Additional projects for Bulk Carrier

Appendix 3

IMU

DECK CADET

STRUCTURED SHIP BOARD TRAINING PROGRAMME

PROJECT FILE

NAME: ANUPAM KUMAR SINGH

IMU ENROLMENT No. 1642813007

INDoS No. 16NL2240

Deck Cadet Record Book No. 29101815

DATE: From - 31.07.2021

To - 21.11.2021

M.V. VISHVA VIJAY SCI LTD. CHIEF OFFICER

P.

PROJECT WORK

INDEX

STO Signature,date and stamp to be taken prior sign off from each vessel :

M.V. VISHVA VIJAY CHIEF OFFICER SCI LTD

Date :- 21.11.2021

PROJECT WORK

NAME :- Anupam Kumar Singh

BATCH NO :- IMU-36

ENROL. NO :- 1642813607

INDOS No :- 16NL2240

CDC NO :- MUM280594

PROJECT :- ADDITIONAL PROJECT FOR BULK CARRIERS

PROJECT No :- 10.4(1)

STO SIGN :-

M.V. VISHVA VIJAY
CHIEF OFFICER
SCI LTD.

PROJECT NAME :-

Write basic steps for carrying out close up inspections for cracks in cargo hold, tanks and other ship's structure (to be accompanied during inspection)

M.V. VISHVA VIJAY

The chief officer is the person who is designated to carryout close up inspection for the cracks in cargo holds, tanks and other ship's structure for the safe carriage of all types of cargo.
If found something wrong and damaged same to be reported and get it rectified as early as practicable. I have accompanied my chief officer on my good vessel "M.V. VISHVA VIJAY" for carrying out close up inspection of cargo holds.

- Cargo Holds

Following area in the cargo hold shall be inspected once in three months or when the holds are required to be made ready for loading new cargo:-

(i) Lower hopper area which are accessible
(ii) Both austrailian and vertical ladder including their joints, welding etc.
(iii) Water integrity of ballast tank manhole
(iv) Hatch pontoons, the hatch drain channel, drain valve(plug) with caps/chain
(v) The tanktop should be carefully examined for loose rust or any damage by grab.
(vi) Hull plating below the suction of bilge well
(vii) Striker plate below the sounding pipe shall be examined for any damage due to corrosion
(viii) The pipes passing through the hold shall be carefully examined including its support angle.
(ix) Securing clamps for pipes shall be examined for any wastage due to corrosion and shall be required/replaced if found damaged or corroded
(x) Ensure that the bilge wells, line and valves (including bilge NRV) are clean and in operational condition.
(xi) The bilge line must be tested to ensure that non-return values are functioning correctly and not allowing any flow back of water into the holds.
(xii) The water ingress detection system must also be tested and confirmed as operational.

For inspection and reporting tank coating follow class publication The inspection record should be hold specific and include photographic evidence whenever practicable.

Ballast tanks

Following are points that we considered while inspecting ballast tanks:-

(i) Accessing the overall condition:- Immediately on entering the tank, the tank's well being is figured out by considering the state of access ways, and the ladders, paint coating and closely observe the areas which are more likely to corrode such as near the weld joints.

(ii) The internal area like solid floor, top and bottom longitudnal, brackets and other structural part shall be examined for any wastage or damage.

(iii) Condition of corrosion level:- Careful examination should be carried out in areas such as in the vicinity of sounding pipes and striker plates, opening for the air vent and tank guaging, internal piping including expansion joints and related fitting/clamps near the valves with the tanks, web frames etc

(iv) Anodes have to be checked and inspected closely for excessive wear and tear. One must also inspect whether the anodes are well secured to the brackets provided

(v) Checks to be carried out for pitting corrosion oftenly observed in the bottom plating of ballast tank especially near the bell mouth/suction wells.

(vi) Checks to be carried out for blister formation where the surface preparation is inadequate prior to application of paint coat and for some reason the coating failed to adhere the surface

(vii) Condition of tank guaging system and gas detection system

(viii) Condition of Mud build up

(ix) Condition of safety device such as water ingress sensor.

(x) Bottom plugs to be checked for no leakage

- Other ship's structure

Following areas shall be carefully inspected and good attention to be paid:-

(i) Special attention to be paid to main deck and poop deck

(ii) Once in a month, carefully visual inspection of the hatch coaming, hatch covers and bulwark stage shall be done for cracks.

(iii) Caps of gas sampling point

(iv) Track ways and compression bar

(v) Hydraulic jacks, lines and associated fittings.

(vi) Inside of hatch coamings

(vii) Holds bilge strum box entirely.

(viii) Air/sounding/temperature pipe passing through the hold.

(ix) Manholes cover to be open/closed and gaskets to be inspected.

(x) Booby hatches should be inspected thoroughly and also rubber packing to be tested for water tightness

(xi) Hatch leak test to be done either chalk test or water hose test

(xii) Water ingress detection system must be tried out every month of every holds.

PROJECT WORK

NAME :- Anupam Kumar Singh

BATCH NO :- IMU-36

ENROL. NO :- 1642813607

INDOS NO :- 16NL2240

CDC NO :- MUM280594

PROJECT :- ADDITIONAL PROJECT FOR BULK CARRIERS

PROJECT NO :- 10.4(2)

STO SIGN :-

M.V. VISHVA VIJAY
CHIEF OFFICER
SCI LTD

PROJECT NAME :-

State the basic steps to prepare loading or discharging sequence and lists the factors governing the distribution of the cargo in the holds.

M.V. VISHVA VIJAY

The basic steps to prepare loading or discharging sequence :-

(1) Firstly shore terminal should provide the ship with following information :-

(i) The characteristics & density of cargo, stowage factor, angle of repose, amounts

(ii) Any special requirement for the sequencing of cargo operation

(iii) Number of loader and unloaders to be used, their ranges of movement and the terminal's maximum loading and unloading rates

(iv) Minimum depth of water alongside the berth and in the fairway channels

(v) Water density at berth

(vi) Air draught restrictions at the berth

(vii) Maximum sailing draft and minimum draft for safe manoeuvring permitted by port authority

(viii) The amount of cargo remaining on the conveyor belt which will be loaded on-board the ship after a cargo stoppage signal has been given by ship.

(ix) Local port restrictions, for example bunkering, deballasting requirements etc.

(2) There are two stages in making a safe plan for cargo loading or unloading :-

(a) STEP 1 :- Give the intended voyage, the amount of cargo and/or water ballast to be carried which devise a safe departure condition known as the stowage plan

(b) STEP 2 :- Given the arrival condition of the ship and knowing the departure condition, derise a safe loading or unloading plan that satisfies the imposed structural and operational limit.

* The factors governing the distribution of cargo

(3) When comes to distribution of cargo, as described in the ship's loading manual, stress and displacement calculation to be carried out to ascertain that :

(a) The still water shear forces and bending moments along the ship's length are within the permissible seagoing limits

(b) The weight of cargo in each holds are within the allowable seagoing

limits for the draft of the ship. These weight include the amount of water ballast carried.

(C) The load limit on the tanktop are not exceeded.

Note:- The consumption of ship's bunkers and fresh water during the voyage should be taken into account when carrying out these stress and displacement calculation.

(4) When deriving a plan for cargo operation, the officer in charge must consider the ballasting operation to ensure:

(a) Correct synchronisation with the cargo operation

(b) that ballasting and deballasting of each pair of symmetrical port and starboard tanks is carried out simultaneously.

(c) deballasting/ballasting rate is considered against the loading rate and imposed structural and operational limit

(5) A cargo loading/unloading plan should be laid out in such a way that for each step of the cargo operation there is a clear indication of :-

(i) The quantity of cargo and the corresponding hold number(s) to be loaded/unloaded

(ii) The amount of water ballast and the corresponding tank/hold number to be discharged/loaded

(iii) The ship's draught and trim at the completion of each step in cargo operation

(iv) The calculated value of the still water shear forces (SWSF) and bending moments (SWBM) at the completion of each step in the cargo operation.

(v) Estimated time for completion of each step in the cargo operation.

(vi) Assumed rate of loading and unloading equipment

(vii) Assumed ballasting rate

Note:- The loading or unloading plan should be changed only when a revised plan has been prepared, accepted and signed by both parties. Loading plan should be kept by ship and terminal for a period of six months.

PROJECT WORK

NAME :- Anupam Kumar Singh

BATCH NO :- IMU-36

ENROL. NO :- 1642813607

INDOS NO :- 16NL2240

CDC NO :- MUM280594

PROJECT :- ADDITIONAL PROJECT FOR BULK CARRIERS

PROJECT No :- 10·4(3)

STO SIGN :-

PROJECT NAME :-

State the bulk carrier publications to be carried on-board and outline the contents.

M.V. VISHVA VIJAY

The following publication are required to carry additional on bulk carriers :-

(a) International maritime solid bulk cargoes code (IMSBC code)
(b) The code of practice for the safe loading and unloading of Bulk carrier (BLU Code or Bulk loading/unloading code)
(c) Bulk carrier booklet
(d) Bulk carrier practices
(e) International code for the safe carraige of grain in bulk (International grain code)

(A) IMSBC Code

Contents are as follows:-

- Section 1 General provision and definitions
- Section 2 General loading, carraige and unloading precautions
- Section 3 Safety of personnel and ship
- Section 4 Assessment of acceptablity of consignments for safe shipment
- Section 5 Trimming procedures
- Section 6 Methods of determining angle of repose
- Section 7 Cargoes that may liquefy
- Section 8 Test procedures for cargoes that may liquefy.
- Section 9 Materials processing chemical hazards
- Section 10 Carraige of solid bulk wastes
- Section 11 Security provisions
- Section 12 Stowage factor conversion tables
- Section 13 References
- Appendix 1 Individual schedules of solid bulk cargoes
- Appendix 2 Laboratory test procedures, associated apparatus and standards
- Appendix 3 Properties of solid bulk cargoes
- Appendix 4 Index of solid bulk cargoes

(B) BLU code

Contents are as follows:-

- Section 1 : Definitions
- Section 2 : Suitablity of ships and terminals
- Section 3 : Procedure beetween ships and shore prior to ship's arrival
- Section 4 : Procedure beetween ships and terminal prior to cargo handling
- Section 5 : Cargo loading and Handling of baaast
- Section 6 : Unloading cargo and Handling of ballast

- Appendix 1 : Reccommended contents of port and terminal information books
- Appendix 2 : Loading and unloading plan
- Appendix 3 : Ship-shore safety checkist for loading and unloading dry bulk cargo carrier
- Appendix 4 : Guidelines for completing the ship shore safety checklists.
- Appendix 5 : Form for cargo information.

(C) Bulk carrier booklet

It is the ship specific booklet different for every ships.

Contents are as follows:-

1. Stability data, as required by regulation II-1/22
2. Ballasting and deballasting rates and capacities.
3. Maximum allowable load per unit surface area in cargo holds
4. Maximum allowable load per hold.
5. General loading and unloading instructions with regard to the strength of the ship's structure including any limitation on the most adverse operating condition during loading, unloading, ballasting operation and the voyage
6. Any special restrictions such as limitations on the most adverse operating condition imposed by the administration or organisation recognized by it
7. When strength calculation are required, maximum permissible forces and moments on the ship's hull during loading, unloading and voyage

(1) Bulk carrier practices

Chapter 1 Bulk carriers past, present & future
Chapter 2 Charterer parties
Chapter 3 log books, records and reference books
Chapter 4 Maintenance and care of hatch covers
Chapter 5 Preparation of holds
Chapter 6 Ensuring systems are operational
Chapter 7 Ballast management
Chapter 8 Strength, stability, draft & trim
Chapter 9 Planning of the loading
Chapter 10 The loading calculation
Chapter 11 The loading or discharging berth
Chapter 12 The loading period
Chapter 13 Establishing the quantity of cargo loaded or discharged
Chapter 14 Cargo documents
Chapter 15 The loaded voyage
Chapter 16 The discharging period
Chapter 17 The ballast voyage
Chapter 18 Special types of bulk carrier
Chapter 19 Carriage of common & typical bulk cargoes
Chapter 20 Unusual cargoes and special trades
Chapter 21 Safety consideration
Chapter 22 Instrument and mechanical equipment
Chapter 23 Maintenance
Chapter 24 Repairs and dry docking
Chapter 25 Ship's housekeeping
Chapter 26 Bulk carrier casualties

(E) International code for the safe carraige of grain in bulk

Contents of International grain code are as follows:-

Part A - Specific Requirements

- Section 1 - Application
- Section 2 - Difinitions
- Section 3 - Document of authorization
- Section 4 - Equivalents
- Section 5 - Exemption for certain voyages
- Section 6 - Information regarding ship stability and grain loading.
- Section 7 - Stability - requirements
- Section 8 - Stability requirements for existing ships
- Section 9 - Optional stability requirement for ships without documents of authorization carrying partial cargoes of bulk grain
- Section 10 - Stowage of bulk grain
- Section 11 - Strength of grain fittings
- Section 12 - Divisions loaded on both sides
- Section 13 - Divisions loaded on one side only
- Section 14 - Saucers
- Section 15 - Bunding of bulk grain
- Section 16 - Overstowing arrangements
- Section 17 - Strapping or lashing
- Section 18 - Securing with wire mesh.

Part B - Calculation of assumed heeled moments and general assumptions

- Section 1 - General assumptions
- Section 2 - Assumed volumetric heeling moment of a filled compartment, trimmed
- Section 3 - Assumed volumetric heeling moment of a filled compartment, untrimmed
- Section 4 - Assumed volumentric heeling moments in trunk
- Section 5 - Assumed volumetric heeling moment of a partly filled compartment
- Section 6 - Other assumptions.

PROJECT WORK

NAME :- Anupam Kumar Singh

BATCH NO :- IMU-36

ENROL. NO :- 1642813607

INDOS NO :- 16NL2240

CDC NO :- MUM280594

PROJECT :- ADDITIONAL PROJECT FOR BULK CARRIERS

PROJECT No :- 10.4(4)

STO SIGN :-

M.V. VISHVA VIJAY
CHIEF OFFICER
SCI LTD

PROJECT NAME :-

List the precautions required to ensure an accurate draft survey

M.V. VISHVA VIJAY

The precautions required to ensure accurate draft survey are:-

(a) At the time of reading draft marks, the vessel should be upright with a minimum of trim. The trim at survey should never exceed the maximum trim for which corrections given in Trim stablity booklet.

(b) The vessel should ideally lying in still, calm water. Vessel lying at exposed berth or anchorages where the swell are unavoidable, in these circumtan-ces, a mean of the average highest and lowest draft reading should be used (after studying wave pattern)

(c) Draft mark must be read on both side of the vessels: forward port and starboard, amidship port and starboard and aft port and starboard.

(d) Draft mark should be read with the observer as close to the waterline as is safe and possible, to reduce parallax error

(e) Although it is a common practice to read the offside marks from a rope ladder, a small boat provides a more stable environment and brings a observer to a safer position closer to waterline

(f) A vessel remote draft guage should never be used for surveys due to lack of accuray and possibilities of error.

(g) Density:- It is prudent to obtain samples of water in which the vessel is floating and the time at which draught marks are read. The samples should be obtained using a closed sampling can at a depth of approximatey half the existing draught of the vessel. A slowfilling container can be used to obtain average sample from Keel to waterline.
When reading the hydrometer floating in the sample of water, the eye of the observer should be as close to the water level to avoid parallax error.

(h) The accurate weight of oils including HFO, diesel oil, service and settling tank to be consider.

(i) The stores variable quantities (constant) should be same at the time of initial and final draft survey.

(j) The proper sounding of all ballast tanks should be obtained and calculated using the correct density.

(K) When using a recommended draft survey computer programme or calculating directly from data extracted from hydrostatic particular contains in the vessel's stability book it is essential that the data is carefully and properly interpolated.

(l) At completion of survey, a survey worksheet or computer printout should be placed on-board for record.

PROJECT WORK

NAME :- Anupam Kumar Singh

BATCH NO :- IMU-36

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CDC NO :- MUM280594

PROJECT :- ADDITIONAL PROJECT FOR BULK CARRIERS

PROJECT NO :- 10.2(5)

STO SIGN :-

M.V. VISHVA VIJAY • SCI LTD • CHIEF OFFICER

PROJECT NAME :-

List the physical checks to be carried out in the holds prior to commencement of loading

M.V. VISHVA VIJAY

The physical checks to be carried out in the holds before commencement of loading are as follows:-

1) Structural damage and defect:- Check for any damage by grabs or any leaks from DB manhole. Attention to be paid for tank top, missing bilge covers, broken ladder, dented coaming, leaking hatch cover etc.
2) Suitability of cargo:- The hold should be cleaned as required by the charterer & IMSBC code depending upon previous cargo and next cargo
3) Check that the holds are properly swept and cleaned from previous cargo residue
4) Loose rust or loose paints are removed.
5) Holds are free from all stains
6) Depending upon charter's requirement, hold effectively washed/rinsed and dried.
7) Check that the bilge suction are working efficiently and that bilge wells are dry. Bilge covers are to be wrapped in burlap
8) No leakage from ballast tank present. Double bottom tank manhole covers are absolutely tight
9) Sounding pipes and air pipes passing from holds are clean and rust free.
10) Check that the hatch lighting are in good condition.
11) Inspect and ensure all means of access to hold are safe.
12) Guard rails and safety barriers should seen to be in place.
13) Ensure all necessary fixed and portable fire fighting arrangements are ready for immediate use. Blow through CO_2 lines with compressed air.
14) Inspect and ensure hatch covers are weather tight and all securing device are in good working condition.
15) Inspect cargo hold ventilation system.

PROJECT WORK

NAME :- Anupam Kumar Singh

BATCH NO :- IMU-36

ENROL. NO :- 1642813607

INDOS NO :- 16NL2240

CDC NO :- MUM280594

PROJECT :- ADDITIONAL PROJECT FOR BULK CARRIERS

PROJECT NO :- 10.4(6)

STO SIGN :-

M.V. VISHVA VIJAY • SCI LTD • CHIEF OFFICER

PROJECT NAME :-

State the hazards associated with the loading carriage and discharge of coal, ore concentrates, DRI/HBI, grain, urea, petcoke, scrap iron and sulphur.

M.V. VISHVA VIJAY

CLASSMATE
Date 19
Page 01.11.2024

* Coal

The hazards associated with the loading, carriage and discharging of coal are:-

(a) Methane emission:- Most coal emits methane which is highly explosive. A naked flame or spark is sufficient to ignite it. Methane is lighter than air and so it flows towards the top empty part of the cargo compartment and may even travel to adjacent compartments, including a hatch top. If the methane level becomes unacceptable, surface ventilation should be carried out as recommended by the IMSBC code.

(b) Spontaneous combustion:- Some coals are liable to spontaneous combustion due to the presence of moisture that causes exothermic oxidation (a reaction that results in production of heat) of coal at ambient temperature. If the heat is not reduced, the temperature rises and coal may ignite.

(c) Corrosion :- Some types of coals react with water to produce acids that can cause excessive corrosion of the ship's structure known as cargo corrosion. As a result of the chemical reaction during the process of forming acid and then corrosion, colourless and odourless gases such as hydrogen are produced.

(d) While loading, the cargo shall only be accepted for loading when the temperature of the cargo is not higher than 55°c otherwise it may lead to self heating.

(e) While discharging self-heating coal cargo, problem may associate that even for a small localized area of smouldering (the process of burning slowly with smoke but no flame), a considerable amount of smoke is generated and will be released in mass when hatch cover are opened which appears the worse situation than it is. In fact, hatches being opened which introduced fresh supplies of oxygen into the cargo holds to support self heating/combustion.

* Ore concentrates

Ironore may be shipped in number of forms One from that is Ore concentrate. Ore that has been refined to remove the bulk of waste materials.

So, the hazards associated with iron ore concentrates are:-

(a) If refined by dry method - In this, high grade ore is crushed to remove waste material, leaving a low moisture content in the powdered ore. Iron concentrates obtained by the dry method are susceptibles to spontaneous combustion because of the air already trapped within the concentrate during the crushing process.

Due to dampness within the cargo, the sulphur can react with the oxygen to produce heat, resulting in spontaneous combustion. Therefore, for concentrates, the hold should be kept closed and ventilation avoided. Additionally, due to sulphur and other metallic contents within the concentrates, they may emit poisonous/explosive gases. The cargo spaces should be treated as enclosed space and appropriate entry procedures followed.

(b) If refined by wet method - In this the crushed rock is washed in water to seperate the sulphides. The concentrate has a high moisture contents that may liquefy and shift onboard ship. The moisture content of these concentrates should therefore be checked prior to loading and, if above TML (Transportable moisture limit), the cargo should be rejected.

* DRI/HBI

DRI - Direct reduced iron

Normally in the form of sponge pellets or lumps varying beetween 6 and 25mm diameter, but often 8 to 12 mm. If this product becomes wet it can significantly overheat and emit hydrogen gas. Thus it must be carried under inert condition.

Reaction with air - They will react with the oxygen present in the air, thereby producing heat. This effect can lead to auto-oxidation (burning) of the iron, in which stow becomes incandescent (emitting light as a result of being heated, red-hot) as the temperature approaches 1000°C.

Reaction with moisture:- This hazard is reactivity of iron with moisture or water. The result is the generation of hydrogen gas, which is explosive

over a wide range of concentration. Explosion of hydrogen in air are extremly violent and rapid and an unfortunate master has no time in which to react to an explosion.

HBI - Hot briquetted iron

This material is manufactured from DRI product, which is compressed at temperatures exceeding 650°C to form briquettes between about 90 and 130 mm long, 80 to 100 mm wide and 20 to 50 mm thick. This product is much safe safer form of DRI than DRI pellets It is far from resistant to overheating if it becomes wet During a voyage it can still generate small amounts of hydrogen. Inerting is not required as per the BC code but adequate surface ventilation is required.

* Grain

Grain includes wheat, rye, maize, rice, oats, barley, pulses, seeds and their processed forms whose behaviour is similar to that of grain in its natural state The hazards associated with the grain cargo are:-

(3) Settling and shifting:- A compartment may be full when the cargo is loaded but due to ship's variation and other movements, the grain settles by about 2% of its volume leaving space at the top of the cargo. This space allows cargo to move from side to side in conjuction with the rowing and pitching of the vessel

As the cargo shifts the vessel lists to one side. The shifting of grain is the greatest hazard involved in the carriage of grain

Grain has a low angle of repose(15-18 degree depending on the type of grain), which means if the ship rolls more than 15°-18° the cargo will shift very easily. That will result to a large list and still rolling will obviously cause a greater shift of cargo which in turn will capasize the vessel Thus the heeling moment for the ship are to kept as small as possible

This is done by

1. Having maximum number of holds completly filled with grain.
2. Restraining or securing the grain surface to prevent shifting.

(b) Heat by fuel oil tanks:- Master and officers should monitor the tank top temperature above the fuel oil tank as this can affect the integrity of grain cargoes. Fuel oil temperature can be monitored on the fuel oil transfer pump

(c) Spontaneous combustion: Some grade of grain cargoes are carried in a damp condition and may cause spontaneous combustion to occur. The center of these cargo will have very little ventilation to allow for cooling effect, therefore the natural heat generated can build up to such a degree that combustion take place.

(d) The other minor hazards associated with grain such as contamination, dust, explosion, rotting due to ingress of water and consequent depletion of oxygen or evolution of toxic vapours.

* Urea

Hazards associated with urea are :-

(a) Moisture pickup and caking:- This cargo is hygroscopic and will cake if wet, so as much as possible prevent ingress of moist air. If the passage is subject to variable temperature, condensation may form on the ship's structure and fall on the cargo. Therefore, it is of importance that the ventilation is controlled to avoid sweating.

(b) Contamination:- Any type of waste like previous cargo residue may lead to contamination of cargo, thus cargo should be cleaned properly.

(c) Product breakdown: It should not be stored in direct sunlight or in condition where temperature cycle can occur, thus causing product breakdown.

* Petcoke

Petroleum coke is a byproduct of the oil refinery coking process that

produces low cost fuel, often with a high sulphur content.
Hazards associated with petcokes are:-

(a) It should be loaded in good weather and shall stop if rain to prevent contamination of cargo

(b) Slip coat needed to be use as it can damage the hold paint.

(c) It is also liable to heat and ignite spontaneously.

(d) This cargo shall not be loaded when the temperature of this cargo exceed 107° degree celcius

(e) As the density of the cargo is very high, the tanktop may be overstressed unless the cargo is evenly spread across the tanktop to equalize the weight distribution.

* Scrap iron

Scrap which can be of different sizes. It may contain car body parts, shredded pieces of metal, cutting of steels etc.
Hazards associated with scrap irons are:-

(a) Spontaneous combustion:- Iron can oxidize rapidly which will release heat. In large compact quantities the heat will be largely retained and as a result, the temperature of mass will increase.

(b) Fire:- The mixed scrap cargo may be polluted with different kind of flammable material. If seawater and salt crystals are present in the cargo hold this can lead to a rapid oxidation resulting in rising temperature and setting the contaminants on fire.

(c) Damage to the cargo hold during loading :- Scrap iron consists of heavy pieces which can easily penetrate the tank top and the sides of the cargo hold. As a result, ballast or fuel tank may be ruptured and start leaking, which can be difficult to notice when the cargo holds are full of cargo. Moreover, pieces of scrap can fall from the grab or magnet during loading and damage decks, railings and hatch coamings

* Sulphur

Hazards associated with sulphur bulk cargo are:-

(a) A cloud of sulphur dust is subject to risk of explosion and will easily be ignited by sparks e.g. iron to iron, static electricity caused by friction and even among particles of sulphur

(b) Sulphur is not soluble in water and when in contact of oil there is a danger of fire.

(c) Sulphur dust, sulphur in water can be very corrosive.

(d) Sulphur is highly flammable and will readily ignite in contact with flame. Metal chains or slings should not be used to load sulphur in order to avoid possiblity of ignition by spark.

(e) There are circumtances during the passage or after discharge whereby bulk sulphur can emit small quantity of hydrogen sulphide gas

PROJECT WORK

NAME :- Anupam Kumar Singh

BATCH NO :- IMU-36

ENROL. NO :- 1642813607

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PROJECT :- ADDITIONAL PROJECT FOR BULK CARRIERS

PROJECT NO :- 10.4(7)

STO SIGN :-

M.V. VISHVA VIJAY
CHIEF OFFICER
SCI LTD

PROJECT NAME :-

Describe the use of ship shore safety checklist and list the contents.

M.V. VISHVA VIJAY

* The use of ship shore safety checklist are as follows:-

(i) The purpose of the Ship/shore safety checklist is to improve working relationships beetween ship and terminal, and thereby to improve the safety of operations.

(ii) Misunderstanding can occur and mistakes can be made when ship's officer do not understand the intension of the terminal personnel. And the same applies when terminal personnel do not understand what the ship can and cannot do. Thus, complying with ship/shore safety checklist establish a proper and efficient managment/understanding beetween ship and shore.

(iii) Complying the checklist together is intended to help ship and terminal personnel to recognize potential problem, and to be better prepared for them.

Contents of the ship/shore safety checklist are as follows:-

(1) The following ship's data to be filled:-

Ship's Name: M.V. VISHVA VIJAY Date: 10.08.2024

Port: AQABA, JORDAN Terminal: Q-3

Loading: ☑ Unloading: ☐

Available depth of water in berth: 19m

Minimum air draft: 17m

Arrival draft: DF/DA - 5.5/7.1

Air draught: 13.6

Calculated departure draught: DF/DA - 12.35/12.50

Air draught: 9.2

(2) Is the depth of water at the berth, and the air draught, adequate for the cargo operation?

(3) Are mooring arrangements adequate for all local effects of tide, current, weather, traffic and craft alongside?

(4) In emergency, is the ship able to leave the berth at any time?

(5) Is there safe access beetween the ship and the wharf?

(6) Is the agreed Ship/terminal communication system operative?
(7) Are the liason contact person during operation positively identified?
(8) Are adequate crew onboard, and adequate staff in the terminal, for emergency?
(9) Have any bunkering operation been advised and agreed?
(10) Have any intended repairs to wharf or ship, whilst alongside been advised and agreed?
(11) Has a procedure for reporting and recording damage from cargo operation been agreed?
(12) Has the ship been provided with copies of Port and Terminal regulation, including safety and pollution requirement and details of emergency services?
(13) Is the atmosphere safe in holds and enclosed space, to which access may be required
(14) Have the cargo handling capacity and any limit of trawel for each loader/unloader been passed to the ship/terminal?
(15) Has a loading/unloading plan been calculated for all stages of loading/deballasting or unloading/ballasting?
(16) Have the holds to be worked been clearly identified in the loading/unloading plan, showing the sequence of work and the grade and tonnage of cargo to be transferred each time the hold is worked?
(17) Has the need for trimming of cargo in the holds been discussed, and the method and extent been agreed?
(18) Do both ship and terminal understand and accept that if the ballast progra-mme goes out of step with the cargo operation, it will be necessary to suspend cargo operation until the ballast operation has caught up?
(19) Have the intended procedure for removing cargo residue lodged in the hold while unloading, been explained to the ship and accepted?
(20) Have the procedures to adjust the final trim of the loading ship been decided and agreed?
(21) Has the terminal been advised of the time required for the ship to prepare for sea, on completion of cargo work?
(22) Is the Illumination on and around vessel and jetty sufficient?

PROJECT WORK

NAME :- Anupam Kumar Singh

BATCH NO :- IMU-36

ENROL. NO :- 1642813607

INDOS NO :- 16NL2240

CDC NO :- MUM280594

PROJECT :- ADDITIONAL PROJECT FOR BULK CARRIERS

PROJECT NO :- 10.4(8)

STO SIGN :-

M.V. VISHVA VIJAY • CHIEF OFFICER • SCI LTD.

PROJECT NAME :-

List the parameters to be recorded on a daily basis when carrying a coal cage

M.V. VISHVA VIJAY

Parameters to be recorded on a daily basis when carrying coal cargo are as follows:-

1) Measure the gas concentration in the hold for methane, carbon monoxide and oxygen atleast once in a day. Frequency should be increased by twice, if the methane or carbon monoxide concentration begins to rise steadily.
2) If methane in excess of 20% LEL is detected, use surface ventilation in accordance to the IMSBC code and only for the minimum time necessary to remove the methane
3) If the concentration of methane is detected even if oxygen is below 10°C, report and get advise from the management ashore
4) If the concentration of carbon mon oxide exceeds 30 ppm, the code recommend that the frequency of measurement should be increased to twice daily.
5) If carbon monoxide exceed 50 ppm, the code recommend that the owner should be notified and get advice from management ashore.
6) Cargo temperature of all hold containing coal are to be monitored and recorded. Temperature reading should be taken during loading and throughout the voyage on daily basis. A sustained increase in cargo temperature exceeding 40°c is to be reported to the management ashore.
7) The pH value of hold bilge sample to be obtained. If pH monitoring indicates a presence of a corrosion risk, the bilges should be frequently pumped out during the voyage in order to avoid possible accumulation of acids on tank top and in the bilge system
8) Extra monitoring should be implemented when coal is loaded in hold adjacent to hot areas such as heat fuel DB tank and engine room bulk heads
9) Comply with any other special precaution or parameter given in shipper's declaration.

(30)

PROJECT WORK

NAME :- Anupam Kumar Singh

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PROJECT :- ADDITIONAL PROJECT FOR BULK CARRIERS

PROJECT No :- 10.4(9)

STO SIGN :-

M.V. VISHVA VIJAY • SCI LTD. • CHIEF OFFICER

PROJECT NAME :-

State the procedure and precaution involved with preparation of bauast holds for ballasting/deballasting operation.

M.V. VISHVA VIJAY

(1) The ballast holds are designated heavy weather ballast hold used to carry ballast in adverse weather condition during ballast voyage where master need to do so.

(2) Before ballasting the heavy weather floodable cargo hold, master should keep in mind that hold should be thoroughly swept or washed if needed. If not done, it may result to the problem during deballasting like blocked suction

(3) Before ballasting, it is offcourse essential to remove any blanks or coverplates which has been fitted to ballast suction within the holds and also seal the CO_2 lines and the hatch coaming drains. The bilge suction must also be sealed to prevent ballast from leaking through the bilge system.

(4) If the master has the reason to believe or it is reasonable to expect that the intended ballast passage require addition ballast for the purpose of increasing draught, the necessary step is taken to do so.

(5) The Master is ultimately responsible for the decision of taking heavy weather ballast. The chief officer is responsible for proper planning of any heavy weather ballasting/ deballasting operation.

(6) The master shall initiate each action as soon as possible and preferrably before the departure. If the master decide to take heavy weather ballast after departure at open sea, all safety precautions and aspect must be considered including deviation, stopping or reducing speed or ultimately return to port or seek refuse. Extreme caution must be exercised to avoid danger.

(7) When filling heavy weather ballast in exposed water or open sea. The vessel appendix to class must be consulted for any filling restriction and noted related to sloshing damage.

- Procedures involved with preparation of ballast holds for ballasting/ deballasting

(a) Prepare heavy weather ballast plan in respect with all the stability condition, for atleast 25, 50, 75 percent filling of the applicable tank/hold. Also consider the shear forces and bending moment of the ship and it should be within permissible seagoing limit at all times.

(b) If in port, request permission from terminal for additional ballast intake or request sheltered anchorage after departure from berth

(c) If in open water, reduce speed and alter course if necessary.

(d) Notify the company prior to commencement of heavy weather ballast operation.

(e) The designated heavy weather ballast hold is No. 4 C/H. Open the blank flange and use the drain hole

(f) Bilge covers to be blank.

(g) Ensure that hold vents are properly working, so as to avoid high pressure buildup inside the cargo hold or while deballasting heavy weather ballast, avoid low pressure creating inside that may lead to structrul damage.

(h) Notify the company when the heavy weather ballast operation is completed.

(i) If there is any cargo residue on the tank top of the heavy weather ballast hold, the heavy weather ballast must not be deballasted in sea, it must be deballasted to the shore reception facility.

. Precautions involved with preparation of ballast hold for ballasting/ deballasting :-

(a) All personnel involved in operation shall be fully familiar, convenient with the equipment, pumping system, pipeline, holds, air vent and certain procedure established by chief officer.

(b) Proper and efficient communication should be established beetween chief officer and duty enginner through out the operation.

(c) Proper sounding of the tank should be monitored at frequent interval.

(d) The CO_2 injection system and hatch coaming drains must be sealed.

(e) Continuos monitoring of trim and stabity of vessel is required throughout the operation.

(f) During filling of hold try to establish if there is any cargo residue on the surface of the ballast & in any case do not overboard any ballast water through the vent during the final stage of ballasting.

(g) When the water level reaches 30-40 cm over the tank top; it is important to remember that a written permission to commence deballasting is required in many ports.

(h) When the deballasting has been completed, a fresh water rinse will be required for cargoes which may require holds to be free of salt.

(i) The ballast pipe of heavy weather ballast hold must be blanked off before commencement of loading.

PROJECT WORK

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ENROL. NO :- 1642813607

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CDC NO :- MUM280594

PROJECT :- ADDITIONAL PROJECT FOR BULK CARRIERS

PROJECT No :- 10.4(10)

STO SIGN :-

M.V. VISHVA VIJAY • MV SCI LTD • CHIEF OFFICER

PROJECT NAME :-

Draw the plan view and elevation of a cargo hold, giving the following dimension

M.V. VISHVA VIJAY

The dimension of the following of my good vessel "M.V VISHVA VIJAY" are

- length and breadth of hatch square

no. 1) 17.2 X 12.1
no. 2) 17.2 X 15.0
no. 3) 17.2 X 15.0
no. 4) 17.2 X 15.0
no. 5) 17.2 X 15.0
no. 6) 17.2 X 15.0
no. 7) 17.2 X 15.0

- total length and average breadth of hold

25.80 X 32.24 X 20.7 (L X B (fwd/aft) X H in metres)
32.24 X 25.80 X 20.7

- breadth of deck beside the hatch forward end/aft end

fwd end - 8.3m fwd aft - 8.6m

- length of cross deck beetween two hatches forward/aft

Hatch no 1 & 2 - 8.70m
Hatch no. 2 & 3 - 9.57m
Hatch no 3 & 4 - 8.70m
Hatch no 4 & 5 - 9.57m
Hatch no 5 & 6 - 9.57m
Hatch no 6 & 7 - 10.44m

- length of tank top from hatch square to forward/aft bulkhead of hold

fwd bulkhead - 7.5m
Aft bulkhead - 3.6m

- breadth of tank top from hatch square to port/starboard shipside
  5.5 metres (each side P&S)

- height from tank top to underside of deck beam of main deck
  20.1 m

- height of the hatch coaming forward/aft from the main deck at the centerline
  1.6 mtrs

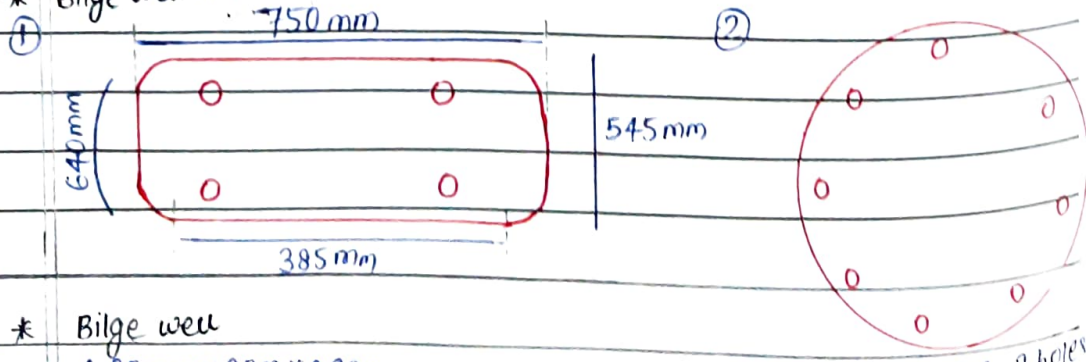
- height of hatch covers (when raised in open condition) from the main deck
  2.0 metres

- load density of tank top, hatch covers, main deck and cross deck beside the hatch

Tanktop:-	no.1	28.5	hatch cover	no.1	68.83
(mt/m²)	no.2	18.9	(mt/m²)	no.2	41.74
	no.3	29.2		no.3	34.3
	no.4	18.9		no.4	59.82
	no.5	29.2		no.5	34.3
	no.6	18.9		no.6	34.3
	no.7	29.3		no.7	34.3

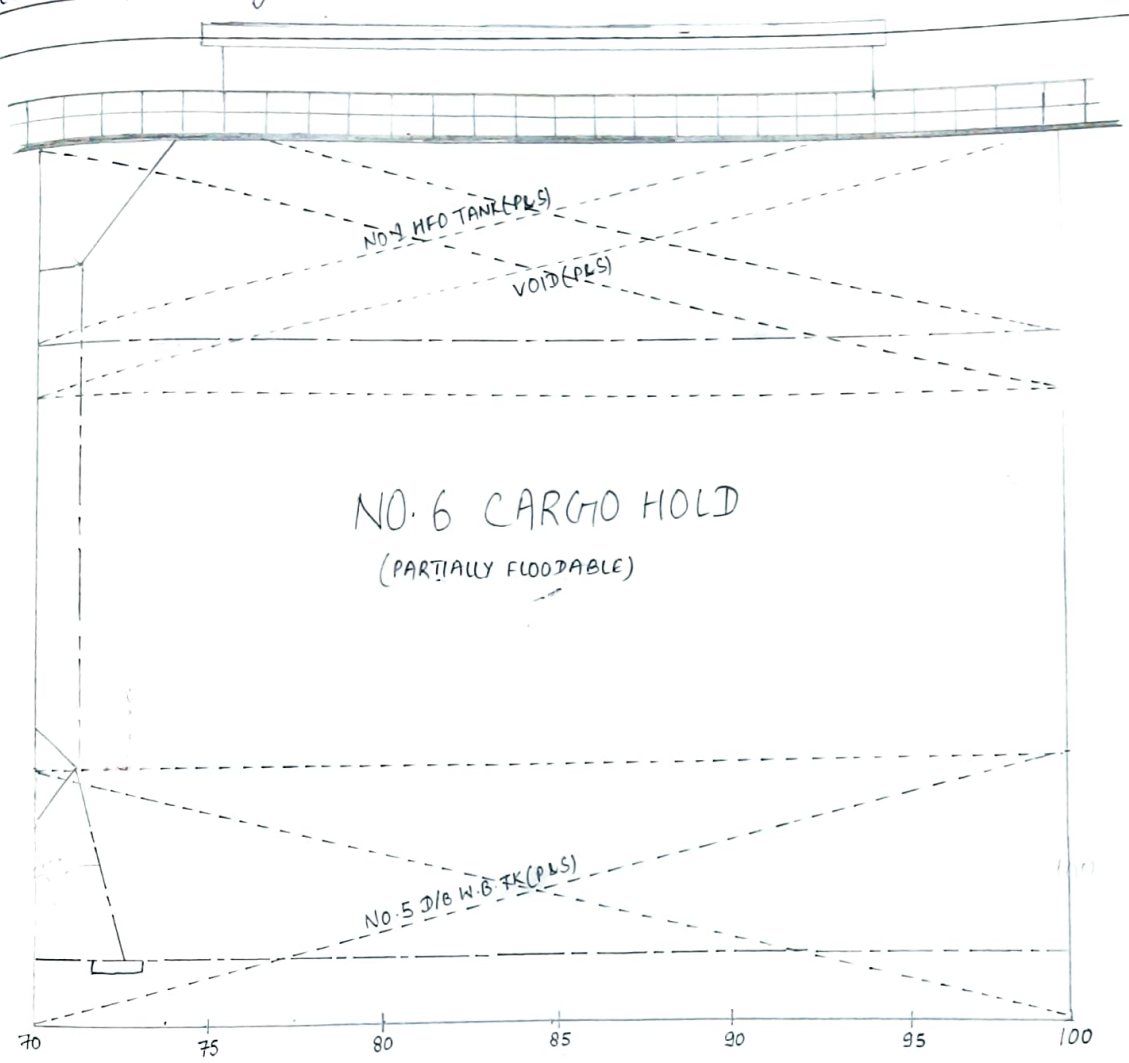
- bilge well dimensions

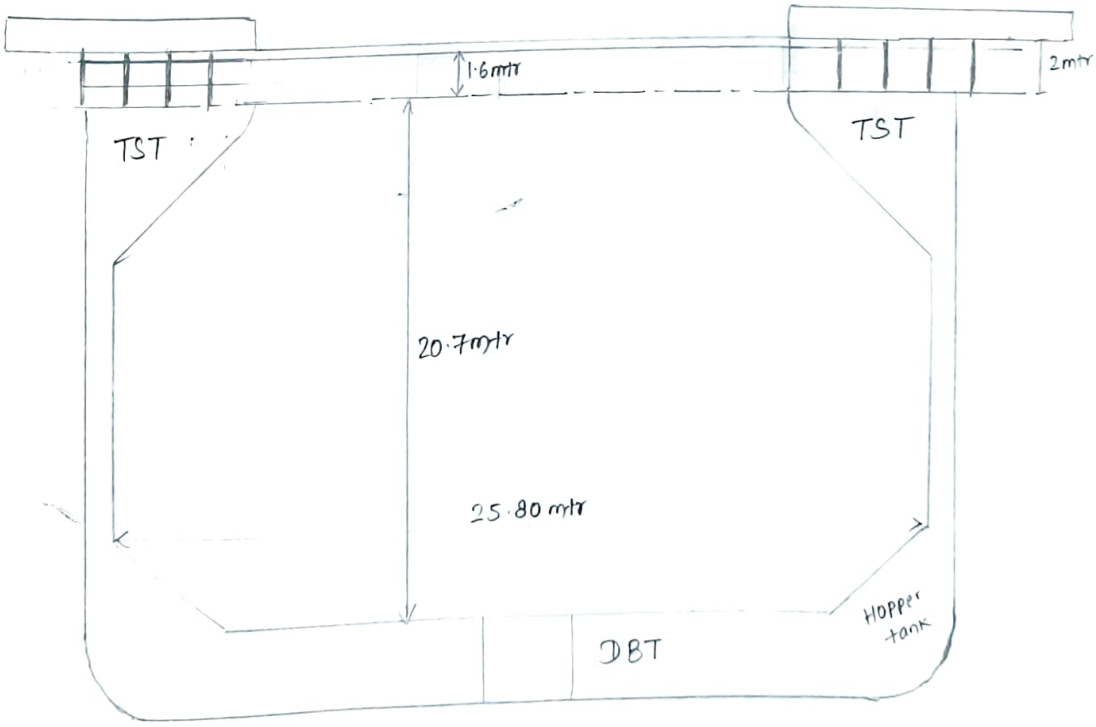
* Bilge well cover

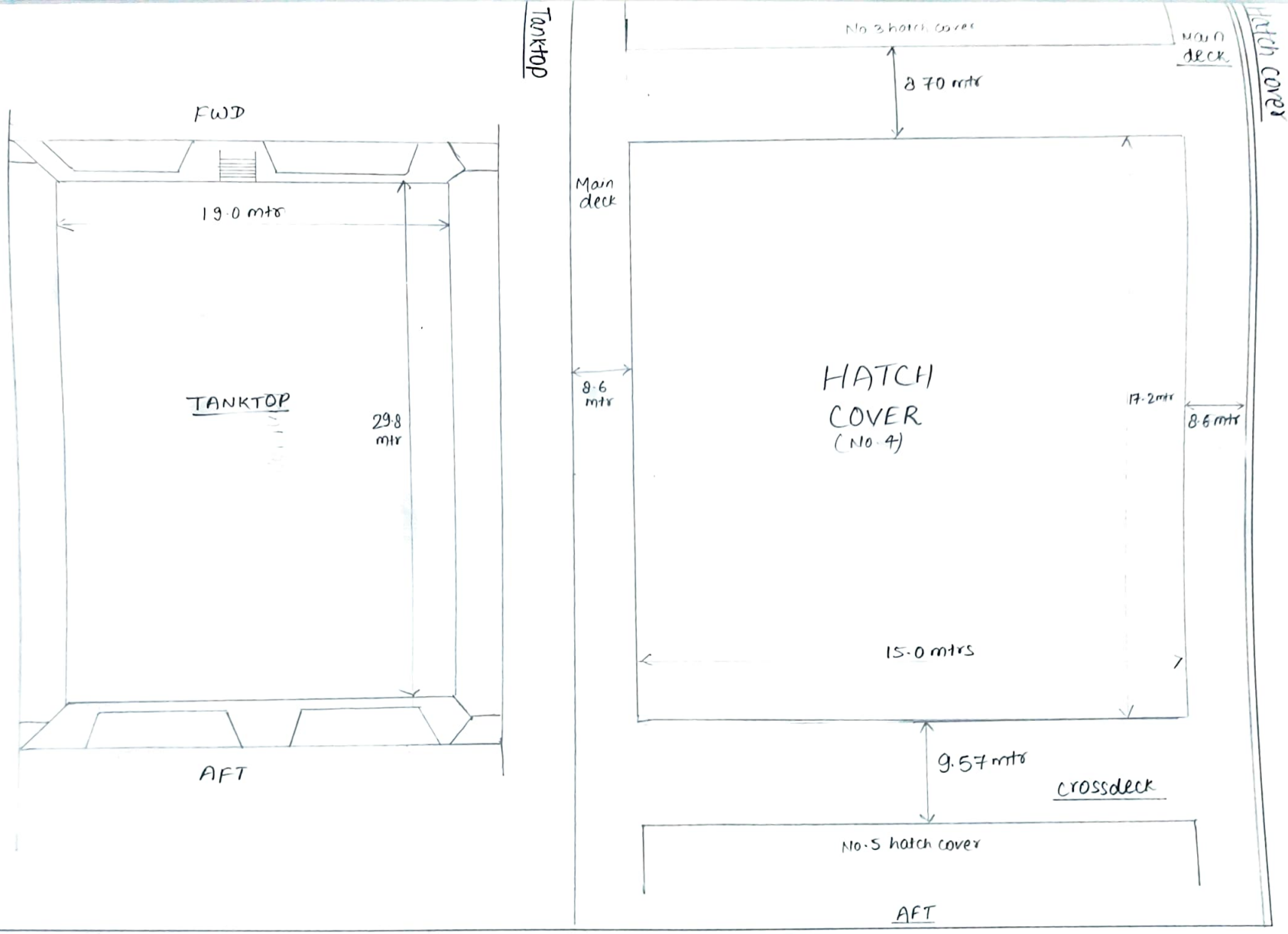


* Bilge well
  1.80m x 0.90m x 0.90m

Plan view of a cargo hold






FWD
19.0 mtr
TANKTOP
29.8 mtr
AFT
Tanktop
No 3 hatch covers
Main deck
Hatch cover
3.70 mtr
Main deck
8.6 mtr
HATCH COVER (NO. 4)
17.2mtr
8.6 mtr
15.0 mtrs
9.57 mtr
crossdeck
No.5 hatch cover
AFT