

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.

“

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

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.

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.

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.

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.



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.

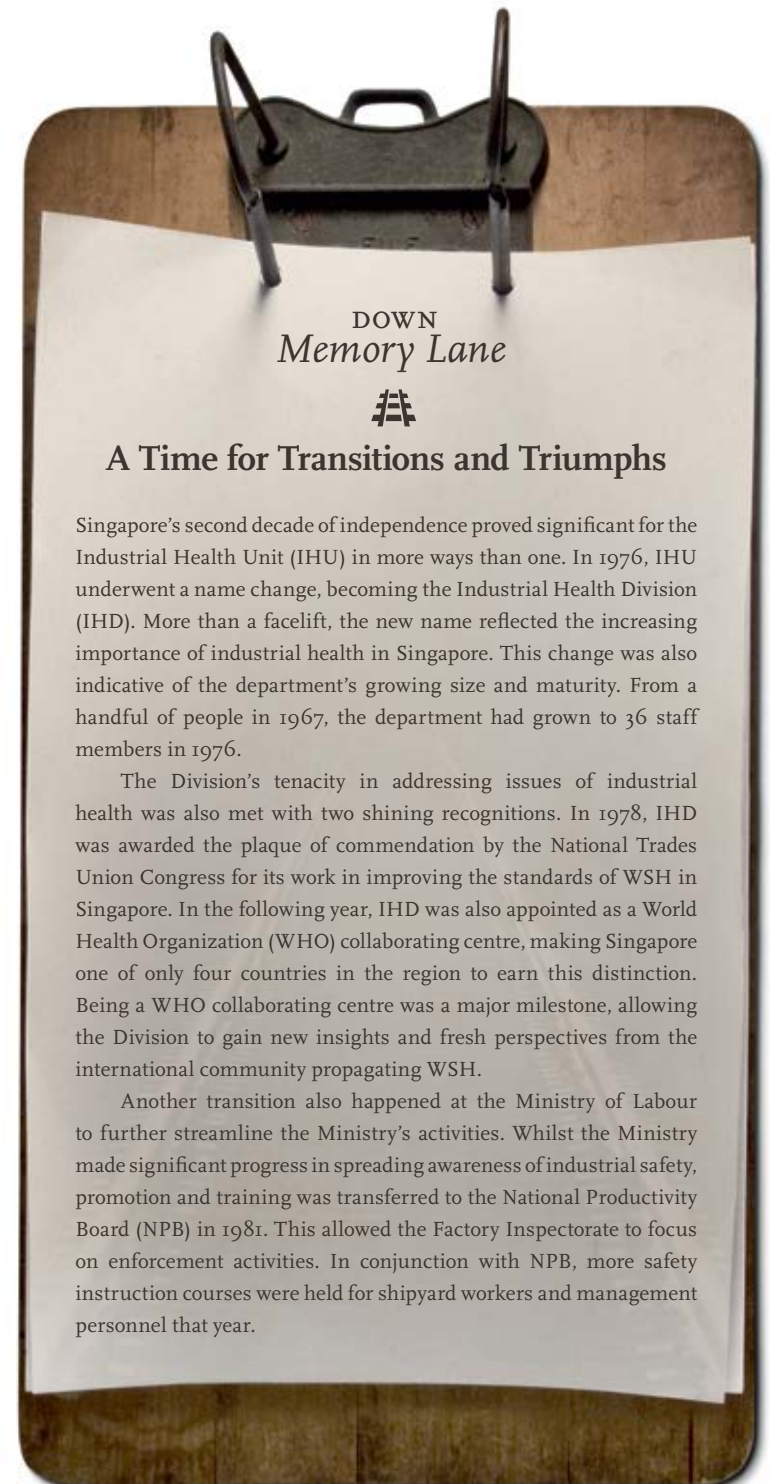
Also introduced in 1975, The Factories (Qualifications and Training of Safety Officers) Notification clarified in detail the wide-ranging duties of a safety officer, from carrying out factory inspections to investigating accidents and organising safety campaigns.

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.*”

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

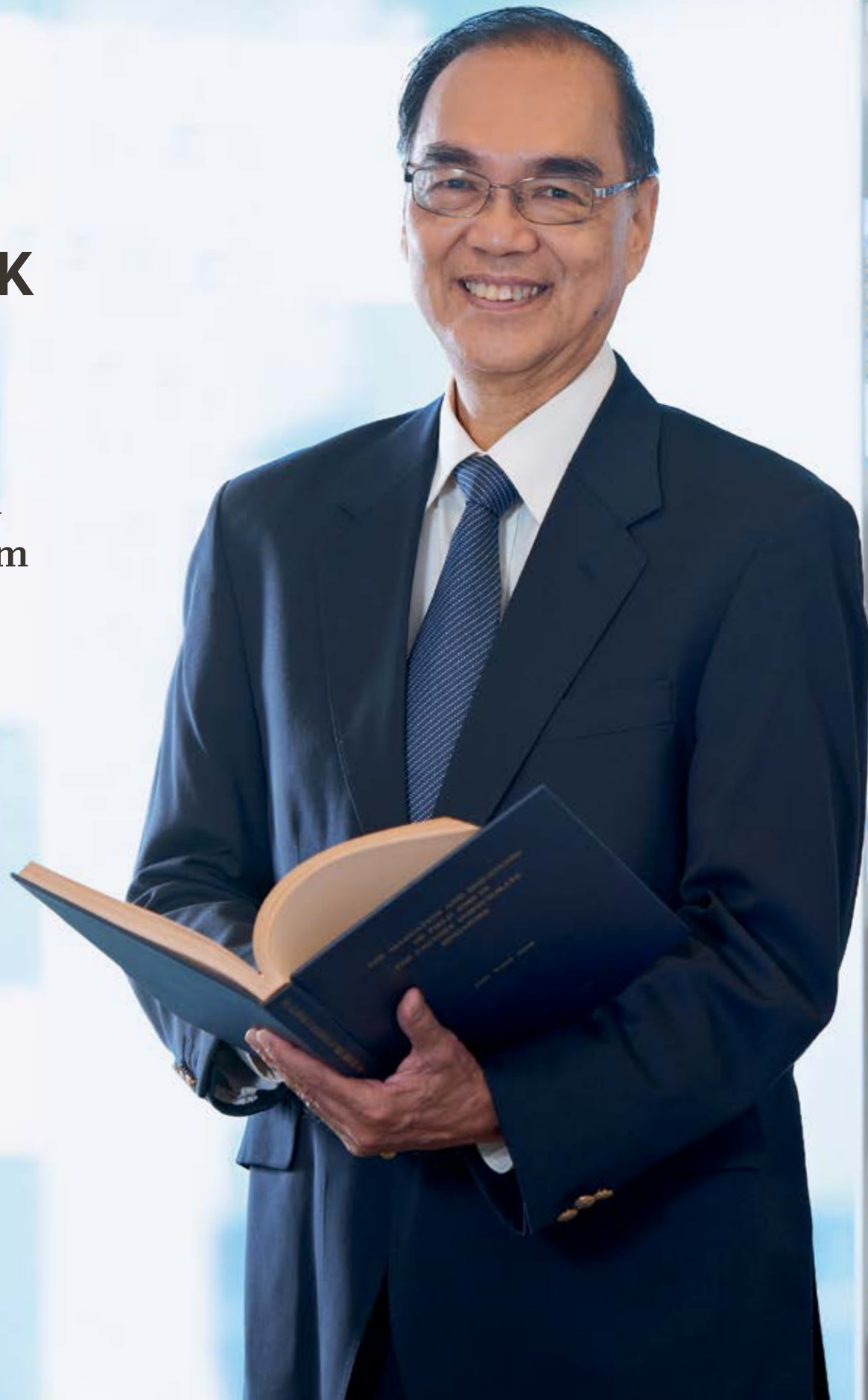
LEFT:
Former Minister for Social Affairs, Mr. Othman Bin Wok, visits the Thye Hong Biscuit Factory.



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.



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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.

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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. Ameerli 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.



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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.

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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.

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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.

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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

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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].

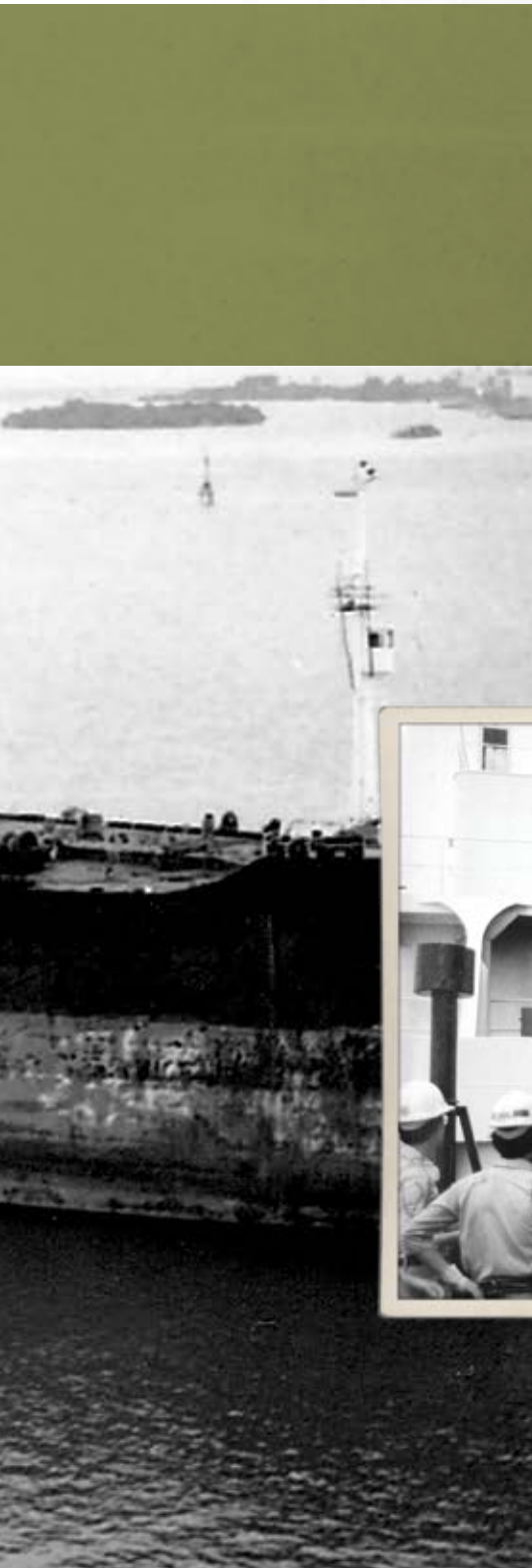
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Mr. Leong Sai Chue, Photographer for the Spyros Investigation, Ministry of Labour

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.

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.

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.

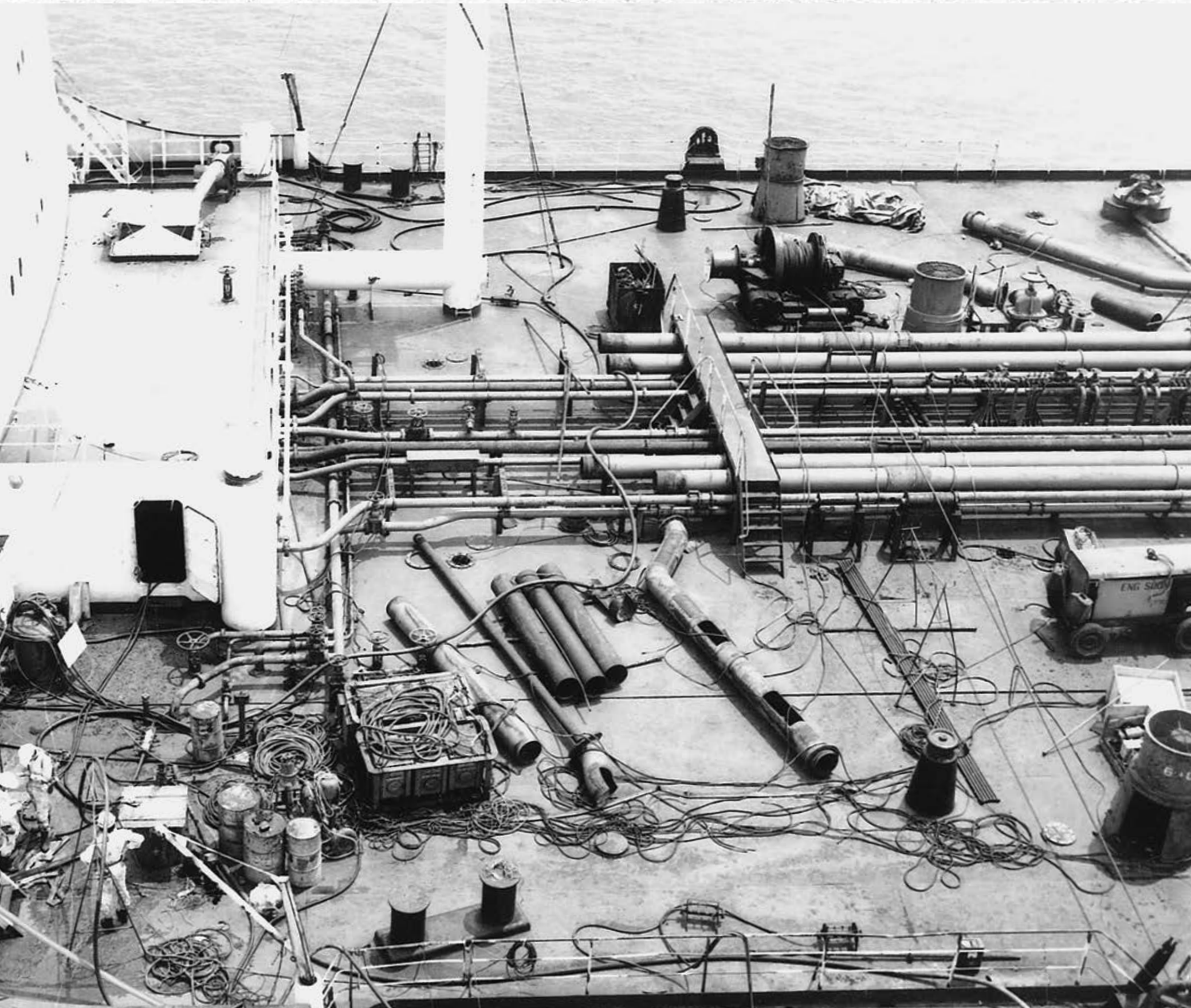
The incident served as a painful and costly lesson in safety complacency. While families of the victims grieved, the Ministry was determined to make safety the first priority in every sector. Many in the industry, who were determined to ensure that these horrors would not be repeated, shared the same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

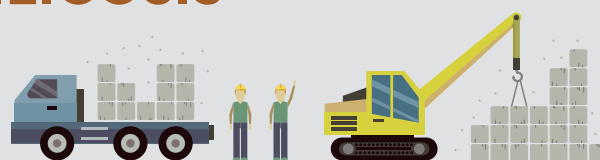




Building the Bedrock of Occupational Health

SILICOSIS

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.



In the 1960s-1990s...

Silicosis was especially prevalent in granite factories that populated the island.

1

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.



2

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.

4

3

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.

5

6

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.



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.

1979

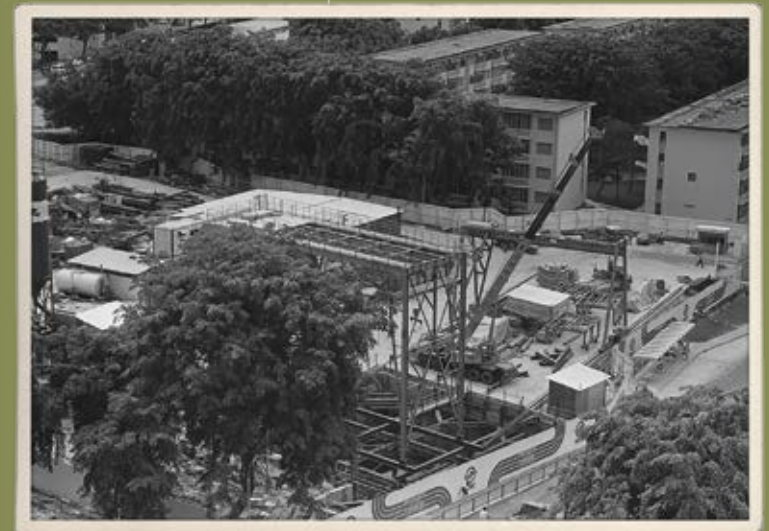
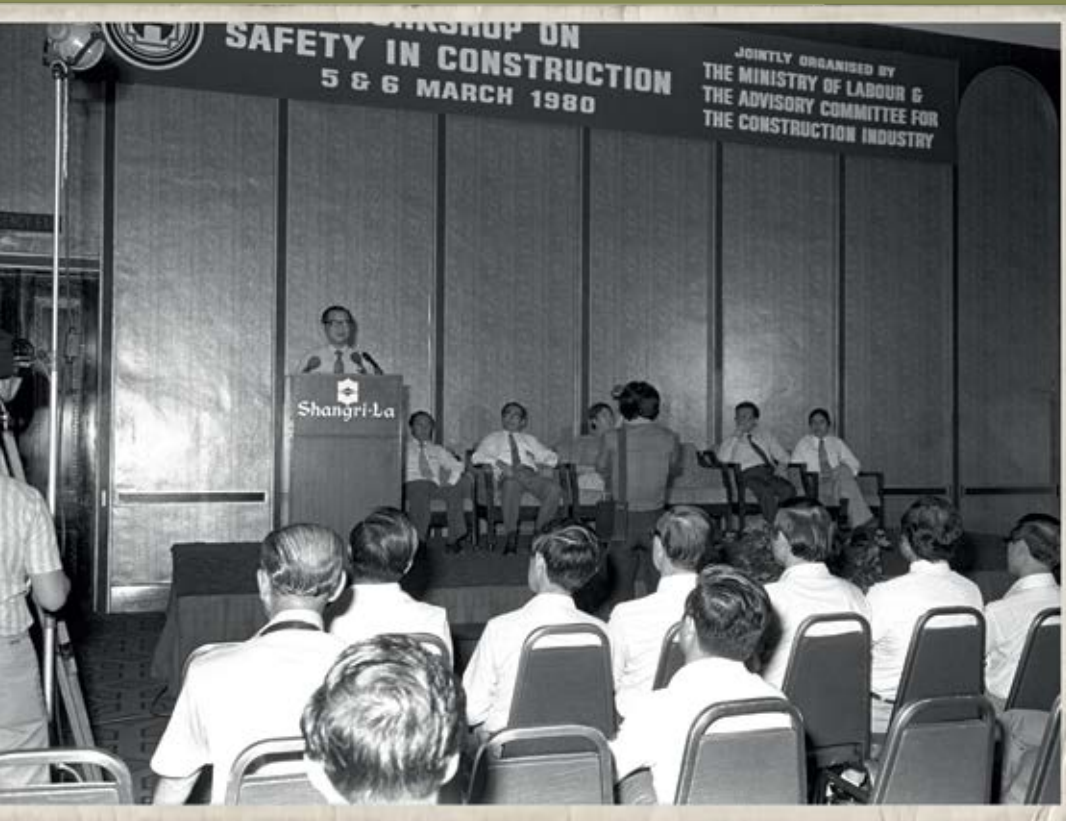
- The Industrial Health Division was officially appointed by the World Health Organization as a collaborating centre of Occupational Safety and Health.
- Jurong Shipyard implemented a new safety code suspending or dismissing workers and fining or barring sub-contractors if they were found to have broken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



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*.