “Highlights” in the trends in economic characteristics in 2000, Department of Statistics Singapore, http://www.singstat.gov.sg/docs/default-source/default-document-library/publications/publications_and_papers/cop2000/census_2000_release3/highlights.pdf
 - b. “Chapter 10: Singapore’s System for Managing Foreign Manpower”, Yap Mui Teng, *Managing International Migration For Development in East Asia*, edited by Richard H. Adams, Jr. and Ahmad Ahsan, 2014, World Bank Group, http://lkyspp.nus.edu.sg/ips/wp-content/uploads/sites/2/2013/04/pa_MT_Managing-International-Migration-for-Development-in-East-Asia-Research-Papers_240215.pdf
 2. Information on the debarment scheme for contractors have been derived from “MOM Press Release: Debarment Scheme for Contractors With Bad Safety Record”, 23 February 2000, Ministry of Information and the Arts, <http://www.nas.gov.sg/archivesonline/speeches/view-html?filename=2000022303.htm>
 3. Information on the Asian Financial Crisis have been derived from:
 - a. “The Asian Financial Crisis in Hindsight”, Donald Low, *Ethos*, October 2007, Civil Service College
 - b. “The Asian Economic Crisis: The Way Ahead For Singapore”, Augustine H. H. Tan, 20 May 1999, Faculty of Arts & Social Sciences, National University of Singapore, <http://www.fas.nus.edu.sg/ecs/pub/wp/previous/AHTAN4.pdf>
 - c. “Asian financial crisis, 1997-1998”, Infopedia, National Library Board Singapore, http://eresources.nlb.gov.sg/infopedia/articles/SIP_1530_2009-06-09.html
 4. Information on the 2001 recession have been derived from “Economic Planning and Industrial Policy in the Globalizing Economy: Concepts, Experience and Prospects”, Murat Yülek, 2014, Springer
 5. Information on Severe Acute Respiratory Syndrome (SARS) have been derived from:
 - a. “Workers Hit by Fever”, 25 April 2003, *Today*, <http://eresources.nlb.gov.sg/newspapers/Digitised/Article/today20030425-2.2.5.3.aspx>
 - b. “SARS in Singapore: Timeline”, 16 March 2013, *The Straits Times*, <http://www.straitstimes.com/singapore/sars-in-singapore-timeline>
 6. Information on Avian Influenza have been derived from “Prevention and Control of Avian Influenza in Singapore”, Hon Keong Leong, et. al, 2008, Annals Academy of Medicine, <http://annals.edu.sg/PDF/37VolNo6Jun2008/V37N6p504.pdf>
- ### REFORMING OUR WORKPLACE SAFETY AND HEALTH LANDSCAPE (2005–2014)
1. Information on fatality rates in 2010 was derived from the Workplace Safety and Health Council’s Annual Report 2010
 2. Information on the role of small and medium-sized enterprises was derived from “SMEs an important part of Singapore’s economy”, 22 October 2013, Channel News Asia, <http://www.channelnewsasia.com/news/specialreports/parliament/videos/smes-an-important-part-of/856032.html>
 3. Information on the Workplace Safety and Health Professionals Workforce Skills Qualifications framework was derived from the following sources:
 - a. The press release “The WSH Professionals WSQ is launched during the opening of the National WSH Campaign on 29 April 2008”, Singapore Workforce Development Agency, http://www.wda.gov.sg/content/wdawebsite/L209-001About-Us/L219-PressReleases/30_Apr_2008.html
 - b. The Workplace Safety and Health Council’s Annual Report 2008
 - c. The Workplace Safety and Health Council’s Annual Report 2009
 - d. The Workplace Safety and Health Council’s Annual Report 2010
 4. Information on capability building in the metalworking industry has been derived from the Workplace Safety and Health Council’s Annual Report 2010
 5. Information on the documents and training courses from the Workplace Safety and Health Council have been derived from “CDA / CS / CTAG”, Workplace Safety and Health Council, https://www.wshc.sg/wps/portal/lut/p/a1/jY89D4IwEIZ_iwMrd3y1xq1xkCjGAVToYsBgvSBt2kr_vsjklOht7-V5cvcChRRom3c1y3XN27x5Zxpc00PvuyTG3SZMHCTuHsNk4Tlx4PdANg6sT95_P04MwV_-GegUMnwwABMn tkBZw4uhbkbawlsyoLK8lbKU9lP26oproVYWWmiMsY2qrrZifRDKQsG1_q5WXGllPwwQj2OK93nTRWT2AgTnMHU!/dl5/d5/L2 dBISEvZoFBIS9nQSEh/?action=cmsPublicView&categoryId=CL2014080300005
 6. Information on Total Workplace Safety and Health have been derived from:
 - a. “Guide to Total Workplace Safety and Health”, Workplace Safety and Health Council, https://www.wshc.sg/files/wshc/upload/cms/file/Guide_to_TotalWSH.pdf
 - b. “Factsheet on Total Workplace Safety and Health”, Workplace Safety and Health Council, https://www.wshc.sg/files/wshc/upload/newsspeeches/file/2014/AnnexC_Factsheet_on_TotalWSH.pdf

REFERENCES

7. Information on Workplace Safety and Health 2018 have been derived from “WSH 2018”, Workplace Safety and Health Council, https://www.wshc.sg/wps/portal/lut/p/a1/jY89D4IwEIZ_iwNr7_gQjVvjIFGMA6jQxYCPBVMoKRX-vsiqqLfd5XnyvgcMEmB11pUiM6WqM_namX8JD57noAh3myC2kTp7DOKFaoe-NwDpNLA-uf_5ODEUf_lnYN-QscElfInYAhNS5eO7KarzdymAaX7jmmvvoMO5MKZpVxZa2Pc9EUoJyclVvaQVFn6yCtUaSN5gaKpjgve57EI6ewLPB5KC/dl5/d5/L2dBISevZoFBIS9nQSEh/?action=cmsPublicView&cmsId=C-2014081900002&tabId=CT-2014081900011
 - c. “Factsheet on Total Workplace Safety and Health”, Workplace Safety and Health Council, https://www.wshc.sg/files/wshc/upload/newsspeeches/file/2014/AnnexC_Factsheet_on_TotalWSH.pdf
 - d. “Factsheet on Vision Zero”, Ministry of Manpower, http://www.mom.gov.sg/~media/mom/documents/speeches/2014/annex%20c_factsheet%20on%20vision%20zero_revised.pdf?la=en
2. Information on the Construction WSH Leadership summit have been derived from “Construction WSH Leadership Summit”, Workplace Safety and Health Council, https://www.wshc.sg/wps/portal/lut/p/a1/o4_Sj9CPykssyoxPLMnMzovMAfGjzOJ9_E1MjByDDbzdPUIMDRyNfAo8QsyNDYMDDYAKInErcA4zJk6_AQ7gaEBIf7h-FD4lYBeAFcXwks_KjonPwns3UjHvCRjij3T9qKLUtNSi1CK9oiKgcEZJSUGxlaqBqkF5ebleen5-ek6qXnJ-rl5xOjY9GfnFJfoRmEoLckMjDLJMc8p8HBUBraLHEw!!/dl5/d5/L2dBISevZoFBIS9nQSEh/?action=publicViewEvent&eventID=EV201505180000000678
1. Information on Vision Zero have been derived from the following sources:
 - a. Mr. Tan Chuan-Jin’s speech at the Launch of National Workplace Safety and Health Campaign, 24 April 2015, Workplace Safety and Health Council, https://www.wshc.sg/wps/portal/lut/p/a1/jY89D4IwEIZ_iwNr7_gQjVvjIFGMA6jQxYCPBVMoKRX-vsiqqLfd5XnyvgcMEmB11pUiM6WqM_namX8JD57noAh3myC2kTp7DOKFaoe-NwDpNLA-uf_5ODEUf_lnYN-QscElfInYAhNS5eO7KarzdymAaX7jmmvvoMO5MKZpVxZa2Pc9EUoJyclVvaQVFn6yCtUaSN5gaKpjgve57EI6ewLPB5KC/dl5/d5/L2dBISevZoFBIS9nQSEh/?action=cmsPublicView&cmsId=C-2015042705699
 - b. “The Swedish Approach to Road Safety: “The Accident Is Not the Major Problem””, Sarah Goodyear, 20 November 2014, CityLab, <http://www.citylab.com/commute/2014/11/the-swedish-approach-to-road-safety-the-accident-is-not-the-major-problem/382995/>

Other sources with supporting facts and statistics not mentioned above include annual reports, internal newsletters and publications from the Ministry of Labour, now the Ministry of Manpower.



