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Inspections on Board Oil Tankers: Present Situation and Suggestion for Improvement

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ABSTRACT

Oil tanker inspections have an important role in enhancing safety and minimizing the risk of oil pollution. However, research has indicated that inspection items are overlapping among inspection regimes observed in a given time span on board oil tankers, thus making negative impact on ship safety, unnecessarily consuming shipboard human resources and having adverse economic effects. In this paper, current inspections performed on board oil tankers have been presented, including duration, intensity and average costs, directly or indirectly paid by shipowners. Our analysis of surveyed components by all regimes has showed that it is possible to reduce critical inspection parameters without compromising safety by introducing a unified inspection method. A content of such inspection, consisting of 529 components, has been presented. Performing the proposed inspection method and sharing its results among interested parties of oil tanker safety regime has been suggested as a measure that could improve oil tanker safety and pollution prevention.

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1 Introduction

A huge potential to pollute the marine environment as a result of accidents has been a cause of *continuous concern* for oil tanker safety and pollution prevention. A series of oil tanker accidents set in motion the chain of events that led to the adoption of relevant requirements included in national and international regulations [1]. However, due to a wide range of willingness and capacities to enforce safety standards by different flag states, a certain percent of the world fleet is regarded substandard and pose a significant risk to humans and environment [2]. Therefore the Port state control emerged, to eliminate substandard shipping and increase safety [3]. In addition to flag and port state control, there are also industry inspections.

The goal of all inspections is to increase environmental performance and safety. However, various stakeholders do not recognize inspections performed by others, which leaves the vessels with a high number of inspections [4]. For example, even inspections performed by PSC officers from port states belonging to another Memorandum of

Understanding (MoU) are not considered as sufficient and vessels are inspected repeatedly. Such over-inspection of oil tankers can have negative effects [5].

The aim of this study is to present the current safety regime for oil tankers and propose the content of unified inspection regime, which could contribute to the improvement of safety and pollution prevention.

The paper is organised as follows. Section 2 provides a review of current inspections performed on board oil tankers. In Section 3 a proposal of the content of unified inspection is presented. Concluding comments are gathered in the final section.

2 Analyses of Inspection Regimes

Oil tankers are exposed to numerous mandatory or non-mandatory inspections, surveys and audits by different external and internal sources: port and flag states, recognised organisations, insurance companies, cargo owners and shipowners. In this paper, 13 inspections by Port state control (PSC), Flag state control (FSC), Annual class sur-

vey, Insurance survey, Vetting inspections, International Ship and Port Facility Security Code (ISPS) external and internal audits, International Safety Management Code (ISM) external and internal audits, Maritime Labour Convention (MLC) external and internal audits, and Green Award survey have been described briefly. A panel of 10 experts (inspectors, seafarers and oil majors' representatives) has been consulted regarding estimated inspection durations and costs that are not publicly available.

Port state control visit on board an oil tanker usually lasts about 5 hours. The review has been performed according to the PSC manual, issued by Paris MoU [6] and accepted by all other MoUs. It has been used on board all ship types and contains 246 items related to oil tankers. Depending on the ship risk category, it is the most commonly one performed twice a year.

Flag state control system is set up by each flag state and therefore there is no universal handbook. In this paper, the content of St. Kitts & Nevis International Ship Registry form [7] has been analysed. The handbook comprises 181 items related to oil tankers, some in the first part, valid for all ship types and some in the second part, related to oil tankers only. This mandatory inspection is usually performed once a year and lasts on an average of 8 hours.

Annual class surveys are performed by the recognized organizations, according to relevant rules. In this paper, we have analysed items applicable for the fleet in service. As an example, the Rules for technical supervision of seagoing ships used by the Croatian Register of Shipping have been analysed [8]. They contain 101 items relevant to oil tankers. Non-mandatory inspections are carried out once a year. They require more than 10 hours, and, therefore, inspectors have to spend 2 days on board.

A mandatory ISM Code audit is performed according to the rules prescribed by the flag state. Most flag states authorise classification societies, whose inspectors carry out examinations in accordance with handbooks. The Rules issued by the Croatian Register of Ships for ships flying the flag of the Republic of Croatia have been used for comparison [9]. The handbooks are universal for all ship types. They contain 30 items thematically related to the ISM Code. Oil tankers are inspected once every 2.5 year, usually for 6 hours.

Internal ISM audit is performed by company's representatives or external experts. A tool for audits is created by the company. Problems related to an efficient implementation of safety management systems are usually in focus. For the purpose of this research, a checklist worked out by Tankerska plovidba [10] has been used. Inspectors examine 60 items, usually once a year, during 4 hours on average. The reported deficiencies are analysed and measures for improvement are subsequently proposed.

The Ship Security audit is conducted in accordance with the rules prescribed by the flag states. Mandatory inspections could also be performed by inspectors appointed by recognised organisations. A handbook issued by the Croatian Register of Ships for ships flying the flag of the

Republic of Croatia [11] has been analysed. The handbook is universal for all ship types. It consists of 13 items thematically related to the ISPS Code. Oil tankers are inspected once every 2.5 year, usually for 6 hours.

Internal ISPS audit is designed and planned by the company and emphasis is put on problematic areas related to the system implementation. It is executed by the company's representatives or external experts. A handbook used in this research, worked out by Tankerska plovidba [10], lists 18 items. Audits take place once a year usually and take on average of 4 hours. Similarly to ISM audit, reports are used as a starting point for designing improvement measures.

Insurance surveys are performed by inspectors appointed by Protecting and Indemnity Clubs (P&I). They use their own instructions and report templates which contain parts applicable to all ship types and ship type-specific parts. The London P&I forms have been analysed [12]. They contain 292 items relevant to oil tankers. Yearly frequency for this inspection is one and it usually lasts 8 hours. The results of the inspection affect the annual insurance premium, not only for the inspected tanker, but also for all other ships owned by the same shipowner.

Vessel inspection questionnaire worked out by the Oil Companies International Marine Forum (OCIMF) as a part of the Ship Inspection Report (SIRE) Programme [13] has been analysed in this paper to assess vetting inspections for oil tankers. The relevant part of the 2015 Vessel inspection questionnaire comprises 282 items. The inspectors appointed by OCIMF spend about 10 hours on board, usually twice a year.

An internal audit performed by technical inspectors as a part of the safety management system is usually performed once a year and lasts on an average of 8 hours. Inspectors appointed by the shipowners (in our research it is Tankerska plovidba [10]) check 78 items categorised in three sections: navigation and bridge procedures, deck department and engine department. An inspection report is a starting point for corrective and preventive actions plan.

Another industry inspection originates from Green Award Foundation [14]. As a part of certification procedure, a survey of the oil tanker takes place once a year. The Ship Certification Regulations and Requirements relevant for oil tankers contain 159 items and it usually takes 8 hours for inspectors to check them.

MLC audit is carried out in accordance with rules the prescribed by the flag states. The mandatory on board inspections could also be performed by inspectors appointed by recognised organisations. A handbook issued by the Croatian Register of Ships for ships flying the flag of the Republic of Croatia [11] has been analysed. The handbook is universal for all ship types. It contains 25 items thematically related to requirements of the Maritime Labour Convention, 2006. MLC audit takes place once every 2.5 year, and lasts usually 6 hours.

Internal MLC audit is performed by inspectors appointed by shipowners. A handbook for auditors is designed by

ship companies. Audit focuses on those requirements of the Maritime Labour Convention, 2006 which are assessed as inadequately implemented. In this research, a tool for carrying out internal audits designed by Pacific Marine Services has been used [15]. It takes 4 hours, usually once a year, to check the proposed 20 items.

3 Suggestion for Improvement

From the analysis presented in this paper and the results obtained in the previous research [16], it can be concluded that there is a need and possibility to improve safety regime for oil tankers. Apart from the extensive annual inspection duration, the intensity and time of execution, usually in ports during intensive activity analysed in our previous research [16], there is another aspect that should be taken into account. Costs of numerous inspections are paid by shipowners and contribute to a significant level of expenditures to comply with maritime regulations [17]. Costs of these inspections, obtained from experts or found on websites are given in Table 1.

Table 1 Annual Cost of Inspections

	Inspection	Annual Cost (\$)
1.	Port state control inspection	1100
2.	Flag state control inspection	1200
3.	Annual class survey	11000
4.	ISM Code audit	600
5.	ISPS Code audit	600
6.	Insurance survey	600
7.	Vetting inspection	5000
8.	Internal audit	1500
9.	Green Award inspection	5000
10.	MLC audit	600
11.	Internal MLC audit	500
12.	Internal ISM Code audit	500
13.	Internal ISPS Code audit	500
Total 33600		

Furthermore, a detailed analysis of the surveyed components of all regimes has shown that a significant number of components (69%) are examined by all regimes [16]. Moreover, results of the previous research indicated that such overlapping and inspection durations and intensity can cause unnecessary psychophysical strain of the crew [16]. Therefore, a unified tanker survey is proposed, which has a potential to reduce costs, duration and intensity of inspections without compromising safety.

Components of a unified method are given in Appendix 1. This components should be checked by inspectors appointed by recognised organisations, based on similar criteria and after standardized training. Therefore, one of the main problem observed regarding inspection, the lack of harmonisation [18] could be also diminished.

Unfortunately, this goal may be hard to achieve. However, as suggested previously [2, 4], sharing of information between inspection sources could enhance effectiveness of inspections and contribute to safety. A need to increase transparency by providing safety related information on board ships has been recognised by the European Commission and the French Maritime Administration, which worked out an information system which collates the existing safety-related information on board ships, Equasis [19]. Data providers have been PSC regimes, classification societies, P&I clubs and insurance companies, intergovernmental organisations, federations and national/EU agencies and private companies or associations from the maritime industry [19]. However, only data for inspections performed by participating MoU are available. We believe that expanding the existing data with the results of all inspections for the proposed 529 components could contribute to the efficiency of inspections. In that case, results from the previous inspections could be used at least as a starting point, and particular inspection by certain stakeholder could check only the remaining component or those evaluated as extremely important for their purposes.

4 Conclusion

Oil tankers are exposed to a wide range of inspections by various stakeholders. Although inspections are performed with the same goal, ensuring ship and seafarers' safety and environmentally friendly oil tanker operations, they are not recognised by other subjects in industry. This research has clearly shown that many inspection items are surveyed more than once in an observed time span by different inspection regimes, therefore making no sense, safety/economically/human-resource-wise. Therefore, they can defeat the purpose of executing them.

Our research has shown that it is possible to work out a unified inspection method with 529 components to be examined during inspection. A suggestion has been made that the results of such inspection should be made available to all the interested parties. This could be done by providing them through publicly available databases such as Equasis.

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Appendix 1 Components of the Unified Inspection Method

SHIP CERTIFICATES	
1	Cargo ship safety equipment (form e)
2	Cargo ship safety construction
3	Cargo ship safety radio
4	Document of compliance-doc
5	Safety management certificate-SMS
6	Load lines
7	Minimum safe manning document
8	International oil pollution prevention
9	International sewage pollution prevention certificate
10	International ship security certificate
11	Continuous synopsis record
12	International air poll. prevention certificate
13	Engine international air pollution prevention certificate.
14	Tonnage certificate
15	Civil liability for oil/engine pollution damage certificate
16	Ballast water management certificate
17	International energy efficiency certificate
18	Maritime labour certificate-MLC/DMLC
19	Certificate of registry
20	Certificates for mooring ropes and wires
21	Certificates of incinerator
CREW CERTIFICATES	
1	Certificate for masters and officers
2	Certificate for radio personnel
3	Certificate for personnel on board tankers
4	Certificate on personnel on fast rescue boats
5	Certificate for advanced fire-fighting
6	Certificate for medical first aid
7	Cert. for personnel on sur. craft & res. boat
8	Certificate for medical care
9	Ship security officer certificate
10	Training and qualification MLC
11	Seafarer employment agreement sea
12	Record of employment
13	Security awareness training
14	Familiar with fixed and other firefighting equip.
15	Officers familiar with changeover proc.
16	Master attended ship handling course
17	Bridge team/resource course
18	Medical certificate
LIFESAVING APPLIANCES	
1	Lifeboats, launching mechanism
2	Muster station
3	Lifeboat davits /procedures
4	Rescue boats
5	Rescue boats inventory and monthly waterborne
6	Life rafts and hydrostatic release
7	Lifeboat/life rafts instructions displayed
8	Life-saving appliances marked with IMO symbols
9	Helicopter landing or winching area is provided
10	Lifebuoy, lights, buoyant lines
11	Lifejackets
12	Immersion suits or thermal protective
13	Are pyrotechnics, including line throwing appar.

FIRE SAFETY	
1	Inert gas system
2	Fire doors
3	Firemen's outfits and breathing apparatus
4	Air cylinder compressor
5	Emergency escape breathing devices (EEBD)
6	Fire pump, hydrant, hoses and nozzles
7	Emergency fire pump
8	Foam pump, hydrants, isolation valves
9	International shore connection
10	Fire station are completed
11	Fire extinguishers, spare charges
12	Machinery space fire alarm/detection system
13	Accommodation fire alarm/detection
14	Fixed foam system, quantity of foam, storage tank
15	Fixed firefighting system for engine room
16	Ventilation
17	Compressor for firefighting BA sets in good order
18	Fixed fire extinguishing in cargo space
19	Watertight doors
20	Escape openings unobstructed
21	Emergency generator
22	Fire dampers/flaps
23	Emergency stops of general service pumps
24	Emergency stops of steering gear pumps
25	Emergency stops of fans
26	Fire detectors and alarms
27	Personal protective equipment
NAVIGATION	
1	Logbook correctly completed
2	Passage planning, Berth to berth
3	Position is fixed at frequent intervals
4	Navigation warnings
5	Pilot ladders/Pilot transfer arrangements
6	Navigational equipment type approval
7	Radar
8	Gyro compass
9	Magnetic compass
10	ARPA
11	Lights, shapes, sound signals
12	Signalling lamp
13	Charts
14	ECDIS
15	AIS
16	VDR
17	Echo sounder
18	Speed and distance indicator
19	Rudder angle indicator
20	Revolution counter
21	Variable pitch indicator
22	Rate-off turn indicator
23	Life-saving signals poster
24	Inert gas alarm
25	UMS-alarm
26	Boiler-alarm

27	Telephone available and working
28	Battery room
29	Well/Automatic Pilot
30	Navigation bridge visibility
31	Machinery controls alarm
32	Communication and alarm
33	Bridge operation
34	LRIT Long range identification
35	BNWAS Bridge navigation alarm system
36	HSC operation
37	GMDSS/Instruction posted
38	Engine room telegraph
39	Radio navigational system
40	VHF/DSC
41	SART
42	GPS
43	MF/HF
44	Two-way radio communication
45	INMARSAT
46	NAVTEX
47	EPIRB
48	Ship security alert system
49	Squat
50	UKC
51	Whistle, bell and gong
52	Pilot card
53	General alarm
54	Fire alarm
55	Steering gear alarm
56	Engineer's alarm
SHIPS PROCEDURES	
1	Company Standing Orders
2	Emergency steering gear change-over proc.
3	Are bunkering and oil transfer procedures
4	Control change from residual to low-sulphur fuels
5	Safe cargo operation policy statements
6	Proc. for the handling of heavy weather ball.
7	Proc. for restoring stability in case of emergency
8	COW manual
9	Sewage treatment plan
10	Anti-fouling procedures
11	SMS Manual/ crew language
12	Designated person a shore
13	Master overriding authority
14	Crew familiar with company policy
15	Non conformities procedure
16	PSC inspection recorded
17	Accident/Incident/near misses
18	Master review SMS
19	Planned maintenance system
20	Safety committee meetings/inform company
21	Safety bulletins on board
22	Risk Assessment
23	Annually operator visit vessels
24	Company policy

25	Familiarisation for new personnel
26	Enclosed space entry procedures
27	SOLAS training manual
28	Master standing orders
29	Inspection rounds after watch
30	Master instruction clearly identified
31	Fire control plan
32	Booklet for loading/unloading
33	SOPEP
34	P&I manual
35	SMPEP Emergency plan
36	Fire safety operational booklet
37	Stability information booklet
38	Ship energy efficiency design index
39	Ship energy efficiency management
40	Procedures for complaint under MLC,2006
41	Garbage management plan
42	Muster list
43	Damage control plan
44	Dangerous goods list
45	Cargo handling procedures
46	Contingency plan
47	ISPS- Ship Security plan
48	Cargo security manual
49	Emergency towing booklet
50	Ballast water management plan
51	Safety management manuals
52	Inspection procedures for mooring equipment
53	Life-saving equipment training manuals
54	Vessel response plan
55	Chief Engineer's Standing Orders
BRIDGE PUBLICATION	
1	SOLAS
2	IMO-Port state procedures
3	Radio aids to navigation
4	List of coast station
5	ISGOTT
6	IGC CODE
7	IMO- Routing schemes
8	Nautical publication
9	Nautical Almanac
10	Tide tables
11	Navigation tables
12	MARPOL
13	COLREG
14	International code of signals
15	IAMSAR
16	ISPS CODE
17	IMDG CODE
18	List of ship station
19	IMO STCW
20	List of radio station
21	Maritime mobile satellite station
22	International medical guide
23	Bridge procedures guide

24	ISM CODE
25	Load line regulation
26	Clean seas guide for oil tanker
27	Code of safe working practice
28	STS transfer guide
29	SMCP communication phrases
30	OCIMF mooring equipment guidelines
32	Contact Addresses of responsible national authorities
SHIP'S RECORDS	
1	Auto to manual steering record
2	Operational with VDR
3	Record of echo sounder
4	GMDSS maintenance record book
5	GMDSS radio log book
6	Bridge bell book
7	Radar maintenance book
8	Temporary and Preliminary properly recorded
9	Deviation card
10	Compass errors frequently recorded
11	Manoeuvring information is recorded
12	Daily reports sent to company
13	Safety net messages recorded
14	Radar log book
15	Chronometer rate book
16	Notices to mariners
17	Compass correction log
18	Navigation records
19	Cargo gear record book
20	Unattended machinery evidence
21	Work and rest hours
22	Survey report file
23	Thickness measurement report
24	Oil record book 1
25	Cargo information
26	Cargo record book
27	Garbage record book
28	Conformance test report
29	Material safety data sheets
30	Report of inspection on MLC, 2006
31	AIS test report
32	STS plan and records
33	VDR-test records
34	Launching of the lifeboats record
35	Life-saving appliances recorded in log book
36	Fire drills records
37	Abandon ship drill records
38	Drafts and soundings record
39	Accidents
40	Arrivals and departures check list
41	Operational with watertight doors
42	Oil spill drill
43	Lookout on duty
44	Helmsman on duty
45	Emergency steering drills
46	Inspection of LSA

47	Security exercises
48	Security drills
49	Medical log
50	Firefighting system inspected record
51	Records of on board inspections of tanks
52	Records to show the loading computer is tested
53	Engine room bell book
54	Engine room log book
55	Oil record book 2
56	Maintenance records main & auxiliary engine
57	Record of dry-dock
58	Record of food inspection
59	Stability calculated during critical period
60	Bilge alarm tested and recorded
61	Tank soundings regularly recorded
62	Enclosed spaces entry permits
63	Hot work permits
64	Drug & alcohol testing
65	Officer familiar with calibration measuring instr.
66	Sampling ballast water records
67	Dead man alarm
68	Steering gear test
69	Security Log Book
70	Security level last 10 ports
71	Contact number update
72	Visitors log book
73	Monthly training/drill plan
74	Security muster list
MOORING/ANCHORING	
1	Wires, ropes, synthetic tails
2	Mooring equipment marked with SWL
3	Windlasses and winch
4	Brake linings, drums, pins
5	Hydraulically system free for leaks
6	Rollers, fairleads and bollards
7	Ropes turned up on barrels
8	Visible portions of anchor cable
9	One layer tension side on drum
10	Mooring tails fitted to wires
11	Mooring satisfactory deployed and tended
12	Emergency towing available
13	SPM equipment
14	Cain locker doors securing
15	Bitter end
16	Anchor ready for use in port limit
17	Anchor equipment
18	Equipment properly greased
19	Snap beck zone
20	Non slip paint
21	Effective hazard marking employed
22	Anchor chain pipes
23	Rat guards
STRUCTURAL CONDITION-HULL AND DECK	
1	Condition of shell plating and coatings
2	Condition of the deck plating and coatings

3	Bow and stern doors plus any alarms
4	Side shell doors
5	Guardrails and bulwarks
6	Hull markings legible
7	Vents and air pipes on deck
8	Closing devices efficient on vents and air pipes
9	Sounding pipes
10	Pilot ladder
11	Weather tight doors and stores hatches
12	Walkways, stairways, catwalks, ladders
13	Voids, cofferdams and pipe tunnels
14	Accommodation ladder
15	Wheelhouse door, window
16	Escape routes
17	Cargo tanks structural integrity
18	Cargo tanks corrosion condition/protection
19	Deck lighting
20	Deck water seal
21	Restricted areas clearly marked
22	Deck house
23	Forecastle compartment
24	Pollution locker
STRUCTURAL CONDITION-BALLAST AND VOID SPACES	
1	These tanks and spaces maintenance
2	Ballast tank corrosion protection
3	Pipeline, couplings, flanges, branches
4	Tanks inspected free from mud and debris
5	Tanks and void spaces free from wastage
6	Corrosion protection void spaces
7	Structure free from buckling, fracture, doublers
8	Manhole covers
9	Tanks free from any sign of oil contamination
10	Pipe work passing through tanks
11	Internal ladders
12	Ballast pipelines and valves
HEALTH AND HYGIENE	
1	Accommodation well lit, clean and habitable
2	Ventilation, heating and air conditioning
3	Sanitary facilities adequate
4	Food storage facilities in good condition
5	Provision rooms maintained
6	Cold store alarms work
7	Galley and food areas clean, tidy
8	Galley extractors and grease traps clean
9	Safety notices posted throughout
10	Hospital and bathroom clean and tidy
11	Medical locker well stocked against a Flag State
12	Valid medical chest certificate provided
13	Medical oxygen provided
14	First aid kits available at key locations
15	Potable water is maintained in a safe condition
16	Lighting, pipes
17	Mess room, Laundry
18	Water, pipes, tanks
19	Cold room

20	Electric in accommodation
21	Sleeping rooms
22	Recreation facilities
MACHINERY SPACE OPERATIONS	
1	Status of the PMS up to date for the machinery
2	Portable measuring instruments/calibration
3	Fixed measuring instruments
4	Machinery spaces well lit, clean, tidy
5	Main engine free from oil and water leaks
6	Machinery exhaust gas manifold and trunking
7	Necessary machinery spare parts available
8	Machinery spare parts properly stowed
9	Machinery HP pipes double walled
10	Machinery monitoring and control systems
11	Main engine operating satisfactorily
12	Boilers, exhaust gas economisers
13	Boilers, piping and valves free from leakage
14	Boiler safety devices in satisfactory operable
15	Auxiliary engines free from oil and water leaks
16	Auxiliary engines operating satisfactorily
17	Self-closing devices on E.R. sounding pipes
18	Bilge and ballast pumps in operable condition
19	Bilge and ballast pumps free from leakages
20	F.O., L.O. pipes and flanges adequately check
21	F.O., L.O., purifiers, heaters and coolers
22	E.R. floor plates secured in place and clean
23	Are the bilges clean
24	Bilge high level alarms operable
25	Machinery guarded where appropriate
26	Gauges, thermometers
27	Purifier rooms ventilated and clean
28	Tools and equipment
29	Oxygen and acetylene bottles correctly stored
30	E.R. pipe systems free from leaks, patches
31	Sea suction + overboard valves free from leaks
32	Self-closing devices of sight glasses
33	Main switchboard earth fault monitoring
34	Deck insulation provided
35	Lifting gear (ER crane etc.) tested
36	Ladders and guard rails
37	Machinery guards in place in the workshop
38	Emergency remote stops and fuel oil shut-offs
39	Electric equipment general
40	Equipment installed explosion-proof
41	Ventilation and lighting interlocked
42	Electrical safety barriers
43	Engine room alarms
44	Compressors
45	Evaporator
46	Purifiers
47	Air condition plant
48	Domestic refrigeration plant
49	Domestic freshwater system
50	Engine control room

CARGO WORTHINESS, TANKER	
1	Double hull construction
2	Maximum loading rates and ventilation capacity
3	Cargo pipeline, inert gas and vent system dia.
4	Segregation oil and water ballast
5	Class approved loading computer
6	Condition Assessment Scheme
7	Stability and stress calculations
8	Tank washing equipment
9	Officers aware of the dangers of free surface
10	Officers familiar with the cargo system
11	Cargo plan been prepared including a sequence
12	Cargo plan been signed by officers
13	Cargo operations recorded in a log book
14	MSDS available for the products handled
15	Emergency procedures to deal with a spillage or fire
16	Ship/Shore Safety Checklists completed
17	Cargo, ballast and stripping pumps, eductors
18	Cargo, ballast pump bearing, temperature check
19	Cargo, crude oil washing, vapour and inert gas lines
20	Cargo pump emergency shut down systems
21	Cargo and ballast system valves
22	Cargo system ullage gauges, vapour locks and UTI
23	Remote and local pressure sensors and gauges
24	Cargo tank high level alarms
25	Deck fittings in apparent
26	Cargo pipelines pressure
27	Where fitted, is the cargo tank heating system test
28	Ullaging, sampling and closed operations equip.
29	Cargo venting system including P/Vs
30	Venting system
31	SOLAS secondary venting requirement
32	Stop v/vs fitted which permit isolation
33	These v\vs provided with positive locking
34	IG system well maintained
35	IG alarms and monitoring systems
36	COW system
37	Static electricity precautions
38	Manifold arrangements
39	Pump rooms entry procedures
40	Cargo hoses in good condition
41	Cargo lifting appliances properly marked, test
42	Foam monitors operable and in good condition
43	Purging records indicate any cargo / hydraulic oil
44	Any indication of oil leaks on hydraulic pumps
45	Class survey records free from any significant defi.
46	Shipboard checks of cargo tank structures
47	ODME in use and records preserved
48	Pump room high level alarm tested regularly
49	Pump room atmospheric monitoring system
50	Pump room generally well maintained and clean

CARGO CONTROL ROOM	
1	Relevant drawings and diagrams available
2	Every pumps separate working
3	Pumps and temperature sensors readout CCR
4	Stripping pumps and temperature sensors in CCR
5	Ballast pumps and temperature sensors readout CCR
6	Cargo pumps with sensors for vibration monitoring
7	Pump control
8	Pump alarms
9	Turbine trips
10	Cargo/Ballast pump gauges
11	Communication operational/satisfactory
12	Calibration span gas
STEERING GEAR SYSTEM	
1	Steering gear been tested and found to comply
2	Steering linkage satisfactory
3	Hydraulic system free from any leaks
4	Communication system with the navigation
5	Bilge alarm
6	Access to steering gear unit unobstructed
7	Heading information displayed at the emergency
8	Compass
9	Rudder angle indicator clearly visible
10	Emergency steering/Procedures

ENVIRONMENTAL PROTECTION	
1	All sources of pollution been identified
2	Measures in place to control these sources
3	Sea valves in satisfactory condition
4	Deck scupper plugs available
5	Oil Spill Equipment available
6	ODME
7	15PPM alarm arrangements
8	Bunkering gauging system
9	Oily Water separator functioning and 15ppm
10	Overboard discharge valve secured
11	Custody and location of the key for the overboard
12	Confirm no sign of any illegal piping
13	Bunker Lines in a satisfactory condition
14	Ship have an operational incinerator
15	Garbage posters and placards displayed
16	Garbage separated and stowed properly
17	Receipts obtained for garbage landed ashore
18	Efficient stripping
19	Diesel engine air pollution control
20	Quality of fuel oil
21	Manifold spill-tank clean
22	Sewage discharge connection
23	Drop valves from spill to slop tanks
24	Bilge separator