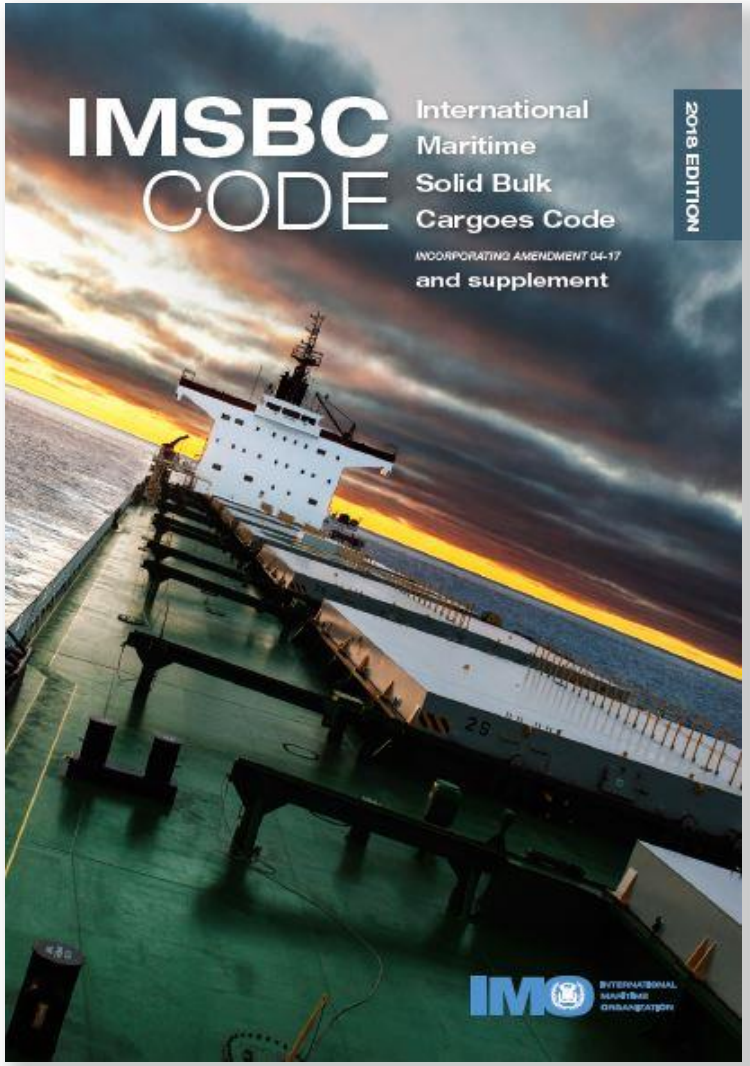


RISKS / IMO

Solid Bulk Cargo

DBTG

Southampton 2019

VISTRATO
enhancing
bulk terminal
operations

International Maritime Organization

- **IMO** is UN agency responsible for safety, security and pollution prevention of shipping

- Membership comprises 170 member states and 70 non-government organizations

- **DBTG - through IBTA, is the designated representative NGO for the international bulk terminals sector at IMO**

- **Loading / Unloading and Shipping of solid bulk cargoes is:**

  1. **Considered as high risk**
  2. Highly regulated under **SOLAS, IMSBC Code, BLU Code, MARPOL,** other codes

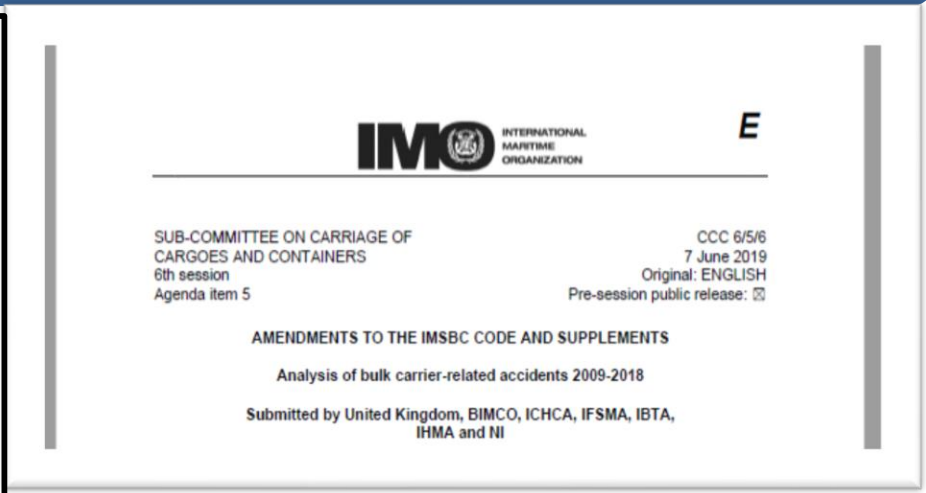
- IMO requires NGOs to contribute / initiate discussions on issues relevant to their sector

IMO CCC/6 Meeting – September 2019

VISTRATO
enhancing bulk terminal operations

DBTG / IBTA submission to **IMO's CCC/6** meeting showed that for 1999-2018:

- **Total of 140 people died** in cargo holds of ships carrying solid bulk cargo:
  - **50 port & terminal workers**
  - **90 crew members**
- **100 died <u>on ships</u> in ports & terminals**
- **118** died due to asphyxiation
- **20** by explosions / fire (vessels in port)
- **88** died on hold ladders
- Many accidents on **coastal bulkers:**
  - **25 fatalities in 2018**
  - **12 fatalities in cargo holds in 2019**



IMO INTERNATIONAL MARITIME ORGANIZATION

E

SUB-COMMITTEE ON CARRIAGE OF CARGOES AND CONTAINERS
6th session
Agenda item 5

CCC 6/5/6
7 June 2019
Original: ENGLISH
Pre-session public release: ☒

AMENDMENTS TO THE IMSBC CODE AND SUPPLEMENTS

Analysis of bulk carrier-related accidents 2009-2018

Submitted by United Kingdom, BIMCO, ICHCA, IFSMA, IBTA, IHMA and NI

IMO Meeting

Grouping of Cargoes In IMSBC Code

VISTRATO
enhancing bulk terminal operations

Cargoes are grouped in three hazard Groups - A, B & C

- **Group A:**
  May **LIQUEFY**

- **Group B:**
  CHEMICALLY HAZARDOUS
  . UN CLASS (IMDG Code)
  . MHB: Chemically hazardous materials NOT in IMDG Code

- **Group C:**
  . NOT liable to liquefy
  . NOT chemical hazardous

It is not possible to tell by sight or smell if a cargo is hazardous or not.

DBTG Concerns

- **DBTG concerned about increasing number of accidents in ports and terminals**

- **Safety of personnel working in cargo holds is governed by:**
  - *SOLAS, IMSBC CODE, and ISM Code*
  - *IMO's Enclosed Space Entry Procedures*
  - *National regulations of the port state*

- **Cargo holds are defined as Enclosed Spaces in both ship & shore rules**

- **Responsibilities:**
  - **Master is fully responsible** for safety of all personnel on board ship
  - **Port operators / employers** have responsibility for safety of their workers when on board ships

- **Current hold entry guidelines are based on**:
  - **Risk Assessment**
  - **Cargo information** in Individual Schedules and Shipper's Form
  - **Assumption** that masters carry out Risk Assessments
  - **Assumption** that port employers instruct employees on dangers

Root Cause of Accidents in Cargo Holds

1. Vistrato research found *that these assumptions are incorrect*

2. *IMSBC Code* and IMO *Enclosed Space Entry Procedures* do NOT provide any guidance on <u>how</u> to carry out risk assessments

3. **Ships' Masters do <u>not</u> always:**
   - **Carry out any risk assessments**
   - **Use cargo safety information as intended by IMO**
   - **Inform ship or shore personnel of hazards**
   - **Secure hold access hatches to prevent unauthorized entry**
   - **Ensure atmosphere in holds is safe before authorizing entry**

3. **Port Employers do <u>not</u> always:**
   - **Carry out risk assessments of ship and cargo**
   - **Obtain up-to-date cargo safety information**
   - **Use information that is available e.g. in IMSBC Code**
   - **Inform employees and subcontractors of dangers**
   - **Instruct personnel not to enter any cargo hold until authorized**

DBTG / IBTA Proposal

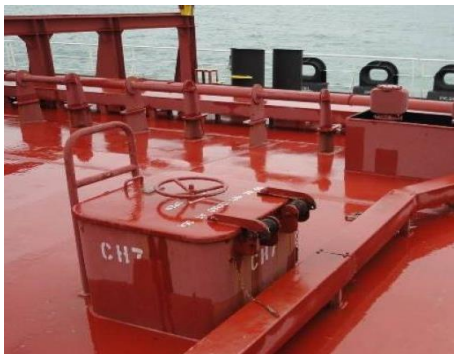
- DBTG / IBTA submitted paper CCC 6-5-6 together with research paper CCC 6/INF.7
- Co-sponsored by ***United Kingdom*** and by leading NGOs' ***BIMCO, ICHCA, IFSMA, IHMA, NI***

- **CCC 6-5-6 proposes that**:

1. **Master of every ship carrying any solid bulk cargo should carry out a standardized risk assessment before:**
   - **Commencing loading /unloading the cargo**
   - **Permitting any person to enter a potentially hazardous cargo hold or adjacent space**

2. **If cargo is Group A or Group C** i.e. **not hazardous,** then standard precautions apply

3. **If cargo is Group B i.e. chemically hazardous then Master should:**
   - **Secure all hold access hatches to prevent unauthorized entry**
   - **Carry out a systematic risk assessment of the cargo**



4. May be done on ***One Page Checklist*** as part of ***BLU Code Ship/Shore Safety Checklist***

5. Checklist should be **retained on board and be available for audit**

RESPONSE FROM IMO MEMBER STATES & NGOs

Comments made by considerable number of delegates:

- **Almost all agreed** that:
  1. The current situation was not acceptable and that action needed to be taken
  2. Amending IMSBC Code is complicated

- **Recommended that submission would:**

1. Need to be approved as a work item by the primary IMO safety committee at the MSC 101 meeting in May 2020

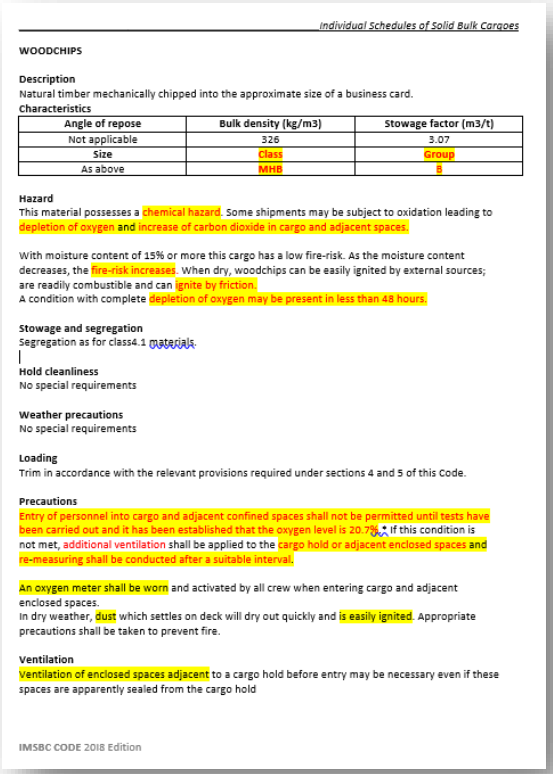
2. Be considered in detail by the IMO CCC 7 meeting and Working Groups in September 2020

3. DBTG will continue to work with its co-sponsors and other supporters across the industry to bring about the required change.

VISTRATO enhancing bulk terminal operations

Required – Three Documents

1. Individual Schedule for Cargo in IMSB Code / or
2. Shipper's Form for Cargo Information
3. Risk Assessment Checklist



individual Schedules of Solid Bulk Cargoes

WOODCHIPS

Description
Natural timber mechanically chipped into the approximate size of a business card.

Characteristics

Angle of repose	Bulk density (kg/m3)	Stowage factor (m3/t)
Not applicable	326	3.07
Size	**Class**	**Group**
As above	MHB	B

Hazard
This material possesses a chemical hazard. Some shipments may be subject to oxidation leading to depletion of oxygen and increase of carbon dioxide in cargo and adjacent spaces.

With moisture content of 15% or more this cargo has a low fire-risk. As the moisture content decreases, the fire-risk increases. When dry, woodchips can be easily ignited by external sources; are readily combustible and can ignite by friction.
A condition with complete depletion of oxygen may be present in less than 48 hours.

Stowage and segregation
Segregation as for class4.1 materials.

Hold cleanliness
No special requirements

Weather precautions
No special requirements

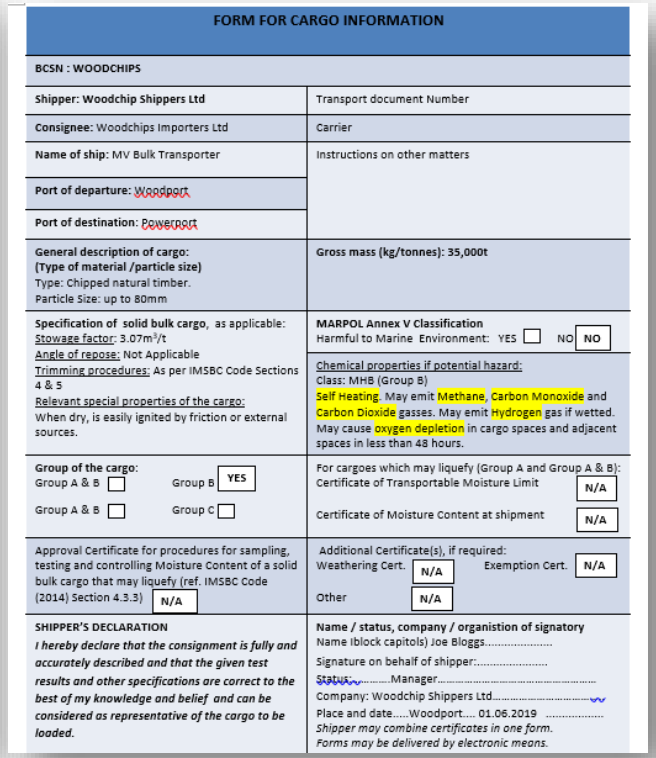
Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

Precautions
Entry of personnel into cargo and adjacent confined spaces shall not be permitted until tests have been carried out and it has been established that the oxygen level is 20.7% . If this condition is not met, additional ventilation shall be applied to the cargo hold or adjacent enclosed spaces and re-measuring shall be conducted after a suitable interval.

An oxygen meter shall be worn and activated by all crew when entering cargo and adjacent enclosed spaces.
In dry weather, dust which settles on deck will dry out quickly and is easily ignited. Appropriate precautions shall be taken to prevent fire.

Ventilation
Ventilation of enclosed spaces adjacent to a cargo hold before entry may be necessary even if these spaces are apparently sealed from the cargo hold

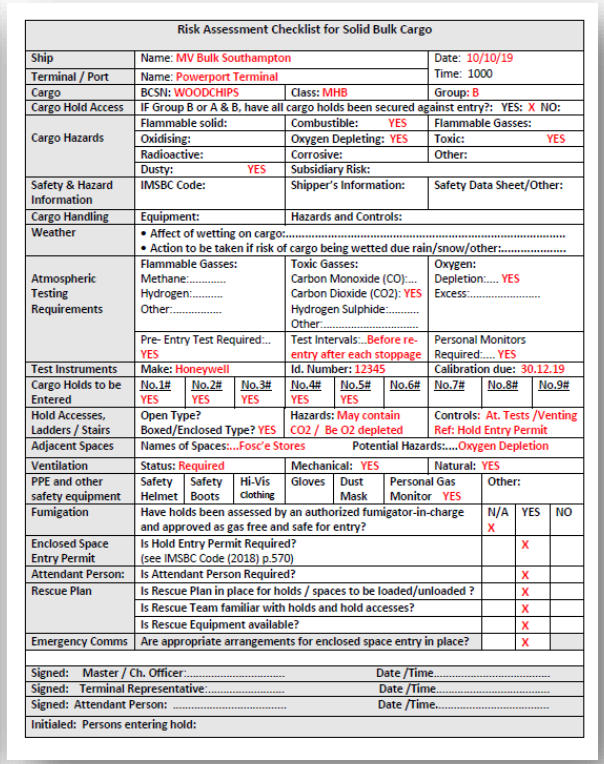
IMSBC CODE 2018 Edition



FORM FOR CARGO INFORMATION

BCSN : WOODCHIPS

Shipper: Woodchip Shippers Ltd	Transport document Number
Consignee: Woodchips Importers Ltd	Carrier
Name of ship: MV Bulk Transporter	Instructions on other matters
Port of departure: Woodport	
Port of destination: Powerport	
General description of cargo: **(Type of material /particle size)** Type: Chipped natural timber. Particle Size: up to 80mm	**Gross mass (kg/tonnes): 35,000t**
Specification of solid bulk cargo, as applicable: Stowage factor: 3.07m³/t Angle of repose: Not Applicable Trimming procedures: As per IMSBC Code Sections 4 & 5 Relevant special properties of the cargo: When dry, is easily ignited by friction or external sources.	**MARPOL Annex V Classification** Harmful to Marine Environment: YES ☐ NO **NO** Chemical properties if potential hazard: Class: MHB (Group B) Self Heating. May emit Methane, Carbon Monoxide and Carbon Dioxide gasses. May emit Hydrogen gas if wetted. May cause oxygen depletion in cargo spaces and adjacent spaces in less than 48 hours.
Group of the cargo: Group A & B ☐ Group B **YES** Group A & B ☐ Group C ☐	For cargoes which may liquefy (Group A and Group A & B): Certificate of Transportable Moisture Limit **N/A** Certificate of Moisture Content at shipment **N/A**
Approval Certificate for procedures for sampling, testing and controlling Moisture Content of a solid bulk cargo that may liquefy (ref. IMSBC Code (2014) Section 4.3.3) **N/A**	Additional Certificate(s), if required: Weathering Cert. **N/A** Exemption Cert. **N/A** Other **N/A**
SHIPPER'S DECLARATION ***I hereby declare that the consignment is fully and accurately described and that the given test results and other specifications are correct to the best of my knowledge and belief and can be considered as representative of the cargo to be loaded.***	**Name / status, company / organistion of signatory** Name Iblock capitols) Joe Bloggs..... Signature on behalf of shipper:..... Status:.....Manager..... Company: Woodchip Shippers Ltd..... Place and date.....Woodport.... 01.06.2019 ..... *Shipper may combine certificates in one form. Forms may be delivered by electronic means.*



Risk Assessment Checklist for Solid Bulk Cargo

Ship	Name: MV Bulk Southampton							Date: 10/10/19 Time: 1000			
Terminal / Port	Name: Powerport Terminal										
Cargo	BCSN: WOODCHIPS			Class: MHB				Group: B			
Cargo Hold Access	IF Group B or A & B, have all cargo holds been secured against entry?: YES: X NO:										
Cargo Hazards	Flammable solid:			Combustible: YES				Flammable Gasses:			
	Oxidising:			Oxygen Depleting: YES				Toxic: YES			
	Radioactive:			Corrosive:				Other:			
	Dusty: YES			Subsidiary Risk:							
Safety & Hazard Information	IMSBC Code:			Shipper's Information:				Safety Data Sheet/Other:			
Cargo Handling	Equipment:			Hazards and Controls:							
Weather	• Affect of wetting on cargo:..... • Action to be taken if risk of cargo being wetted due rain/snow/other:.....										
Atmospheric Testing Requirements	Flammable Gasses: Methane:..... Hydrogen:..... Other:.....			Toxic Gasses: Carbon Monoxide (CO):... Carbon Dioxide (CO2): YES Hydrogen Sulphide:..... Other:.....				Oxygen: Depletion:..... YES Excess:.....			
	Pre- Entry Test Required:... YES			Test Intervals:...Before re-entry after each stoppage				Personal Monitors Required:..... YES			
Test Instruments	Make: Honeywell			Id. Number: 12345				Calibration due: 30.12.19			
Cargo Holds to be Entered	No.1# YES	No.2# YES	No.3# YES	No.4# YES	No.5# YES	No.6#		No.7#	No.8#	No.9#	
Hold Accesses, Ladders / Stairs	Open Type? Boxed/Enclosed Type? YES			Hazards: May contain CO2 / Be O2 depleted				Controls: At. Tests /Venting Ref: Hold Entry Permit			
Adjacent Spaces	Names of Spaces:...Fosc'e Stores			Potential Hazards:....Oxygen Depletion							
Ventilation	Status: Required			Mechanical: YES				Natural: YES			
PPE and other safety equipment	Safety Helmet	Safety Boots	Hi-Vis Clothing	Gloves	Dust Mask	Personal Gas Monitor YES		Other:			
Fumigation	Have holds been assessed by an authorized fumigator-in-charge and approved as gas free and safe for entry?							N/A X	YES	NO	
Enclosed Space Entry Permit	Is Hold Entry Permit Required? (see IMSBC Code (2018) p.570)								X		
Attendant Person:	Is Attendant Person Required?								X		
Rescue Plan	Is Rescue Plan in place for holds / spaces to be loaded/unloaded ?								X		
	Is Rescue Team familiar with holds and hold accesses?								X		
	Is Rescue Equipment available?								X		
Emergency Comms	Are appropriate arrangements for enclosed space entry in place?								X		

Signed: Master / Ch. Officer:..... Date /Time.....
Signed: Terminal Representative:..... Date /Time.....
Signed: Attendant Person: ..... Date /Time.....
Initialed: Persons entering hold:

Mandatory Cargo Information example Woodchips

VISTRATO enhancing bulk terminal operations

Individual Schedule - IMSBC Code 2018

WOODCHIPS

Description
Natural timber mechanically chipped into the approximate size of a business card.

Characteristics

Angle of repose	Bulk density (kg/m3)	Stowage factor (m3/t)
Not applicable	326	3.07
Size	**Class**	**Group**
As above	**MHB**	**B**

Hazard
This material possesses a chemical hazard. Some shipments may be subject to oxidation leading to depletion of oxygen and increase of carbon dioxide in cargo and adjacent spaces.

With moisture content of 15% or more this cargo has a low fire-risk. As the moisture content decreases, the fire-risk increases. When dry, woodchips can be easily ignited by external sources; are readily combustible and can ignite by friction.
A condition with complete depletion of oxygen may be present in less than 48 hours.

Stowage and segregation
Segregation as for class4.1 materials.

Hold cleanliness
No special requirements

Weather precautions
No special requirements

Loading
Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

Precautions
Entry of personnel into cargo and adjacent confined spaces shall not be permitted until tests have been carried out and it has been established that the oxygen level is 20.7%. If this condition is not met, additional ventilation shall be applied to the cargo hold or adjacent enclosed spaces and re-measuring shall be conducted after a suitable interval.

An oxygen meter shall be worn and activated by all crew when entering cargo and adjacent enclosed spaces.
In dry weather, dust which settles on deck will dry out quickly and is easily ignited. Appropriate precautions shall be taken to prevent fire.

Ventilation
Ventilation of enclosed spaces adjacent to a cargo hold before entry may be necessary even if these spaces are apparently sealed from the cargo hold

IMSBC CODE 2018 Edition

Shipper's Form for Cargo Information

Danger Words Highlighted

FORM FOR CARGO INFORMATION

BCSN : WOODCHIPS

Shipper: Woodchip Shippers Ltd	Transport document Number
Consignee: Woodchips Importers Ltd	Carrier
Name of ship: MV Bulk Transporter	Instructions on other matters
Port of departure: Woodport	
Port of destination: Powerport	
General description of cargo: **(Type of material /particle size)** Type: Chipped natural timber. Particle Size: up to 80mm	**Gross mass (kg/tonnes): 35,000t**
Specification of solid bulk cargo, as applicable: Stowage factor: 3.07m³/t Angle of repose: Not Applicable Trimming procedures: As per IMSBC Code Sections 4 & 5 Relevant special properties of the cargo: When dry, is easily ignited by friction or external sources.	**MARPOL Annex V Classification** Harmful to Marine Environment: YES ☐ NO **NO** Chemical properties if potential hazard: Class: MHB (Group B) Self Heating. May emit Methane, Carbon Monoxide and Carbon Dioxide gasses. May emit Hydrogen gas if wetted. May cause oxygen depletion in cargo spaces and adjacent spaces in less than 48 hours.
Group of the cargo: Group A & B ☐ Group B **YES** Group A & B ☐ Group C ☐	For cargoes which may liquefy (Group A and Group A & B): Certificate of Transportable Moisture Limit **N/A** Certificate of Moisture Content at shipment **N/A**
Approval Certificate for procedures for sampling, testing and controlling Moisture Content of a solid bulk cargo that may liquefy (ref. IMSBC Code (2014) Section 4.3.3) **N/A**	Additional Certificate(s), if required: Weathering Cert. **N/A** Exemption Cert. **N/A** Other **N/A**
SHIPPER'S DECLARATION ***I hereby declare that the consignment is fully and accurately described and that the given test results and other specifications are correct to the best of my knowledge and belief and can be considered as representative of the cargo to be loaded.***	**Name / status, company / organistion of signatory** Name Iblock capitols) Joe Bloggs..... Signature on behalf of shipper:..... Status:.....Manager..... Company: Woodchip Shippers Ltd..... Place and date.....Woodport.... 01.06.2019 ..... *Shipper may combine certificates in one form.* *Forms may be delivered by electronic means.*

Risk Assessment Checklist – Group A or C Cargo

VISTRATO enhancing bulk terminal operations

Risk Assessment Checklist for Solid Bulk Cargo									
Ship	Name: MV Bulk Southmpton						Date: 10/10/19 Time:		
Terminal / Port	Name: Powerport Terminal								
Cargo	BCSN: ALUMINA		Class: C				Group:		
Cargo Hold Access	IF Group B or A & B, have all cargo holds been secured against entry?: N/A								
Cargo Hazards	Flammable solid:		Combustible:				Flammable Gasses:		
	Oxidising:		Oxygen Depleting:				Toxic:		
	Radioactive:		Corrosive:				Other:		
	Dusty:		Subsidiary Risk:						
Safety & Hazard Information	IMSBC Code: YES		Shipper's Information: YES				Safety Data Sheet/Other: N/A		
Cargo Handling	Equipment:		Hazards and Controls:						
Weather	• Affect of wetting on cargo:..... • Action to be taken if risk of cargo being wetted due rain/snow/other:.....								
Atmospheric Testing Requirements	Flammable Gasses: Methane:..... Hydrogen:..... Other:.....		Toxic Gasses: Carbon Monoxide (CO):... Carbon Dioxide (CO2):..... Hydrogen Sulphide:..... Other:.....				Oxygen: Depletion:..... Excess:.....		
	Pre- Entry Test Required:.....		Test Intervals:.....				Personal Monitors Required:.....		
Test Instruments	Make:		Id. Number:				Calibration due:		
Cargo Holds to be Entered	No.1#	No.2#	No.3#	No.4#	No.5#	No.6#	No.7#	No.8#	No.9#
Hold Accesses, Ladders / Stairs	Open Type? Boxed/Enclosed Type? YES			Hazards: Steep stairs			Controls: Use with care		
Adjacent Spaces	Names of Spaces:.....			Potential Hazards:.....					
Ventilation	Status:			Mechanical:			Natural:		
PPE /other safety equipment YES	Safety Helmet	Safety Boots	Hi-Vis Clothing	Gloves	Dust Mask	Personal Gas Monitor N/A	Other:		
Fumigation	Have holds been assessed by an authorized fumigator-in-charge and approved as gas free and safe for entry?						N/A		
Enclosed Space Entry Permit	Is Hold Entry Permit Required? (see IMSBC Code (2018) p.570)								NO
Attendant Person:	Is Attendant Person Required?								NO
Rescue Plan	Is Rescue Plan in place for holds / spaces to be loaded/unloaded ?							YES	
	Is Rescue Team familiar with holds and hold accesses?							YES	
	Is Rescue Equipment available?							YES	
Emergency Comms	Are appropriate arrangements for enclosed space entry in place?						N/A		
Signed: Master / Ch. Officer:.....							Date /Time.....		
Signed: Terminal Representative:.....							Date /Time.....		
Signed: Attendant Person:							Date /Time.....		
Initialed: Persons entering hold:									

BLU CODE - SHIP / SHORE SAFETY CHECKLIST

- **Is Mandatory**
- **Must be completed by Master/Ch.Off**

13. Is the atmosphere safe in holds and enclosed spaces to which access may be required, have fumigated cargoes been identified, and has the need for monitoring of atmosphere been agreed by ship and terminal? ☐ **YES**

ALUMINA:

- **Is a Group A or C Cargo**
- **Is Non-Hazardous**
- **Atm.Testing is NOT APPLICABLE**

Completed Form is signed, dated and filed

Risk Assessment Checklist – Group B Cargo

VISTRATO enhancing bulk terminal operations

Risk Assessment Checklist for Solid Bulk Cargo									
Ship	Name: MV Bulk Southampton					Date: 10/10/19 Time: 1000			
Terminal / Port	Name: Powerport Terminal								
Cargo	BCSN: WOODCHIPS		Class: MHB			Group: B			
Cargo Hold Access	IF Group B or A & B, have all cargo holds been secured against entry?: YES: X NO:								
Cargo Hazards	Flammable solid:		Combustible: YES			Flammable Gasses:			
	Oxidising:		Oxygen Depleting: YES			Toxic: YES			
	Radioactive:		Corrosive:			Other:			
	Dusty: YES		Subsidiary Risk:						
Safety & Hazard Information	IMSBC Code:		Shipper's Information:			Safety Data Sheet/Other:			
Cargo Handling	Equipment:		Hazards and Controls:						
Weather	• Affect of wetting on cargo:..... • Action to be taken if risk of cargo being wetted due rain/snow/other:.....								
Atmospheric Testing Requirements	Flammable Gasses: Methane:..... Hydrogen:..... Other:.....		Toxic Gasses: Carbon Monoxide (CO):... Carbon Dioxide (CO2): YES Hydrogen Sulphide:..... Other:.....			Oxygen: Depletion:.... YES Excess:.....			
	Pre- Entry Test Required:... YES		Test Intervals:...Before re-entry after each stoppage			Personal Monitors Required:.... YES			
Test Instruments	Make: Honeywell		Id. Number: 12345			Calibration due: 30.12.19			
Cargo Holds to be Entered	No.1# YES	No.2# YES	No.3# YES	No.4# YES	No.5# YES	No.6#	No.7#	No.8#	No.9#
Hold Accesses, Ladders / Stairs	Open Type? Boxed/Enclosed Type? YES		Hazards: May contain CO2 / Be O2 depleted			Controls: At. Tests /Venting Ref: Hold Entry Permit			
Adjacent Spaces	Names of Spaces:...Fosc'e Stores					Potential Hazards:....Oxygen Depletion			
Ventilation	Status: Required		Mechanical: YES			Natural: YES			
PPE and other safety equipment	Safety Helmet	Safety Boots	Hi-Vis Clothing	Gloves	Dust Mask	Personal Gas Monitor YES	Other:		
Fumigation	Have holds been assessed by an authorized fumigator-in-charge and approved as gas free and safe for entry?						N/A X	YES	NO
Enclosed Space Entry Permit	Is Hold Entry Permit Required? (see IMSBC Code (2018) p.570)							X	
Attendant Person:	Is Attendant Person Required?							X	
Rescue Plan	Is Rescue Plan in place for holds / spaces to be loaded/unloaded ?							X	
	Is Rescue Team familiar with holds and hold accesses?							X	
	Is Rescue Equipment available?							X	
Emergency Comms	Are appropriate arrangements for enclosed space entry in place?							X	
Signed: Master / Ch. Officer:..... Date /Time.....									
Signed: Terminal Representative:..... Date /Time.....									
Signed: Attendant Person: ..... Date /Time.....									
Initialed: Persons entering hold:									

WOODCHIPS:

- **Is a Group B cargo**
- **Is Hazardous**

Discharging Group B Cargo

If shore personnel are required to enter holds containing Woodchips or any Group B cargo, then a Risk Assessment should be completed jointly by Ship and Terminal representatives to:

1. **Identify the hazards**
2. **Identify the risks**
3. **Identify the required controls**

Completed Form is signed, dated and Filed

Case Study– "MV A Navigation"

VISTRATO enhancing bulk terminal operations

Port Kelang - April 2018

- Post Panamax bulk carrier discharging coal
- ***Day 1***: Hatch covers all open on arrival
- ***Day 2***: Continuous unloading

- ***Day 3:*** All hatches open for two days
- Tests show safe atmosphere in all holds (Oxygen 20.9% with zero Methane)

- **05.00**: Stevedores complete No.2#
- **10.00**: Burning smell from No.2#

- **16.00:** Body of stevedore recovered from upper section of No.2 hold ladder
- He was not wearing a personal gas monitor
- It was his first time to work on a ship

- **Findings:**
  - Gas disturbed by unloading accumulated in top section of ladder trunk
  - Source of ignition unknown – maybe phone?

Shippers Form provided to Master declared cargo as a ***Group B***, stating.

- *The cargo emits methane*
- *May cause explosive atmosphere*
- *Methane is lighter than air so may accumulate in upper section of hold*
- **Individual Schedule gives similar advice**

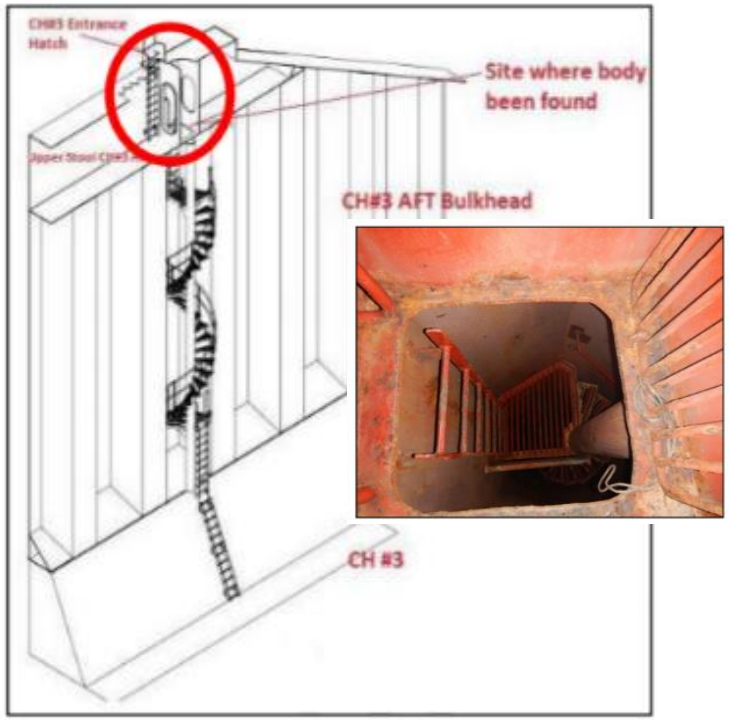


Figure 1: Location of body


VISTRATO
enhancing
bulk terminal
operations
THANK YOU

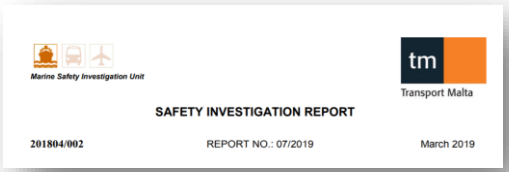
References

Co-sponsors of submission to IMO CCC 6:

- **United Kingdom**
  https://www.gov.uk/government/organisations/maritime-and-coastguard-agency

- **BIMCO** https://www.bimco.org/
- **ICHCA** https://ichca.com/
- **IFSMA** https://www.ifsma.org/
- **IHMA** https://www.harbourmaster.org/
- **NI** https://www.nautinst.org/

- **MV "A Navigation"**
  https://mtip.gov.mt/en/msiu/Documents/MV%20A%20Navigation_Final%20Safety%20Investigation%20Report.pdf



- **BLU CODE**
  http://www.imo.org/en/OurWork/Safety/Cargoes/CargoesInBulk/Pages/BLU-Code-and-BLU-Manual.aspx
- https://eur-lex.europa.eu/legal-content/GA/TXT/?uri=CELEX:52000AC1181