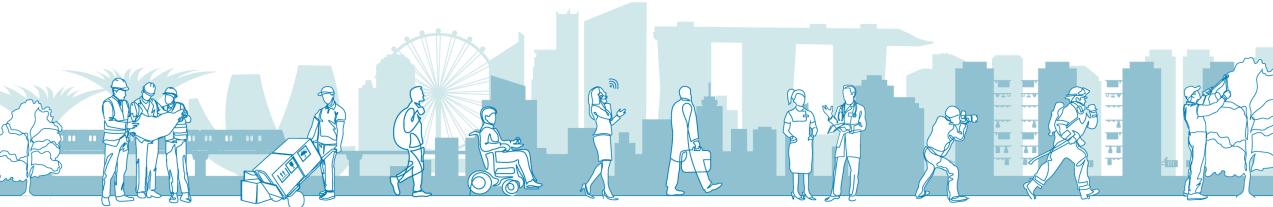
Strengthening Ownership in Commercial Diving Operations



Raymond Koh Senior WSH Inspector (MOM) OSH Inspectorate 18 Aug 2023



Overview

- WSH Statistics
- Commercial Diving Inspection Findings
- Accident Case Study
- Strengthening WSH Ownership









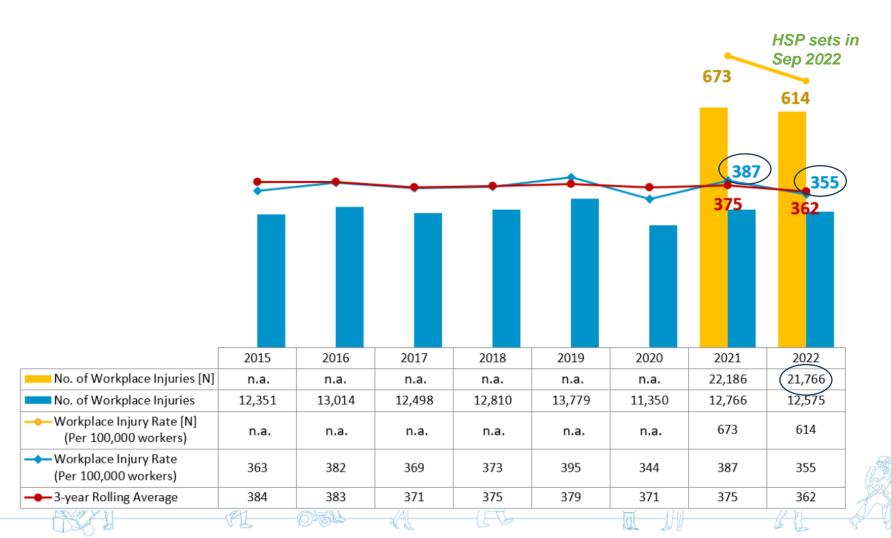








Number and Rate of Workplace Injuries





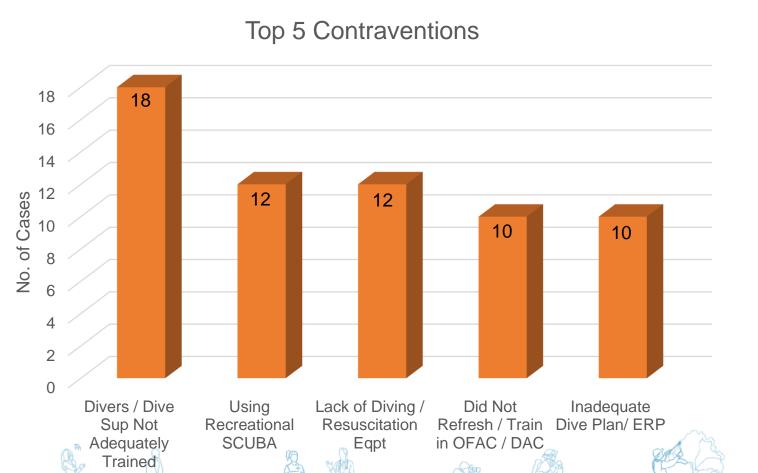
Number and Rate of Workplace Injuries





Top Contraventions from MOM Inspection Findings on Commercial Diving





2018 - 2023

Key Findings: Approved Divers Certs and Use of Recreational SCUBA

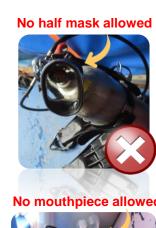


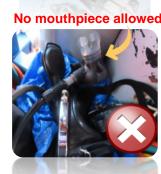


Clause 5 of SS511: 2018- COP for Diving at Work

Divers and Dive Supervisors should be trained and certified with the relevant Commercial Diving Competency Standards for Inland/Inshore issued by Workplace Safety and Health Council











1.2 Scope

The guide covers two diving methods, namely Surface-Supplied Diving Equipment (SSDE)/ Surface-Supplied Breathing Apparatus (SSBA) and Commercial Self-Contained Underwater Breathing Apparatus (CSCUBA). Recreational Self-Contained Underwater Breathing Apparatus (SCUBA) shall <u>not</u> be used for commercial diving operations.

The scope does not cover recreational diving/technical diving, scientific diving, archaeological diving projects as well as diving activities using oxygen-enriched gas mixtures (NITROX).

Key Findings: Approved Divers Certs and Use of Recreational SCUBA

Country / Accreditation	CSCUBA (30m)	CSSDE (30m)	Offshore (50m)
Divers			
Australia (ADAS)*	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 Supplied Diver	Unrestricted Surface Supplied Diver & above
France (INPP)*	Class 1 Mention A – (SCUBA and Surface Supply to 40m)	Class 1 Mention A – (SCUBA and Surface Supply to 40m)	Class II Mention A
Malaysian (CIDB)*	Construction Diver Level 1	Construction Diver Level 2	N/A
Norway (PSA)*	N/A	N/A	Norwegian PSA Class 1 Surface Oriented Diver
Singapore (MOM)	CSCUBA Diver	SSDE Diver	N/A
South Africa (DOL)*	Class IV Diver (SCUBA)	Class IV Diver (SSDE)	Class II Diver (SSDE)
United Kingdom (HSE) pre 1998	HSE part 4	HSE part 3	HSE part 1 & HSE part 2
United Kingdom (HSE) post 1998	HSE SCUBA	HSE Surface Supplied	HSE Surface Supplied with Top Up & above
ADCI*	Inland / Inshore Diver (need to certification in the List of Accep 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			
Australia (ADAS)*	Onshore Diving Supervision SCUBA to 30m (previously, ADAS Part 1)	Onshore Diving Supervision SSDE to 30m (previously, ADAS Part 2)	ADAS Offshore Air Diving Supervisor & ADAS Closed Bell Diving Supervisor (previously, Offshore Air/Bell)

Canada (DCBC)*	Onshore S	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 Divir supplemented with any certific Commercial Diving Sup	N/A	
ADCI*	Surface-Supplied Air Divir supplemented with any certific Commercial Diving Su	N/A	
IMCA*	N/A	IMCA Offshore Air Diving Supervisor & Mix Gas Bell Diving Supervisor	

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

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 Safety Execute (United Kingdom)	ADC UK	Association of Diving Contractors
ADCI	Association of Diving Contractors International	PSA	Petroleum Safety Authority
IMCA	International Marine Contractors Association		



Clause 5 of SS511: 2018- COP for Diving at Work

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Item	SSDE/SSBA	CSCUBA	Recreational SCUBA
Air Supply (Main)	Surface supplied	Air Cylinders — Main and Bail-out	Air Cylinder — Normally only one
Backup Air Supply from surface	Yes	Nil	Nil
Emergency Air Supply — carried by diver	Yes	Yes	Nil
Type of mask/air regulator	Full face mask or helmet/ integrated demand regulator	Full face mask/ integrated demand regulator	Half mask/separate integrated demand regulator held by a 'mouthpiece'
Voice communications	Yes	Yes	Nil Workplace Safety Health Guideline Inland/Inshore Commercial
Full Body Harness	Yes	Yes	Sometimes
Lifeline using rope	Yes	Yes	Sometimes

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The guide covers two diving methods, namely Surface-Supplied Diving Equipment (SSDE)/ Surface-Supplied Breathing Apparatus (SSBA) and Commercial Self-Contained Underwater Breathing Apparatus (CSCUBA), Recreational Self-Contained Underwater Breathing Apparatus (SCUBA) shall not be used for commercial diving operations.

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Figure 1: SSDE/SSBA diver.



Key Findings: Diving Plan and ERP

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 su	pervisor				
Method of carrying out the task						
Type of diving		Tasks		Diving	equipment/gas	
□ Vessel - per ops ma	nual	□ Manual clea	ning	□ SCU man	BA air only - per ops ual	
□ Shore - per ops man	ual	□ Harvesting by	y hand	□ SSB/ man	A air only - per ops ual	
		□ Inspection			departure checks pleted	
		 Scientific san 	npling	□ Pre	dive checklist available	
				□ Othe	er (specify)	
Decompression mana	gement					
□ Computer (specify)		□ Tables (speci	fy)	□ Flyin	g after diving	
□ Other deco factors (s	pecify)					

Name		Competent	Medical	Duties	
Site specific	hazards (in addit	ion to controls in	ops manual)		
Hazard		Risk		Control measures (site rules)	
□Environmen (specify)	tal hazards				
	nazards (specify)			1	
□ Task hazards (specify) □ Other (specify)				i	
Diving planne	ed				
Date range	Location	Depth range	Max time	Task	
Emergency p	rocedures				
□Emergency	procedures availa	ble on site (as pe	er ops manual)		
	procedures review	1 1 0	1.1 12 1		





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.

A written emergency response plan (ERP) containing the appropriate contact details and protocols to be followed in the event of an emergency shall be available at the dive site.

Key Findings: Diving Plan and ERP

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		□ Inspection			departure checks pleted	
		□ Scientific sampling		□ Pre	dive checklist available	
				□ Othe	er (specify)	
Decompression mana	gement					
□ Computer (specify)		□ Tables (speci	fy)	□ Flyin	ng after diving	
□ Other deco factors (s	pecify)					

Name		Competent	Medical	Duties
Site specific	hazards (in addit	ion to controls in	ops manual)	
Hazard		Risk		Control measures (site rules)
□Environmen (specify)	tal hazards			
□Equipment h	nazards (specify)			
□Task hazard				
□ Other (spec	cify)			
Diving planne	ed			
Date range	Location	Depth range	Max time	Task
Emergency p	rocedures			
□Emergency	procedures availa	ble on site (as p	er ops manua	al)
	procedures review	and and an artist	ar have all the same	

Task and duties(all members of dive team)							
Name	Competen	t Medical	Duties				
lvan			Dive Supervisor/ Captain				
Bernard			Diver/ Dive Supervisor				
Ahmad			Diver/ Tender				
Tommy			Diver/ Tender				
Titus			Diver/ Tender				
Site specific hazards (in a	Site specific hazards (in addition to controls in ops manual)						

Name	Competer	nt Medical	Duties
Ivan			Dive Supervisor
Bernard			Diver
Ahmad			Diver
Tommy			Tender
Titus			Tender

Task and duties(all memb	Time: 1300hr to 1700hr		
Name	Competent	Medical	Duties
Bernard			Dive Supervisor
Ivan			Diver
Ahmad			Diver
Tommy			Tender
Titus			Tender
Site specific hazards (in a	addition to controls in	n ops manua	

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A written emergency response plan (ERP) containing the appropriate contact details and protocols to be followed in the event of an emergency shall be available at the dive site.

Key Findings: AED and First Aid Courses



Clause 9.6.3 of SS511: 2018- COP for Diving at Work
In addition to the first aid medical equipment, an AED unit shall be
available at the dive site for immediate use.



Clause 5.5.2 of SS511: 2018- COP for Diving at Work

All divers and dive tenders shall have the basic occupational first aid and shall be trained in diving first aid in accordance with the relevant Commercial Diving Competency Standards for Inland/Inshore issued by the Workplace Safety and Health Council or its equivalent competency standard.

8 Fatal Diving Accidents From 2008 to 2018

2018 2008 2009 2012 2014

Sep 2008

A diver was fixing a sea **chest grating** on a vessel when the grating swing suddenly and hit him and his co-diver. Both their breathing lost regulator and decided surface. While waiting for their dive boat, the diver disappeared below the water.

Sep 2009

Deceased and co-diver were tasked to dive underwater to connect strand jack wire to the bow thrusters to oil rig. While surfacing up, the Deceased's air supply in the tank had depleted became he and panicked and shoot up to the surface quickly but was found missing thereafter.

May 2012

Deceased and his buddy diver were tasked to carry underwater out hull cleaning for vessel. Buddy diver surfaced and returned to the workboat, leaving the Deceased alone to continue the cleaning works. Dive sup. realized maximum dive time for the Deceased had reached and tried to search for the Deceased but in vain.

Sep 2012

Deceased, who was involved in aligning a vessel that had docked into a floating dock. He re-surfaced and dived into the waters again found but was submerged at the bottom of the dock.

Sep 2012

5 divers were deployed to align and set a jackup rig and drill ship that had been docked Drv Dock. into Deceased was subsequently found submerged at bottom of rig.

Jun 2014

Deceased was SCUBA diving and taking photographs document the works done in the starboard sea chest of the vessel where he was drawn towards the pipe orifice inside the sea chest. He was found motionless when rescued by his co-divers.

May 2018

Deceased and co-diver were cleaning the hull of vessel when the went Deceased missing. likely He removed his diving equipment and attempted to swim up to the surface.

Jun 2018

Deceased and his coonto struck



diver were working underwater. installing brackets concrete pile, when he by a collapsed concrete pile subsequently against the pinned seabed by the pile















Accident case study presented during seminar have removed from this deck of slides for distribution



















Risk **Assessment**

- Hazard identification
- Risk evaluation
- Risk control



Control Measures*

- Dive Plan with briefings and pre-dive checks
- Qualified dive team of required composition
- Use Surface Supplied **Diving Equipment (SSDE)**
- * In accordance to SS511 requirements





- No RA or **SWP** for the job
- Recreational **SCUBA** diving gear used with no lifeline
- No certified commercial dive supervisor and divers

- No dive plan and no emergency procedures in-place
- Lack of or inadequate standby divers / tenders



































Workplace Safety and Health Guidelines





Strengthening WSH Ownership



WSH 2028

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

Strategic Outcomes













Ownership

- Make WSH more salient
- Align company directors and top management to WSH ownership

in business decisions

Strengthen WSH ownership of workers



KEY RECOMMENDATIONS

- a. Expand occupational disease prevention efforts
- Build companies' capabilities to promote workforce health
- Develop a WSH technology ecosystem to deepen industry capability

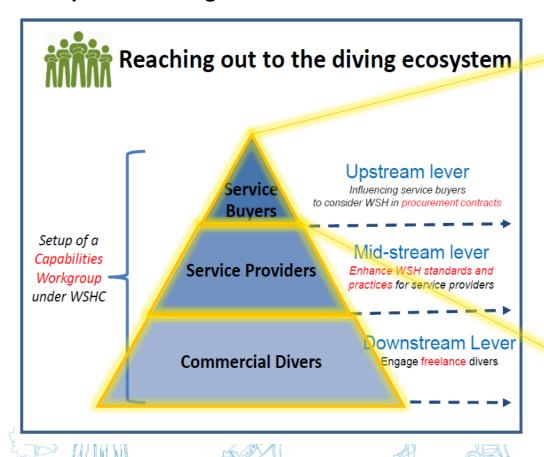
Technology-Enabled WSH

b. Strengthen WSH training through technology



Moving Upstream of the Diving Ecosystem to Curb the Unsafe Practices

> MOM will continue to take enforcement actions on errant diving contractors, but we are also moving upstream along the value chain to address the unsafe practices





Taking Up WSH Ownership





A. Required Documents for Diving Operations

Before every diving operation is conducted you must ensure to have collected the following from the diving contractor:

- Signed Risk Assessment
- Signed Dive Plan

Minimum Dive Operation Tean

As part of The Singapore Standard SS511, a dive team must consist of at least 5 people, regardless of task/job scope:

- · 1 diving supervisor
- 2 divers (one in water, one standby diver) and
- 2 tenders

WSHCOUNCIL. Transition following for Visited Salitony and Health

C. Certifications

Use WSHC website to check for approved certifications:

https://www.tal.sg/wshc/resources/trainingmaterials/resources-for-training-providers/list-ofacceptable-commercial-diving-certifications

materials/recources-for-training-providers/list-or acceptable-commercial-diving-cerulications

Recommended Advisory

- I.Contact the Commercial Diving Association Singapore (CDAS) to check diving companies' credibility and if they are a member of CDAS.
- 2. Obtain the diving team's qualifications and keep them as procurement documents.
- 3.Obtain SIGNED confirmation of the suitability and certifications of the team and equipment to perform the proposed tasks. Hull cleaning must be done with a minimum equipment of Surface Supply Equipment (diver umbilicals). Please note that SCUBA is prohibited and C-Scuba with lifeline, secondary Air supply and communications is allowed for inspection only.
- 4.Obtain SIGNED confirmation from the diving company stating that all diving equipment used in the project has been inspected and checked and is in good condition for the dive operations.
- 5. Never engage recreational divers for your projects.

Useful Numbers & Contacts:

MPA:+65 6325 2488/2489, https://www.mpa.gov.sg CDAS:+65 9689 5071, https://www.cdas.sg MOM:+65 6438 5122 , https://www.mom.gov.sg/efeedback WSH Council Website: https://www.tal.sg/wshc BizSafe Website: https://www.tal.sg/wshc/programmes/bizsafe/about-

bizsafe

Shippin Associa

Everyone Plays a Part to Ensure WSH



Heightened safety period extended amid rise in workplace accidents; higher penalties for breaches



SINGAPORE. The heightened safety period imposed on companies in higher-risk industries will be extended by three months from Mar Limbi the end of May, with additional measures such as higher penalties for workplace safety breaches.

Amouncing this on Friday (Feb 10), the Ministry of Managever (MOM) noted that the heightened safety period was introduced in September 2022 for six months to address the 'concerning rise' in workplace fatalities.

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Related Tapics

In the News

Stiffer penalties for firms with poor workplace safety

Announced by Senior Minister of

State for Manpower, Mr Zagy Mohamad that stiffer penalties will be issued to errant companies.

Doubling of composition fines for offences uncovered during

Companies issued with SWOs or have workers with major injuries have to engage external auditors to review current WSH system

This include:

inspections

Workplace Safety and Health (WSH) Risk Management

Code of Practice on





A Great Workforce A Great Workplace

SMS (Manpower) Mr

announced the new

Approved Code of

Practice (ACOP) for

Company Directors

WSH Duties that will

be published by end

of this year. Company

leaders can and wil

be prosecuted for

WSH lapses.

In the News

Company leaders can be prosecuted for workplace safety lapses, says Zagy

Company leaders can and will be prosecuted if they are culpable for workplace safety and health (WSH) lapses, and compliance with an upcoming code of practice

day that the Approved Code of Practice (Acop) for Company Di-rectors' WSH Duties will be published later this year, with public

ing whether to expand the require-ment for WSH staff to more workplaces. Mr Zagy added In his speech, Mr Yong had

There have been 31 work-related deaths so far this year, the most over the same period since 2016 and more than the 30 deaths recorded in the whole of 2020.

Mr Yong had asked whether the

surely act to stop this." dards, given it Mr Yong also called for better ment, he said. Agreeing broadly, Mr Zaqy said from this episode to build a safety the Ministry of Manpower (MOM) culture that will produce for years to We are putting managements submisseries and boards on notice that the Acop
He cited an Australian case sometime to recoming, he told Parliament in reome to a speech by Mr Melvin rectors were judied after a worker
The ministry's analysis of recent put to recent put t

ter," the labour MP said.

was killed, and noted that it is a le-

company directors and business sessments or follow safe work proconducts. This is disturbing – simple and totally avoidable mixtables to see the
Mr Yong also noted that Sweden
that resulted in loss of lives, "Mr
Zonzadden that resulted in loss of lives," Mr
Zonzadden that resulted in loss of lives." Mr
Zonzadden that resulted in loss of lives, "Mr
Zonzadden that resulted in loss of lives," Mr requires every company, regard-less of size and industry, to have a

it receives on safety lapses seri-ously, and that there are safe-guards to protect workers who re-port breaches.

Noting that a factor behind the

Code of Practice

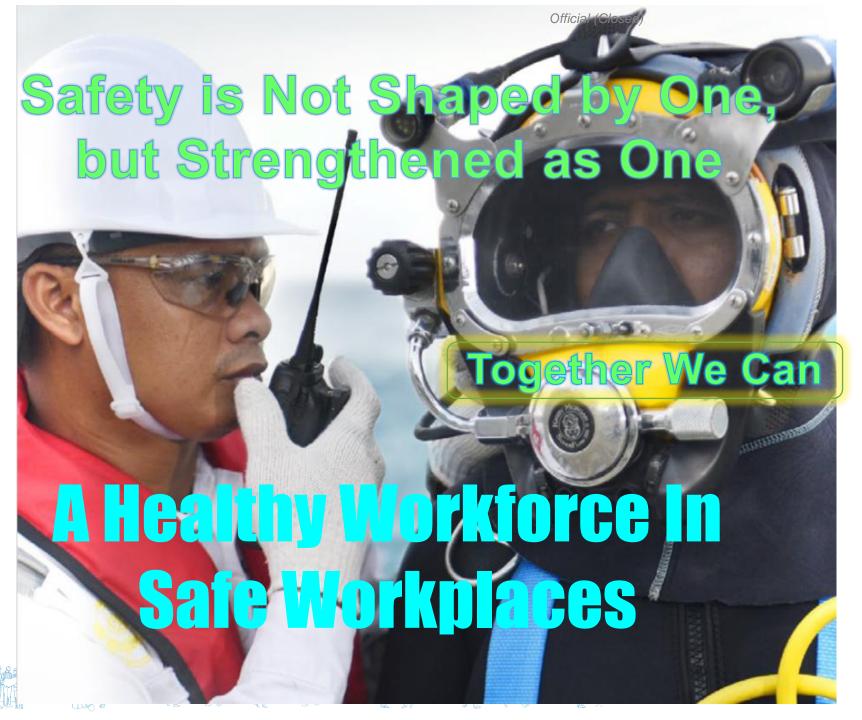
Chief Executives' and Board of Directors' Workplace Safety and Health Duties













Thank you