



**RISK AWARENESS**

# **CARGO CLAIMS: TANKERS**

**CRUDE/PRODUCT/CHEMICAL/GAS**

*An aid to risk identification and loss reduction*



UK P&I CLUB  
IS MANAGED  
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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?**

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# 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**

### **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 dockmen?
- Are names/responsibilities of shore people known/logged?
- Is there a procedure in place for bad weather thunderstorms/wind, etc?
- What procedures are in place for clausing mate's receipts?
- 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

#### **Weather routeing**

- Does vessel participate in weather routeing service?
- Does ship receive weather maps and messages?
- Is master advised in ample time of any adverse weather?
- Does ship takes evasive action/alter course/reduce speed and follow weather routeing?
- Are adequate records kept?
- Are protests made?

#### **Tank and pipeline preparation/checks prior to loading**

- Are tank cleaning procedures available/adequate?
- Are pipeline cleaning procedures available/adequate?
- Are tank cleaning/pipeline operations recorded in a rough log?
- Are tanks/pipelines inspected by a surveyor prior to loading and a certificate of cleanliness issued?
- Are details of cleaning procedures properly logged?
- Are pipeline diagrams understood?
- Is correct valve separation in place (double checked)?
- Is there a designated person to confirm pipelines correctly set up?

## **Tank coating condition (if applicable)**

- Are they in good condition?
- Are they inspected regularly?
- Are inspections logged and any breakdown of coatings reported?

## **Weather deck openings**

- Are cargo tank lids, DPV (deck pressure vessel [LPG]), all vents (including but not limited to PV valves, safety relief valves, IG lines, secondary vents and vapour return systems) and openings under a 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 fit for present cargo carriage (pressure seals, chemical resistance, oil tight seals, gas tight seals)?
- Are there written records of inspections?

## **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 tanks inspected prior to load by shore surveyor and competent officer?
- Are certificates of cleanliness and approval for cargo load issued?
- 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, oil tanks, holding tanks 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 clean and fully inerted as required by custom of the trade
- 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 sampling**

- Does the company have standard procedures for sampling?
- Are first foot samples always taken?
- Are cargo samples taken by trained competent persons familiar with cargo properties in presence of ship's crew?
- Are ship's staff familiar with correct sampling procedures for the cargo and trained in the sampling of the cargo to avoid contamination?
- Is ship's/surveyors sampling equipment approved and fit for purpose?
- Are sampling ports and devices in good condition and under a PMS?
- Do all persons engaged in sampling procedures observe safety regulations for cargo being sampled?
- Are samples correctly sealed, labelled and safely stored out of sunlight?
- Are clean/new sample containers used for all samples?
- Suggest samples be retained for 12 months (claims can be presented in this time under normal bills of lading)

## **Cargo segregation procedures**

- Are there procedures in place and are they complied with?
- Pipeline/valve separation/blanking, etc
- Vapour lines transfer segregation (valves locked/lines blanked as required)
- Proper bulkhead segregation for chemicals and edible oils, etc

## **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)?
- Tank suitability for cargo/cleanliness?

## **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 heating or cooling systems suitable for the cargo?
- Vessel will remain within stability and stress limits?

- Cargo segregation is suitable for the cargo to be carried (valve and blank segregation/cooling or heating segregation/ventilation segregation)?
- Cargo pumping arrangements are suited to the cargo without cross contamination possible on discharge?
- Are ship's staff familiar with the cargo carriage?
- Have ship's staff had training with the type of cargo?
- Is the ship's manning level sufficient for the trade/cargo carried?

## SCORE

### Threat: Contamination

Cargo loading/discharge supervision	
Weather routeing	
Pre-loading tank and pipeline preparation/checks	
Tank coating condition (if applicable)	
Weather deck openings	
Equipment condition	
Ship's structure and fittings intact	
Cargo sampling	
Cargo segregation procedures	
Cargo survey	
Ship suitable	

### COMMENTS

# THREAT: SHORTAGE

## CONTROLS:

### Cargo calculations – bulk liquids

- Correct cargo data used in all calculations?
- Cargo tank readings taken by trained competent persons familiar with cargo type?
- Correct API Tables agreed between parties (API – American Petroleum Institute)?
- Ullaging done using calibrated gauging equipment, approved for the vessel?
- Cargo calculations completed by competent ship's staff and surveyors (if possible both owners and charterers)?
- Cargo measuring devices working correctly under a PMS and approved for cargo measuring?
- Written records of all tank soundings and calculations?
- Ship retains a copy of shore calculations?
- Notes of protest issued if ship/shore calculations exceed parameters?

### Cargo security and containment

- Ship's security complies with ISPS?
- Pipelines and fixtures and fittings in good condition (PMS system)?
- No leaking pipe lines/valves or illegal tapping of cargo?
- Cargo containment areas in good condition – no inter-tank leakage on board?

### Cargo tank stripping procedures

- Large effective trim when stripping tanks
- Effective tank soundings
- Aft sounding points used when stripping
- Puddling (manual removal) for edible oil remains
- Sludge build-up (crude oil washing)
- Crude oil wash (COW) dipping points utilised
- Effective cargo heating as per custom of the trade

### 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 of dockmen?
- Are names/responsibilities of shore people known/logged?



- Is there a procedure in place for bad weather, thunderstorms/wind?
- What procedures are in place for clausuring 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?
- Has allowance for vapour contamination been taken into consideration?

## **Ship/shore experience factor**

- Is there a listed ship/shore experience factor for the vessel?
- When assessing B/L quantity and necessity to issue LOP is the experience factor taken into account?
- What is discrepancy allowance is it within C/P or trade limits – norm for crude 0.5%?
- What procedures are in place if discrepancy too large?

## **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 heating or cooling systems suitable for the cargo?
- Vessel will remain within stability and stress limits?
- Cargo segregation is suitable for the cargo to be carried (valve and blank segregation/cooling or heating segregation/ventilation segregation)?
- Cargo pumping arrangements are suited to the cargo without cross contamination possible on discharge?
- 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/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)?
- Tank suitability for cargo/cleanliness?

**SCORE**

**Threat: Shortage**

Cargo calculations – bulk liquid	
Cargo security and containment	
Cargo tank stripping procedures	
Cargo loading/discharge supervision	
Ship/shore experience factor	
Ship suitable	
Cargo survey	

**COMMENTS**

# THREAT: PRE-SHIPMENT QUALITY

## CONTROLS:

### 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?
- 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?
- Ship to be advised of any IMO category, if applicable, or special needs
- 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 and fully understood?
- Contact details of shipper and consignee received and understood?
- Cargo to be delivered to the ship in good order/condition/quality
- Are samples received and safely stored away from sunlight?
- Sample containers must be sealed and clearly marked as to ship's name and contents
- MSDS (marine safety data sheets) to be supplied to the vessel for all grades to be carried

### 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 communication 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, wind?
- What procedures are in place for clausuring mate's 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?
- Have precautions been taken to prevent vapour contamination?

## **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)?
- Tank suitability for cargo/cleanliness?

## **Cargo sampling**

- Does the company have standard procedures for sampling?
- Are first foot samples always taken?
- Are cargo samples taken by trained competent persons familiar with cargo properties in presence of ship's crew?
- Are ship's staff familiar with correct sampling procedures for the cargo and trained in the sampling of the cargo to avoid contamination and personal injury?
- Is ship's/surveyors sampling equipment approved and fit for purpose?
- Are sampling ports and devices in good condition and under a PMS?
- Do all persons engaged in sampling procedures observe safety regulations for cargo being sampled?
- Are samples correctly sealed, labelled and safely stored out of sunlight?
- Are clean/new sample containers used for all samples?
- Samples retained for 12 months (claims can be presented in this time under normal bills of lading)

**SCORE**

**Threat: Pre-shipment quality**

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

**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 emergency 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?

### Monitoring of temperature during load/ carriage/discharge

- During the 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/position 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 tank void space areas inerted as required by the trade and continuously monitored for any breaches?
- 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 instructions/temperature
- Instructions are not beyond ship's staff or machinery capabilities
- Documentation to clearly state any special carriage requirements
- Ship to be advised of any IMO category, if applicable or special needs
- 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 in good order/condition/quality and at correct temperature
- Are samples received and safely stored away from sunlight?
- Sample containers must be sealed and clearly marked as to ship's name and contents
- MSDS (marine safety data sheets) supplied to the vessel for all grades to be carried

## **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, other equipment prior to commencing operations
- Cargo
  - All tank/hatch covers, and all openings under a PMS system regularly inspected by ship's staff and class?
  - Sufficient spares on board to maintain hatches either weather, oil, chemical, or gas tight as applicable?
  - All closing devices in good order on all openings (includes cleats, dogs, etc)?

- 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)?
- No corrosion of trunk, no rust stains in hold/tank?
- Tanktop/ballast tank plating – mechanical damage, corrosion, inserts, wastage?
- Tank inspections for all tanks (cargo and ballast) – coating condition regularly inspected 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?
- Sampling devices are safe and in good order?
- 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 heating or cooling systems suitable for the cargo?
- Vessel will remain within stability and stress limits?
- Cargo segregation is suitable for the cargo to be carried (valve and blank segregation/cooling or heating segregation/ventilation segregation)?
- Cargo pumping arrangements are suited to the cargo without cross contamination possible on discharge?
- 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)?
- Tank suitability for cargo/cleanliness?

## SCORE

### Threat: Temperature

Machinery and temperature monitoring	
Temperature monitoring – loading/carriage/discharge	
Stowage position fit for purpose	
Cargo declaration procedures/carriage instructions	
Inspection and planned maintenance	
Inspection and planned maintenance	
Ship suitable	
Cargo survey	

## COMMENTS

# THREAT: EQUIPMENT OPERATIONAL FAILURE

## CONTROLS:

### Inspection and planned maintenance (cargo equipment)

- Is all machinery 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?

## SCORE

### Threat: Equipment operational failure

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Inspection and planned maintenance (cargo equip)	
Operational procedures	

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## 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 loading/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	
Bilge/Ballasting systems/procedures	
Cargo loading/discharge supervision	

## COMMENTS

# **THREAT: FIRE AND 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 checklist 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**

- Has the cargo plan taken into account possible chemical reactions between cargoes to be carried?
- Are required segregations of grades in place?
- 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?
- Ship to be advised of any IMO category, if applicable, or special needs
- 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 and fully understood?
- Contact details of shipper and consignee received and fully understood?
- Cargo to be delivered to the ship in good order/condition/quality
- MSDS (marine safety data sheets) sheets supplied to vessel for all grades to be carried
- Are portable gas detectors in use as required and maintained/calibrated?

## 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?

## 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?

## Inert gas systems

- PMS in place?
- Is gas quality monitoring system working effectively?
- Is deck seal effective?
- Are all alarms operational?
- Are tank pressures and oxygen levels automatically monitored and recorded?
- Are tank pressures and oxygen levels also monitored by portable instruments and/or manual methods?

## SCORE

### Threat: Fire and explosion damage

Hot work outside ER	
Regular inspection (fire rounds)	
Stowage position procedures	
Pre-shipment declaration control	
Gas detection system	
Fire detection system in place	
Inert gas systems	

## COMMENTS

# THREAT: PRE-LOADING/ DISCHARGE PLANNING

## CONTROLS:

### 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?
- 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?
- Ship to be advised of any IMO category, if applicable, or special needs
- 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
- Cargo to be delivered to the ship in good order/condition/quality

### 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 heating or cooling systems suitable for the cargo?
- Vessel will remain within stability and stress limits?
- Cargo segregation is suitable for the cargo to be carried (valve and blank segregation/cooling or heating segregation/ventilation segregation)?
- Cargo pumping arrangements are suited to the cargo without cross contamination possible on discharge?

- 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 loading/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 any tanks, pipes and valves have any changes with proper? 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 loading/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 to do so, 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, minor and major accidents should occur)

## **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)?
- Tank suitability for cargo/cleanliness?

## **Documentation control during loading**

Correct documentation presented to load the cargo:

- Mate's receipts
- MSDS (marine safety data sheets) for dangerous goods
- Quality certificates
- Samples receipts
- 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 tank cleaning procedures available/adequate?
- Are pipeline cleaning procedures available/adequate?
- Are tanks/pipelines inspected by a surveyor prior to loading and a certificate of cleanliness issued?
- 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 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 dockmen?
- 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?
- Has allowance for vapour contamination been taken into consideration?

## SCORE

### Threat: Pre-loading/Discharge planning

Cargo declaration procedures/carriage instructions	
Ship suitable	
Stability/Stress calculations	
Bilge/Ballasting systems/procedures	
Trade competency of personnel	
Continuous on board training	
Toolbox talks	
Cargo survey	
Documentation control during loading	
Documentation control during discharge	
Pre-loading tank and pipeline preparation/checks	
Cargo loading/discharge supervision	

## COMMENTS

# Consequences

## CONTROLS:

### Damage mitigation procedures

- What procedures are in place to help reduce the effects of a personal injury incident and how effective are they?
- Have all possible measures been taken and recorded to limit physical damage to crew/passengers in every possible way, as appropriate to the trade and type of the vessel?
- 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, where fitted, 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
- 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
  - Fire plans, external and internal

- Ventilation plans
- Damage control plans
- 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 notarised, 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.)
- 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
- 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

## **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))
- 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
- Stability advice:
  - Collision – classification society
- 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 enhance safety culture
- Full risk assessment undertaken to improve barriers/controls in on board checklists
- 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?



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