ASMI 28th Workplace Safety & Health Convention

12 May 2026, Jurong Town Hall Resources

Organised by ASMI Association of Singapore Marine and Offshore Energy Industries

Silver Partners Dräger

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Sharing Sessions

1. Learning from Failures: How Fire Investigations Improve Marine Safety
2. WSH in Commercial Diving & Work at Anchorage
3. Understanding, Preventing, and Managing Occupational Diseases (OD) in the M&OE Industry
4. Mental Well-Being (MWB) on Ground: Managing Fatigue, Pressure and Safety at Work

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Sharing Session 1

Learning from Failures: How Fire Investigations Improve Marine Safety

by Mr. Liu Xianbin, Director, Oskefer Consulting Pte Ltd

Organised by ASMI Association of Singapore Marine and Offshore Energy Industries

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OSKEFER
Failure & Incident Investigation

Learning from Failures - How Fire Investigations Improve Marine Safety

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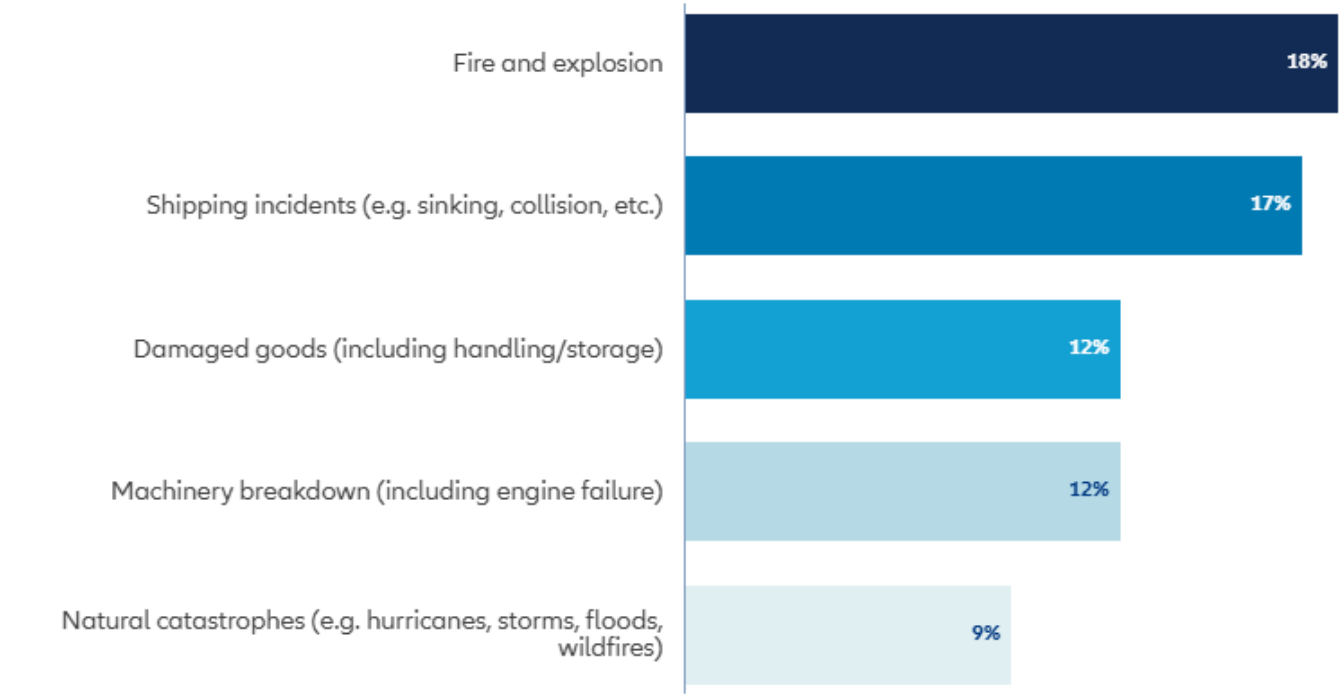
AGENDA

1. Why Fire Matters: Financial Impact

Allianz

Top causes of loss by value of claims in marine

Based on analysis of 244,451 insurance claims between January 1, 2017, and December 31, 2021, worth approximately €9.2bn in value.
"Other" causes of loss account for 32% of the value of all claims. Claims total includes the share of other insurers in addition to AGCS.



AGCS News & Insights

Allianz Global Corporate & Specialty (AGCS)

Fire is the **TOP** cause of claims by value!

Fire and explosion remain the most expensive cause of marine insurance claims. **62%** of all claims above USD **20 million** since 2015 were fire-related (Cefor 2025).

1. Why Fire matters: Business & Legal Implications

Business Impact

- **Operational Disruption:** Vessel downtime for months (Maersk Honam-2018)
- **Reputational Damage**: Severe environmental pollution (X-Press Pearl-2021)
- **Financial Strain**: Total loss -500M+ (Felicity Ace Car Carrier Fire-2022)
- **Project Delays**: Logistics delays → contractual penalties (Yantian Express Fire-2019)

Legal Consequences

- **Liability Exposure:** Misdeclared cargo (Maersk Honam-2018)
- **Regulatory Action**: Government sanctions (X-Press Pearl-2021)
- **Litigation Costs**: Multi-billion claims → long-term legal exposure (Deepwater Horizon-2010)
- **Contractual Breaches**: Cargo loss claims (Felicity Ace Car Carrier Fire-2022)

1. Why Fire matters: Safety & Life Risk

Fire Has No Mercy! They directly **threaten crew lives**.

22 deaths & 26 injured

Date	Incident	Possible Causes
25 Dec 2023	Genius Star XI— **Lithium Battery** Fire	Wrong lash belt hooks & poor bracket welding
8 Jan 2024	Cargo Vessel *Stride* — **Engine Room** Fire (2 deaths, 1 injured)	Incorrect valve type caused fuel misdirection
9 Aug 2024	Fire and explosion-Container Ship "M" in Ning Bo	Non-electric refrigerated container was used, thermal runaway of cargo (Tert-butyl peroxybenzoate (TBPB)) under high temperature
24 May 2025	Bulk Carrier M.V. Olivia — **Engine Room** Explosion (3 injured)	Boiler explosion or furnace flashback during **maintenance**
9 June 2025	Container Vessel Wan Hai 503 —Explosion & Fire (4 deaths)	**Hazardous cargo** in container
15 Oct 2025	Fire and explosion at PT ASL Shipyard Indonesia, Batam (13 deaths, 18 injured)	Ignition of **accumulated flammable gases** during repair work (Likely)
17 Feb 2026	**Engine Room Fire**-bulk carrier MANDY (2 deaths)	Not disclose yet
20 Feb 2026	Fire -World Legacy Cruise Ship (one death)	Not disclose yet

Most incidents occurred in **engine rooms** or involve **hazardous cargos**, primarily rooted from **engineering-related failures**.

2. Fire vs Explosion

a) **Are 🔥 Fire and 💥 Explosion separate phenomena?**

b) **Are they actually the same process?**

2. Fire vs Explosion

🔥 Fire

- Relatively slow combustion
- Energy released mainly as heat and flame
- Pressure rise is low
- Usually gives warning signs (smoke, heat, odour)

➡️ Fire damages by heat over time

➡️ Fires can often be controlled

💥 Explosion

- Extremely rapid combustion or energy release
- Energy released mainly as pressure
- Produces a shockwave
- Little or no warning

➡️ Explosion damages by pressure in an instant

➡️ Explosions can only be prevented

Fire and Explosion are not separate phenomena.

They are closely related forms of combustion.

2. Fire vs Explosion

Chemistry in Fire and Explosion

- ❖ Both involve oxidation reactions
- ❖ Dominant flame-propagating radicals
  - H• (hydrogen radical)
  - O• (oxygen radical)
  - OH• (hydroxyl radical)

Fire and explosion share the same chemistry, the same causes, and often the same failures — only the speed and pressure separate them.

➡ Explosion = chain reaction runs uncontrollably fast

➡ Fire = chain reaction progresses at a controllable rate

- ❖ The difference between fire and explosion is *combustion speed*, *pressure buildup*, and *confinement*.

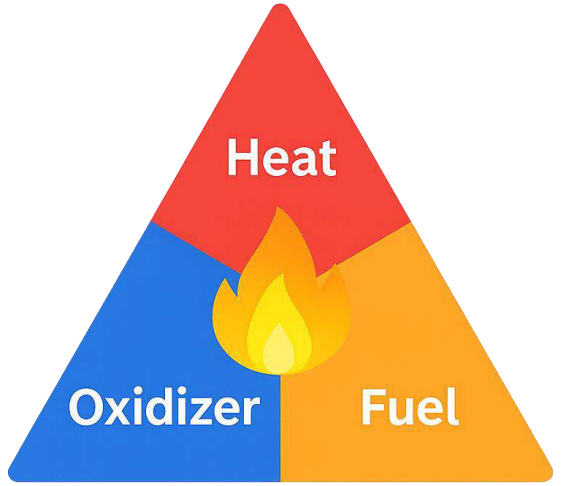
3. Fire Triangle & Tetrahedron

Fire Triangle

-explains the three essential elements required for a fire to start and sustain

- Heat – ignition source (hot surfaces, sparks, friction, electrical faults)
- Fuel – combustible materials (oil, fuel vapours, insulation, wiring)
- Oxygen – typically from the atmosphere (~21%)

➡️ **Conventional firefighting**: Remove any one of the three (by cooling, smothering, or isolation of the fuel), and the fire will extinguish.

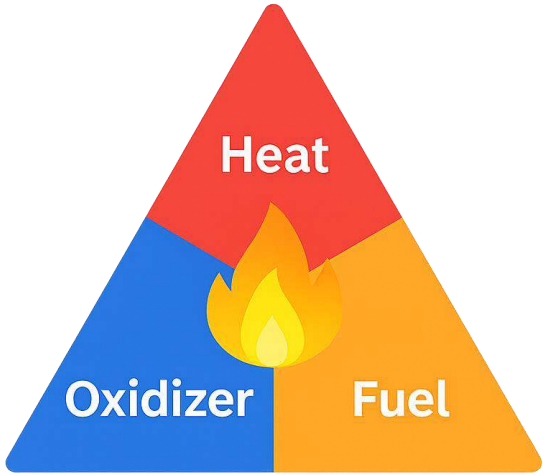


Fire Triangle

3. Fire Triangle & Tetrahedron

Combustion Does Not Always Need Air (oxygen)—alternative oxidizers can drive fire and explosion

Oxidizer source	Example
💧 Water (H_2O)	Alkali metals (Na, K, Li) + H_2O
🔥 Metal Oxide	Thermite- type, Aluminum + iron(III) oxide, Magnesium/Silicon + metal oxides
🧪 Nitrates/chlorates	NH_4NO_3
⚗️ Peroxide	MEKP (Methyl Ethyl Ketone Peroxide), TBPB (Tert-butyl peroxybenzoate)
💣 Energetic compounds	TNT, propellants
🔋 Batteries	Li-ion thermal runaway



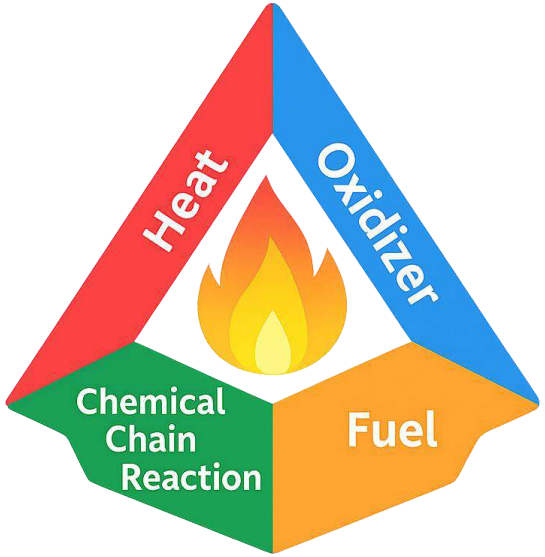
Fire Triangle

3. Fire Triangle & Tetrahedron

Fire Tetrahedron

-adds a fourth component essential (Chemical Chain Reaction) for sustaining combustion:

➡️Some fires continue burning even after cooling or smothering efforts—until the reaction is disrupted.



Fire Tetrahedron

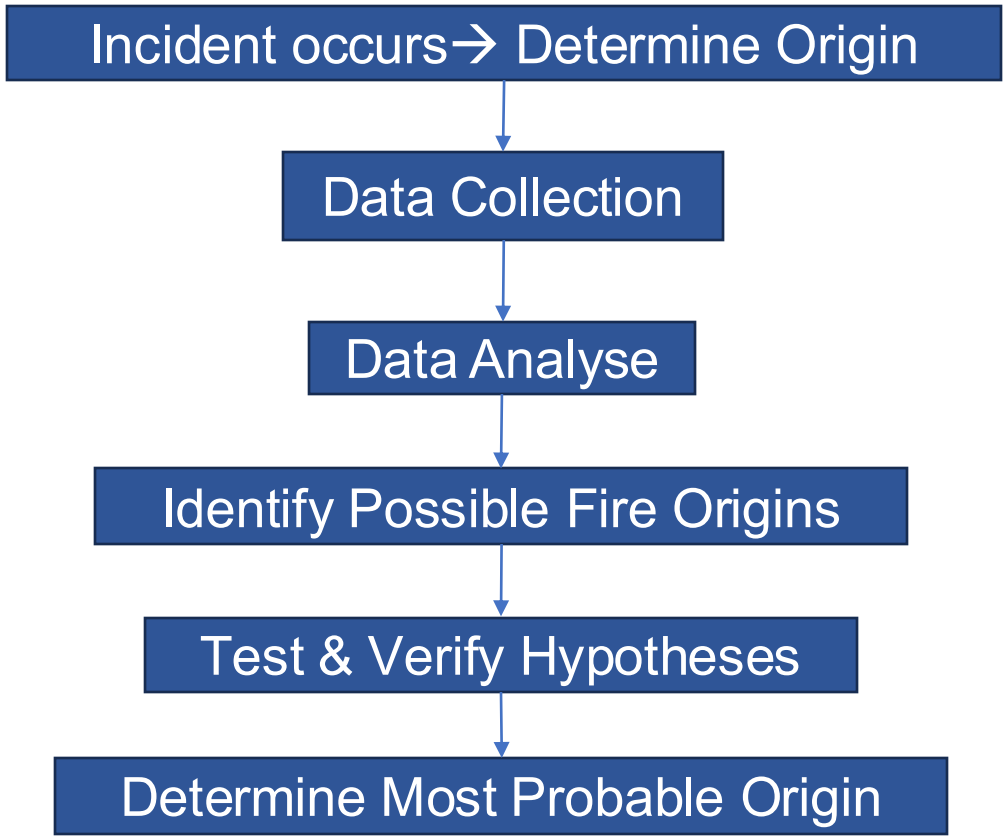
➡️ **Morden Extinguish mechanism**: To neutralize/reduce flame radicals to terminate the reaction

4. Fire Investigation Methodology

Determine the Fire Origin	Determine the Fire Cause	Analyse Fire Spreading
○ The fire origin is the exact physical location within the fire scene where a heat source, the fuel, and the oxidizing agent interact, resulting in a fire or explosion. ○ Determination of the fire origin is the first important objective in a fire investigation. If the origin cannot be determined, the cause cannot be determined. ○ If the correct origin is not identified, the subsequent cause determination will also be incorrect.	○ Fire cause determination is the process of identifying the first fuel ignited, the ignition source, the oxidizing agent, and the circumstances that result in the fire. ○ A fire cause determination can be considered reliable only if the origin has been correctly determined. ○ Classification of the fire cause clearly – due to product quality issue, due to workmanship issue, due to environmental attack, due to wear and tear, etc.	○ The purpose of fire investigation is often much broader than just determining the fire origin and fire cause. ○ Sometimes, it is necessary to analyse the fire spreading taking into consideration of adequacy of fire protection, the sufficiency of building construction, and the contribution of any products to flame spread and to smoke propagation.

4. Fire Investigation Methodology

Fire Origin Determination Methodology



Key Input

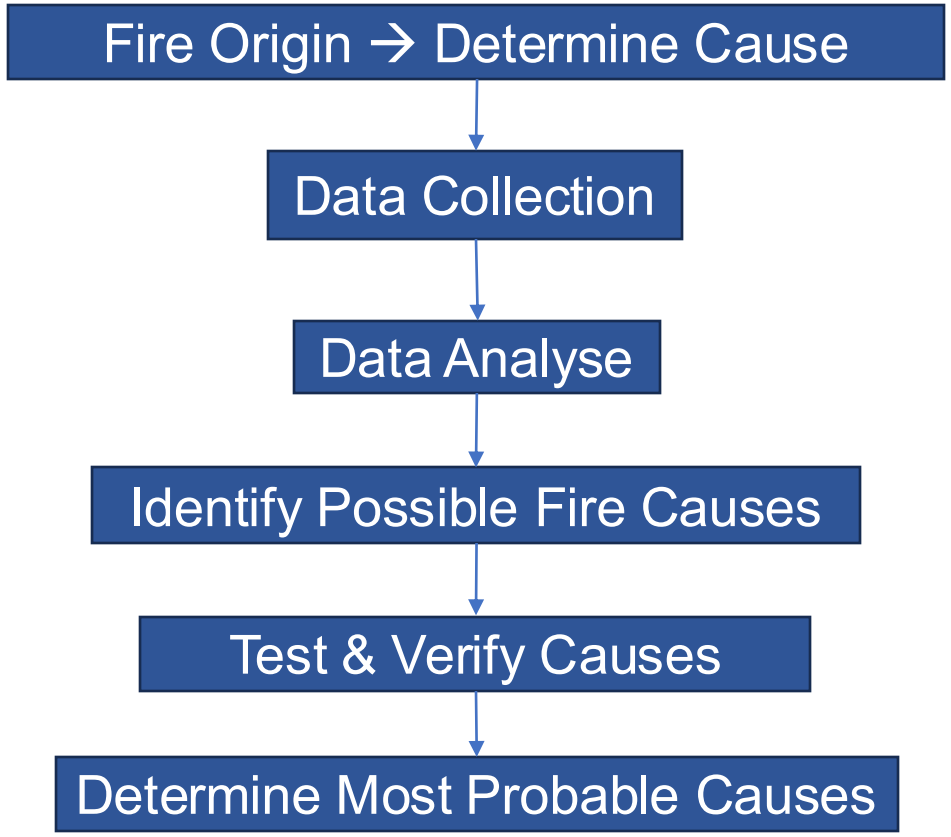
- Witness statement & CCTV footage
- Alarm system activation records
- Operational logs
- Photographs & videos
- Fire patterns & damage extents
- Fire dynamics assessment

Key Questions

- What is the credible heat source?
- What is the first fuel ignited?
- Were heat and fuel present at the same location?
- Does any contradictions in all evidence?

4. Fire Investigation Methodology

Fire Cause Determination Methodology



Key Input

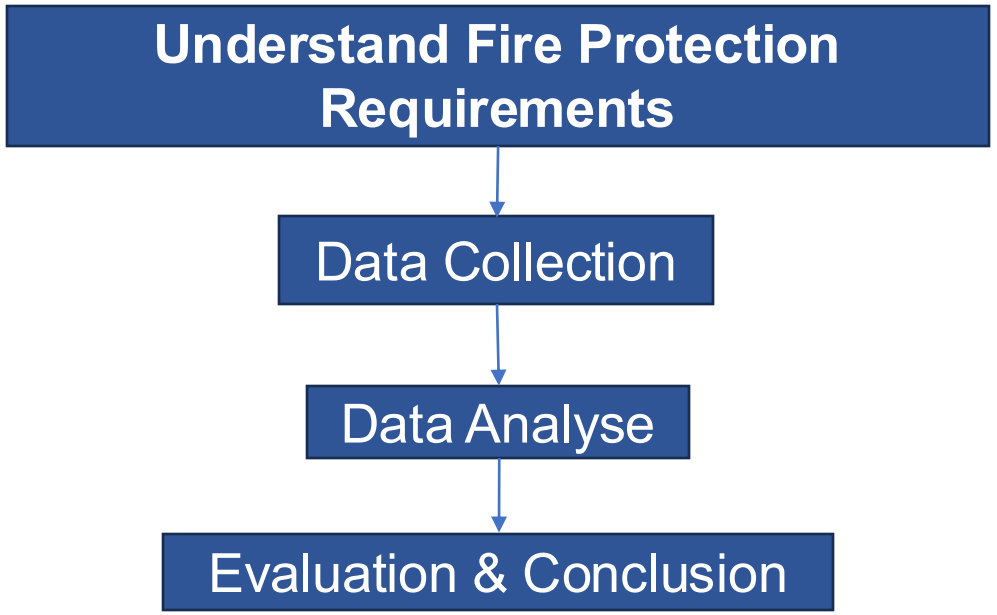
- Witness statement & CCTV footage
- Origin determination report
- Laboratory analysis results

Key Questions

- Is the ignition source at the origin?
- Can the source ignite the first fuel?
- Was time sufficient to ignite fuel?
- Is the cause consistent with known facts
- Does any alternative causes fit data equally well?

4. Fire Investigation Methodology

Fire Spread Analysis Methodology



Fire spread often determine the fire severity!

Key Factors

- Containment of fire and smoke
- Intended vs actual building material usage
- Detection & Alarm system
- Fire suppression activation
- Ventilation impact
- Code or structure failures

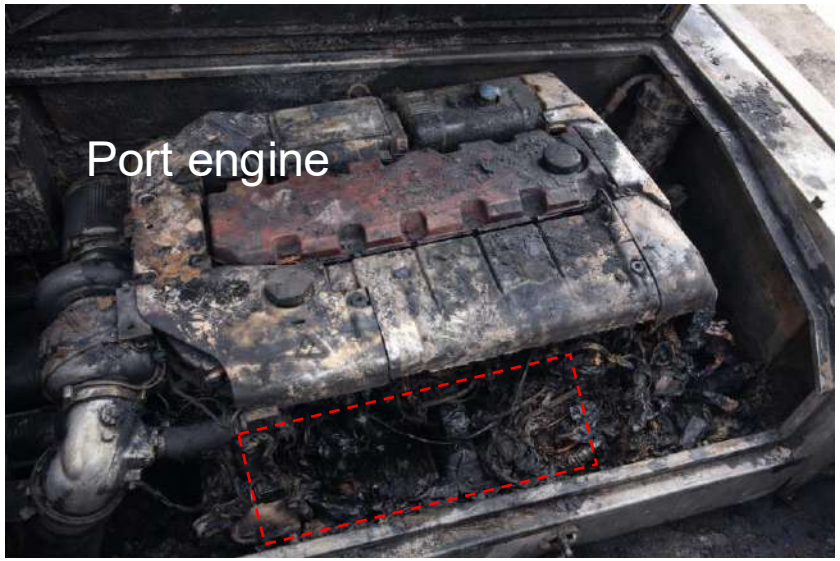
Origin → Cause → Spread

This structured approach **turns incidents into prevention lessons.**

5. Case Studies: 1) Engine Control Panel Fire

Background Information

A fire incident took place port engine of a Vessel

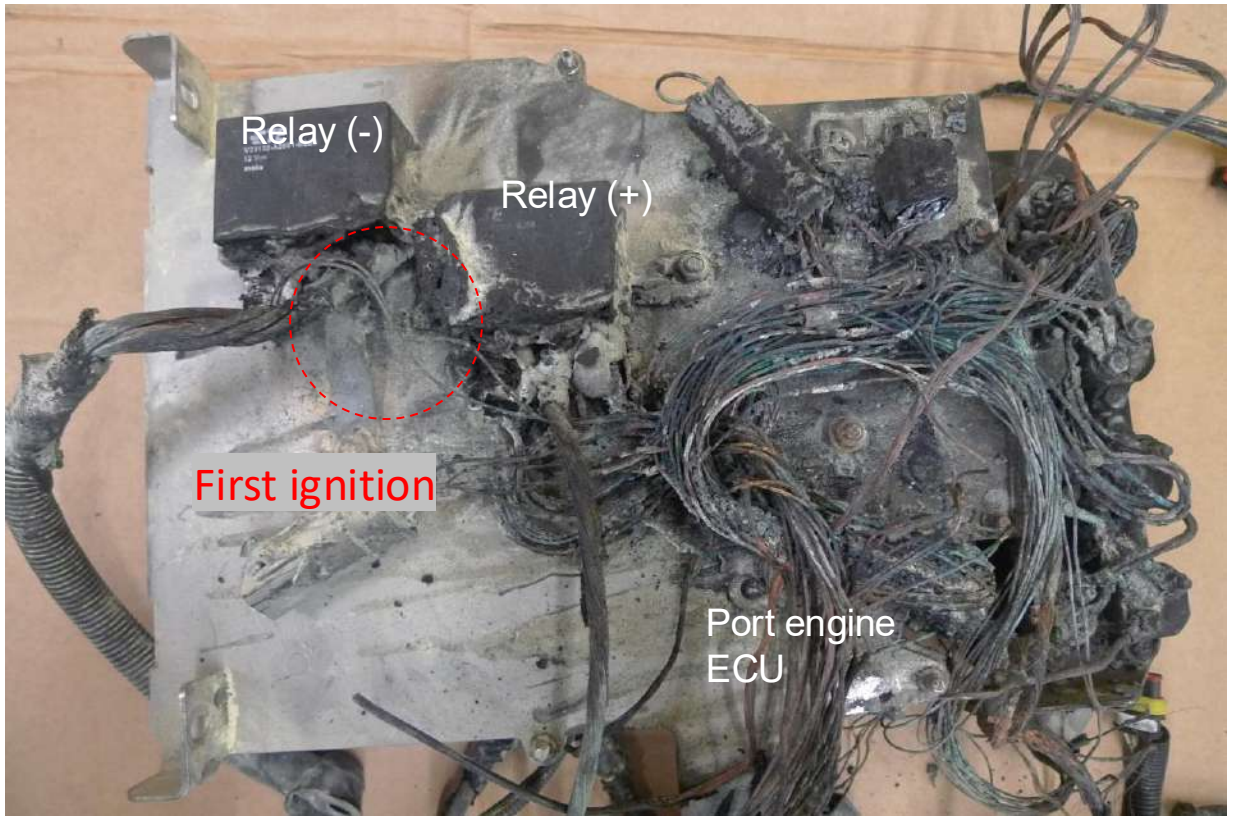


Determine Fire Origin Area

Site inspection revealed that the fire likely initiated from Electronic Engine Control Unit (ECU) of port engine.

5. Case Studies: 1) Engine Control Panel Fire

Determine Fire Origin Point



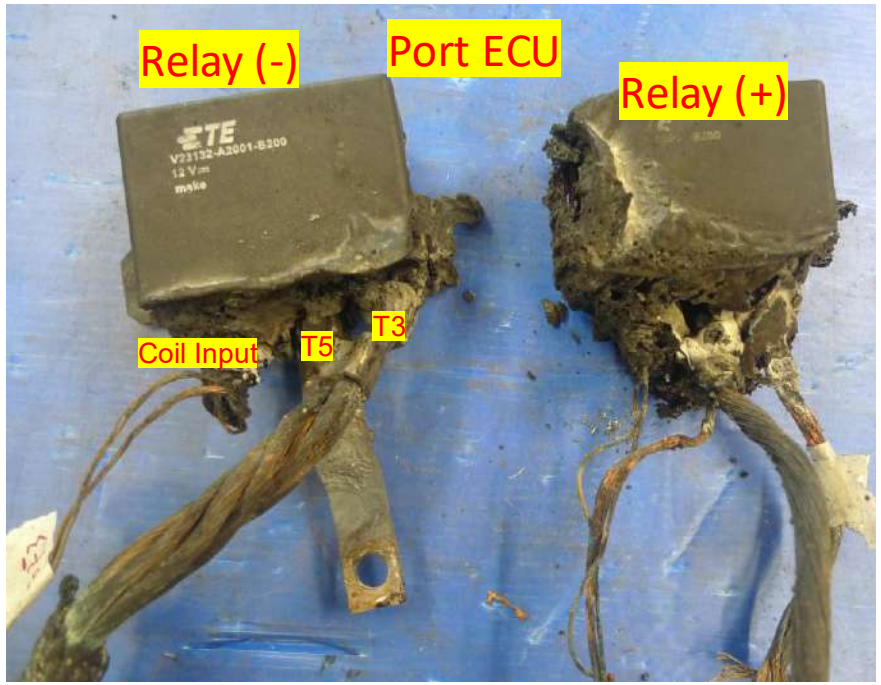
The first ignition point was from the negative relay in Engine Control Unit (ECU) of port engine

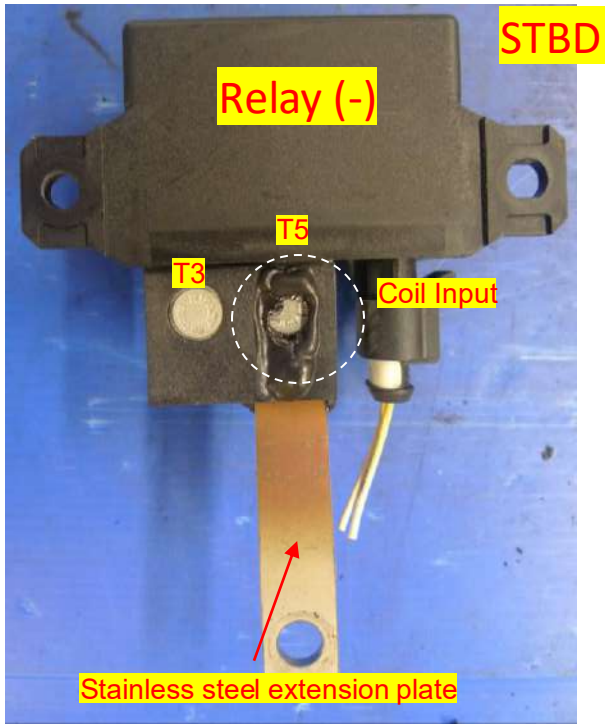
3. Case Studies: 1) Engine Control Panel Fire

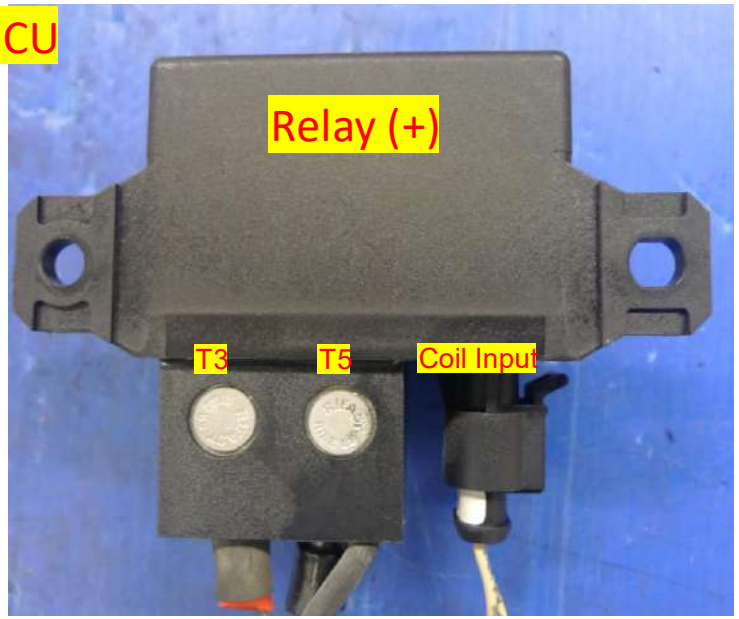
Port ECU

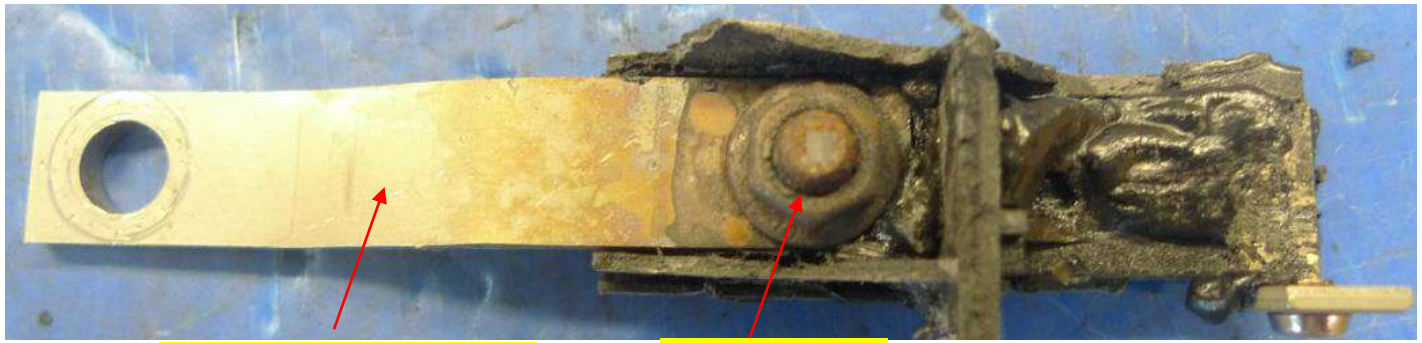
STBD ECU

5. Case Studies: 1) Engine Control Panel Fire



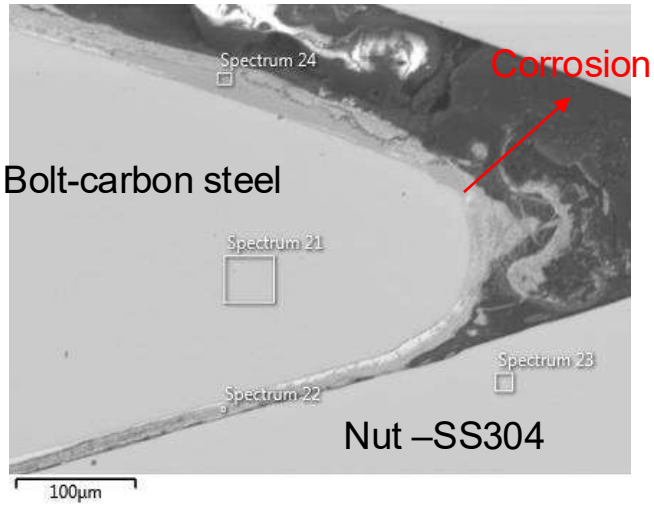


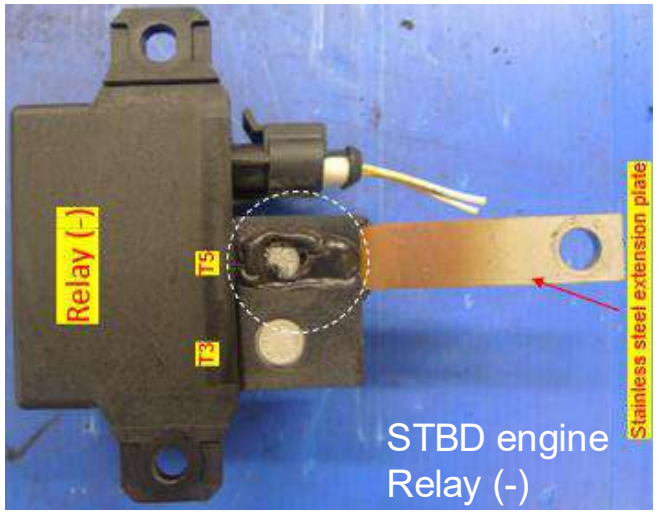


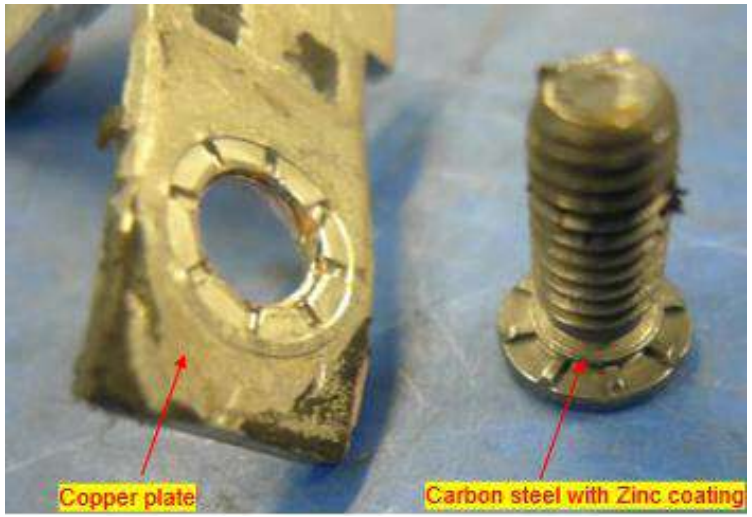


5. Case Studies: 1) Engine Control Panel Fire

Corrosion at SS–carbon steel interface







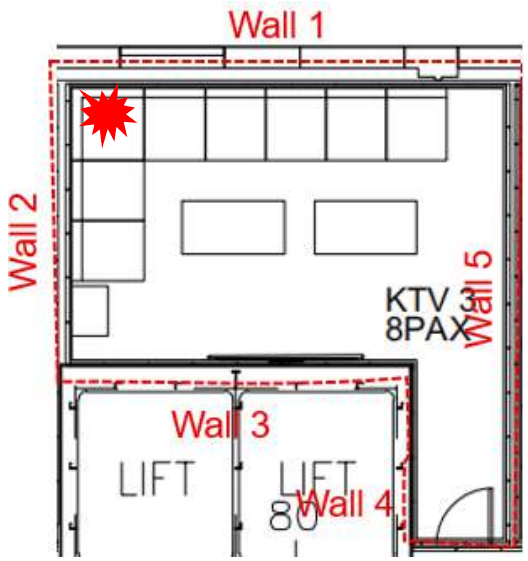
Wrong Material Selection → Galvanic Corrosion → Resistance → Heating → Fire risk

5. Case Studies: 2) KTV Room Fire

Background Information

A fire incident took place in one KTV room of a vessel. At the time of the incident, nobody was inside.

5. Case Studies: 2) KTV Room Fire



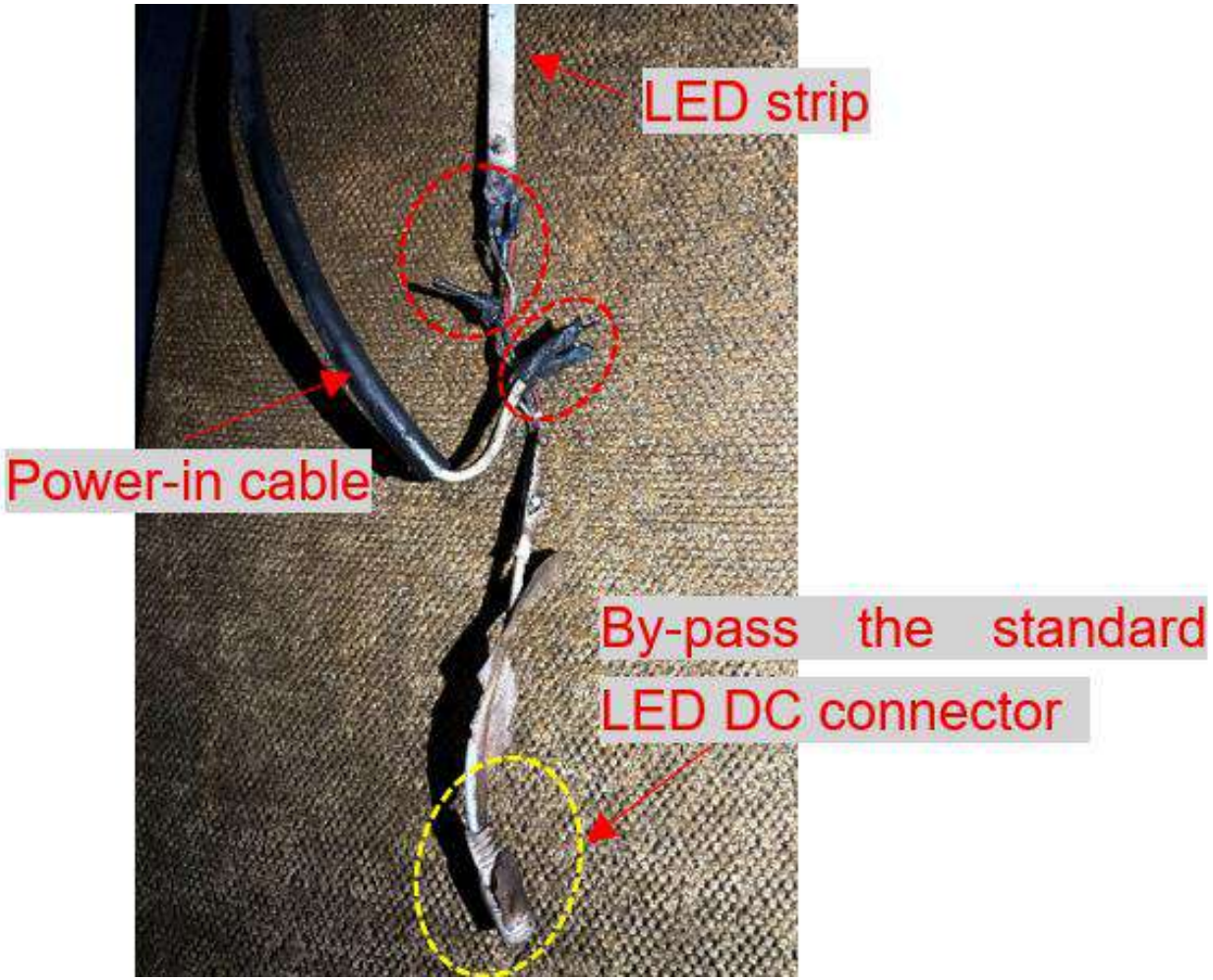
Determine Fire Origin Area

A) Wall 1
B) Wall 2
C) Corner of Wall 1 & Wall 2
D) Wall 3

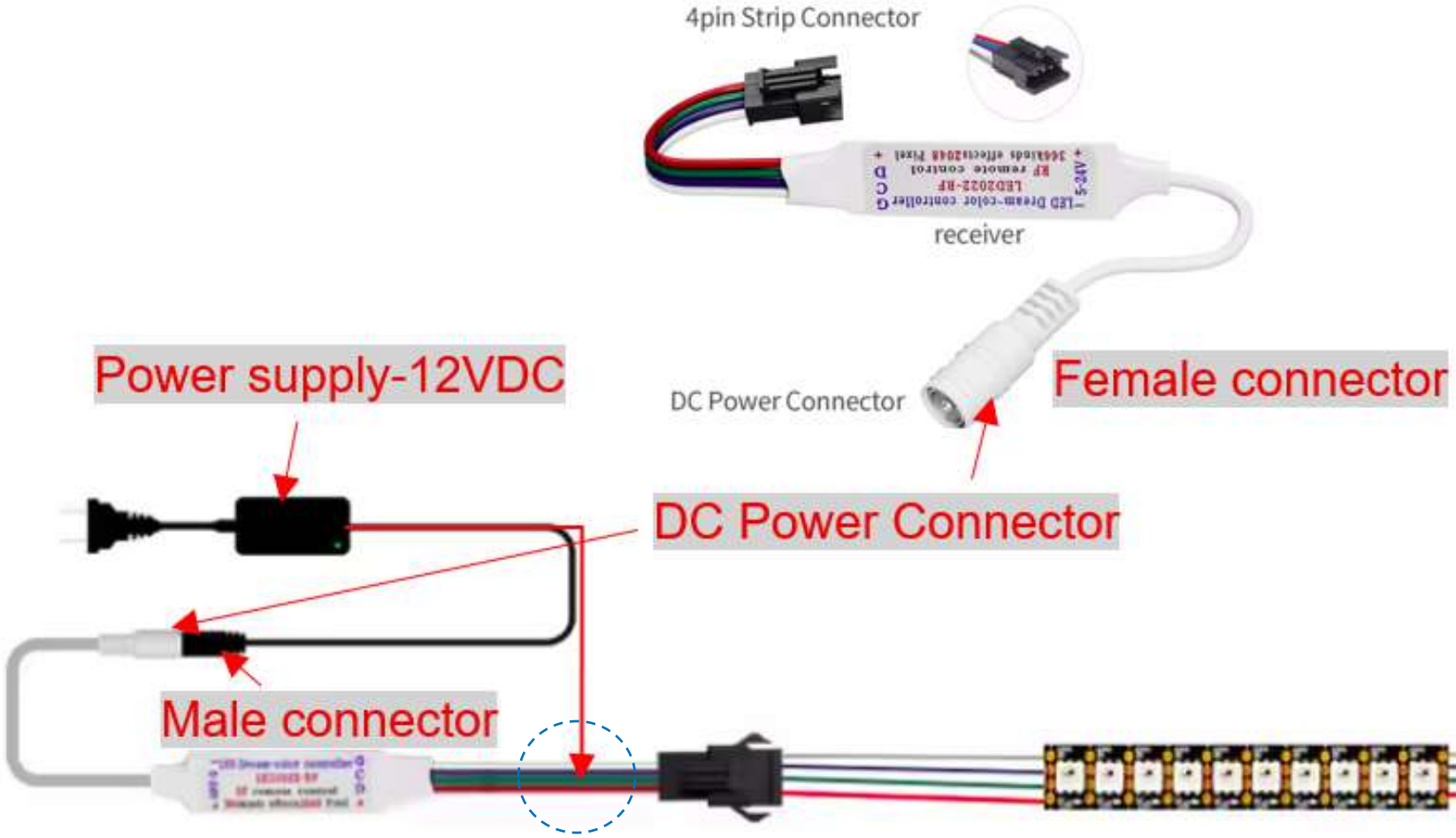
5. Case Studies: 2) KTV Room Fire

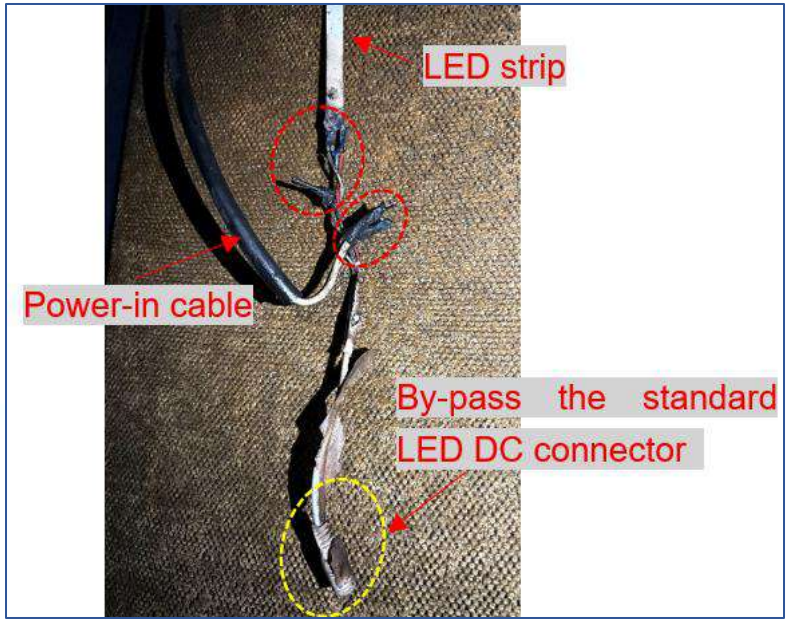
Determine Fire Origin Point

5. Case Studies: 2) KTV Room Fire



5. Case Studies: 2) KTV Room Fire





Poor workmanship

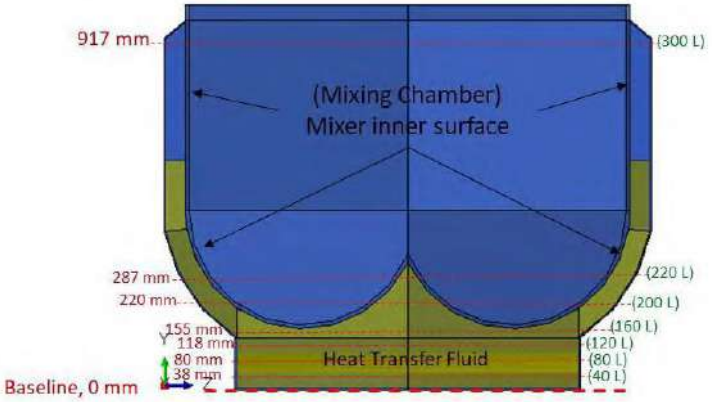
Improper wiring connection → Resistance/Arcing → Heating → Fire risk

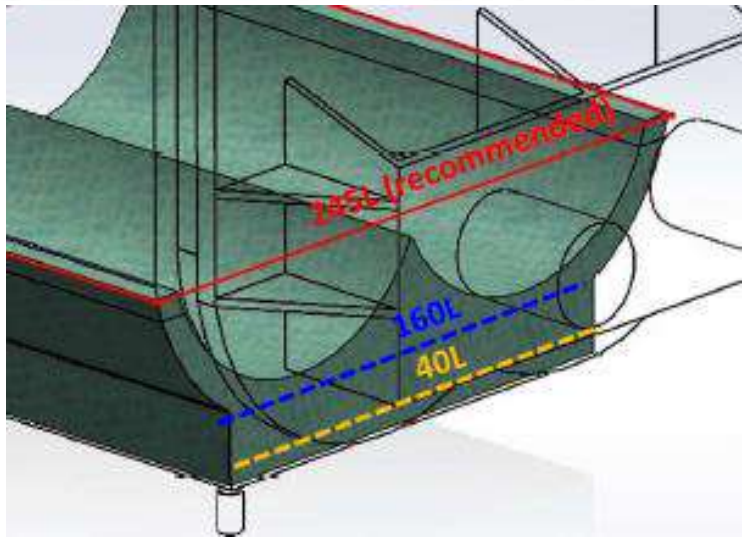
5. Case Studies: 3) TUAS Fire & Explosion

Fire & explosion occurred at an industrial building in Tuas on 24 Feb 2021, which left seven injured and three workers dead.

5. Case Studies: 3) TUAS Fire & Explosion

Insufficient oil





Total 200L Oil was purchased for use in the oil jacket:

On 16 June 2020, 40L was injected into the oil jacket;

On 8 Aug 2020, another 80L was added to the oil jacket;

On 5 Feb 2021, another 40L was added to the oil jacket.

Two unused buckets of thermic oil were found in the worksite.

The maximum possible amount of oil that could have been added to the jacket in the mixer machine's lifetime was 160 litres, while it needs **245L** oil to immersion the heaters completely.

5. Case Studies: 3) TUAS Fire & Explosion

Schematic diagram of the mixer machine

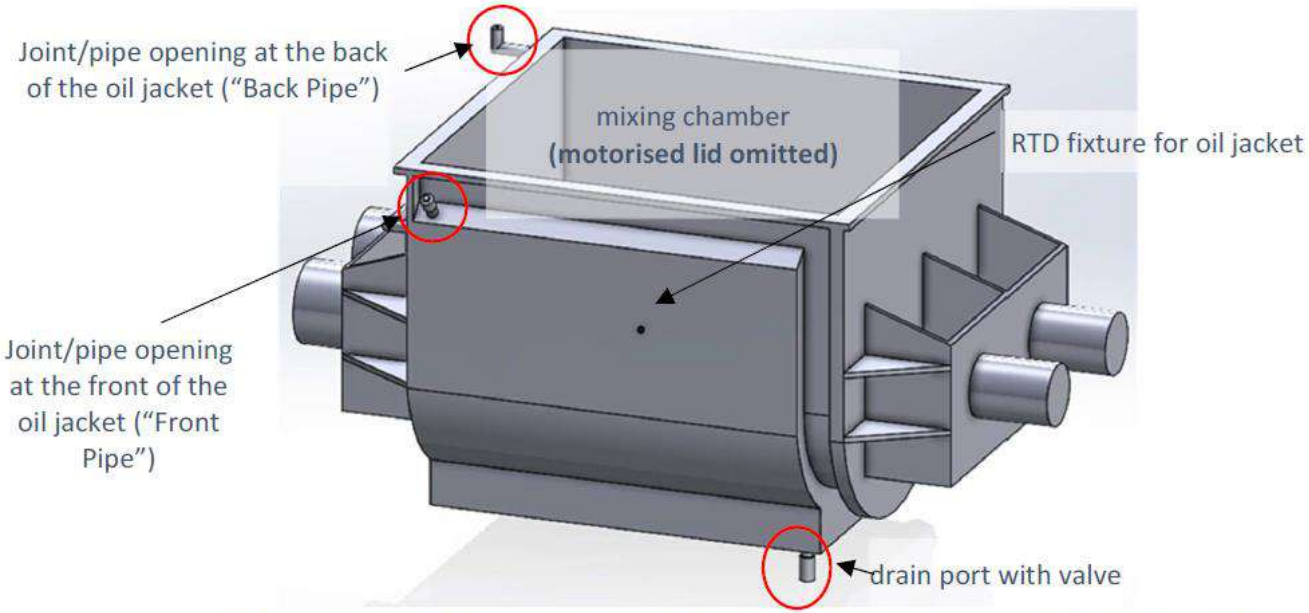


Figure 7: Front view of mixer machine with the three openings on oil jacket circled in red

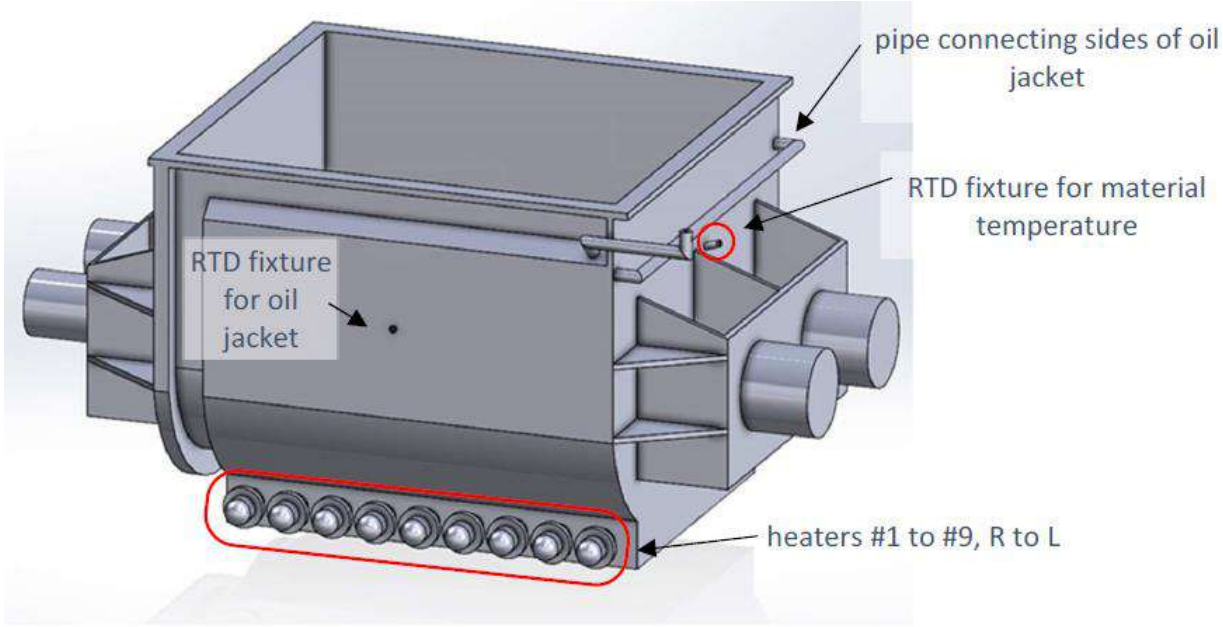


Figure 8: Rear view of mixer machine with nine heaters encircled in red

The mixer machine was used in the production of the fire clay by mixing starch flour and water, but came with an external jacket for heat transfer fluid and built-in heaters for heating the contents.

There were three openings on the oil jacket. However, all of them were sealed by the client.

5. Case Studies: 3) TUAS Fire & Explosion

Damaged heater

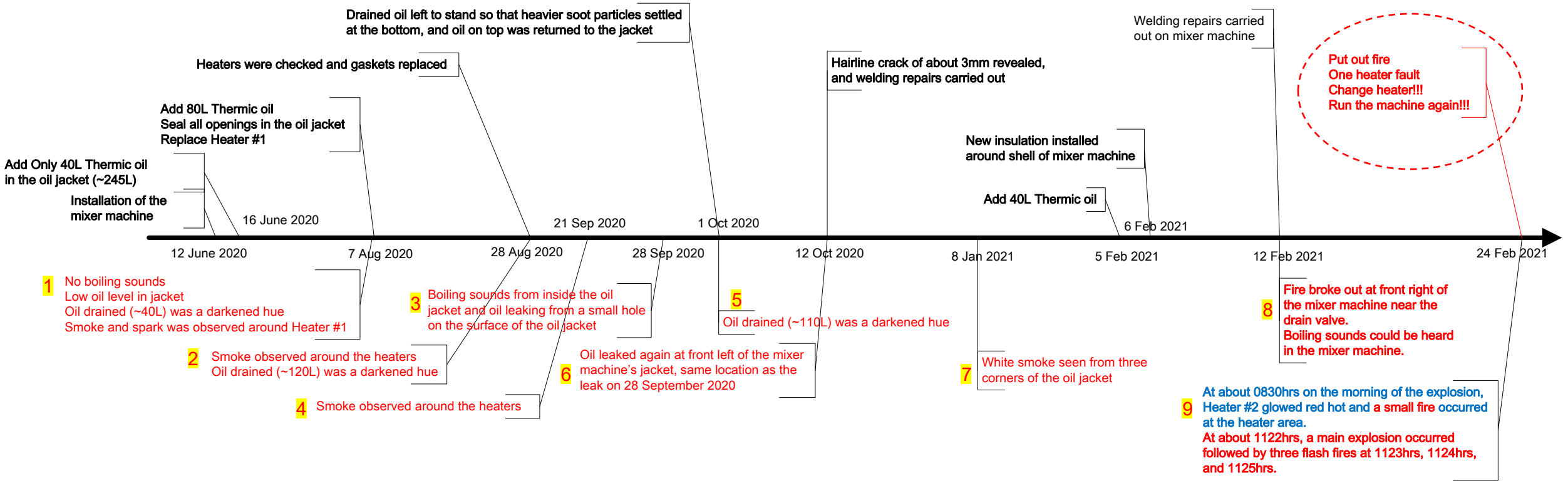
Spoiled heater #1 on 8 August 2020

Post-explosion view of spoilt heater, likely to be heater #1, that was replaced on 8 August 2020

FEA modelling with a 45kW heat source showed that the temperature of the oil jacket reached around 700°C to 1800°C when the effective thermal conductivity between the heat transfer fluid and the mixer contents was low.

5. Case Studies: 3) TUAS Fire & Explosion

Key Events and Warning Signs



Mistakes one by one! 9 Warning signs were overlooked!

5. Case Studies: 3) TUAS Fire & Explosion

Court Proceedings and Penalties

Stars Engrg Pte Ltd: Charged with two counts under the Workplace Safety and Health Act (WSHA) for failing to ensure the safety of the heated mixer machine and failing to ensure the safety and health of its employees.

Chua Xing Da (Director): Faces two charges under the Workplace Safety and Health Act (WSHA) for failing to ensure that the heated mixer machine was safe for use and failing to ensure the safety of employees, as well as charges for obstructing justice.

Lwin Moe Tun (Production Manager): Faces charges under WSHA for negligent acts endangering worker safety and multiple charges of obstructing justice.

6. Key Takeaways

- Beyond the immediate finance loss and safety hazards, fire and explosion incidents carry **far-reaching legal and business consequences** that can persist for years after the flames are extinguished.
- **Most real-world fires are engineered failures, not random accidents**, commonly involving material selection, workmanship, system design, maintenance, or degradation.
- **Fire investigations are about learning, prevention, and design improvement** — every failure provides insight to enhance marine safety and WSH standards.
- **Bad deed NO, good deed YES**. (勿以恶小而为之，勿以善小而不为)

OSKEFER
Failure & Incident Investigation

Thanks for your attention!

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Sharing Session 2

WSH in Commercial Diving & Work at Anchorage

by Ms. Nadia Ramdan, Senior WSH Inspector, General Workplaces - Marine (Occupational Safety and Health Division, MOM)

Organised by ASMI Association of Singapore Marine and Offshore Energy Industries

Silver Partners Dräger

Bronze Partner Ailytics

Empowered *workforce*, Thriving *workplaces*

Ensuring Workplace Safety & Health in Commercial Diving & Work at Anchorage

ASMI 28th WSH Convention

Nadia Ramdan

Senior WSH Inspector

Occupational Safety & Health Inspectorate

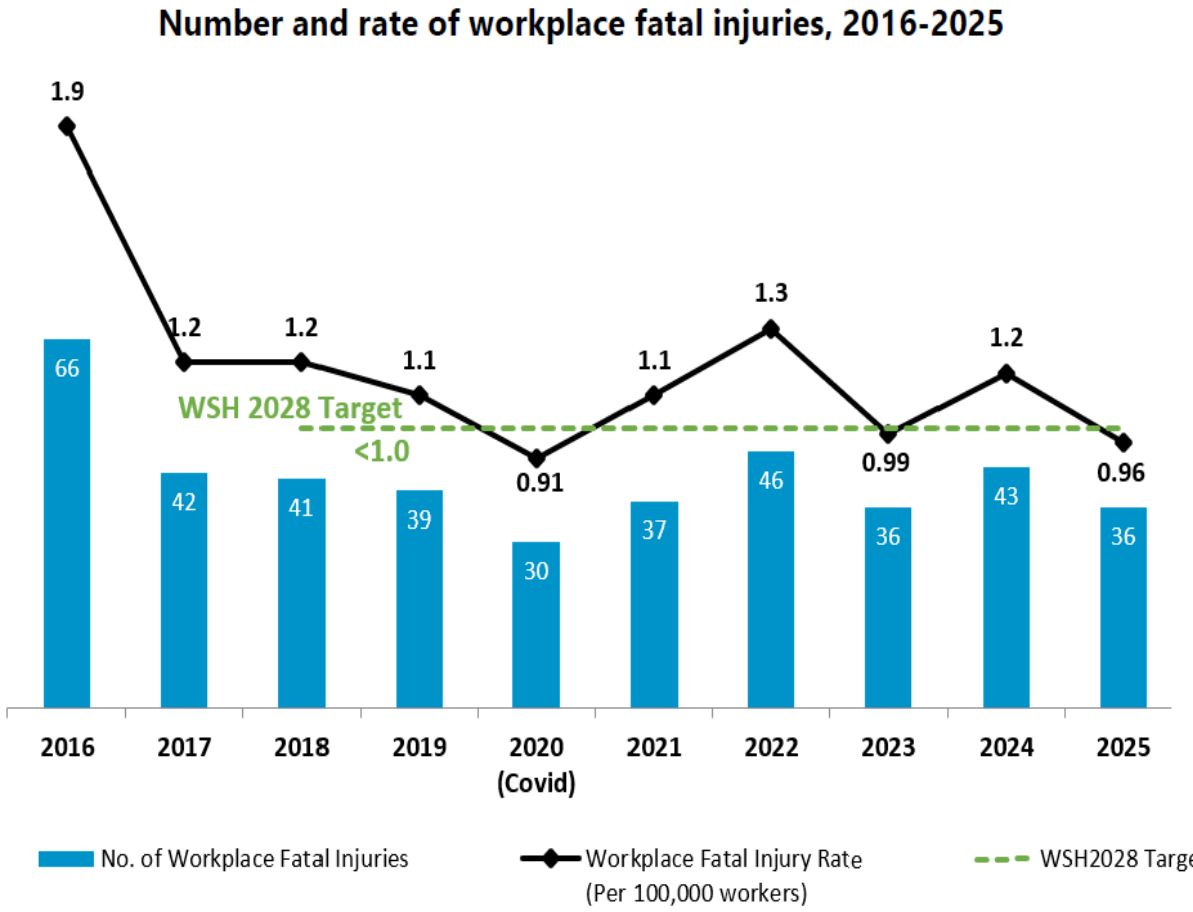
12 May 2026

Overview

- **WSH Statistics & Performance**
- **WSH Risks in Commercial Diving & Work at Anchorage**
- **Top Contraventions & Key Findings**
- **Case Studies**
  1) **Unsafe Diving Operation**
  2) **Transfer To And From Vessels**

Ministry of Manpower

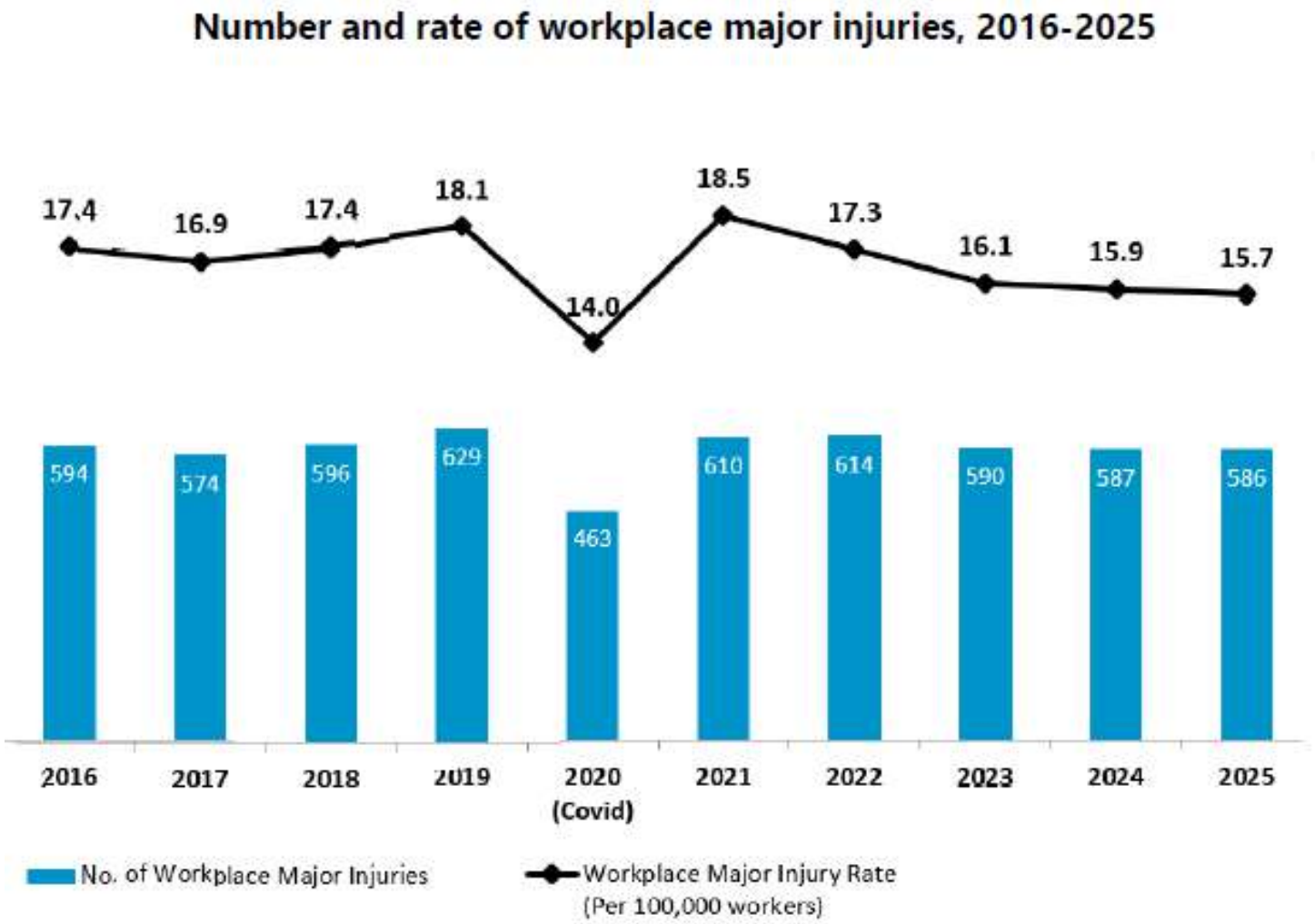
Singapore achieved record low workplace fatal injury rate in 2025



* Fatal injury rate per 100,000 workers.

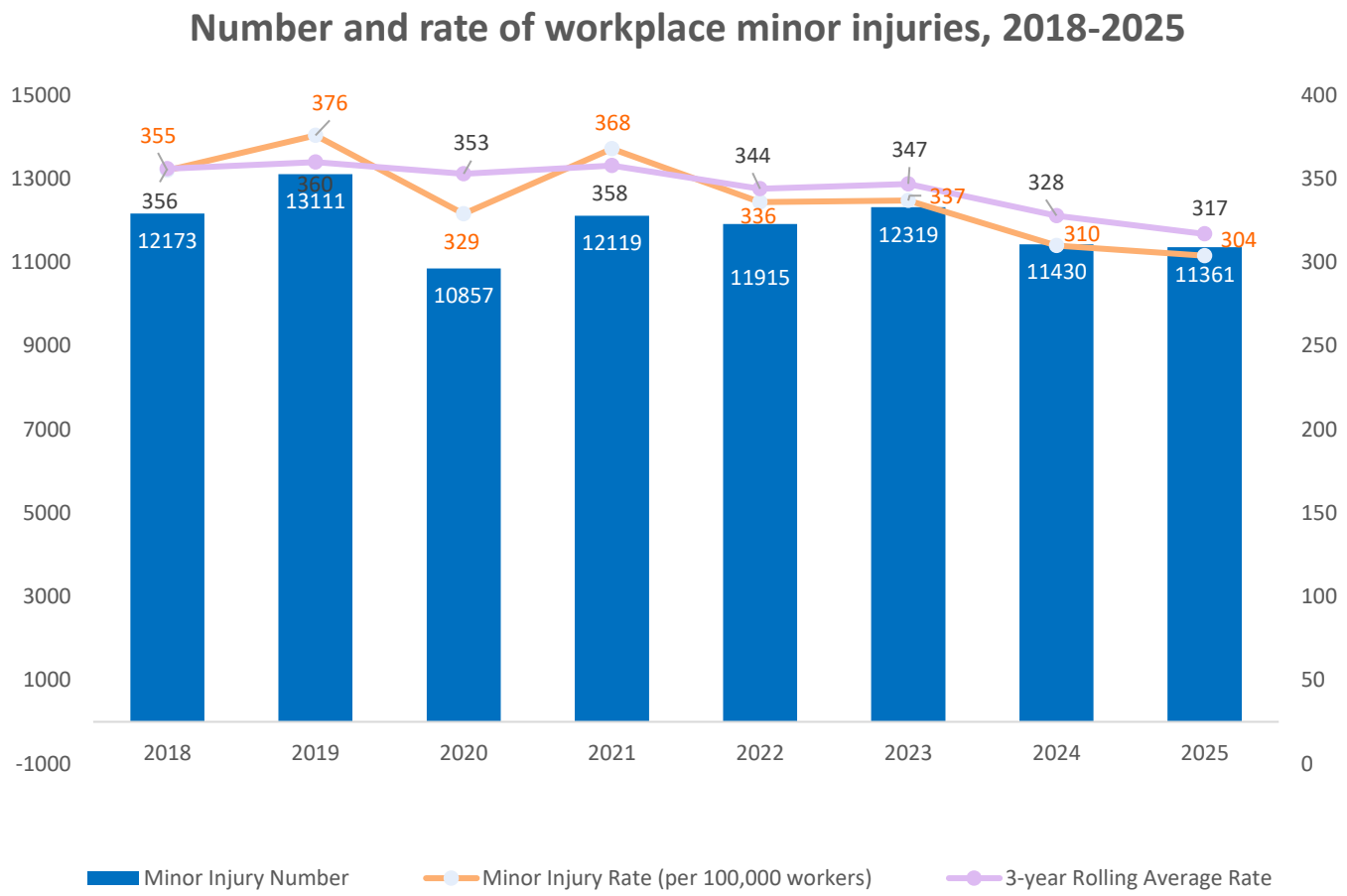
Ministry of Manpower

Workplace major injury rate hits record low



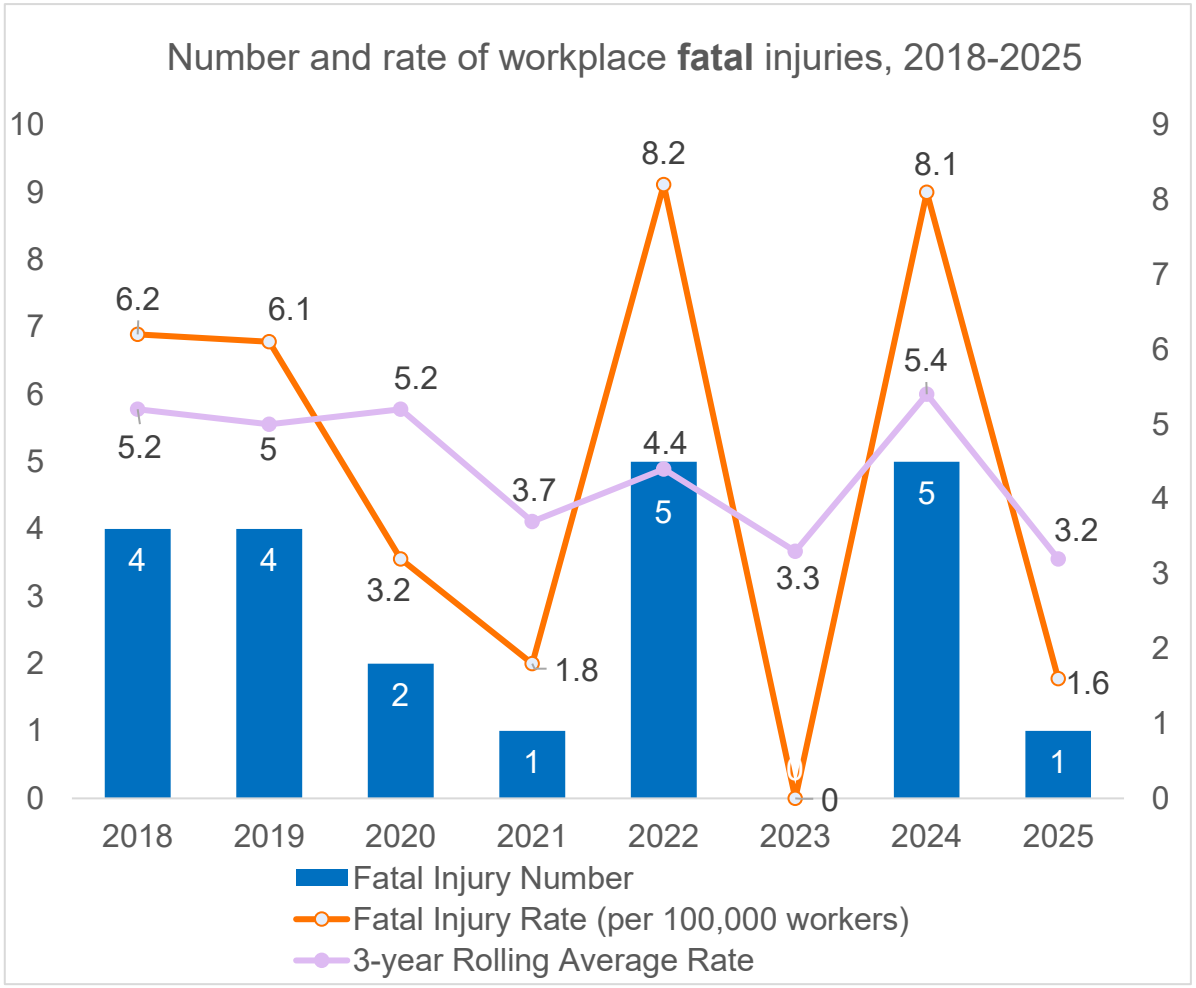
Ministry of Manpower

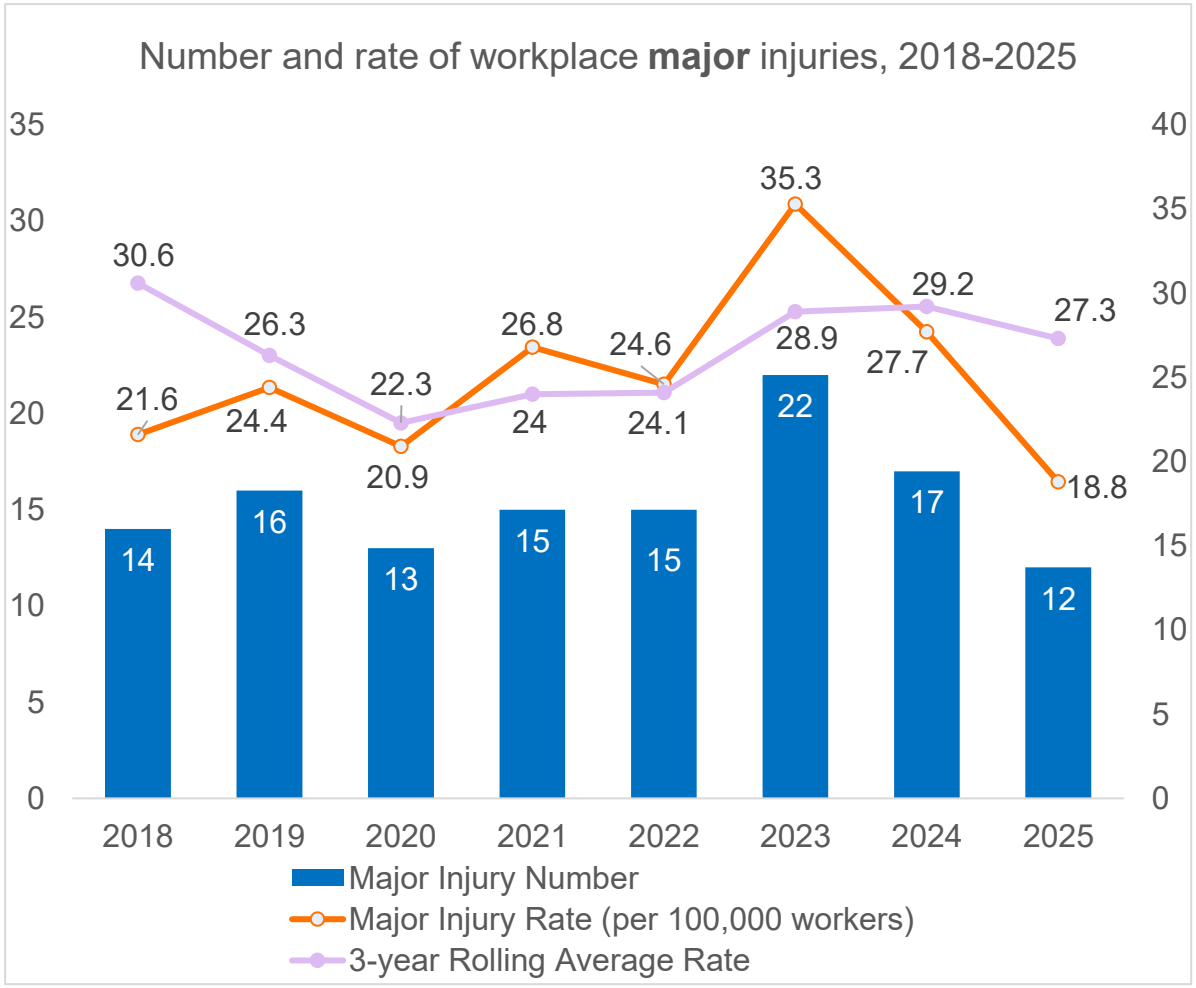
Workplace minor injury rate also hits record low



Ministry of Manpower

Marine industry recorded fewer fatal and major injuries in 2025

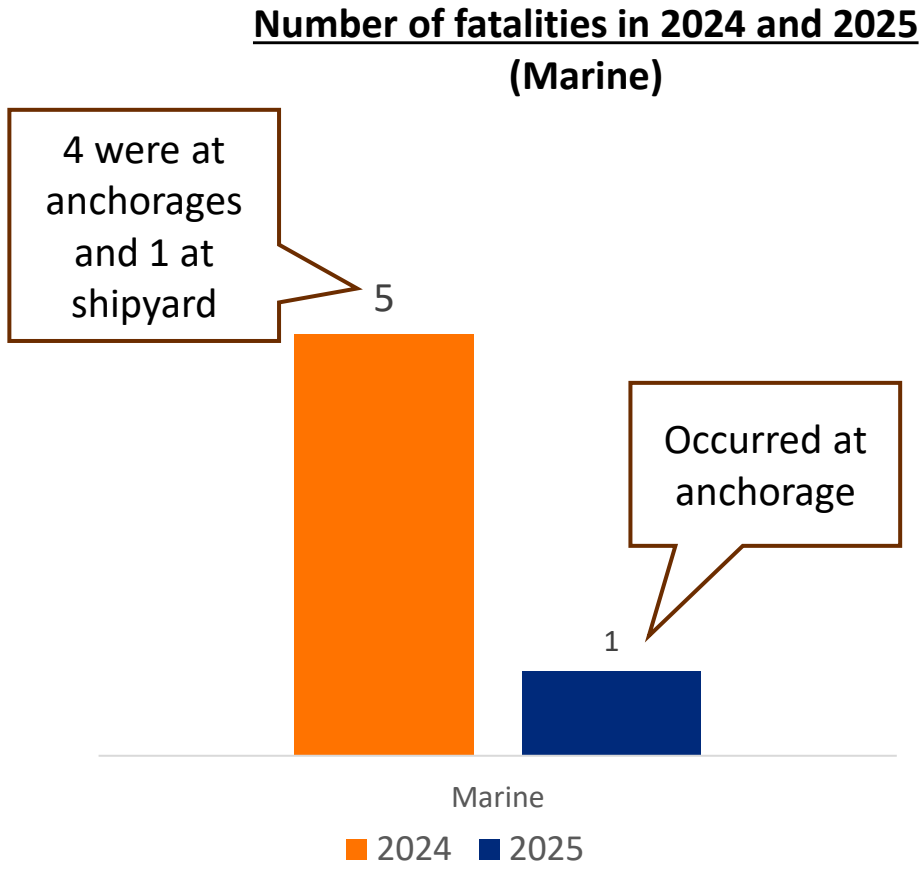




Ministry of Manpower

5 fatalities recorded at anchorages in 2024–2025

Incident Types	Locations
2 involved diving operations • Failure to surface after expired diving time • Entanglement with boat propellers	Anchorage
2 involved common hazards • Fall through opening • Oxygen deficiency in confined space	
1 involved a fall from the pilot ladder while disembarking the vessel	



Ministry of Manpower

Incidents with higher fatality risk in Marine industry were attributed to workers struck by moving objects

Common incident type (cause) for fatal and major injuries in 2025

Marine			
Type A		**Type B**	
Incident Type (Cause)	**2025**	**Incident Type (Cause)**	**2025**
Struck by Moving Objects	4	Slips, Trips & Falls	6
Suffocation/Drowning	1		
Struck by Falling Objects	1		

Ministry of Manpower

WSH Risks: Commercial Diving

- Entanglement or entrapment underwater
- Loss of consciousness underwater
- Decompression sickness (DCS)
- Barotrauma during descent or ascent
- Being struck by or drawn into vessel propellers and thrusters

Ministry of Manpower

Standards and recommended guidelines have been established for commercial diving operations

Singapore Standards Council

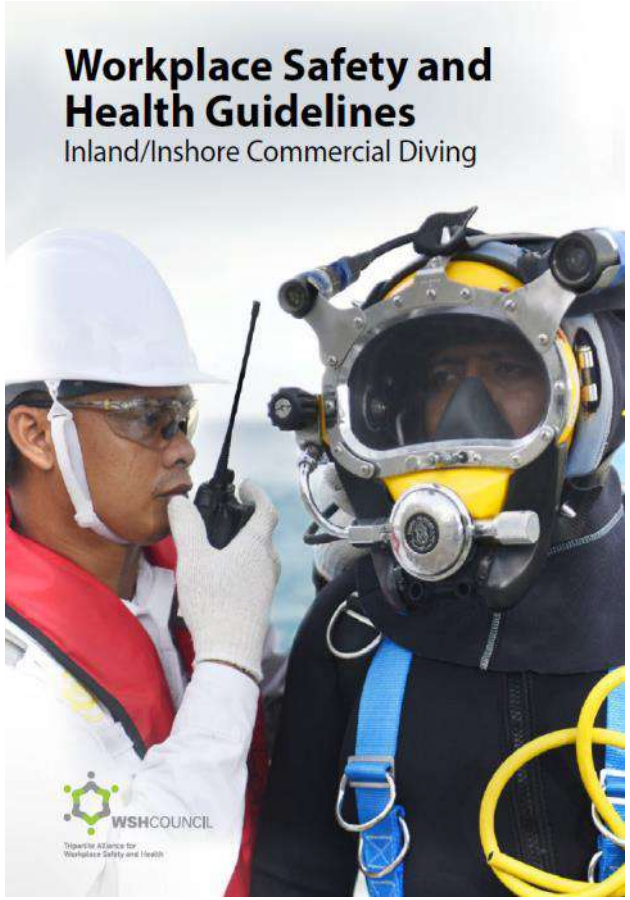
SS 511 : 2018
(ICS 13.100)

SINGAPORE STANDARD

Code of practice for diving at work

Published by
Enterprise Singapore

Contents



Contents

Recreational SCUBA is prohibited

Ministry of Manpower

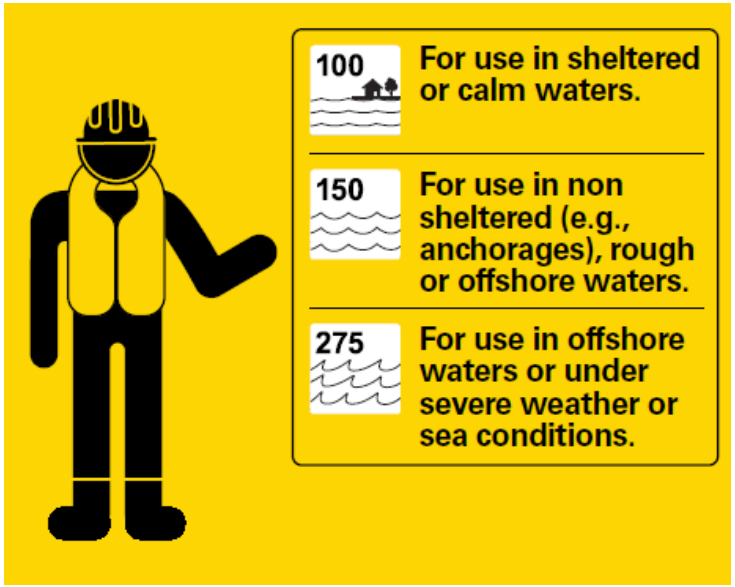
WSH Risks: Work at Anchorage

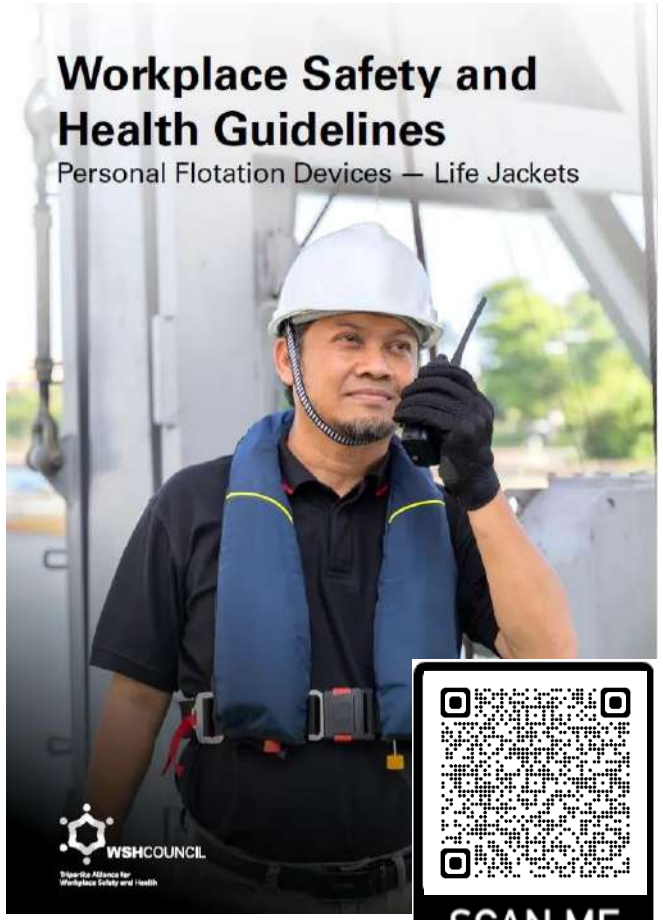
- Falling overboard during vessel embarking or disembarking
- Being caught between vessels during transfer
- Falling overboard due to capsizing or flooding of small crafts
- Falling from height or into opening aboard vessels
- Confined space risks aboard vessels
- Fire or explosion risks aboard vessels

Ministry of Manpower

WSH Guidelines on Personal Flotation Devices - Life Jackets

- Published in July 2025
- Helps users select suitable life jackets for different work environments, in line with international standards
- Recommends good practices for their proper use and maintenance





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For ISO 12402-certified life jackets, at least **Level 150** shall be provided for workers operating in non-sheltered or rough waters, including **anchorages**.

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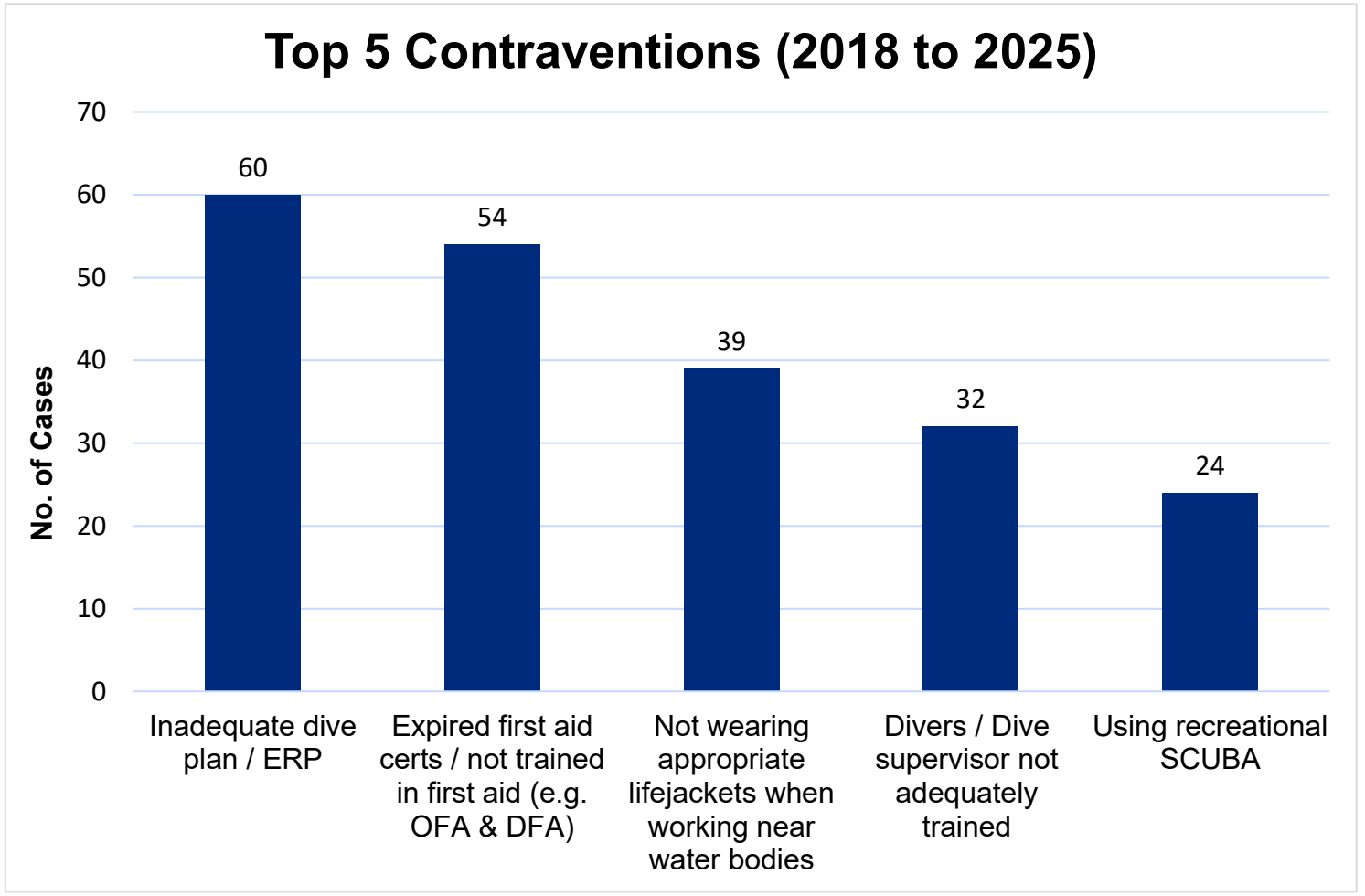
Top contraventions from diving contractor and marine contractor inspections

Diving Contractor & Marine Contractor Inspections (2018-2025)	
No. of Stop Work Orders	6
No. of Contraventions	351
Total fines issued	$113,000



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1a) Key Findings: Inadequate Dive Plan

Dive plan for diving work

Dive plans set out the way diving will be carried out to ensure the participant's health and safety. The dive plan should assist with the implementation of control measures that have been selected during the risk management process.

A single dive plan may be prepared for several dives when the risks of the dives are similar. When the risks of the dive vary (e.g. when there are different tasks, equipment used or significant environmental change), then a new dive plan should be prepared.

Example dive plan for diving work:

Dive plan			
Business legal name:	ABN:	Depart date:	Return date:
Dive supervisor:		Vessel master if applicable:	
Dive site locations:			
Dive plan prepared by: Date:			
☐ All persons briefed by dive supervisor			

Method of carrying out the task		
Type of diving	Tasks	Diving equipment/gas
☐ Vessel - per ops manual	☐ Manual cleaning	☐ CSCUBA air only – per ops manual
☐ Shore - per ops manual	☐ Harvesting by hand	☐ SSBA air only - per ops manual
☐	☐ Inspection	☐ Pre departure checks completed
☐	☐ Scientific sampling	☐ Pre dive checklist available
☐	☐	☐ Other (specify)

Decompression management		
☐ Computer (specify)	☐ Tables (specify)	☐ Flying after diving
☐ Other deco factors (specify)		

Task and duties(all members of dive team)

Name	Competent	Medical	Duties
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	

Site specific hazards (in addition to controls in ops manual)

Hazard	Risk	Control measures (site rules)
☐ Environmental hazards (specify)		
☐ Equipment hazards (specify)		
☐ Task hazards (specify)		
☐ Other (specify)		

Diving planned

Date range	Location	Depth range	Max time	Task

Emergency procedures

☐ Emergency procedures available on site (as per ops manual)

☐ Emergency procedures reviewed and practiced by dive team
Last drill date:

Task and duties(all members of dive team)

Name	Competent	Medical	Duties
Ivan	☐	☐	Dive Supervisor/ Captain
Bernard	☐	☐	Diver/ Dive Supervisor
Ahmad	☐	☐	Diver/ Tender
Tommy	☐	☐	Diver/ Tender
Titus	☐	☐	Diver/ Tender
	☐	☐	
	☐	☐	

Site specific hazards (in addition to controls in ops manual)

Task and duties(all members of dive team)

Name	Competent	Medical	Duties
Ivan	☐	☐	Dive Supervisor
Bernard	☐	☐	Diver
Ahmad	☐	☐	Standby Diver
Tommy	☐	☐	Tender
Titus	☐	☐	Standby Dive Tender
	☐	☐	
	☐	☐	

Site specific hazards (in addition to controls in ops manual)

Clause 6.1.4.1 and 8.3 of SS511: 2018- COP for Diving at Work

Prior to any diving operation, a dive plan shall be prepared and be agreed upon by all parties involved.

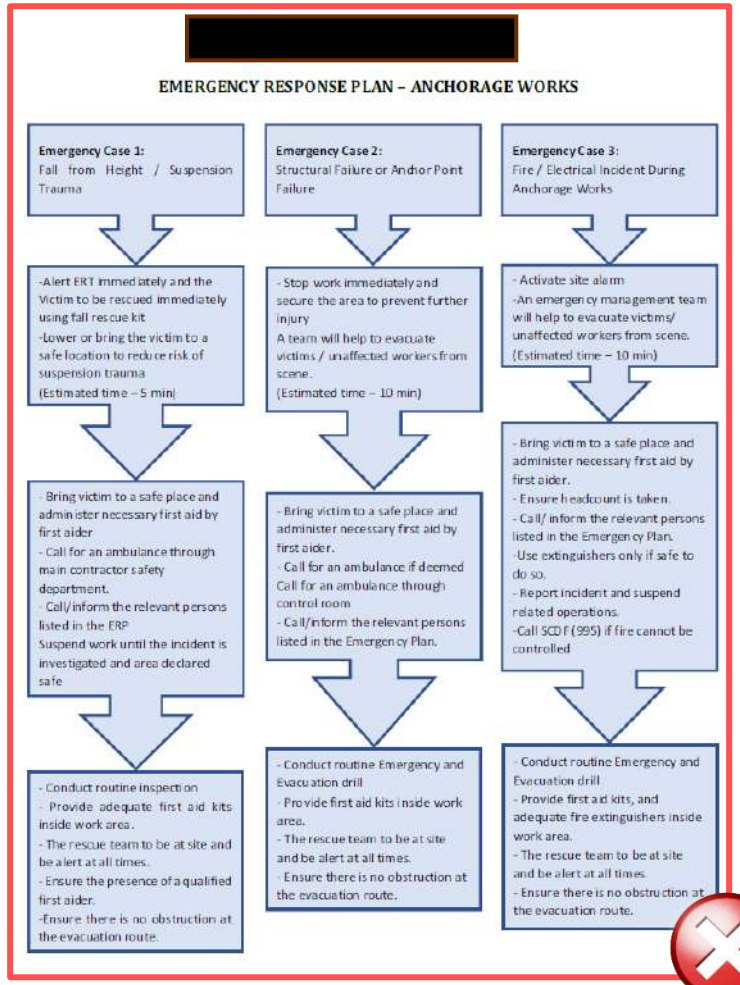
Ministry of Manpower

1b) Key Findings: Inadequate ERP

Lack of and inadequate Emergency Response Plan (ERP)

- Contractors failed to establish their own ERPs, instead relying on those of international vessels, which were not tailored to local conditions

- ERPs contained contingencies and evacuation procedures but did not include emergency response team contacts



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2) Key Findings: Occupational First Aid (OFA) & Diving First Aid (DFA) Courses

CERTIFICATE OF SUCCESSFUL COMPLETION

is awarded to

for successful completion of the

Occupational First Aid (OFAC) with CPR+AED Course

@ Avanta Global Pte Ltd
Blk 20 Bendemeer Road #04-08 Bendemeer 339914
(ISO 29993:2017 Certified by SOCOTEC
for Occupational First Aid (OFAC) with CPR+AED Course)
On

26th March 2025

Validity : 26/03/2027

This Course is accredited by the WSH CPD Board, with 10 SDUs

Director
Training & Development
Avanta Global Pte Ltd

Trainer
Training & Development
Avanta Global Pte Ltd

Avanta Global Pte Ltd
UEN: 201014905M
20, Bendemeer Road #04-06, BS Bendemeer Centre,
Singapore 339914
Tel: +65 62952112 Fax: +65 62956669
Email: enquiry@avanta.com.sg Web: www.avanta.com.sg

KBA Training Centre Pte Ltd
A Member of IMCA

DIVING FIRST AID

Issued By: KBA Training Centre Pte Ltd
Date of Issue: 10-January-2025
Issued To:
Date of Birth:

Date on which certificate ceases to be valid unless further training is undertaken

Date: 09-January-2027

KBA a Total Management System Company

This certificate has been issued on successful completion of the stated training course. KBA Training Centre Pte Ltd is not responsible for the acts or omissions made by the individual named on this certificate whilst employed in any capacity while using the knowledge and training conducted during this course. It is solely the responsibility of the employer to ensure that the individual is competent and has been trained for any and all operational tasks undertaken at the behest of the employer.

KBA Training Centre Pte Ltd
25 Lepang Crescent, Blk 103, Tops Avenue 1, #05-02 Singapore 508868
Tel: +65 6542 4084
Email: courses@kbatraining.org | Website: www.kbatraining.org

- Ensure OFA certification attained from an approved occupational first aid training provider

- Ensure that all certifications are within the validity period
  - OFA certification is valid for 2 years
  - DFA certification is valid for 2 years

Check for approved training providers here:

SCAN ME

Ministry of Manpower

3a) Key Findings: Dive tenders working without life jackets

Workplace Safety and Health Guidelines Personal Flotation Devices — Life Jackets

In general, all persons who are exposed to the risk of falling into water and of drowning at work should use life jackets. Buoyancy aids, which are not suitable for work, should only be used with supervision for recreational purposes or by rescuers performing water rescue.

Ministry of Manpower

3b) Key Findings: Life jackets used did not meet the required standards for work at anchorages

Buoyancy: More than 7.5kg (73.6N)

Buoyancy: At least 150N

For ISO 12402-certified life jackets, <u>at least **Level 150**</u> shall be provided for workers working in non-sheltered or rough waters, including **anchorages**.

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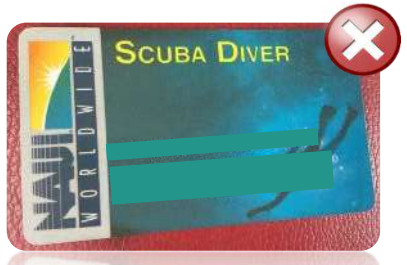
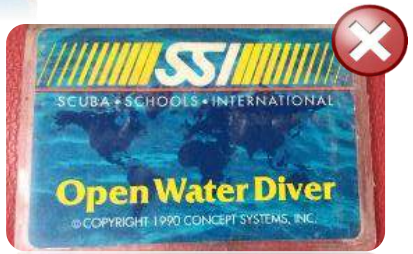
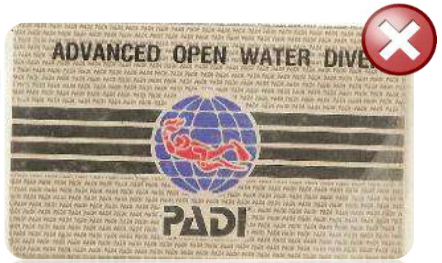
4) Key Findings: Unacceptable Commercial Diving Certificates (1/2)





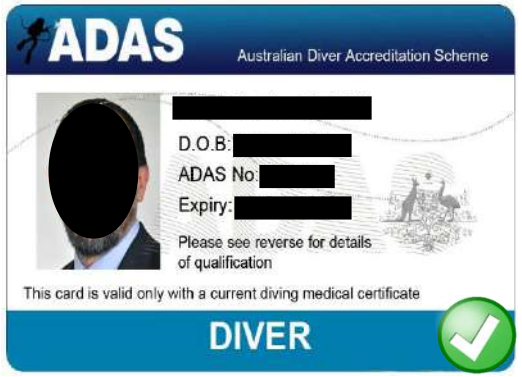


Recreational scuba diving certifications are not accepted for commercial diving activities.

Divestuff International Sdn Bhd (Divestuff) and Commercial Divers Network International (CDNI) are not CIDB-accredited training providers in Malaysia. Commercial diving certifications issued by them are not recognised in Singapore.

Ministry of Manpower

4) Key Findings: Unacceptable Commercial Diving Certificates (2/2)



WSHCOUNCIL

List of Acceptable Commercial Diving Certifications

Country / Accreditation	CSCUBA (30m)	CSSDE (30m)	Offshore (50m)
Divers			
Australia (ADAS)* In-house training certificates are not recognised unless trainees also received an ADAS card upon completion	Occupational SCUBA to 30m (previously, ADAS Part 1)	Occupational SSBA to 30m (previously, ADAS Part 2)	Occupational SSBA to 50m (previously ADAS Part 3)
Canada (DCBC)*	Unrestricted SCUBA	Restricted Surface Supply	Unrestricted Surface Supply & above
France (INPP)*	Class I Mention A – (Occupational SCUBA to 30m)	Class II Mention A – (Surface Supply to 50m)	Class II Mention A (Surface Supply to 50m) & above
Malaysian (CIDB)*	Construction Diver Level 1	Construction Diver Level 2	N/A
Norway (PSA)*	N/A	Diving Certificate Class III – Advanced Underwater Work	Diving Certificate Class I – Surface Orientated Diver
Singapore (MOM)	CSCUBA Diver	SSDE Diver	N/A
South Africa (DOL)*	Class IV Diver (SCUBA)	Class III Diver (SSDE)	Class II Diver (SSDE)
United Kingdom (HSE) pre 1998*	HSE part 4	HSE part 3	HSE part 1
United Kingdom (HSE) post 1998*	HSE SCUBA	HSE Surface Supply	HSE Surface Supply (Top Up) & above
ADCI*	Inland / Inshore Diver (need to be supplemented with any certification in the List of Acceptable Commercial Diving Certifications)		ADCI surface supplied diver certificates **bearing the words "INTERNATIONAL ENDORSEMENT"**
IMCA* approved training member	N/A	N/A	IMCA Surface Supplied Diver

Diving Supervisors			
Country / Accreditation	**CSCUBA (30m)**	**CSSDE (30m)**	**Offshore (50m)**
Australia (ADAS)* In-house training certificates are not recognised unless trainees also received an ADAS card upon completion	Onshore Diving Supervision SCUBA to 30m (previously, ADAS Part 1)	Onshore Diving Supervision SSBA to 30m (previously, ADAS Part 2)	Offshore Diving Supervision – SSBA to 50m (previously, ADAS Part 3 / Offshore Air/Bell)
Canada (DCBC)*	Onshore Supervisor		Offshore Air/Saturation Diving Supervisor
Malaysian (CIDB)*	Onshore SCUBA Supervisor	Onshore SSBA Supervisor	N/A
Singapore (MOM)	CSCUBA Supervisor	SSDE Supervisor	N/A
Association of Diving Contractors – ADC UK*	Surface-Supplied Air Diving Supervisor (need to be supplemented with any certification in the List of Acceptable Commercial Diving Supervisor Certifications)		N/A
ADCI*	Surface-Supplied Air Diving Supervisor (need to be supplemented with any certification in the List of Acceptable Commercial Diving Supervisor Certifications)		N/A
IMCA*	N/A	N/A	IMCA Offshore Air Diving Supervisor & Mix Gas Bell Diving Supervisor

NOTE*: The WSH Act requires employers and principals to ensure that workers performing commercial diving activities are provided with sufficient instructions, information, training and supervision as is necessary for them perform their work. While divers may possess overseas diving qualifications that are recognised, the employer/principal needs to ensure that local requirements in the WSH Act, relevant industry standards such as the SS511 Code of Practice for Diving at Work are complied with. Some of these local requirements can be taken in reference from section 2.1.1 Legislation and Standards (CD-CCD-100A-0) of the Commercial Diving Competency Standard (Link).

Abbreviations:

ADAS	Australian Diver Accreditation Scheme	**CTAG**	Curriculum, Training and Assessment Guide
DCBC	Diver Certification Board of Canada	**CSCUBA**	Commercial Self-Contained Underwater Breathing Apparatus
DOL	Department of Labour	**SSDE**	Surface Supplied Diving Equipment
INPP	Institut National de Plongée Professionnelle	**MOM**	Ministry of Manpower
HSE UK	Health and Safety Executive (United Kingdom)	**ADC UK**	Association of Diving Contractors
ADCI	Association of Diving Contractors International	**PSA**	Petroleum Safety Authority
IMCA	International Marine Contractors Association	**CIDB**	Construction Industry Development Board

Check for list of acceptable commercial diving certs here:

SCAN ME

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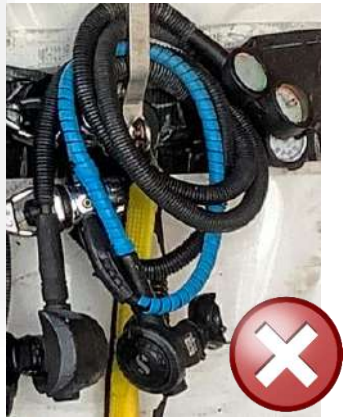
5) Key Findings: Use of recreational SCUBA to perform commercial diving operations

No half mask allowed

No mouthpiece allowed



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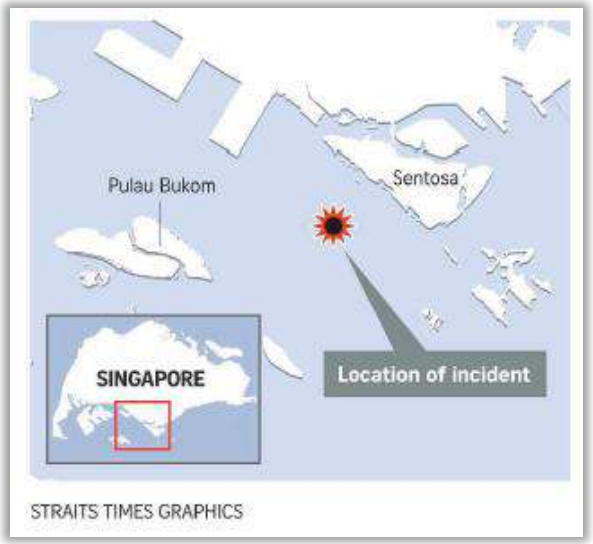
Case Studies

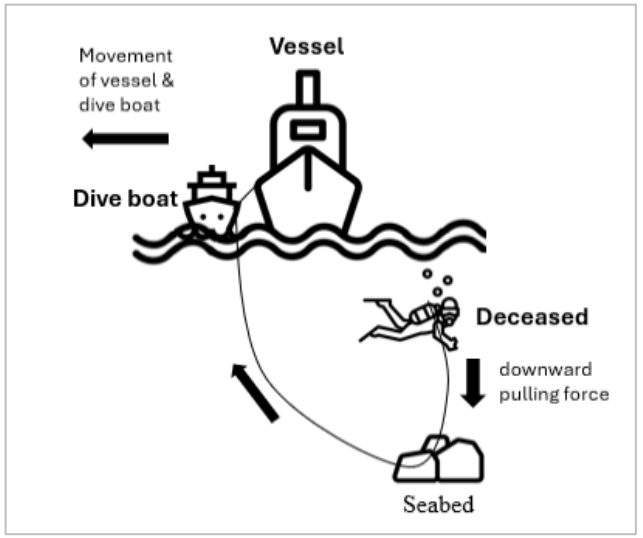
Ministry of Manpower

Case Study (1) : Diver drowned during hull cleaning (1/2)

What happened?

- Deceased and co-diver were doing underwater cleaning for a vessel at anchorage using Surface Supplied Breathing Apparatus
- Deceased's umbilical got caught on the seabed. He removed his helmet and tried to swim to the surface.
- Went missing and was found drowned 2 days later





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Case Study (1) : Diver drowned during hull cleaning (2/2)

What went wrong?

- × Allowed 2 divers working underwater (using 5-men team). No standby diver and attendant during diving operation
- × Dive supervisor failed to monitor deceased's distress signals
- × Fatigue from earlier dive jobs
- × Dive superintendent forged his diving supervisor certification
- × Deceased's diver certification not recognized in Singapore. No recognized commercial diver training.

Learning points

- Ensure qualified dive team with required composition
- Ensure supervision at all times during operation
- Ensure divers are fit to dive and standby diver for response to emergency

Penalties

- Diving contractor was fined $190,000 by the Court.
- Diving supervisor jailed for 1 year for rash act causing the diver's death.
- Dive superintendent jailed for 2 years for falsified qualification and safety lapses

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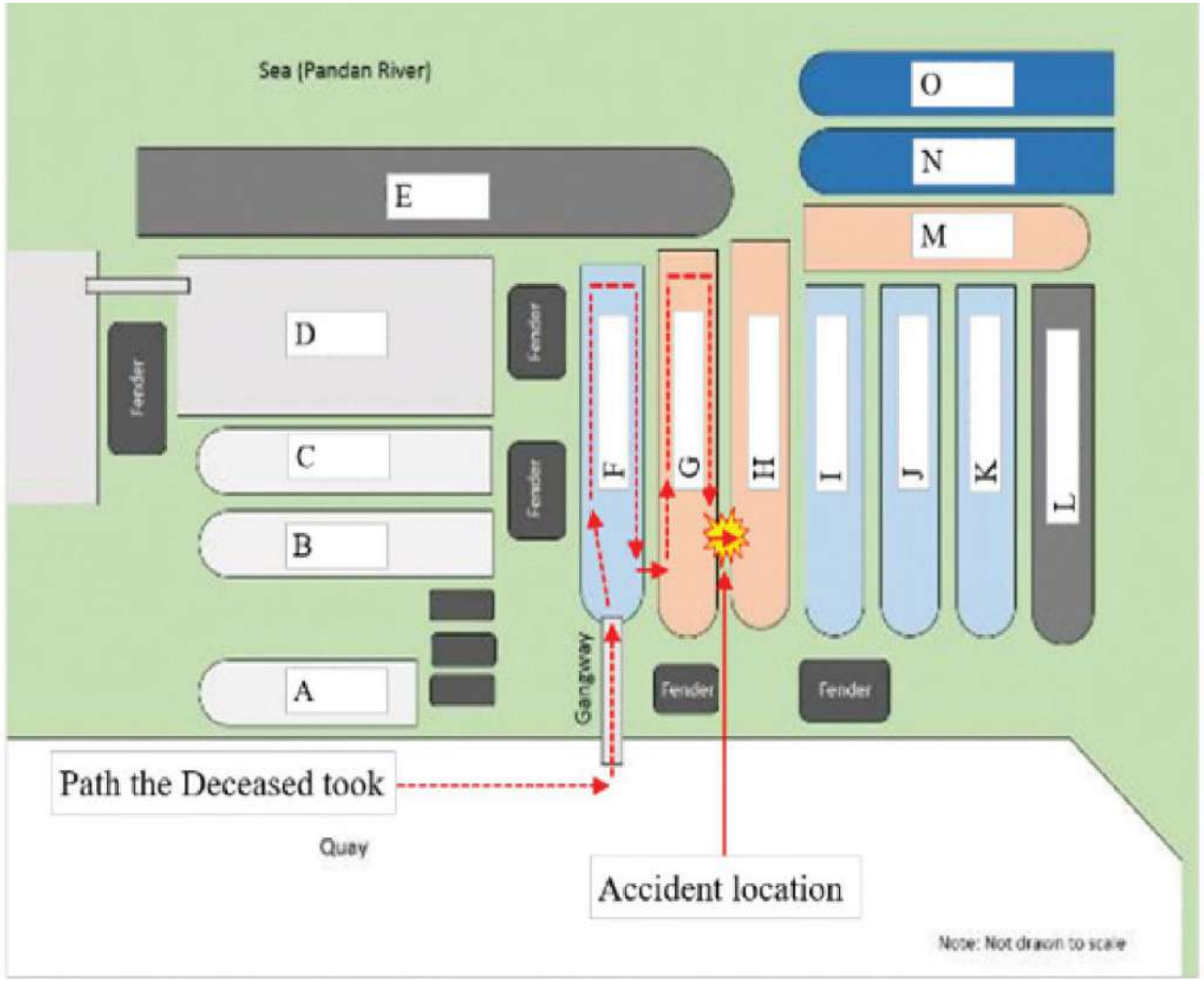
Case Study (2) : Worker fell into sea while moving from vessel-to-vessel (1/3)



What happened?

- Deceased was tasked to repair an engine on a vessel at a shipyard.
- He crossed a gangway onto vessel F, then traversed two adjacent vessels, G and H.
- While crossing between G and H, he stepped on fender tyres whilst carrying a bag.
- He slipped at the gunwale of vessel H and fell through the gap between vessels G and H.
- His body was later found afloat by a worker on a nearby tugboat, and he was pronounced dead upon being brought ashore.

Ministry of Manpower

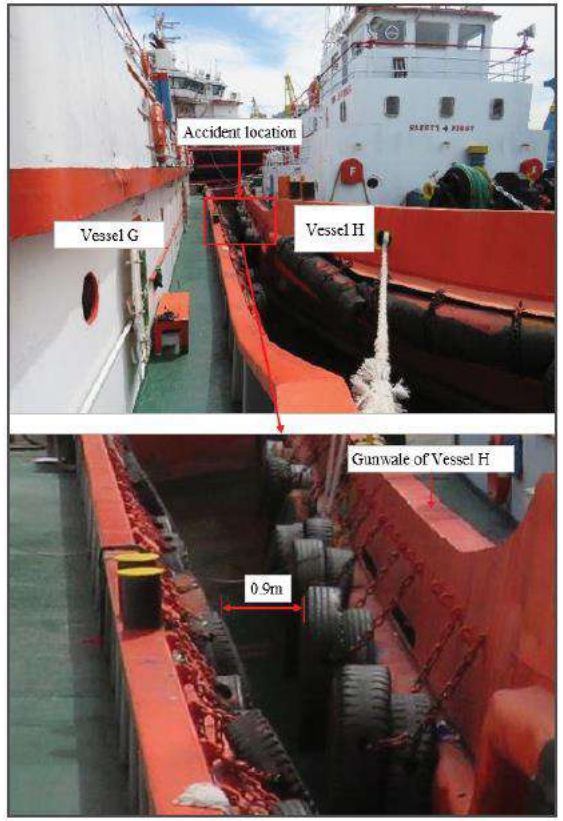
Case Study (2) : Worker fell into sea while moving from vessel-to-vessel (2/3)

What went wrong?

- × Worker did not wear a life jacket
- × No proper means of access was provided for persons to access to/egress from vessel to vessel
- × The mooring and tide conditions could have caused the vessels to move away from each other

Learning points

- **Risk assessment & safe work procedure:** should specifically cover the risk of falling into water when moving between shore and vessels or between vessels
- **Safe work environment:** provide safe means for access and egress when driving or walking from shore-to-vessel or vessel-to-shore, and while on the vessel
- **Equipment and tools:** workers must wear life jackets when working near bodies of water



Photographs show the accident location between the 2 berthed vessels.

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Useful Links

Check for approved training providers here:

WSHC's list of acceptable commercial diving certs:

Report unsafe work:

SnapSAFE

https://go.gov.sg/snapsafe

WSH Guidelines on Life Jackets:

Ministry of Manpower

Ministry of Manpower

Thank you

Sharing Session 3

Understanding, Preventing, and Managing Occupational Diseases (OD) in the M&OE Industry

by Ms. Ashwiyni, Senior Specialist (Occupational Hygienist, MOM)

Organised by ASMI Association of Singapore Marine and Offshore Energy Industries

Silver Partners Dräger

Bronze Partner Ailytics

Sharing Session 4

Mental Well-Being (MWB) on Ground: Managing Fatigue, Pressure and Safety at Work

by Mr. Cheang Chee Kit, Head of Health, Safety & Security, South East Asia, PSA Corporation
and
Mr. Dannie, Head of Academy & Learning Solutions, Psychosocial Well-being Practitioner, Kaleidoscope Labs

Organised by ASMI Association of Singapore Marine and Offshore Energy Industries

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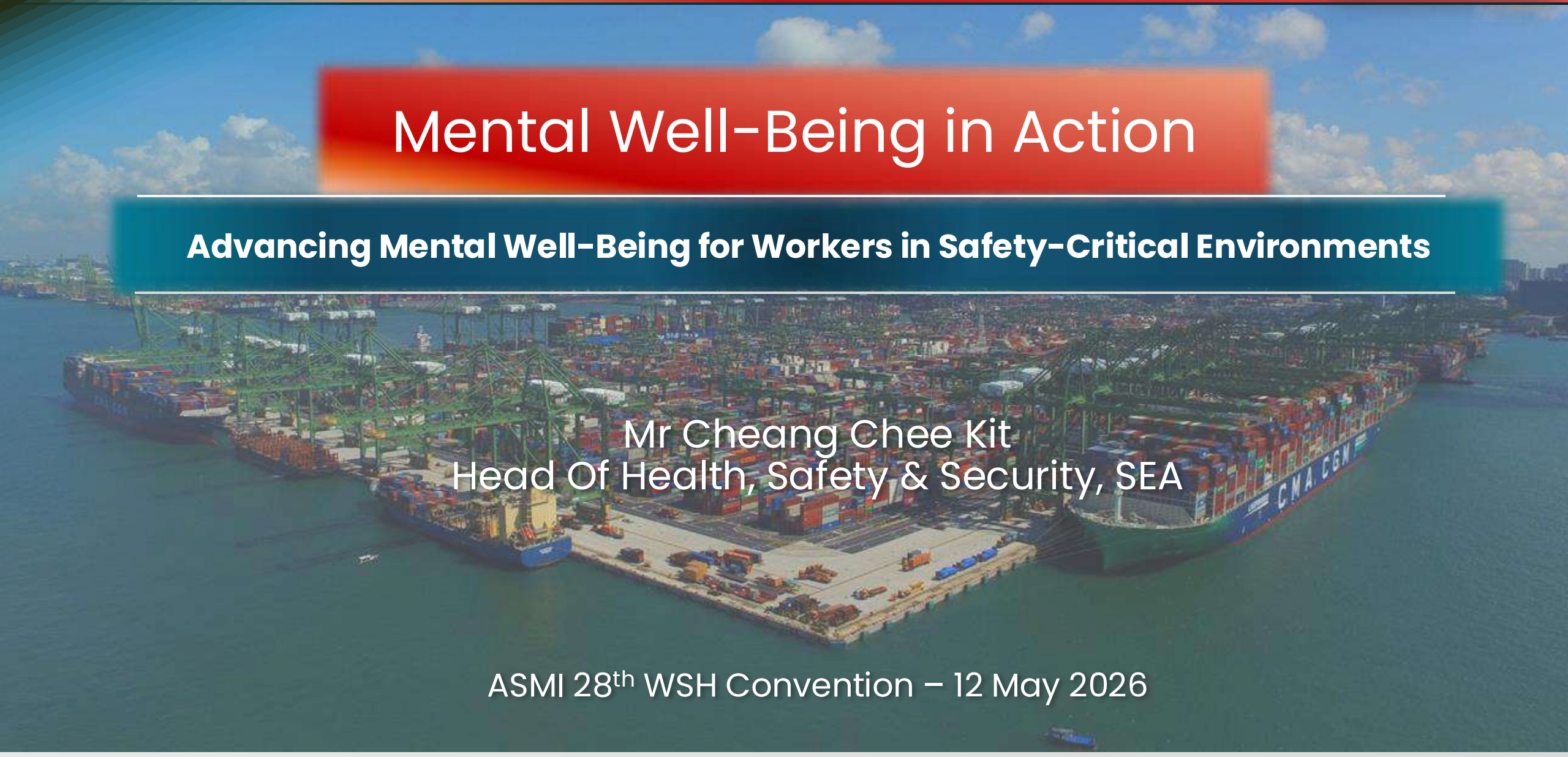
Mental Well-Being in Action

Advancing Mental Well-Being for Workers in Safety-Critical Environments



Mr Cheang Chee Kit
Head Of Health, Safety & Security, SEA

ASMI 28th WSH Convention – 12 May 2026

Agenda

- About PSA
- Safety Matters
- The Turning Point
- Trusted Support
- Turning Listening Into Action
- System, Not Chance
- Key Takeaways
- Closing

From Listening → Action → Trust

About PSA

- **Singapore-headquartered global port operator**
- **Operating some of the world's busiest container terminals**
- **Large frontline workforce**

Safety-Critical Environments

Safety Matters

Latent Safety Risks can Align to Trigger an Incident

- Reduced Focus & Awareness
- Fatigue & Isolation
- Weakened Risk Perception
- Complex Operations & Pressure

Latent Safety Risks can Align to Trigger an Incident

The Turning Point

Why Change Was Needed

COVID-19 Impact

Separation From Families

Lack of Psychological Safety

People must **feel safe** before they speak up

Trusted Support

Our Early Safety Intervention

Worker

Early Support

Trusted Peer

Confidential Support

Professional Support

Appropriate Help

Early → Trusted → Appropriate

Turning Listening to Action

From Data to Visible Change

PEOPLE

- Trusted Peers

CAPABILITY

- Mental Health Literacy
- Awareness Training

CONNECTION

- Social and sports programmes
- Leaders and Unions
- Clear access to help

From Listening → Action → Trust

System, Not Chance

Embedding Mental Wellbeing into Safety Starfish Training

- ☑ **Mandatory** -> full coverage
- ☑ **Normalized** -> no stigma
- ☑ **Practical** -> usable skills

Key Takeaways

What Safety Leaders Can Take Away

Start with **listening**, not assumptions

Trusted peers catch what systems miss

Embed mental well-being into safety routines

Closing

If we want people to work safely, we must first ensure they **feel safe** - psychologically

Thank you

ASMI 28th Workplace Safety & Health Convention

12 May 2026, Jurong Town Hall

Organised by ASMI Association of Singapore Marine and Offshore Energy Industries

Silver Partners Dräger

Bronze Partner Ailytics