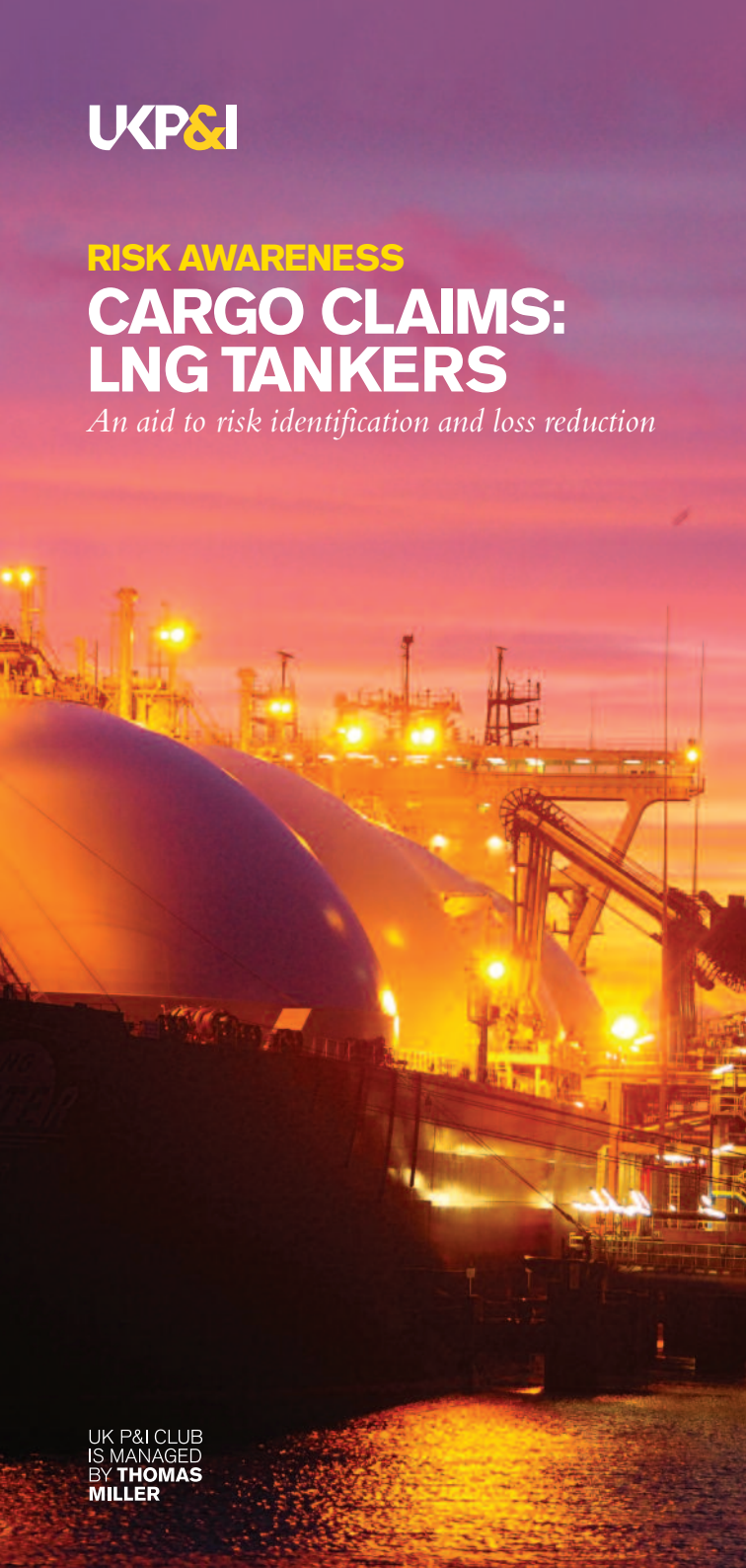
UKP&I

RISK AWARENESS

CARGO CLAIMS: LNG TANKERS

An aid to risk identification and loss reduction



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DEFINITIONS

In this checklist, colour is used to denote the various elements in the risk awareness process

Threat

Something that if not controlled could cause a P&I incident

Consequence

The monetary cost to the Club/Member

Control

Something which reduces the possibility of a 'Threat' causing an incident

Something that should be in place after the incident to help reduce the cost of the claim

How effective do you think the Controls are on your ship – are there any accidents just waiting to happen?

USING THIS CHECKLIST / SCORING

This booklet is a guide to the Controls and key points that the UK Club's Risk Assessors look for when inspecting a vessel.

It will allow you to carry out a similar check on the Threats and Controls and make sure the vessel has a good risk profile.

Each booklet in the *Risk Awareness* series deals with an area of Risk – Personal injury, collision, pollution, etc – and these are sub-divided into Threats and then Controls.

Each Threat is followed by a 'score' section where the individual Controls can be graded according to how effective they are:

1 **Very good control**

2 **Good control**

3 **Average control**

4 **Poor control**

5 **Very poor control (maybe non-existent)**

Furthermore, there is space to make comments on certain Controls; to note ways in which deficient ones could be improved.

At the back, there is a section on Consequences, which is also divided into Controls that should be in place to mitigate the cost of any claim, i.e. after the event controls. These too can be graded.

Cargo loss or damage

THREAT: CONTAMINATION / CARGO LEAKAGE

CONTROLS:

Cargo loading/discharge supervision

- Is there a dedicated cargo care officer
- Is there a cargo watch system in place
- Is there an efficient communication system between ship and shore
- Does cargo officer know who is in charge of terminal operations
- Are names/responsibilities of shore people known/logged
- Is there a procedure in place for bad weather thunderstorms/wind, etc.
- Is a rough cargo log book kept
- Is there a system in place for emergency cargo shut down (ESD)
- Has allowance for vapour contamination been taken into consideration

Tank and pipeline preparation/checks prior to loading

- Are pipeline diagrams understood
- Is correct valve separation in place
- Is there a designated person to confirm pipelines correctly set up
- Monitoring of tank temperatures

Weather deck openings

- Vents and vapour return systems and openings all under a Planned Maintenance System (PMS) and in good condition
- Are all fittings and securing devices in position, working correctly
- Are tank lid seals and all pipeline valves and connections approved and fit for present cargo carriage
- Are there written records of inspections

Pipelines

- Is the pipeline insulation regularly checked
- Do the pipelines move freely through the ‘U’ bolts / clamps
- Are the line cool-down procedures prepared and understood by key personnel
- Is there a procedure in place to avoid ‘blocking’ in the pipelines
- Are the crew aware of the maximum pressure limits in the pipelines

- Is the condition of the pipeline thermocouples, sensors, pipes and supports properly monitored
- Is there a watch kept on the bridge for the purposes of monitoring vapour clouds

Flanges

- Is there a planned maintenance system in place to torque check all flanges on deck and in the cargo machinery room
- Are correct tightening procedures being observed
- Are the correct gaskets in place at the manifolds and are they being renewed at appropriate intervals

Manifold drip tray and liquid dome

- Are the manifold drip trays kept in a clean and dry condition
- Are unessential personnel kept away from the cargo handling areas
- Are there company circulars available regarding Rapid Phase Transition (RPT)
- Is the company policy on liquid domes (with/without water) understood by the crew

Equipment condition – all fixtures, fittings, measuring sampling and recording devices

- Are all cargo tank fixtures and fittings in a good condition and under a PMS
- Is cargo tank insulation in good condition
- Are there written records of all inspections and repairs to cargo tanks or associated equipment.
- Are cargo measuring, sampling, recording devices all tested and confirmed working correctly on a regular basis
- Are written records of tests kept

Ship's structure and fittings intact

- Ship's hull, ballast tanks, holding tanks, DPV, voids and all pipes fixtures and fittings are under a PMS and regularly inspected
- No inter-tank leakage, no pipeline leaks, no external leak via the hull
- Voids dry and clean
- All insulation around tanks and pipelines to be in a good condition and under a PMS
- Full and complete written records of any repairs or alterations
- Ship's structure to be fit for purpose

Cargo survey

- Is a surveyor appointed to survey the loading and discharge process and quality of the cargo
- Are crew aware on whose behalf surveyor appointed (charterer/sub-charterer/owner, etc.)

- Is survey monitored by ship's staff
- Are survey records left on board/signed (for receipt only)
- Are surveys challenged as required (letters of protest, etc.)

Ship suitable

- Is the ship approved / fit to carry the cargo:
- Tank design fit for cargo
- Cargo cooling systems suitable for the cargo
- Vessel will remain within stability and stress limits
- Are ship's staff familiar with the cargo carriage
- Have ship's staff had training/instructions for the type of cargo
- Is the ship's manning level sufficient for the trade/cargo carried

Pressure surges

- Are pressure surges in the pipelines avoided
- Are the crew properly trained in the operation of cargo valves
- Is there a contingency plan in place to deal with pressure surges – and are the crew properly trained
- Are the crew trained and do they understand the pipeline systems

Float gauges

- Maintenance instructions for float gauge
- Training and familiarisation of ship's crew
- Markings permanently stencilled on float gauge
- Operation of float gauge included in pre-cargo operations meeting / 'toolbox' talk

Dry-docking and cargo tank preparation

- Continuous monitoring of inert gas
- Compliance with operational recommendations of containment system manufacturer
- Maximum number of days vessel in inert condition not exceeded
- System in place to check cargo equipment is properly clean and free of residues on completion of repairs
- Daily 'toolbox' meetings, documentation of jobs performed, crew training and crew delegation

SCORE	
Threat: Contamination / cargo leakage	
Cargo loading/discharge supervision	
Tank and pipeline preparation/checks prior to loading	
Weather deck openings	
Pipelines	
Flanges	
Manifold drip tray and liquid dome	
Equipment condition-all fixtures, fittings, measuring sampling and recording devices	
Ship's structure and fittings intact	
Cargo survey	
Ship suitable	
Pressure surges	
Float gauges	
Dry-docking and cargo tank preparation	

COMMENTS

THREAT:
CARGO SHORTAGE/LOSS

CONTROLS:

Cargo calculations – bulk liquids

- Correct cargo data used in all calculations
- Cargo tank readings taken by trained competent persons familiar with cargo type
- Ullaging done using calibrated gauging equipment, approved for the vessel
- Cargo calculations completed by competent ship's staff and surveyors
- Cargo measuring devices working correctly under a PMS and approved for cargo measuring
- Written records of all calculations
- Ship retains a copy of shore calculations

Cargo security and containment

- Ship's security complies with ISPS
- Pipelines and fixtures and fittings in good condition (PMS system)
- Cargo containment areas in good condition – no inter-tank leakage on board

Cargo loading/discharge supervision

- Is there a dedicated cargo care officer
- Is there a cargo watch system in place
- Is there an efficient communication system between ship/shore
- Does cargo officer know who is in charge at terminal
- Are names/responsibilities of shore people known/logged
- Is there a procedure in place for bad weather, thunderstorms/wind
- Is a rough cargo log book kept
- Is there a system in place for emergency cargo shut down (ESD)
- Has ESD been tested recently and log entry made

Ship suitable

- Is the ship approved / fit to carry the cargo:
- Tank design fit for cargo
- Tank coatings suitable
- Cargo cooling systems suitable for the cargo
- Vessel will remain within stability and stress limits
- Have ship's staff had training with the type of cargo
- Is the ship's manning level sufficient for the trade/cargo carried

Cargo survey

- Is a surveyor appointed to survey the loading/discharge process and quality of the cargo
- Are crew aware on whose behalf surveyor appointed (charterer/sub-charterer/receiver/owner, etc.)
- Is survey monitored by ship's staff
- Are survey records left on board/signed (for receipt only)
- Are surveys challenged as required (notes of protest, etc.)

Containment system

- Is the pressure in the insulation spaces properly monitored
- Is the gas concentration in the insulation spaces monitored properly
- Proper secondary barrier tightness testing (membrane vessel only)
- Are there procedures in place to control the pressure in the insulation spaces in the event of loss of control air pressure – and are the crew properly trained
- Is the cold spot inspection routine adequate

Safety relief valves

- Are inspections of the safety relief valves included in the planned maintenance system
- Are the safety relief valves maintained as per manufacturers guidelines
- Are spare parts stored in an accessible and known location
- Are the officers trained in the operation of the safety relief valve resetting device

Cargo machinery

- Are work instructions prepared on board and planned as per manufacturer's recommendations
- Is there regular monitoring and trending of the cargo machineary (when in use)
- Are logs being kept of any problems with the cargo machinery
- Are the crew properly trained / experienced in the use of the equipment
- Is the condition of the equipment included in the end-of trip hand-over notes/reports of the senior officers
- Are the running hours of the equipment properly monitored and recorded

'BOG' management in the engine room

- Is there a 'cool-down' plan for the ballast voyage
- Is there a system in place to monitor the performance of the boiler over the course of the voyage
- Is there a system in place to share / benchmark data between other company vessels to enhance performance

SCORE

Threat: Cargo shortage/loss

Cargo calculations – bulk liquids	
Cargo security and containment	
Cargo loading/discharge supervision	
Ship suitable	
Cargo survey	
Containment system	
Safety relief valves	
Cargo machinery	
‘BOG’ management in the engine room	

COMMENTS

THREAT:
PRE-SHIPMENT QUALITY

CONTROLS:

Cargo declaration procedures / carriage instructions

- Correct documentation to be supplied to the ship in ample time for ship's staff to understand all requirements
- Is the cargo declaration and description clear and precise and in a language understood by ship's staff
- Is there confidence that the cargo declaration details are correct
- Have any special carriage instructions or stowage precautions been received
- Cargo carriage instructions to be supplied to ship in ample time and prior to load
- Instructions are in a language that ship's staff fully understand
- No ambiguity in carriage instructions
- Instructions are not beyond ship's staff or machinery capabilities
- Documentation to clearly state any special carriage requirements
- Documentation in a language understood by the ship
- Is the cargo declaration a true declaration of the cargo to be carried
- Check documentation that delivery is correct
- Bill of lading instructions received and fully understood
- Contact details of shipper and of consignee received and understood

Cargo loading/discharge supervision

- Is there a dedicated Cargo Care Officer
- Is there a cargo watch system in place
- Is there an efficient communication system between ship/shore and has the communications been tested
- Does cargo officer know who is in charge of dockmen
- Are names/responsibilities of shore people known/logged
- Is there a procedure in place for bad weather, thunderstorms and wind
- What procedures are in place for clausing mates receipts
- Is a rough cargo log book kept
- Is there a system in place for emergency cargo shut down (ESD)
- Has ESD been tested and log entry made

Cargo survey

- Is a surveyor appointed to survey the loading process and quality of the cargo to be loaded
- Are crew aware on whose behalf surveyor appointed (charterer/sub-charterer/owner, etc.)
- Is survey monitored by ship's staff
- Are survey records left on board/signed(for receipt only)
- Are surveys challenged as required (letters of protest, etc.)

SCORE

Threat: Pre-shipment quality

Cargo declaration procedures / carriage instructions	
Cargo loading/discharge supervision	
Cargo survey	

COMMENTS

THREAT: TEMPERATURE

CONTROLS:

Machinery and temperature monitoring

- Is machinery used to control, monitor or record the cargo temperature fit for purpose
- Is all machinery/pipework fully operational and adequate
- Are machinery spares carried on board in the event of a machinery breakdown
- Is machinery operated by experienced, suitably qualified, fully trained personnel
- Are written records of training maintained (if required)
- Are full and complete records of cargo monitoring maintained
- Are full and complete records of any equipment failures maintained
- Are full and complete records kept of PMS on machinery
- Procedures for cooling tanks after off-hire ballast voyage (if applicable)

Monitoring of temperature during load/ carriage/discharge

- During the cargo load and discharge is the cargo temperature monitored and written records maintained
- Is cargo load and discharge temperature kept within cargo instructions/limitations
- Are cargo carriage temperatures continuously monitored and written records maintained
- Are cargo temperature fluctuations investigated and written records maintained of any corrective action

Stowage position fit for purpose

- Is cargo contained in a tank unaffected by exterior elements or inter-tank heating/cooling or contamination
- Is cargo stowage area approved by class and suitable for cargo containment
- Is insulation protecting cargo in a good condition and under a PMS
- Do insulated tanks have written records of insulation checks/temperature monitoring
- Are full and complete written records kept of any void space alarms

Cargo declaration procedures / carriage instructions

- Is the cargo declaration presented to the ship in sufficient time for the cargo plan to be produced
- Correct documentation to be supplied to the ship in ample time for ship's staff to understand all requirements

- Is the cargo declaration and description clear and precise and in a language understood by ship's staff
- Is there confidence that the cargo declaration details are correct
- Have any special carriage instructions or stowage precautions been received
- No ambiguity in carriage temperature
- Instructions are not beyond ship's staff or machinery capabilities
- Documentation to clearly state any special carriage requirements
- Is the cargo declaration a true declaration of the cargo to be carried
- Check documentation that delivery is correct
- Bill of lading and instructions received – shipper and consignee details are correct
- Cargo to be delivered to the ship at correct temperature

Inspection and planned maintenance

- Hull, machinery and equipment in all areas is logged into an inspection and planned maintenance system on board, either a written or computerised system is used and is adequate for the task performed
- Equipment in poor condition is removed from service and replaced as soon as possible for safety as required
- All personnel are instructed to inspect all equipment prior to use and to replace any worn or dangerous seeming tools, PPE, or other equipment prior to commencing operations
- Cargo
  - All tanks and all openings under a PMS system regularly inspected by ship's staff and class
  - Sufficient spares on board to maintain gas tight
  - Crew trained in maintaining hatches, vents and sounding pipes
  - Gas sampling points watertight
  - Condition of pipework: cargo, air, sounding, ballast, tank cleaning
  - PV valves, safety relief valves and ventilators: marked, free (hinges, flaps, dogs), watertight (seals effective)
- Tank inspections for all tanks (cargo and ballast) – coating condition regularly inspected as applicable and recorded. Steel testing carried out as applicable and recorded
- Steel testing carried out as applicable and recorded – thickness determination by ultra sonic testing (U/S)
- Pumps, compressors, heaters, heat exchangers, etc. under planned maintenance and inspection.
- Ballast tanks under inspection regularly for coating condition, and all manholes, etc. in good order
- Insulation in good order as applicable
- Deck fitting securing arrangements in good order as applicable.
- Sounding devices and recording devices in good order as applicable for cargo and ballast operations

- Void spaces inerted or in dry air as custom of trade, void spaces inspected regularly under PMS
- All bilges kept free of obstructions and cleaned on regular basis, bilge alarms functioning and sounding records are kept for all bilge well in the vessel. Bilge eductors or pumps are regularly tested and records maintained

Ship suitable

- Is the ship approved / fit to carry the cargo:
- Tank type fit for cargo
- Tank coatings suitable for the cargo to be carried
- Cargo cooling systems suitable for the cargo
- Vessel will remain within stability and stress limits
- Have ship's staff had training with the type of cargo
- Is the ship's manning level sufficient for the trade/cargo carried

Cargo survey

- Is a surveyor appointed to survey the loading process and temperature/quality of the cargo to be loaded
- Are crew aware on whose behalf surveyor appointed (charterer/sub-charterer/owner, etc.)
- Is survey monitored by ship's staff
- Are survey records left on board/signed(for receipt only)
- Are surveys challenged as required (letters of protest, etc.)

SCORE

Threat: Temperature

Machinery and temperature monitoring	
Monitoring of temperature during load/ carriage/discharge	
Stowage position fit for purpose	
Cargo declaration procedures / carriage instructions	
Inspection and planned maintenance	
Ship suitable	
Cargo survey	

COMMENTS

THREAT: EQUIPMENT FAILURE / LOSS OF AUTOMATION

CONTROLS:

Inspection and planned maintenance (cargo equipment)

- Is all equipment involved with cargo operations under a PMS and approved for type of cargo carried
- Are all fixtures and fittings involved in cargo handling covered by a PMS and approved for the type of cargo carried
- Are all machinery equipment, fixtures and fittings adequately insulated as per the manufacturers instruction manuals
- Are all equipment fixtures and fittings regularly inspected and approved by class
- Are written records and certification of all maintenance work maintained

Operational procedures

- Are all officers engaged in cargo operations fully trained, have approved STCW certification and endorsements, completed a ship familiarisation course
- Are all crew involved in the cargo operation fully conversant with all the cargo machinery, valves and pipelines, cargo specifications and carriage limitations/precautions
- Are cargo operations supervised by a senior officer to prevent cargo loss or incorrect load/discharge
- Are monitoring records clear and accurate

Sensors/radars

- Do the officers understand the limitations of the equipment
- Is the data regularly verified
- Is the equipment tested at regular intervals, and is a log maintained
- Are there contingency plans in place and are these plans practised by the crew

Custody Transfer Measurement System (CTMS)

- Is the redundancy of the CTMS computer regularly checked
- Are all Tank Protection Systems (TPS) tests carried out prior to arrival
- Is the CTMS inclinometer checked regulary and visually verified
- Are there written work instructions for the purposes of performing cargo operations with the use of float gauges

Intergrated automated systems

- Is there a security system in place to avoid computer viruses
- Have procedures for each individual laptop computer been identified and understood
- Do the crew understand the information chain between the automated components
- Are regular visual checks performed by the crew

SCORE

Threat: Equipment failure / loss of automation

Inspection and planned maintenance (cargo equipment)	
Operational procedures	
Sensors/radars	
Custody Transfer Measurement System (CTMS)	
Intergrated automated systems	

COMMENTS

THREAT: STABILITY ERROR

CONTROLS:

Stability/stress calculations

- Is loadicator approved by class
- Prior to any load or discharge is the stability loadicator test program run and are written records maintained
- Are ship's stability calculations completed by certificated officers approved by flag state
- Do all officers have required STCW documentation/training requirement
- Are officers familiar with ship and voyage/stability requirements
- Are officers fully competent in use of loadicator instrument
- Are full and comprehensive written stability calculations retained on board
- Are full clear and comprehensive list of all tanks/cargo weights of the vessel maintained in an approved format
- Is the Master updated regularly on ship's stability criteria
- Are hourly stability and stress checks made during loading and discharging operations
- Are regular draft and stability checks made throughout the cargo load/discharge

Effective bilge/ballasting systems/procedures

- Who is responsible for bilge and ballast operations and are they properly planned
- Are proper communications established between deck and engine room
- Are internal transfers of liquids properly monitored and strictly controlled to prevent overflow
- Use of tank isolation valves correct
- Air and sounding pipe checks
- Transfer failure procedures
- Manual sounding procedures
- Are bilge non-return valves checked and tested (void spaces)
- Are written log entries made of all bilge tests
- Are all ship's tanks, bilges, pipes and couplings carrying seawater, fresh water, or oil, well maintained under a PMS inspection
- Are all tanks secured tightly with all bolts/gaskets in good order
- Are tanks and piping leak/hole free
- Are tank valves working correctly/regularly tested
- Do any tanks, pipes and valves have any changes with proper written approval from class

Loading and discharging procedure

- Load and discharge procedures followed
- Ensure that the stability and stress calculations are within limits for the vessel at all times, both in harbour and sea conditions

SCORE

Threat: Stability error

Stability/stress calculations	
Effective bilge/ballasting systems/procedures	
Loading and discharging procedure	

COMMENTS

THREAT: MOORING ISSUES

CONTROLS:

Compatability

- Has a comprehensive compatability study of the port and/or terminal been carried out
- Has the subject port/terminal approved the above compatability study
- Is the above study and subsequent terminal approval understood by the crew
- Modifications to the compatability study to be reported and included in the study

Quality of ropes and wires

- Is there a system in place to monitor the condition of the mooring lines
- Is there a quality benchmark in place to compare the performance of different mooring manufacturers
- Has there been expert advice sought on the best mooring lines to use
- Are the mooring lines maintained as per company procedures and manufacturer's advice

Care of ropes and wires

- Are mooring lines on deck suitably protected from the environment
- Are mooring lines flushed with fresh water before stowing
- Are there records kept regarding usage of mooring lines
- Are mooring lines appropriately 'whipped' and checked at regular intervals

SCORE

Threat: Mooring issues

Compatability	
Quality of ropes and wires	
Care of ropes and wires	

COMMENTS

THREAT: FIRE/EXPLOSION DAMAGE

CONTROLS:

Hot work outside ER subject to specific approval

- All hot work in any cargo area is subject to approval and a proper check-list, risk assessment and permit to work system being in place
- No hot work on tanks or hatches unless the possible fire/explosion risk from the cargo is fully assessed

Regular inspection (fire rounds)

- Are procedures in place for checking/testing/maintaining remote sensors
- Are procedures in place for manual checking of areas

Stowage position procedures

- Is the cargo plan accurate and has the cargo been stowed as per the plan
- Has the stowage of the cargo on board ship been supervised by ship's staff/OOW
- Has the cargo plan been approved by the Chief Mate / Master

Declaration control prior to shipment

- Correct documentation to be supplied to the ship in ample time for ship's staff to understand all requirements
- Documentation to clearly state any special carriage requirements
- Documentation in a language understood by the ship
- Is the cargo declaration a true declaration of the cargo to be carried
- Check documentation that delivery is correct
- Bill of lading instructions received and fully understood
- Contact details of shipper and consignee received and understood

Gas detection system

- Fixed gas detection to all non-cargo compartments on board the vessel
- Are fixed gas detectors calibrated and on at all times
- Are portable gas detectors in use as required and maintained/calibrated

Fire detection system in place accommodation/ engine room/stores and cargo holds

- Fire detection system in spaces, PMS included for this item, regularly tested and verified, log maintained

Smoking controls on board

- Designated smoking areas – with correct posters/signs as per company/terminal regulations
- Are smoking controls effectively policed

SCORE

Threat: Fire/explosion damage

Hot work outside ER subject to specific approval	
Regular inspection (fire rounds)	
Stowage position procedures	
Declaration control prior to shipment	
Gas detection system	
Fire detection system in place accommodation/ engine room/stores and cargo holds	
Smoking controls on board	

COMMENTS

THREAT: PRE-LOADING/ DISCHARGE PLANNING

CONTROLS:

Cargo declaration procedures/carriage instructions

- Correct documentation to be supplied to the ship in ample time for ship's staff to understand all requirements
- Is the cargo documentation, declaration and description clear and precise and in a language understood by ship's staff
- Is there confidence that the cargo declaration details are correct
- Have any special carriage instructions or stowage precautions been received
- Cargo carriage instructions to be supplied to ship in ample time and prior to load
- Instructions in a language that ship's staff fully understand
- No ambiguity in carriage instructions
- Instructions are not beyond ship's staff or machinery capabilities
- Documentation to clearly state any special carriage requirements
- Documentation in a language understood by the ship
- Is the cargo declaration a true declaration of the cargo to be carried
- Check documentation that delivery is correct
- Bill of lading and instructions received – shipper and consignee details are correct
- Contact details of consignee

Ship suitable

- Is the ship approved / fit to carry the cargo:
- Tank type fit for cargo
- Tank coatings suitable for the cargo
- Cargo cooling systems suitable for the cargo
- Vessel will remain within stability and stress limits
- Have ship's staff had training with the type of cargo
- Is the ship's manning level sufficient for the trade/cargo carried

Stability/stress calculations

- Is loadicator approved by class
- Prior to any load or discharge is the stability loadicator test program run and are written records maintained
- Are ship's stability calculations completed by certificated officers approved by flag state
- Do all officers have required STCW documentation/training requirement
- Are officers familiar with ship and voyage/stability requirements

- Are officers fully competent in use of loadicator instrument
- Are full and comprehensive written stability calculations retained on board
- Are full clear and comprehensive list of all tanks/cargo weights of the vessel maintained in an approved format
- Is the Master updated regularly on ship's stability criteria
- Are regular draft, stability and stress checks made throughout the cargo load/discharge

Effective bilge/ballasting systems/procedures

- Who is responsible for bilge and ballast operations and are they properly planned
- Are proper communications established between deck and engine room
- Are internal transfers of liquids properly monitored and strictly controlled to prevent overflow
- Use of tank isolation valves
- Air and sounding pipe checks
- Transfer failure procedures
- Manual sounding procedures
- Are bilges cleaned each voyage
- Are bilge non-returns checked and tested regularly (void spaces)
- Are written log entries made of all bilge tests
- Are all ship's tanks, bilges, pipes and couplings carrying seawater, fresh water or oil, well maintained under a PMS inspection
- Are all tanks secured tightly with all bolts/gaskets in good order
- Are tanks and piping leak free
- Are tank valves working correctly/regularly tested
- Do tanks, pipes and valves have any changes without written approval from class

Trade competency of personnel to perform required duties

- Do all personnel have required certification for the jobs they do, are these certificates valid
- Training checks, human resources (HR) and ship follow up on joining, full familiarisation and training on board the vessel as required for tasks to be performed

Continuous on board training as required carried out in all areas (ISM requirement)

- On job training to be carried out by supervisors and not workmates
- Continuation training by senior officers for junior ranks and on job supervision during training
- Some workmate intervention is allowed in training as well, if appropriate

- (Safety awareness for all can be enhanced if a 10 minute 'buddy overview' is used
- A colleague watches what the worker is doing, makes notes on both the good and bad points and then critiques the on job safety starting with the good points.
- Both persons can learn from this type of interaction and safety awareness promotion on board)
- Ongoing training and proper familiarisation of all officers and ratings on vessel type

  To cover:

  - Emergency situations during load/discharge
  - Safe cargo operations

Toolbox talks and work planning meetings

- Are these pre-work meetings held on board
- They should include as far as practical, but not limited to the following:
  - Risk Assessment of operation to include the plan to be discussed and evaluated with the team members.
  - Safety matters to include:
    - Discuss the job plan overall
    - What is the job, and procedure to follow
    - Who will do what
    - Discuss the safety rules for the area of work to be done
  - What could go wrong
  - What are the main hazards
  - Assess the risks and how do you eliminate them
  - Get all to participate to create ownership of safety in the job to be done and full safety awareness
  - Ensure as far as possible all personnel understand the safety rules for the job to be done
  - Remind all of the STOP procedure if the job changes (i.e. weather hazards, additional ropes required, winch problems, if minor or major accidents should occur)

Cargo survey

- Is a surveyor appointed to survey the loading process and temperature of the cargo to be loaded
- Are crew aware on whose behalf surveyor appointed (charterer/sub-charterer/owner/receiver, etc.)
- Is survey monitored by ship's staff
- Are survey records left on board/signed (for receipt only)
- Are surveys challenged as required (letters of protest, etc.)

Documentation control during loading

Correct documentation presented to load cargo:

- MSDS (Marine Safety Data Sheets) for dangerous goods

- Quality certificates
- Loading plan agreed

Documentation control during discharge

Correct documentation to be presented to the Master prior to releasing the cargo (bills of lading):

- Landing orders checked
- Discharge plan confirmed as correct
- Correct consignee details
- Cargo landed in correct port to secure area to correct receiver

Tank and pipeline preparation/checks prior to loading

- Are pipeline cleaning procedures available/adequate
- Are details of cleaning procedures properly logged
- Are pipeline diagrams understood
- Is correct valve separation in place
- Is there a designated person to confirm pipelines correctly set up
- Is there a designated person to double check that pipelines are correctly set up

Cargo loading/discharge supervision

- Is there a dedicated cargo care officer
- Is there a cargo watch system in place
- Is there an efficient communication system between ship/shore and has the system been checked and logged
- Does cargo officer know who is in charge of terminal
- Are names/responsibilities of shore people known/logged
- Is there a procedure in place for bad weather, thunderstorms, rain/wind
- What procedures are in place for cargo discrepancies (notes of protest, etc.)
- Is a rough cargo log book kept
- Is there a system in place for emergency cargo shut down (ESD)
- Has ESD been tested and log entry made

SCORE
Threat: Pre-loading/discharge planning
Cargo declaration procedures / carriage instructions
Ship suitable
Stability/stress calculations
Effective bilge/ballasting systems/procedures
Trade competency of personnel to perform required duties
Continuous on board training as required carried out in all areas (ISM requirement)
Toolbox talks and work planning meetings
Cargo survey
Documentation control during loading
Documentation control during discharge
Tank and pipeline preparation/checks prior to loading
Cargo loading/discharge supervision
COMMENTS

Consequences

CONTROLS:

Damage mitigation procedures

- What procedures are in place to help reduce the effects of a cargo/pollution/collision/PI/FFO incident, and how effective are they
- Have all possible measures been taken and recorded to limit physical damage to:
  - Cargo/ship/personnel in every possible way, as appropriate to the trade and type of the vessel

    Cargo:
    - Gas alarms and monitoring
    - Bilge alarms

    Pollution:

    Fixed and floating objects:

    Collision:

    Personal injury:
- Is required PPE available and worn in all areas as follows:
  - Safety helmets – look at design and condition, should have short peak to allow all round view
  - Condition important, no stickers, no painted helmets, etc.
  - Damaged helmets are not fit for purpose
  - Safety shoes/boots – hard toecaps (steel/kevlar/titanium)
  - Galley clogs with steel toes and non-slip soles
  - Boiler suits or suitable clothing (no flapping sleeves/long sleeves as appropriate)
  - Goggles or safety glasses as required
  - Gloves of correct type for work (cotton, rubber, leather, etc.)
  - Safety harness with fall arrest fitted (not safety belts)
  - Chemical aprons
  - Galley aprons
- All mitigation measures are logged

Alarm/stop procedures

- Are procedures in place to warn ship/shore of incident and to stop the operation
- Communications procedure in place for all incidents.
- General and fire alarms are functioning correctly
- Automatic fire detection is good
- Fixed gas detectors – check regular calibration, etc.
- Verbal alarm raising system is defined and can be shown to be adequate

- Procedure in place to suspend or stop the operation if an accident occurs and if it is safe to do so
  - Pumps on board/ashore
  - Cranes/derricks
  - Electrical power cut outs

Emergency drills/training

- Are drills/training procedures in place to cope with high risk incidents
- Fire drills
- Lifeboat and abandon ship drills
- MOB rescue drills to include Williamson turn and deployment of all equipment
- Security drills
- Anti piracy drills
- Anti pollution drills
- Emergency steering drills
- Medical emergency drills and rescues for various areas of the vessel
- Pollution drills – bunker leak, cargo leak, grounding, collision, etc.
- Watertight integrity drills – watertight doors, bulkhead valves, etc.
- Ballasting procedures in the event of a hull breach

Emergency equipment adequacy/availability

- Is the ship's equipment available/adequate to deal with high risk incidents
  - Fixed fire equipment
  - Portable fire equipment
  - SCBA
  - EEBD and location suitability for all breathing apparatus
  - Lifebuoys
  - Life rafts
  - Lifeboats
  - MOB boats or designated MOB boats
  - MOB equipment including scrambling nets
  - Thermal protective aids – LSA and FFE
- Fire plans, external and internal
  - Crew lists
  - Ventilation plans
  - Damage control plans
- First aid equipment
- Vessel hospital, medical equipment and treatment on board as required
  - Standard of hospital
  - Stretchers and equipment overall
  - Suitable portable winch equipment for enclosed spaces

- Are crew familiar with the equipment

Emergency reporting/communication procedures

- Are there reporting procedures in place and understood if an incident occurs?
- Reporting to owner, charterer, P&I correspondent
- Categorisation of incident?
- Timing of incident?
- Communication requirements
- Who was informed on board?
  - On shore?
  - When?
  - How?
  - Why?
  - What did they do?
- Records of communications (ship management, third parties, national authorities, P&I, etc.)
- Letters of protest:
  - Are there procedures in place for issuing letters of protest?
  - Are the reasons for issuing letters of protest understood?
  - For all incidents LOP should be issued and where possible notorised, signed for receipt, etc.
  - Copies retained on file on board and entered in the evidence log for use in defending the claim should it arise

Record keeping/evidence retention

- Information required to help process claims:
  - Log books preserved and records tallied with bell books (movement book – deck and engine)
  - Charts preserved and records kept as evidentiary chain
  - Voyage Data Recorder (VDR) information properly preserved and evidence used
  - Time of the incident GMT and Local time?
  - What happened and to whom
  - Where did it happen?
  - When did it happen?
  - What were they doing at the time?
  - What were the immediate consequences?
  - Full list of witnesses to the incident
  - Witness statements
  - Electronic records of ship's operational position at the time of the incident
  - Operational status of vessel: at sea, in port, tank cleaning, cargo operations, mooring, etc.
  - Records of casualty communications and third party responses (salvors / other vessels / etc.)

- Oil pollution:
  - ORB (Parts 1 and 2 as applicable) and garbage logs are maintained and properly updated
  - Vessel has SOPEP or SMPEP as applicable
  - Vessel has correct certification for air/oil/sewage and Garbage Pollution properly updated.
  - PMS System records maintained
  - OWS and ODM alarm testing records and function testing records maintained
  - OWS and ODM cleaning records maintained
  - Interface detectors on board and in good order/function test records maintained as appropriate.
- Weather conditions:
  - Description of incident environment (hot, cold, stuffy, dark, confined, moving machinery, etc.)
  - Description of weather
  - Description of sea state
- Use of NI publication *The Mariner's Role in Collecting Evidence*
- Photos of incident and location time/date stamped, camera set up recorded, full description given in title and/or in comments field under properties.
- Photos to be secured from tampering by using security settings under properties
- Layout diagram
- Ship's logs
- Procedures in use at time of incident
- Risk assessment records
- Personal protective equipment (PPE) in use
- Exhibits (failed ladder, rope, etc.)
- Service records
- Certifications
- Communications logs
- Permit to work records as applicable
- Toolbox talk records
- List of equipment (tools) involved in incident: condition of equipment, missing equipment
- Equipment certification, inspection logs, maintenance records
- UK Club list of what is required to be produced in the event of a cargo incident: (attach as links in btf for printing off and leaving on board)
  - Collision incident:
  - Pollution incident:
  - Personal Injury Incident:
  - FFO Incident:

Capability of crew to deal with incident

- How capable is the crew to deal with the incident

- Competence of individuals involved in incident (recruitment, certification, training records, fitness to work (medical records)
- Medical:
  - Junior Deck Officers and Chief Officer are minimum trained in first aid overall
  - Master has Ship Captain's medical training as a minimum
- Fatigue factors: hours of work, rest, time on shift
- Contracted time on board vessel
- Actual time on board vessel current period
- Competence of individuals involved in response
- Experience of crew involved in the incident
- Language barriers of crew/shore personnel involved, if any

Use of third party assistance

- Procedures for contacting third parties for assistance in the event of an incident
- By phone, radio, satellite link, etc.
- General advice:
  - Club correspondent
- Medical advice:
  - Doctor
  - Hospital
- Stability advice:
  - Collision – classification society
- Pollution:
  - Authorities
  - Harbour Master
- Cargo:
  - Correspondent

Learning from incidents

- Are lessons learned from previous incidents
- Non-conformity raised for incident
- Incident/accident report correctly filled in
- Incident is raised at safety meetings and full crew meetings:
  - Discussion of what went wrong and how this can be avoided in future
- Incident is discussed and appraised at company level:
  - Actions to avoid future incidents are discussed and taken, improving barriers
- Incident promulgated to full fleet to avoid duplication, if possible
- Incident promulgated industry wide, if appropriate to enhanced safety culture
- Full risk assessment undertaken to improve barriers/controls in on board check-lists
- Toolbox talks, job hazard awareness (JHA) systems and others as appropriate in all fleet vessels

SCORE

Consequences

Damage mitigation procedures	
Alarm/stop procedures	
Emergency drills/training	
Emergency equipment adequacy/availability	
Emergency reporting/communication procedures	
Record keeping/evidence retention	
Capability of crew to deal with incident	
Use of third party assistance	
Learning from incidents	

COMMENTS

METHODOLOGY

Following the well-known definition:

RISK = FREQUENCY x CONSEQUENCE

The Club has analysed the number and value of the Club's claims to prioritise high risk areas and determine what the THREATS are that cause these claims. Then, with the aid of those at the sharp end – our correspondents, surveyors, claims executives and underwriters, and last but not least, our crews – we have sought to determine what CONTROLS – be it engineered, procedural or managerial – have mitigated such claims, or would have done so if they had been in place. Those threats and controls can then be targeted for assessment, either with the help of the Club's own risk assessors, or by Members themselves in conjunction with their crews.

Although 60% of UK Club claims are caused by 'human error', human error is often only 'the straw that breaks the camel's back' – the last event in a chain of causal events.

These causal events can normally be traced back to failures in one or more areas of ship operation, we sometimes refer to them as 'accidents waiting to happen'.

How can we reduce the frequency of these 'accidents waiting to happen'? What 'controls' should we be looking at to ensure the 'threat' is contained and an 'incident' does not occur?

For further information, see *No room for risk,* a short explanatory film, available on the Club's website at www.ukpandi.com/loss-prevention

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