Safe Return to Port

Instructions for the Guidance of Surveyors on the implementation of SOLAS regulations II-1/8-1, II-2/21 and II-2/22

CONTENTS

CHAPTER 1: INTRODUCTION

1. Passenger ships are being designed to carry ever larger numbers of passengers and voyages to remote areas such as the Antarctic have become more common. This raised concerns about passenger safety particularly the difficulty of safely evacuating large numbers of passengers, including the elderly and infirm, from ship to lifeboats to rescue vessels and the Search and Rescue challenge this presents. Fire also represents a vulnerability for large passenger ships. The Maritime Safety Committee (MSC) at the International Maritime Organisation (IMO) agreed that future passenger ships should be designed for improved survivability based on the principle that 'a ship is its own best lifeboat'.

2. The MSC at its 82nd session in 2006 adopted a package of amendments to SOLAS designed to improve passenger ship safety. The guiding philosophy behind the new regulations was that more emphasis should be placed on the prevention of a casualty occurring in the first place and that future passenger ships should be designed for improved survivability so that, in the event of a casualty, persons can stay safely on board as the ship proceeds to port.

3. The regulations require ships to be designed so that passengers and crew should normally be able to evacuate to a safe haven on board and stay there and be provided with amenities to maintain a habitable environment. The ship must be designed so that it has enough propulsion redundancy so that it can proceed to port under its own power at a minimum safe speed.

REGULATION

4. SOLAS regulations II-2 21, II-2 22, II-2 23 and II-1 8, collectively referred to as the 'Safe Return to Port (SRtP) Regulations' and reproduced below for convenience, were introduced which apply to passenger ships constructed on or after 1 July 2010 having a length of 120 m or more or having three or more main vertical zones:

SOLAS Chapter II-2 – Construction - fire protection, fire detection and fire extinction

Part G - Special requirements

Regulation 21 - Casualty Threshold, Safe Return to Port and Safe Areas

Application

Passenger ships constructed on or after 1 July 2010 having length, as defined in regulation II-1/2.5, of 120 m or more or having three or more main vertical zones shall comply with the provisions of this regulation.

Purpose

The purpose of this regulation is to establish design criteria for a ship's safe return to port under its own propulsion after a casualty that does not exceed the casualty threshold stipulated in paragraph 3 and also provides functional requirements and performance standards for safe areas.

Casualty threshold

The casualty threshold, in the context of a fire, includes:

1) loss of space of origin up to the nearest "A" class boundaries, which may be a part of the space of origin, if the space of origin is protected by a fixed fire extinguishing system; or
2) loss of the space of origin and adjacent spaces up to the nearest "A" class boundaries, which are not part of the space of origin.

Safe return to port

When fire damage does not exceed the casualty threshold indicated in paragraph 3, the ship shall be capable of returning to port while providing a safe area as defined in regulation 3. To be deemed capable of returning to port, the following systems shall remain operational in the remaining part of the ship not affected by fire:

1) propulsion;
2) steering systems and steering-control systems;
3) navigational systems;
4) systems for fill, transfer and service of fuel oil;
5) internal communication between the bridge, engineering spaces, safety centre, fire-fighting and damage control teams, and as required for passenger and crew notification and mustering;
6) external communication;
7) fire main system;
8) fixed fire-extinguishing systems;
9) fire and smoke detection system;
10) bilge and ballast system;
11) power-operated watertight and semi-watertight doors;
12) systems intended to support "safe areas" as indicated in paragraph 5.1.2;
13) flooding detection systems; and
14) other systems determined by the Administration to be vital to damage control efforts.

Safe area(s)

Functional requirements:

1) the safe area(s) shall generally be internal space(s); however, the use of an external space as a safe area may be allowed by the Administration taking into account any restriction due to the area of operation and relevant expected environmental conditions;
2) the safe area(s) shall provide all occupants with the following basic services* to ensure that the health of passengers and crew is maintained:
    a) sanitation
    b) water;
    c) food;
    d) alternate space for medical care;
    e) shelter from the weather;
    f) means of preventing heat stress and hypothermia;
    g) light; and
    h) ventilation;

3) ventilation design shall reduce the risk that smoke and hot gases could affect the use of the safe area(s); and

4) means of access to life-saving appliances shall be provided from each area identified or used as a safe area, taking into account that a main vertical zone may not be available for internal transit.

Alternate space for medical care

Alternate space for medical care shall conform to a standard acceptable to the Administration.

Regulation 22 - Design Criteria for Systems to Remain Operational after a Fire Casualty

Application

Passenger ships constructed on or after 1 July 2010 having length, as defined in regulation II-1/2.2, of 120 m or more or having three or more main vertical zones shall comply with the provisions of this regulation.

Purpose

The purpose of this regulation is to provide design criteria for systems required to remain operational for supporting the orderly evacuation and abandonment of a ship, if the casualty threshold, as defined in regulation 21.3, is exceeded.

Systems

1) In case any one main vertical zone is unserviceable due to fire, the following systems shall be so arranged and segregated as to remain operational:

a) fire main;

b) internal communications (in support of fire-fighting as required for passenger and

crew notification and evacuation);

c) means of external communications;

d) bilge systems for removal of fire-fighting water;

e) lighting along escape routes, at assembly stations and at embarkation stations of life-saving appliances; and

f) guidance systems for evacuation shall be available.

3) The above systems shall be capable of operation for at least 3 hours based on the assumption of no damage outside the unserviceable main vertical zone. These systems are not required to remain operational within the unserviceable main vertical zones.

4) Cabling and piping within a trunk constructed to an "A-60" standard shall be deemed to remain intact and serviceable while passing through the unserviceable main vertical zone for the purposes of paragraph 3.1. An equivalent degree of protection for cabling and piping may be approved by the Administration.

Regulation 23 - Safety Centre on Passenger Ships

Application

Passenger ships constructed on or after 1 July 2010 shall have on board a safety centre complying with the requirements of this regulation.

Purpose

The purpose of this regulation is to provide a space to assist with the management of emergency situations.

Location and arrangement

The safety centre shall either be a part of the navigation bridge or be located in a separate space adjacent to and having direct access to the navigation bridge, so that the management of emergencies can be performed without distracting watch officers from their navigational duties.

Layout and ergonomic design

The layout and ergonomic design of the safety centre shall take into account the guidelines developed by the Organization*, as appropriate.

Communications

Means of communication between the safety centre, the central control station, the navigation bridge, the engine control room, the storage room(s) for fire extinguishing system(s) and fire equipment lockers shall be provided.

Control and monitoring of safety systems

Notwithstanding the requirements set out elsewhere in the Convention, the full functionality (operation, control, monitoring or any combination thereof, as required) of the safety systems listed below shall be available from the safety centre:

a) all powered ventilation systems;

b) fire doors;

c) general emergency alarm system;

d) public address system;

e) electrically powered evacuation guidance systems;

f) watertight and semi-watertight doors;

g) indicators for shell doors, loading doors and other closing appliances;

h) water leakage of inner/outer bow doors, stern doors and any other shell door;

i) television surveillance system;

j) fire detection and alarm system;

k) fixed fire-fighting local application system(s);

l) sprinkler and equivalent systems;

m) water-based systems for machinery spaces;

n) alarm to summon the crew;

o) atrium smoke extraction system;

p) flooding detection systems; and

q) fire pumps and emergency fire pumps.

SOLAS Chapter II-1 - Construction - Structure, subdivision and stability, machinery and electrical installations
Part B-1 - Stability

Regulation 8-1 - System capabilities after a flooding casualty on passenger ships

Application

This regulation applies to passenger ships constructed on or after 1 July 2010 to which regulation II-2/21 applies.

Availability of essential systems in case of flooding damage

A passenger ship shall be designed so that the systems specified in regulation II-2/21.4 remain operational when the ship is subject to flooding of any single watertight compartment.

The IMO produced guidance on the application of these regulations in the form of MSC.1/Circ 1369 ‘Interim Explanatory Notes For The Assessment Of Passenger Ship Systems’ Capabilities After A Fire Or Flooding Casualty’ with revision MSC.1/Circ.1369/Add.1, and Unified Interpretations of SOLAS.Regulation II-2/21.4 in the form of MSC.1/Circ.1437 and these are attached at Annex 1 and 2 of this guidance.

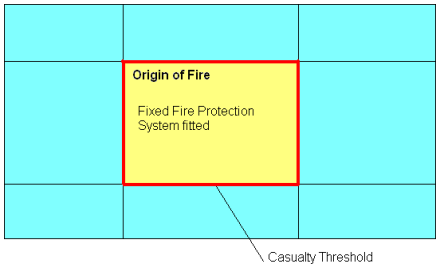
CHAPTER 2: EXPLANATION OF TERMS

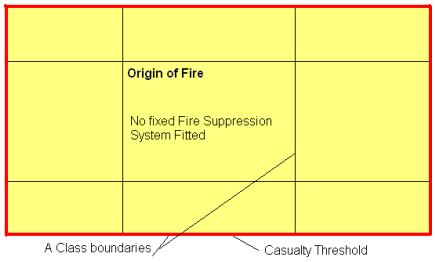
The regulations use the terms ‘casualty threshold’ and ‘essential’ and ‘critical’ systems:

1) Fire Casualty Threshold

This is the limit of fire damage a ship should be able to sustain and still be able to return to port.

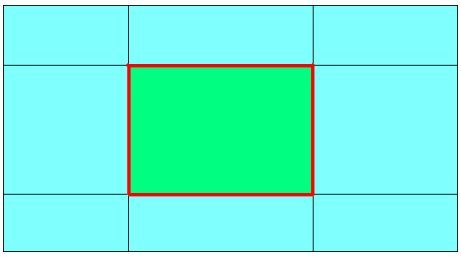
For fire in a space with a fixed fire-fighting system, this is the space of origin up to the A class boundaries. If the space is not protected then the extent is up to the next A class boundary.

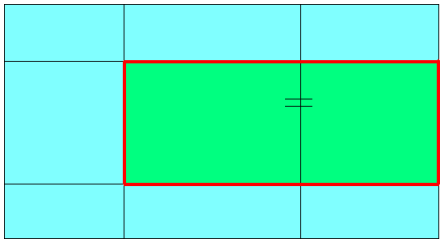




2) Flooding Casualty Threshold

A space will be lost up to the water tight boundary enclosing it, taking into account progressive flooding.





In summary SRtP ships can move to port under their own power if they sustain damage up to the casualty limit but anything exceeding that causes them to revert to the traditional ‘orderly evacuation’ mode that applies to all other ships if severe damage is experienced.

3) Essential and Critical Systems

SOLAS defines what services must remain viable for damage up to the casualty threshold. These are the essential systems. Critical systems are those essential services which require intervention by the crew to keep them operational in the event of damage. Examples would be the potable water system or the engine fuel system. In some cases, such as flooding of a machinery space, to keep these systems running these fluids are re-routed by opening and closing valves – the so-called ‘manual actions’.

An example of an essential service which is not a critical system could be the fire detection and alarm system because it is constructed with fire resistant cabling and has multiple control stations. This will continue to operate under any damage conditions because of its design.

CHAPTER 3: PLAN APPROVAL

1. Current practice is for large passenger ship newbuild projects for REG flags to be undertaken in conjunction with one of the seven REG approved Recognised Organisations and plan approval delegated to them.

2. REG Surveyors should be involved in discussions between the owner, ship yard and Class Society early in the design process to assist in interpretations of the requirements. Particular topics are likely to be interpretations of IMO MSC.1/ Circular 1369, layout of main propulsion, generators and shafting (if not pod design) and the range to refuge for the design concerned as this needs to be carefully considered at the design stage.

CHAPTER 4: DESIGN EQUIVALENCES

For reference the following ‘equivalences’ in design have been agreed by the REG in newbuild projects featuring SRtP compliant vessels. These are in addition to those referred to in MSC.1/Circular 1369, ‘Interim Explanatory Notes for the Assessment of Passenger Ship Systems’.

1) CO_2 Rooms

Compliance with Safe Return to Port demands complete duplication of systems. For the CO_2 system providing fire-extinguishing capability for machinery spaces however an acceptable equivalent to complete duplication can be allowed subject to conditions:

a) The CO_2 storage space should not contain any machinery or equipment other than CO_2 storage bottles and the equipment necessary for its discharge;
b) The CO_2 room boundary should be insulated A60;
c) The CO_2 room should be situated on the boundary of two MVZ’s with at least two doors so that it can be accessed from either MVZ;
d) The CO_2 room should be protectively located on an outside deck i.e. on a ro-ro vessel sited amidships on the uppermost deck;
e) All CO_2 delivery pipes should be routed so that they deliver gas directly to the spaces they serve and not pass through any other machinery spaces of Category A.

This is in line with Interpretation 8 of MSC.1/Circular 1369, Interim Explanatory Notes for the Assessment of Passenger Ship Systems’ Capabilities after a Fire or Flooding Casualty.

2) Drencher Systems for RoRo Vessels

For drencher systems an acceptable equivalence to complete duplication can be considered subject to the following conditions:
a) The drencher room only contains the drencher system manifold and control and indication equipment required to activate and monitor the system operation,
b) The drencher manifold is served by two pumps located in different compartments,
c) The drencher room boundary should be insulated A60,
d) The drencher room is protected with a fixed fire extinguishing system,
e) The drencher room is protectively located and has two accesses one of which is from an adjacent MVZ.

Note: to comply with SRtP, vessels will be equipped with two drencher pumps. The FSS Code Chapter 7 para 2.1.1.5 requires drencher pumps to be connected to the emergency switch board (ESB). SRtP ships will usually be fitted with two main switch boards. Better redundancy is given if one drencher pump is connected to the ESB and the other connected to one of the MSB’s.

3) Location of Watertight Doors

The increased sub-division which compliance with SRtP necessitates, can lead to

more underdeck watertight doors being fitted. For spaces where access and use of the doors is infrequent, consideration may be given to fitting the doors in a longitudinal bulkhead – as opposed to transverse bulkheads as required by SOLAS II-1 Regulation 15. An example is where a vessel is fitted with two independent rudders and actuators divided by a longitudinal bulkhead. Access through the bulkhead is required infrequently and the location makes it difficult to fit a door in a transverse direction.

4) Watertight Doors Between Machinery Spaces

Surveyors should note the following concerning underdeck watertight doors separating machinery spaces:

The machinery space design on a vessel designed for SRtP will normally incorporate main propulsion machinery and generators in compartments separated by A60 watertight bulkheads. Power operated watertight doors will usually be fitted for access.

Some SRtP scenarios will envisage the loss of one machinery space due to fire and the vessel proceeding to a safe port using the machinery in an adjacent compartment. In this case it is important that the watertight doors dividing the spaces remain gas-tight because the fire affected space will remain full of CO_2 for the duration of the voyage.

Some watertight door designs are only designed to be watertight when they have water pressure on one side of them. These designs should not be used where gas-tight segregation between machinery spaces might be required.

5) Secondary Wheelhouse

SRtP compliance will require a second ‘wheelhouse’. The regulations don’t stipulate that this secondary bridge requires windows and vessels have been built without. It is REG policy that the owner should be able to demonstrate safe navigation from the secondary wheelhouse and therefore if an arrangement without windows is proposed, then means for demonstrating navigation should be agreed with the owner.

6) AIS Systems

Note that two AIS systems will be required. The vessel cannot broadcast on both at the same time and means should be provided to isolate the main bridge AIS when it is evacuated, without having to re-enter the bridge, before the secondary bridge AIS is brought into operation.

7) Heading Information

Note also that the heading information in the steering gear compartments at the emergency steering positions should be provided from the gyro on the secondary bridge and not the main bridge.

8) Passenger Lifts

Where passenger lifts are provided for disabled passengers' access to Assembly Stations or LSA in an emergency then consideration should be given to their power source; certain scenarios may require them to be provided with power from a UPS battery system.

9) Pipes of 'substantial thickness'

Where steel pipes are used and pass through spaces affected by a fire casualty and are considered to remain operational by virtue of their 'substantial thickness' (see MSC.1/Circ.1369 Interpretation 12) then these pipes should be conspicuously marked. This is to ensure that such pipes are replaced 'like for like' should they need to be repaired or replaced.

CHAPTER 5: HABITABLE AREAS

1) When the vessel is operating in a SRtP condition passengers and crew must be provided with a safe area and habitable conditions. These are areas which provide shelter from the weather, are appropriately heated or cooled, give access to sewage and sanitation and are equipped to provide food, potable water and medical facilities.

2) Safe areas may be external spaces but before the approval of such a design consideration must be given to the possibility of passenger heat exhaustion or hypothermia.

3) The minimum requirements are detailed in MSC.1/Circ 1369 and include:

a) A minimum space of 2m^2 per person for voyages over 12 hours, 1m^2 for voyages less than 12 hours,
b) One toilet for 50 persons,
c) Three litres of potable water per person per day plus water for cooking and hygiene,
d) Food can be of any kind but must be appropriately distributed,
e) Alternative medical care facilities,
f) Ambient temperature maintained at between 10°C and 30°C,
g) Lighting equivalent to emergency lighting which may be portable rechargeable battery operated lighting provided it's provided with adequate charging capability,
h) Ventilation volume not less than 4.5 m^3 per hour per person.

Note: heating/cooling is better provided on a SRtP compliant vessel in damaged condition by adopting the use of local heating/chiller units in each space instead of the more usual centralised systems.

CHAPTER 6: SURVEY UNDER CONSTRUCTION

1) During construction it must be confirmed that the ship has been built in accordance with the approved plans and that the design features which enable the ship to comply with the requirements of SRtP have been implemented.

2) Cable and pipe routing. Cables and pipes for SRtP functions are often required to be routed to avoid certain spaces or areas. Care must be taken to ensure that cables are routed in accordance with the plans. Often shipyard cable-layers and pipefitters will realise that a more efficient routing is available to them and lay pipes and cables through spaces which mean that SRtP compliance is lost; it follows that special attention has to be paid by Class and REG Surveyors during construction of these vessels. It should be ensured that ‘substantial thickness’ pipes are the correct specification.

CHAPTER 7: TESTING PRIOR TO ENTERING SERVICE

1) SRtP compliant vessels may have several hundred individual spaces which can be shut down in the event of fire or flood by carrying out one or more ‘manual actions’ which then allows the ship to proceed to a safe port under its own propulsion. These will vary from a simple void compartment requiring few ‘manual actions’ to the isolation of one of the machinery spaces which may require many.

2) It is not necessary that all spaces be shut down on test before delivery of a new ship. All essential systems should be verified taking into account the interactions and inter-dependability of the various systems which will be involved in casualty scenarios. The following should be considered as a minimum:

a) Isolation of both machinery spaces
b) Isolation of one propulsion motor room (if fitted)
c) Isolation of one steering gear compartment
d) Isolation of one main vertical zone (MVZ)
e) Isolation of the space with the most manual actions
f) Isolation of bridge

3) Following the loss of any compartment the required SRtP functions should be achievable within one hour. During trials (sea or quayside) this should be demonstrated by taking a representative sample of SRtP scenarios which require a large number of operations and conducting a ‘touch’ drill to confirm the shipyard predicted time is achievable.

CHAPTER 8: DOCUMENTATION

1) Machinery Configuration & Operational Limitations
Machinery configuration is critical to compliance with SRtP requirements and any limitations in performance which affect compliance should be detailed in the Operational Limitations. An example is where four engines are fitted in two engine rooms and each pair of engines consists of one ‘father’ engine and one smaller ‘son’ engine. If tests at trials indicate that when a ‘father’ engine is out of commission the ‘son’ engine cannot produce enough power to supply the SRtP hotel load and drive the ship at 6kn in Beaufort 8 then the operational range of the vessel in this condition is reduced appropriately and this is recorded in the Operational Limitations.

2) Machinery Design
Compliance with SRtP requirements necessitates a more complex machinery design. Loss of a seemingly unimportant item of machinery which for a non-compliant ship has no affect on system capability may have an effect on a SRtP vessel which renders it non-compliant.

An example is the non-availability of a main bilge pump due to breakdown. In a non-compliant ship fitted with several bilge pumps connected to the bilge main this situation might not be serious. In a SRtP compliant ship where we can assume the loss of any space due to fire and flood and expect the ship to still have bilge pumping capability the loss of a single pump might mean there is no redundancy.

In order to identify these situations owners are encouraged to analyse their machinery systems and to identify critical components the loss of which will render the vessel non-compliant. Reference to a document containing this information (go/no-go document) will enable owner and the REG Administration to decide on appropriate action. If owners incorporate appropriate mitigation actions then decisions on allowing a ship to sail are better informed and more easily made. In the example above for instance mitigation could be that a spare pump casing and motor are carried and the time to fit one or both of these components is three hours.

3) Onboard Documentation System

After an incident not exceeding the casualty threshold it will be necessary to isolate a space in order for the ship to proceed. This will possibly mean many ‘manual actions’ being carried out – all of which must be completed within one hour. Ship operators are encouraged to provide a system which enables crew to access the information required and carry out these functions within the time limit. Such systems may be paper-based or electronic. The criteria for acceptance must be that they can be demonstrated to work effectively and are immediately available at all times. Electronic systems, if used, must be backed up in some way so that in a casualty situation the accessibility of the required information is assured.

4) Marking of SRtP equipment

Valves and equipment which are required to be operated in order to bring the ship into an operable condition following a fire or flooding casualty should be clearly and distinctively marked.

Consideration should be given to clearly marking the access doors to all machinery spaces with the space notation used on the paper or electronic system used to guide the crew to carry out the manual actions required after a fire or flooding casualty.

CHAPTER 9: SURVEY OF SHIPS IN SERVICE FOR ANNUAL PSSC RENEWAL

SRtP compliant vessels are complex ships but, as issuers of the PSSC, REG Administrations must ensure that these ships continue to operate as designed. It is recognised that the complexity of these arrangements makes it difficult for them to be surveyed both initially and annually in their entirety.

Prior to issue of the first PSSC the following items are required:

1) The Assessment Documentation itemised in MSC Circ 1369 Paragraph 7.4.1 must be submitted and approved by the Administration. This function may be delegated to Class. Approved copies must be carried onboard. Evidence of approval must be provided by the Administration.

2) A SRtP Operation Manual must be developed by the Operator and placed onboard, which must include a test plan (MSC Circ 1369 Paragraph 7.4.2 – 7.4.4). The test plan should cover all systems over a 5 year period.

3) The Operational Limitations Certificate must include those limits imposed by the assumptions made for SRtP.

4) The provision of stability information for the Master either onboard or shore based must be checked (Guidance in MSC Circ 1400).

At subsequent PSSC Renewal Surveys assumptions made when developing items (b) and (c) above must be verified to still hold true.

REG policy is that the equipment and systems that form the ship's SRtP capability should be verified during initial and renewal PSSC surveys.

Compliance should be demonstrated by scenario testing, confirmation of individual system capability or by equipment or component renewal or a combination of the above in a program developed by the Operator and carried out by ship's crew. The program should be agreed with the REG Administration and form part of the on-board documentation.

In practice this means that machinery and equipment are tested or replaced (main engine HT isolating valves for instance) on a continuous basis over a five-year cycle planned by the operator. Records are maintained in the ship's planned maintenance system. Surveyors should review the records for the previous year and ask for a sample of the tests to be repeated, witness tests planned during PSSC renewal, and for evidence where components have been replaced. Surveyors should be aware that some operators of SRtP ships are using ultrasonic meters which can detect fluid flow to establish whether isolation valves used in essential and critical systems remain tight.

A SRtP scenario drill should be carried out at each PSSC Renewal Survey which has a significant number of 'manual actions'. Every five years one

machinery space should be shut-down as a ‘live test’ and the functionality of the remaining machinery spaces confirmed.

Where the Administration has a separate SRtP Compliance Certificate it shall be issued to the vessel and endorsed at each Passenger Ship Safety Certificate renewal survey to record on-going compliance. Otherwise the re- issue of a full-term Passenger Ship Safety Certificate shall account for SRtP elements.

It is recognised that as the ship continues in service, it will be subject to modification and this, if not closely controlled, can have a bearing on the functionality of essential systems and the assumptions made with respect to SRtP. Surveyors should look for unauthorised modifications. Control of modifications should be examined during SMC audits.

Annexes

1. MSC.1/Circ.1369, (as amended) ‘Interim Explanatory Notes For The Assessment Of Passenger Ship Systems’ Capabilities After A Fire Or Flooding Casualty’.

2. MSC.1/Circ.1437, (as amended) ‘Unified Interpretations of SOLAS Regulation II-2/21.4.

3. MSC.1/Circ.1532, (as amended) ‘Revised guidelines on operational information for Masters of passenger ships for safe return to port’.

4. MSC.1/Circ.1400, (as amended) ‘Guidelines on operational information for Masters of passenger ships for safe return to port by own power or under tow’.

5. Example of an REG Administration SRtP Compliance Certificate.

October 2019

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MSC.1/Circ.1369/Add.1
4 December 2012

INTERIM EXPLANATORY NOTES FOR THE ASSESSMENT OF PASSENGER SHIP SYSTEMS' CAPABILITIES AFTER A FIRE OR FLOODING CASUALTY

REVISIONS TO INTERPRETATIONS NOS. 22 AND 27 OF APPENDIX 1 OF MSC.1/CIRC.1369

1 The Maritime Safety Committee, at its ninety-first session (26 to 30 November 2012), having considered the proposals by the Sub-Committee on Safety of Navigation, at its fifty-eighth session, approved the revisions to interpretations Nos. 22 and 27 of appendix 1 to MSC.1/Circ.1369 on Interim Explanatory Notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty.

2 Member Governments are invited to bring the annexed revised interpretations Nos. 22 and 27 of appendix 1 to MSC.1/Circ.1369 to the attention of passenger ship owners, ship builders, ship designers and other parties concerned.

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ANNEX

REVISIONS TO INTERPRETATIONS NOS. 22 AND 27 OF APPENDIX 1 OF MSC.1/CIRC.1369

Regulation	Interpretations
II-2/21.4.3 Navigational systems	**Interpretation 22** Equipment essential for navigation, position fixing and detection of risk of collision should be available. The following equipment should be available as a minimum: a) a properly adjusted standard magnetic compass b) a Receiver for a global navigation satellite system or a terrestrial radionavigation system c) a 9 GHz radar d) Electronic Chart Display and Information System (ECDIS) or an appropriate folio of paper nautical charts and publications e) Whistle f) Navigation lights g) Internal communications with engine control room and steering gear h) a pelorus or Compass bearing device to take bearings j) Means of correcting heading and bearings to true at all times The ship should be capable of displaying the proper light configuration in compliance with the International Regulations for Preventing Collisions at Sea in force.
II-2/21.4.6 External communication	**Interpretation 27** The ship should be capable of communicating via the GMDSS or the VHF Marine and Air Band distress frequencies, even if the main GMDSS equipment is lost. The external communication may be achieved by additional fixed means or portable means installed in the same area as the navigation and manoeuvring equipment.

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MSC.1/Circ.1369
22 June 2010

INTERIM EXPLANATORY NOTES FOR THE ASSESSMENT OF PASSENGER SHIP SYSTEMS' CAPABILITIES AFTER A FIRE OR FLOODING CASUALTY

1 The Maritime Safety Committee, at its eighty-seventh session (12 to 21 May 2010), having considered the proposal by the Sub-Committee on Fire Protection, at its fifty-fourth session, approved the Interim Explanatory Notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty, set out in the annex, to provide additional guidance for the uniform implementation of SOLAS regulations II-1/8-1, II-2/21 and II-2/22, which were adopted by resolution MSC.216(82) and are due to enter into force on 1 July 2010.

2 Member Governments are invited to bring the annexed Interim Explanatory Notes to the attention of passenger shipowners, ship builders, ship designers and other parties concerned.

3 This circular revokes circular MSC.1/Circ.1214.

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ANNEX

INTERIM EXPLANATORY NOTES FOR THE ASSESSMENT OF PASSENGER SHIP SYSTEMS CAPABILITIES AFTER A FIRE OR FLOODING CASUALTY

INTRODUCTION

The requirements relevant to the safe return to port for passenger ships, as contained in resolution MSC.216(82), entering into force on 1 July 2010, have been shown to be challenging.

These Interim Explanatory Notes have been developed in the light of the experience gained so far in the early application of the aforementioned requirements, taking into account the guidance contained in the Performance standards for the systems and services to remain operational on passenger ships for safe return to port and orderly evacuation and abandonment after a casualty (MSC.1/Circ.1214).

1 GENERAL

1.1 These Interim Explanatory Notes are intended to outline the process of verification and of approval of a ship's design by the Administration, as well as describing the necessary documentation required, when requirements relevant to safe return to port (regulations II-1/8-1, II-2/21 and 22 of the 1974 SOLAS Convention, as amended) are applied.

1.2 These Interim Explanatory Notes are also intended to support safe engineering design with guidance on all three scenarios to be considered in the light of the above mentioned regulations:

.1 availability of essential systems after a flooding casualty, according to SOLAS regulation II-1/8-1;

.2 availability of essential systems to support a ship's safe return to port after a fire casualty, according to SOLAS regulation II-2/21; and

.3 availability of essential systems to support a ship's evacuation and abandonment after a fire casualty, according to SOLAS regulation II-2/22.

In light of the above, general and specific interpretations to regulations II-2/21 and 22 of the 1974 SOLAS Convention, as amended are given in appendix 1.

1.3 The outcome of these assessments should confirm that the ship is designed and constructed to provide the capabilities required by SOLAS regulations II-1/8-1, II-2/21 and 22.

1.4 Within these Interim Explanatory Notes a system-based approach is primarily intended to be performed. Where a system approach will outline potential weaknesses, a compartment or space-by-space based approach may also be applied. In the latter case, part of or all the spaces subject to individual consideration may be subject to operational restrictions on access, use and installations as one element of the overall system of protection. All such spaces and their restrictions should be identified on drawings or in manuals as appropriate (see paragraphs 7.3 and 7.4). For the application of these Interim Explanatory Notes to be successful, all relevant parties, including the Administration or its designated representative, owners, operators, designers and classification societies, should be in continuous communication from the onset of a specific proposal to utilize these Interim Explanatory Notes.

1.5 A pre-requisite and starting point for this assessment is that the owner of the ship has defined the operating pattern or patterns of the ship (for instance, worldwide liner/cruise ship or point-to-point ferry operations, maximum number of passengers and crew for required routes, foreseeable area of operation and routes, etc.). The capabilities that will be needed to be built into the ship will depend on the above.

1.6 The Administration may (as per SOLAS regulation II-2/21.4.14) determine any system to remain operational after a casualty in addition to those identified.

2 DEFINITIONS

For the purpose of these Interim Explanatory Notes, the following definitions apply:

2.1 *Passenger ship systems' capabilities after a fire or flooding casualty (short: ship systems' capabilities)* are those required for passenger ships according to SOLAS regulations II-1/8-1, II-2/21 and II-2/22. The ship systems' capabilities are addressing:

.1 availability of essential systems after a flooding casualty, according to SOLAS regulation II-1/8-1;

.2 availability of essential systems to support a ship's safe return to port under its own propulsion after a fire casualty, according to SOLAS regulation II-2/21.4 (including functional requirements for safe areas according to SOLAS regulation II-2/21.5); and

.3 availability of essential systems to support a ship's evacuation and abandonment after a fire casualty, according to SOLAS regulation II-2/22.

2.2 *Passenger ship systems' design (short: ship systems' design)* is a design description of systems intended to be installed, including all essential information showing how to achieve the ship systems' capabilities after a fire or flooding casualty according to SOLAS regulations II-1/8-1, II-2/21 and II-2/22.

2.3 *Passenger ship systems' functionality (short: ship systems' functionality)* is part of the passenger ship systems' design and defines how the onboard systems achieve the functional requirements defined in SOLAS regulations II-2/21 and II-2/22.

2.4 *Fire casualty* is any possible fire case on board the ship under consideration. Fire casualties may or may not exceed the casualty threshold stipulated in SOLAS regulation II-2/21.3.

2.5 *Flooding casualty* is any possible flooding case~~s~~ on board the ship under consideration. Flooding casualties may not exceed a single watertight (WT) compartment flooding as stated in SOLAS regulation II-1/8-1.2.

2.6 Essential systems are all systems and those sections of systems in spaces not directly affected by the casualty that need to remain operational after a fire or flooding casualty, according to SOLAS regulations II-2/21.4 and II-2/22.3, and as referred to in SOLAS regulation II-1/8-1.2.

2.7 *Critical systems* are essential systems that were identified in the overall assessment of essential systems to have a possibility to fail to operate adequately as a consequence of one or more fire casualty case, each not exceeding the fire casualty threshold, or as a consequence of one or more flooding case, each not exceeding a single WT compartment. The failure of the

system may be caused by a failure of the whole system, of one component or of a connection between system components or by any other failure causing unsatisfactory operation of the essential system under consideration.

3 SHIP'S DESCRIPTION

3.1 For the purpose of the ship's description, any necessary information regarding the design of the ship should be provided to the Administration along with description of ship essential systems' design and functionality following a fire or flooding casualty. As a minimum, such information and description should include:

.1 the design criteria for each individual essential system or group of essential systems, to achieve compliance (e.g., separation, duplication, redundancy, protection, or a combination of the above);

.2 the basic layout of the vessel including boundaries of compartments subject to the casualty (watertight or "A" class boundaries), e.g., in the form of plan views and cross-sections, including, but may not be limited to: general arrangement plan, capacity plan, watertight subdivision plan, space fire categorization plan (or structural fire protection plan), plan of spaces protected by fixed fire-extinguishing systems, etc.;

.3 criteria adopted for the selection of safe areas and intended locations;

.4 a list of all systems that are intended to be submitted for assessment. It should be noted that although such a list would include, in the first instance and as a minimum, all essential systems referred to in SOLAS regulations II-2/21.4 and 22.3, their actual number and identification may vary depending on the size, type, arrangements, design, etc., (e.g., propulsion systems: shaft or podded propulsion units, etc.) of the ship;

.5 drawings/documents describing the location, arrangement and connections of essential systems (including any of their components) mentioned in SOLAS regulation II-2/21 or II-2/22;

.6 the description of the power supply for the essential systems;

.7 data regarding the minimum speed vs. weather and sea conditions (e.g., results of model tank tests in sea keeping conditions including consideration of wind forces); and

.8 any additional design detail intended to ensure or support the ship systems' capabilities.

3.2 Additional information about the intended area of operation, the operating pattern or patterns (which may be used to define any intended speed/maximum distance for safe return to port) should be included in the ship's description.

3.3 Interpretations as contained in paragraph 1 of appendix 1 to these Interim Explanatory Notes may be used when completing the ship's description.

4 ASSESSMENT OF REQUIRED SHIP SYSTEMS' CAPABILITIES

4.1 The assessment of ship systems' capabilities should follow the process described in these Interim Explanatory Notes and refer to appendix 2. The assessment should be based on structured methods and should document the intended essential systems functionality after a fire or flooding casualty defined by SOLAS regulations II-1/8-1, II-2/21 and II-2/22. An example of the development of an assessment is given in appendix 3.

4.2 Each assessment should be divided in two steps.

4.2.1 The first step is an overall systems' assessment. The systems' assessment is addressing all essential systems and functional requirements mentioned in SOLAS regulations II-2/21 and II-2/22. This step should include a structured assessment of all essential systems after a fire or flooding casualty, as defined in SOLAS regulations II-1/8-1.2, II-2/21.4 or II-2/22.3.1. Propulsion and steering systems are required to remain in operational and may not be identified as "critical systems". However, manual intervention may be accepted in order to make these systems available in the minimum possible time.

4.2.2 The second step is a detailed assessment of critical systems identified in the systems' assessment. The detailed assessment is only required if any critical system was identified in the previous systems' assessment.

4.3 SOLAS regulations II-1/8-1, II-2/21 and 22 do not include reference to quantities or performance limits. The ability of the ship to return to port should be linked to the area and conditions of operation. The capability available for each system in the worst case (e.g., minimum propulsion power for return to port, electrical generating capacity, heating capacity, ventilation capacity, food and water storage/availability, etc.) should be included in the onboard documentation as a part of the assessment report (see paragraph 7.4).

5 OVERALL ASSESSMENT OF ESSENTIAL SYSTEMS

5.1 Assessment of all essential systems

5.1.1 A structured assessment of all essential systems should be conducted. The systems' assessment can be performed in qualitative terms. Quantitative analysis may be required as part of the detailed systems' assessment as described in section 6. A systems' assessment report should be prepared according to section 7.

5.2 Identification of critical systems

5.2.1 Essential systems identified to be fully redundant for all fire and flooding casualty cases not exceeding the threshold (e.g., when runs of cables, pipes and equipment are duplicated and adequately separated), need not be further analysed as described in section 6.

5.2.2 For the arrangement of equipment, components or connections reference may be made to relevant interpretations contained in paragraph 2 of appendix 1 to these Interim Explanatory Notes. Where other solutions are adopted, equipment, components or connections should be further analysed as described in section 6.

5.2.3 Manual action by the crew, to provide ship systems' capabilities, may also be possible but should be assessed in detail taking into account that:

.1 manual action should only be acceptable by the Administration in connection with an agreed defined number of fire and flooding casualties and should be clearly described in the documentation that should be prepared as per section 7;

.2 compliance with the return to port criteria should be based on the assumption that any manual action that may be required for the ship to return to port, or for any essential system to remain operational, following a casualty:

.1 is pre-planned, pre-set and instructions as well as necessary materials are available on board;

.2 is performed on systems designed to ensure that the required manual action can be completed within one hour from the time the action started; and

.3 emergency lighting and a means of communication is demonstrated available in the area where manual actions are to be taken; and

.3 in general, feasibility of manual actions should be demonstrated by tests or drills, as applicable.

5.2.4 Performance requirements applicable to any essential system may be analysed and documented separately; however, any relevant information should be included in the overall assessment of essential systems' report.

5.3 Results of overall assessment

5.3.1 Should no critical systems be identified, the overall assessment can be considered acceptable without the need for a detailed systems' assessment to be carried out. The systems' assessment report can be used for the preparation of documentation and approval submission, as referred to in section 7.

6 DETAILED ASSESSMENT OF CRITICAL SYSTEMS

6.1 When performing a detailed assessment of critical systems, additional information may be necessary. The ship's description, described in section 3, should be supplemented, for each identified critical system, with the following, as applicable:

.1 details of pipes, cables or other devices connecting the components of the critical system, or connecting different critical systems including their location within the affected area;

.2 details of any manual action providing the required ship systems' functionality (see also paragraph 5.2.3); and

.3 details of any operational solution forming part of the design criteria.

6.2 Where acceptable to the Administration, a quantitative analysis can be carried out as a part of the detailed assessment of all critical systems. As an example, the following may be performed:

.1 quantitative analysis of fire risk within a space, supplemented by fire engineering analysis and/or fire testing where necessary (e.g., to assess consequences of a fire casualty on a system or system component);

.2 Failure Mode Effect Analysis (FMEA) of a system or system component analyses in accordance with standard IEC 60812, *Analysis techniques for system reliability – Procedure for failure mode and effects analysis (FMEA)* or resolution MSC.36(63), annex 4 (Procedures for Failure Mode and Effects Analysis), would be acceptable; and

.3 detailed analysis of possibility of flooding of internal watertight compartments and of consequences of flooding on system components, given the location of the compartment and arrangement of piping within the compartment.

7 DOCUMENTATION

7.1 Design of ship and ship's systems

7.1.1 Different design criteria may be followed in the design of the ship and in the design of the ship's systems and arrangements to achieve the passenger ship systems' capabilities after a fire or flooding casualty and to comply with the requirements. The chosen design criteria should be well documented. This is to form the basis for the preparation of all ship's operational procedures to be adopted by the crew for the case of any such casualty.

7.2 Documentation for future design changes

7.2.1 The documentation to be presented for approval is described in detail in the paragraphs below. Such documentation should also be referred to in case design changes to the ship are proposed and may also be used as evidence of compliance should the ship transfers to the flag of another State.

7.3 Documentation of the assessment of required ship systems' capabilities for approval

7.3.1 The documentation of the assessment to be presented for approval should include the design criteria followed to reach ship systems' capabilities and summarize the whole process of assessment including methods and assumptions. The following information should be provided for approval of ship systems' capabilities:

.1 ship's description (see section 3);

.2 overall assessment of essential systems' report (see paragraph 4.2.1 and section 5);

.3 detailed assessment of critical systems' report (see paragraph 4.2.2 and section 6), if any critical system is identified; and

.4 additional information:

.1 list of manual actions (see paragraph 5.2.3);

.2 test programme (for both testing during construction, and sea trials, as applicable) which should include methods of testing, and test facilities provided, where applicable;

.3 maintenance plan; and

.4 references.

7.4 Onboard documentation

The onboard documentation demonstrating the ship system capabilities should include:

.1 documentation, as per paragraphs 7.3.1.1, 7.3.1.2 and 7.3.1.3 above;

.2 operational manual for fire and flooding casualty cases and safe return to port operation, including details of any manual action required to ensure operation of all essential systems, availability of safe areas including provision of basic services therein (e.g., closing/opening of valves, shutting down/start of equipment/fans, etc.);

.3 description of operation of essential systems after a fire casualty exceeding the casualty threshold;

.4 list of spaces considered having negligible fire risk, if any; and

.5 test, inspection, and maintenance plan.

7.5 Record of ship systems' capabilities

7.5.1 The ship systems' capabilities should be included in the list of operational limitations issued to passenger ships (reference SOLAS regulation V/30). The ship's safety management manual should describe in detail the quantities, arrangements and procedures that are to be applied in each particular case. (For example, food/drink/fuel carriage requirements may be different for a ship cruising in the Aegean to one cruising in the Antarctic.) Example of wording concept for this purpose may be as follows:

"Safe return to port voyage planning should be based on:

.1 habitable conditions for passengers and crew is provided according to "Owners document xyz" dated yyyy-mm-dd (the operational area will determine maximum possible distance to a safe location and the maximum number~~s~~ of persons that can be supported during the safe return voyage).

.2 the ship systems' capabilities of returning to port following a fire casulaty is contingent upon the conditions/assumptions given in onboard document xyz, yyyy-mm-dd.

.3 ships "port/aft/main" propulsion and steering system is capable of x knots in Beaufort x with a consumption of x tonnes of fuel.

.4 ships "starboard"/forward/emergency propulsion and steering system is capable of x knots in Beaufort x with a consumption of x tonnes of fuel.".

APPENDIX 1

INTERPRETATIONS TO SOLAS REGULATIONS II-2/21 (SAFE RETURN TO PORT AND SAFE AREAS) AND II-2/22 (SHIP'S ORDERLY EVACUATION AND ABANDONMENT)

1 Interpretation for ship's description

1.1 The following interpretations are intended to be of assistance when carrying out the ship description contained in section 3 of the Interim Explanatory Notes, before performing assessments as described in sections 4, 5 and 6.

1.2 These interpretations provide design criteria. The decision on whether or not to evacuate the ship remains with the Master. In actual situations the Master may well decide, based on the actual appraisal of the situation that it is safer to evacuate for accidents that are below the casualty threshold and remain on board for accidents that are above it.

Regulation	Interpretations
II-2/21.1 Application	**Interpretation 1** Horizontal Fire Zones (special category and ro-ro spaces) should not be included in the count of the number of the Main Vertical Zones.
II-2/21.1 Application	**Interpretation 2** Where electrical or machinery installation, fire safety, or lifesaving appliances of a ship have been approved following the methodology of SOLAS regulations II-1/55, II-2/17 or III/38 respectively (Alternative design and arrangements), the effect on the ship essential system capability should be explicitly included in the analysis required by the above regulations. Special attention is to be given to the determination and assignment of Safe Areas and compliance with the requirements of SOLAS regulation II-2/22.
II-2/21.2 Purpose	**Interpretation 3** For the purpose of assessing the ship systems' capabilities, fire casualties and flooding casualties may be considered as not occurring at the same time.
II-2/21.3 Casualty threshold	**Interpretation 4** "A" class boundaries refers to both bulkheads and decks.

Regulation	Interpretations
II-2/21.3 **Casualty threshold**	**Interpretation 5** The rating of "A" class boundaries does not affect the application of this regulation. However, a trunk closed at all boundaries constructed to "A-60" standard and containing ducts, cabling and/or piping is considered operational when passing through a space of origin.
II-2/21.3 **Casualty threshold**	**Interpretation 6** The lay-out of special category and ro-ro spaces, normally extending for more than the length of one MVZ, does not properly fit with the casualty threshold. However, during the assessment of the ship systems' capabilities it has to be verified that a casualty in such spaces would not compromise the operation of the essential systems in the remaining fire zones of the ship.
II-2/21.3.2 **Casualty threshold**	**Interpretation 7** Where a space of origin is not protected by a fixed fire-extinguishing system, for determining the "nearest "A" class boundaries, which are not part of the space of origin": a) only the spaces within the same Main Vertical Zone need to be considered; and b) casualty threshold includes spaces one deck upwards.
II-2/21.3.2 **Casualty threshold**	**Interpretation 8** Spaces in which the risk of a fire originating is negligible[1] need not be considered as spaces of origin of a fire. Examples of such spaces include but may not be limited to: a) spaces with restricted accessibility for inspection and/or maintenance only, such as: .1 void spaces; .2 trunks closed at all boundaries only containing pipes and/or electrical cables; and .3 cofferdams;

[1] **Note**: A fire/risk assessment may be requested (refer to paragraphs 7.4.4 of the Interim Explanatory Notes), to determine whether a space other than those listed in the above can be considered as being "space in which the risk of a fire originating is negligible". Different factors should be taken into account while performing the assessment such as:

a) presence of combustible material, flammable liquids and/or flammable gases;
b) presence of electrical switchboards and relevant power;
c) statistics on fire within spaces having the same purpose;
d) intended service of equipment/machinery installed; and
e) other factors considered appropriate for the space under consideration.

Regulation	Interpretations
II-2/21.3.2 Casualty threshold	**Interpretation 8 (cont'd)** b) tanks; c) chain lockers; d) ventilation trunks except those containing ducts presenting fire hazard such as galley range exhaust ducts, laundry exhaust ducts, category "A" machinery spaces ducts, special category and ro-ro spaces ducts; e) cross flooding ducts connecting void spaces. In the case where connected spaces are not with a negligible fire risk, ducts should be separated from those spaces by non-watertight fire resistant boundaries to be considered as a space where fire risk is negligible; f) vertical escape trunks from machinery spaces, service spaces, control stations and other crew accommodation spaces; g) store rooms for gaseous fixed fire-extinguishing systems; h) busbars enclosed in "A" class divisions; i) "A" class enclosures within spaces of Category 1, 2 or 4 only containing isolation valves or section valves forming part of the fixed fire-extinguishing system for the protection of accommodation spaces, service spaces and control stations; and j) shaft tunnels only used for this purpose, i.e. no storage is allowed.
II-2/21.3.2 Casualty threshold	**Interpretation 9** Concealed spaces (spaces above ceilings, behind bulkheads linings) are considered as part of the space of origin. Lack of a fixed fire-extinguishing system above ceilings or behind linings need not be considered under regulation II-2/21.3.2.
II-2/21.3.2 Casualty threshold	**Interpretation 10** In case of manual actions, equipment and systems the controls of which cannot be reached without accessing the space affected by the casualty should not be considered operational.
II-2/21.3.2 Casualty threshold	**Interpretation 11** For passenger ships carrying not more than 36 passengers space of origin is any space bounded by "A" class boundaries or divisions of steel or equivalent material. Where the deck between two spaces is constructed of steel or equivalent material it should be considered to form part of the "A" class boundary provided all penetrations are tight to prevent the passage of flame or smoke.

2 Interpretations for detailed assessment of critical systems

2.1 The following interpretations are intended to be of assistance when performing detailed assessments of critical systems, as described in section 6.

Regulation	Interpretations
II-2/21.4 Safe Return to Port/Fire Casualty	**Interpretation 12** Steel pipes other than those carrying flammable liquids and passing through (not serving) spaces affected by a fire casualty may be considered to remain operational provided they are of substantial thickness (reference can be made to ICLL 66 regulation 22(3), as interpreted by IACS UI LL36/Rev. 2 paragraph (b)) or "A-60" insulated ("A-60" class insulation approved in accordance with resolution A.754(18) for bulkheads or decks may be used for this purpose). In both cases the pipes should be adequately supported. In order to be considered as remaining operational after a fire casualty, steel pipes should be joined by welding otherwise mechanical joints should be tested according to IACS UR P2.11.5.5.6 fire test or equivalent to the satisfaction of the Administration. Temperature increase of liquids carried may need to be considered, and measures taken where necessary, so that the performance and purpose of the affected systems can be maintained as intended after the casualty has occurred. Plastic pipes can be considered to remain operational after a fire casualty if tested to resolution A.753(18), Level 1.
II-2/21.4 Safe Return to Port/Fire casualty	**Interpretation 13** Fire-resistant cables complying with standards IEC 60331-1 and IEC 60331-2 (see also IACS UR E15) passing through (not serving) spaces may be considered to remain operational after a fire casualty provided they have no connections, joints and equipment connected to them, etc., within the space affected by the casualty. Installation of these cables should be made to support their survival in a fire casualty and during fire fighting efforts.

Regulation	Interpretations
II-2/8.1 **Flooding casualty** **II-2/21** **Fire casualty**	**Interpretation 14** An electrical balance should be submitted for each of the following return to port scenarios: a) minimum electrical-generating capacity available; and b) any other scenario of reduced power that would cause any essential system to run at reduced capacity due to lack of electrical generating capacity. In connection with the above, all essential systems and their auxiliaries and systems needed to support safe areas should be accounted according to their use in these particular conditions.
II-2/21 **Fire casualty**	**Interpretation 15** Emergency generator, fitted for compliance with SOLAS regulation II-1/42, may be used to meet the requirements on safe return to port and ship's orderly evacuation and abandonment providing that its ability to supply emergency services as referred to in SOLAS regulation II-1/42.2, is not impaired (e.g., the availability of fuel needed for providing those services listed in regulation II-1/42 should be maintained). In the evaluation of the emergency generator capacity, the most demanding condition between regulations II-1/42, II-2/21 and 22 may be considered.
II-2/21.4 **Safe return to port**	**Interpretation 16** Electrical power should be available and sustainable for all essential services specified in SOLAS regulations II-2/21.4 and II-2/21.5.1.2, with due regard being paid to such services as may be operated simultaneously. The application of regulation II-2/21.4 requires that other systems (e.g., engine-room ventilation, lighting of spaces outside safe areas not affected by the casualty, etc.) remain operational to support the functionalities listed therein.
II-2/21.4.1 **Propulsion**	**Interpretation 17** Propulsion machinery and auxiliary machinery essential for the propulsion of the ship should remain operable.
II-2/21.4.1 **Propulsion**	**Interpretation 18** Following a fire casualty within the threshold, the ship should be able to maintain an adequate speed for sufficient time to permit the ship's planned safe return to port in sea and wind conditions acceptable to the Administration taking into account the intended area of operation. A minimum speed of 6 knots while heading into Beaufort 8 weather and corresponding sea conditions is recommended. Configuration for power generation and propulsion in the worst case scenario in terms of casualty cases should be verified during normal sea trials.

Regulation	Interpretations
II-2/21.4.1 **Propulsion**	**Interpretation 19** A steel shaft line including relevant bearings passing through a space affected by a flooding or a fire casualty (see also interpretation 11), may be considered operational if it is enclosed in a watertight and "A" class tunnel or alternatively if: a) in the flooding case it can be shown that it can operate under water; and b) in the fire case it is protected by a dedicated water spray system capable of delivering not less than 5 //m^2/min on the protected area or equivalent.
II-2/21.4.1 **Propulsion**	**Interpretation 20** Manual control at local positions can be accepted provided adequate communication and emergency lighting are arranged and it is demonstrated that the loss of any control and monitoring system does not prevent or impair any such manual/local control of the propulsion and electrical power generation systems (including, but may not be limited to, engines, electric motors, fuel system, etc.). Consideration should be given to the provision of machinery alarms when operating in that manner.
II-2/21.4.2 **Steering systems and steering-control systems**	**Interpretation 21** When documenting that steering system is operable the following should be taken into consideration: a) local control of remaining steering system is acceptable provided adequate communication and emergency lighting are arranged; b) emergency means of steering, e.g., azimuth thrusters, pump jets, rudder, propellers, may be considered; and c) in general, tunnel thrusters should not be considered adequate for emergency steering.
II-2/21.4.3 **Navigational systems**	**Interpretation 22** Equipment essential for navigation, position fixing and detection of risk of collision should be available. The ship should be capable of displaying the proper light configuration in compliance with the International Regulations for Preventing Collisions at Sea in force.
II-2/21.4.4 **Systems for fill, transfer and service of fuel oil**	**Interpretation 23** Systems for internal fill transfer and service of fuel oil should be capable of fuel transfer to active propulsion and power generation equipment.

Regulation	Interpretations
II-2/21.4.4 Systems for fill, transfer and service of fuel oil	**Interpretation 24** Systems for internal fill, transfer and service of: a) fuel; b) other flammable hydrocarbons; or c) any fluid that may be flammable or dangerous if heated to a very high temperature (both within the pipe and on going through pumps, orifices or other equipment), should not be considered operational within spaces affected by a fire casualty.
II-2/21.4.5 Internal communication between the bridge, engineering spaces, safety centre, fire-fighting and damage control teams, and as required for passenger and crew notification and mustering	**Interpretation 25** Internal communications should be achieved by any effective portable or fixed means of communications. However, portable equipment may be accepted provided that repeater system or equivalent remains operational after the casualty and charging capability is available in more than one MVZ.
II-2/21.4.5 Internal communication between the bridge, engineering spaces, safety centre, fire-fighting and damage control teams, and as required for passenger and crew notification and mustering	**Interpretation 26** PA systems, arranged as general alarm systems, should remain operational in the MVZs not affected by the casualty.

Regulation	Interpretations
II-2/21.4.6 External communication	**Interpretation 27** The ship should be capable of communicating via the GMDSS or the VHF Marine and Air Band distress frequencies, even if the main GMDSS equipment is lost.
II-2/21.4.7 Fire main	**Interpretation 28** Automatic start of remaining pumps may not be necessarily required (manual local start may be accepted after a casualty). The system should be so arranged that SOLAS regulation II-2/10.2.1.5.1 is fulfilled in all other Main Vertical Zones of the ship not affected by the casualty. Isolating valves should be arranged as appropriate. The remaining part of the affected deck in a Main Vertical Zone may be served from hydrants of adjacent zone or water tight compartment. Fire hoses may be extended for fire-fighting within the affected Main Vertical Zone; however, for complying with this requirement, two lengths of hoses from each hydrant may be accepted.
II-2/21.4.8 Fixed fire-extinguishing systems	**Interpretation 29** When a gaseous based system located outside the protected space is the sole fixed fire-extinguishing system as defined in regulations II-2/10.4.1 and 10.7.1 and it is designed to protect more than one space: a) there should be enough capacity to protect the two largest spaces; b) where the application of the fire casualty threshold leads to the loss of the storage room due to fire in an adjacent space, there should be two rooms, not being lost by the result of the same casualty, each holding a quantity of gas, capable of protecting the largest space; and c) the system should be so arranged that a casualty in one protected space does not impair the operation of the system in another protected space. When a gaseous based system located outside the protected space is the sole fixed fire-extinguishing system as defined in regulations II-2/10.4.1 and 10.7.1 and it is designed to protect a single space, where the application of the fire casualty threshold leads to the loss of the storage room due to fire in an adjacent space, there should be two rooms, not being lost by the result of the same casualty, each holding the quantity of gas required for the protected space.
II-2/21.4.8 Fixed fire-extinguishing systems	**Interpretation 30** Sprinkler or equivalent fixed fire-extinguishing systems may be considered to be lost only in spaces directly affected by the fire casualty and in other spaces that are protected by the same section (i.e. are controlled by the same section valve) provided each section should not serve more than one deck area in one MVZ. However, all levels of a stairway enclosure may be protected by the same section.

Regulation	Interpretations
II-2/21.4.8 Fixed fire-extinguishing systems	**Interpretation 31** Section valves (as referred to in FSS Code, chapter 8, paragraph 2.4.2.2) located within the space affected by the fire casualty should be considered to be not operational unless they are suitably fire rated or fire protected (e.g., contained within a solely dedicated enclosure having "A" class boundaries, or protected by a water nozzle, etc.).
II-2/21.4.8 Fixed fire-extinguishing systems	**Interpretation 32** Equivalent water based fire-extinguishing systems intended for the protection of machinery spaces (total flooding, as referred to in MSC/Circ.1165, as amended) should be so designed that in case of loss of any section valve it would still be possible to supply the entire system at the required performance, except where another fixed fire-extinguishing system is provided for the protection of such spaces (e.g., gaseous based systems). Duplication, fire protection of valves (e.g., contained within a solely dedicated enclosure having "A" class boundaries, or protected by a water nozzle, etc.), fire rated valves* or location of valves in spaces as identified by interpretation 11 may be considered. * Reference may be made to IACS UR P2.11.5.5.6.
II-2/21.4.8 Fixed fire-extinguishing systems	**Interpretation 33** Indication of activated sections in the continuously manned central control station for sprinkler or equivalent fixed fire-extinguishing systems, located outside the Main Vertical Zone, where the space affected by the casualty is located, should continue to function after a fire or flooding casualty.
II-2/21.4.8 Fixed fire-extinguishing systems	**Interpretation 34** Arrangement of piping distribution for sprinkler systems or equivalent, or for water based fixed fire-extinguishing systems for machinery spaces, may include isolation valves, to ensure the system can be reconfigured as to remain operational after a casualty, which should be kept to a minimum, clearly marked and easily accessible. Valves whose uncorrected status may jeopardize the operation of the system under normal condition should be provided with status indication in the continuously manned control station.
II-2/21.4.8 Fixed fire-extinguishing systems	**Interpretation 35** When sprinkler or equivalent water based fixed fire-extinguishing systems include one or more emergency feed, risers, connection, or other emergency means to comply with this regulation, then hydraulic calculations (as referred to in the FSS Code, chapter 8, paragraph 2.3.3.2) should take this into account.

Regulation	Interpretations
II-2/21.4.8 Fixed fire-extinguishing systems	**Interpretation 36** Local application systems need not to remain operational following a casualty unless they form part of a system for the protection of machinery spaces (total flooding, as referred to in MSC/Circ.1165, as amended).
II-2/21.4.9 Fire and smoke detection systems	**Interpretation 37** Fire and smoke detection systems may be considered to be lost only in spaces directly affected by the fire casualty and in other spaces on the same deck that are part of the same section, as defined by the FSS Code, chapter 9, paragraph 2.4.1, provided that all other detectors remain operational in any other decks served by that section.
II-2/21.4.10 Bilge and ballast systems	**Interpretation 38** The bilge and ballast pumping systems and all associated essential equipment should be operational in all spaces served by the systems and not directly affected by the casualty. Manual control at local positions may be accepted provided fixed or portable means of communication are available from those positions to the Safety Centre or the Engine Control room.
II-2/21.4.11 Power-operated watertight and semi-watertight doors	**Interpretation 39** Indication to show whether each door is open or closed should be provided for any fire casualty not exceeding the casualty threshold except for those doors in the boundary of spaces directly affected by the casualty.
II-2/21.4.13 Flooding detection systems	**Interpretation 40** Flooding detection systems may be considered to be lost only in spaces directly affected by the fire casualty and in other spaces in the same compartment that are part of the same section provided that all other detectors remain operational in any other compartment served by that section.
II-2/21.5 Safe areas	**Interpretation 41** When considering a fire casualty in a certain MVZ, only spaces within the casualty threshold are to be considered lost. Food, water and equipment for the support of the basic services to the safe areas, stored in spaces not directly affected by the fire casualty and belonging to the same MVZ, could be considered still available.

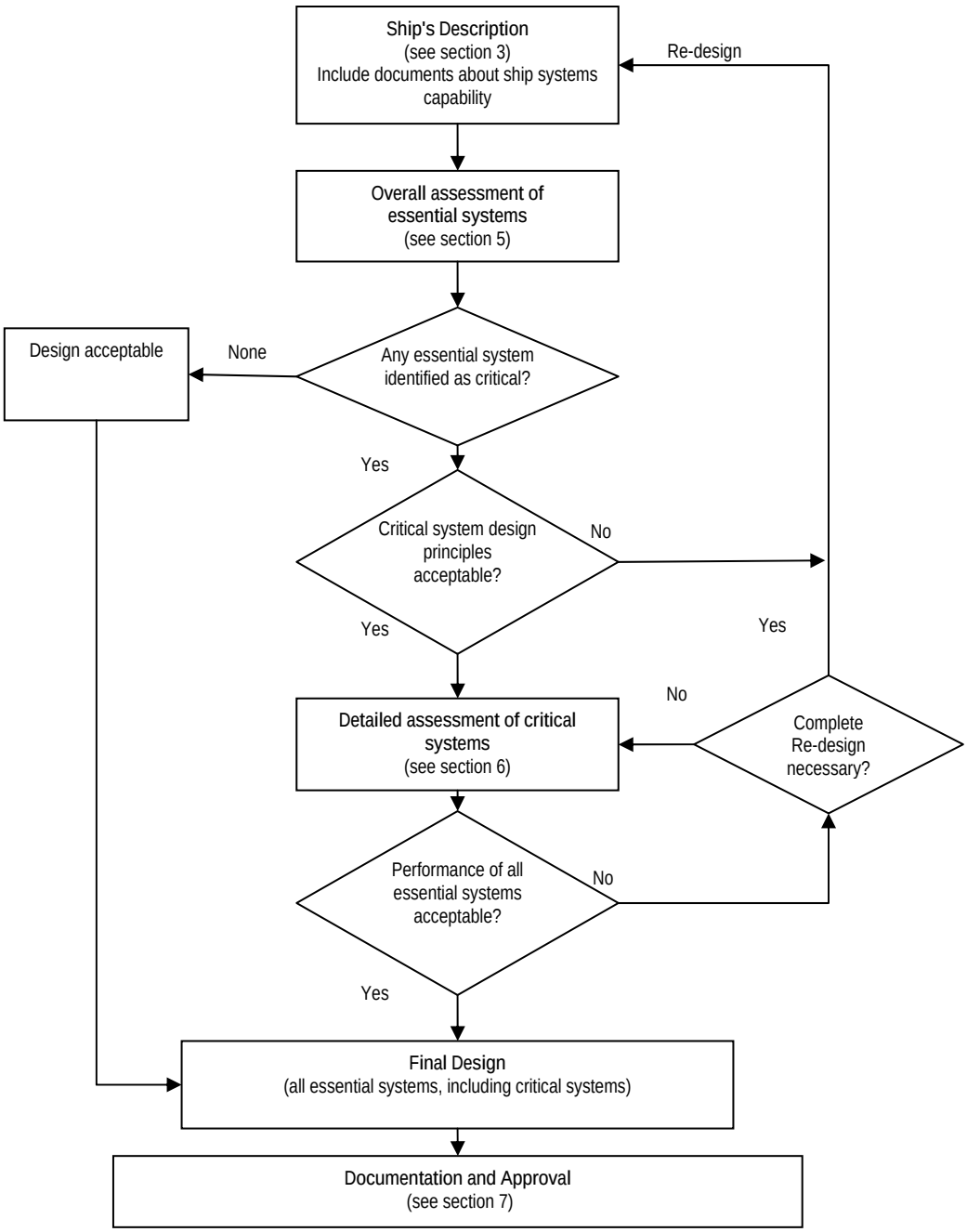
Regulation	Interpretations
II-2/21.5.1.1 **Safe areas** **Functional requirements**	**Interpretation 42** Safe areas could be a number of spaces distributed on board and should preferably be arranged in accommodation spaces. Sizing of safe areas where persons are accommodated could be based on the time needed for safe return to port operation. For safe return to port operations longer than 12 h a minimum space of 2 m^2 per person, calculated on the basis of the gross deck surface of the space(s) being considered, should be provided. For safe return to port operations shorter than 12 h a minimum space of 1 m^2 per person should be provided.
II-2/21.5.1.2.1 **Safe areas, sanitation**	**Interpretation 43** As a minimum one toilet for every 50 persons or fraction should remain operational. Grey and black water can be disposed of into the sea, allowed by MARPOL (reference MARPOL Annex IV, regulation 3).
II-2/21.5.1.2.2 **Safe areas, water**	**Interpretation 44** As a minimum 3 litres per person per day drinking water should be available. Additional water for food preparation and hygiene may need to be provided.
II-2/21.5.1.2.3 **Safe areas, food**	**Interpretation 45** Food could be of any kind including dry food. Storage of food should be distributed as necessary, so that an access route is available from the safe areas.
II-2/21.5.1.2.4 **Safe areas** **Alternate space for medical care**	**Interpretation 46** In addition to the ship's hospital or medical centre one or more locations on the ship should be provided which should: a) be in a different Fire Zone (from the hospital or primary medical centre); b) be easily accessible; and c) have lighting and power supply on the main and emergency source of electrical power. Reference should also be made to MSC/Circ.1129.

Regulation	Interpretations
II-2/21.5.1.2.6 **Means of preventing heat stress and hypothermia**	**Interpretation 47** Definition of means for protection against heat stress and hypothermia should take into account external weather conditions, which may depend on area(s) of operation of the vessel. Casualty scenarios for which there is a reduction in ventilation or heating capacity should be identified and consequences assessed. The temperature within the internal safe areas should be maintained in the range of 10 to 30°, consideration being paid to the external temperature during expected operations.
II-2/21.5.1.2.7 **Safe areas, light**	**Interpretation 48** Portable rechargeable battery operated lighting may be acceptable for use in spaces which are not covered by the ship's emergency lighting system. Adequate charging capability should be available for these lights. Supplementary lighting complying with regulation II-1/42-1 is also acceptable.
II-2/21.5.1.2.8 **Safe areas, ventilation**	**Interpretation 49** Ventilation volume should be available as a minimum of 4.5 m^3/h per person.
II-2/21.4.14 **Safe areas, other systems vital to damage control efforts**	**Interpretation 50** This includes any system that the Administration determines is vital to damage control pertaining to fire or flooding.
II-2/21.5.1.4 **Safe areas, access to embarkation deck**	**Interpretation 51** Means of access from safe areas to life-saving appliances should be provided from all safe areas in case of any casualty, either internally through areas unaffected by the fire or via external routes. External routes are considered to remain available also in the portion of the ship containing the MVZ where the casualty had occurred.
II-2/22.3.1 **Evacuation and abandonment, Systems**	**Interpretation 52** Electrical power should be available for the abandonment of the ship, including life-saving appliances and arrangements and the systems referred to in SOLAS regulation II-2/22.3.1, with due regard being paid to such services as may be operated simultaneously.

Regulation	Interpretations
II-2/22.3.1.1 Evacuation and abandonment, Fire Main Safe	**Interpretation 53** The fire main should remain operational in all main vertical zones not directly affected by the casualty. Water for fire-fighting purposes should be available to all areas of the ship.
II-2/22.3.1.2 Evacuation and abandonment, Internal communications	**Interpretation 54** A means should be available for communicating orders to fire-fighting and damage control teams and personnel in charge of evacuation and abandonment.
II-2/22.3.1.4 Evacuation and abandonment, Means of external	**Interpretation 55** The ship should be capable of communicating via the GMDSS or the VHF Marine and Air Band distress frequencies even if the main GMDSS equipment is lost.
II-2/22.3.1.3 Evacuation and abandonment, Bilge system	**Interpretation 56** The bilge pumping system and all associated equipment essential for its operation should be available in all spaces not directly affected by the casualty.

APPENDIX 2

Assessment of passenger ship systems' capabilities process flowchart



APPENDIX 3

EXAMPLE OF THE DEVELOPMENT OF AN ASSESSMENT
(refers to an assessment for SOLAS regulation II-2/22)

Note: Users should note that the example provided represents one way of handling an assessment as other approaches could be equally effective.

The assessment is developed adopting the following steps:

Step 1 – Identification of all essential systems and any required auxiliaries and support systems.

Step 2 – For each deck of each MVZ, determination of which essential systems are present.

Step 3 – For each essential system that is located in the MVZ under analysis, verification of the availability of an alternative in another location.

Step 4 – Essential systems without a suitable alternative in another location must be protected from a fire/flooding casualty.

Step 5 – For each critical system, determination of how the cables, pipes, components will be protected. A hierarchy for protecting critical systems is proposed as follows:

1. First solution – Provide an alternative in a MVZ not affected by the casualty

Example: A main power cable for the GMDSS system passes through the MVZ on deck 3. In a fire this cable could be damaged. An emergency power cable is routed from a different direction to the navigation bridge that does not pass through this area. The conclusion is that further analysis is not needed. Damage to the power cable does not affect the ship's safe return to port capability.

2. Second solution – Protect the essential system within the MVZ under analysis

Example: In the case of the a.m. power cable, it is determined that only a short length of cable passes through the MVZ under consideration, located 5 m above the deck. An A-60 trunk is installed to protect the cable to preclude fire damage.

3. Third solution – Provide a repair or manual action to compensate for loss of the system

Example: – Another essential system cable is analysed, and it is determined that the cable is routed throughout the MVZ at various levels and construction of an A-60 trunk is not practicable. Instead, a repair cable is prepared and staged with necessary tools at a protected location. If the cable is damaged from a fire in the MVZ under analysis, the crew is able to temporarily re-route power from another location using the repair cable.

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MSC.1/Circ.1437
31 May 2012

UNIFIED INTERPRETATIONS OF SOLAS REGULATION II-2/21.4

1 The Maritime Safety Committee, at its ninetieth session (16 to 25 May 2012), with a view to providing more specific guidance for the assessment of passenger ship systems' capabilities after a fire or flooding casualty, approved the unified interpretations of SOLAS regulation II-2/21.4, prepared by the Sub-Committee on Fire Protection, at its fifty-fifth session, as set out in the annex, for use in conjunction with the Interim explanatory notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty (MSC.1/Circ.1369), when conducting an assessment of critical systems.

2 Member Governments are invited to use the annexed unified interpretations as guidance when applying relevant provisions of SOLAS regulation II-2/21 and to bring them to the attention of all parties concerned.

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ANNEX

UNIFIED INTERPRETATIONS TO SOLAS REGULATION II-2/21.4

(To be used in conjunction with the interim explanatory notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty (MSC.1/Circ.1369))

Regulation II-2/21.4 – Fire and flooding casualty, pipes and vent ducts

All pipes and vent ducts passing through (not serving) a compartment affected by a flooding casualty are considered to remain operational provided they, together with relevant fittings, are capable of withstanding the head of water expected at their location.

Regulation II-2/21.4 – Fire and flooding casualty, electrical cables

Electrical cables complying with standard IEC 60092-359 may be considered to remain operational in a space affected by a flooding casualty, provided they have no connections, no joints, no equipment connected to them, etc., within such space or such connections, joints and devices have a degree of protection IPX8 in accordance with standard IEC 60529 (head of water expected at their location for a period not inferior to that estimated for the safe return to port).

Regulation II-2/21.4.4 – Systems for fill, transfer and service of fuel oil

Systems for internal fill, transfer and service of:

.1 fuel;

.2 other flammable hydrocarbons; or

.3 any fluid that may be flammable or dangerous if heated to a very high temperature (both within the pipe and ongoing through pumps, orifices or other equipment),

should be established as being capable of remaining operational when crossing flooded watertight compartments, considering in particular consequences of low seawater temperature on liquids behaviour.

Regulation II-2/21.4.6 – External communications

.1 Portable radiocommunication equipment might be accepted; and

.2 charging capability for any portable devices should be available in more than one main vertical zone (MVZ).

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MSC.1/Circ.1532/Rev.1
24 May 2018

REVISED GUIDELINES ON OPERATIONAL INFORMATION FOR MASTERS OF PASSENGER SHIPS FOR SAFE RETURN TO PORT*

1 The Maritime Safety Committee, at its ninety-sixth session (11 to 20 May 2016), having considered a proposal by the Sub-Committee on Ship Design and Construction, at its third session, approved the *Revised guidelines on operational information for masters of passenger ships for safe return to port* to provide additional guidance for the uniform implementation of SOLAS regulation II-1/8-1.3.

2 The Maritime Safety Committee, at its ninety-ninth session (16 to 25 May 2018), approved the revision of the *Revised guidelines on operational information for masters of passenger ships for safe return to port* (MSC.1/Circ.1532), as set out in the annex, updating the references to the paragraphs of SOLAS regulation II-1/8-1.3 amended by resolution MSC.436(99).

3 Member States are invited to apply the annexed Revised guidelines to passenger ships constructed on or after 13 May 2016 and to bring them to the attention of owners of passenger ships, operators and all other parties concerned.

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* In accordance with the decision of MSC 99 (MSC 99/22, paragraph 3.81.6), these Guidelines should be kept in abeyance until the date of the entry into force of the amendments to SOLAS regulation II-1/8-1.3 adopted by resolution MSC.436(99), i.e. 1 January 2020.

ANNEX

REVISED GUIDELINES ON OPERATIONAL INFORMATION FOR MASTERS OF PASSENGER SHIPS FOR SAFE RETURN TO PORT

General

1 When an onboard stability computer is provided in accordance with regulation II-1/8-1.3.1.1, the system referred to in these Guidelines should comprise an onboard stability computer capable of receiving and processing manual and electronic data to provide the master with regularly updated operational information on the residual damage stability of the ship after a flooding casualty. Two-way communication links to shore-based support should also be available to provide the master with post-damage residual structural strength information.

2 When shore-based support is provided in accordance with regulation II-1/8-1.3.1.2, the system referred to in these Guidelines should comprise two-way communication links to the shore-based support with a stability computer capable of receiving and processing manual and electronic data to provide the master with regularly updated operational information on the residual damage stability of the ship after a flooding casualty. In addition, the shore-based support should also have the capability to provide the master with post-damage residual structural strength information.

3 The stability computers should utilize software with the following capabilities:

Using the pre-damage loading condition, software calculating the residual damage stability following any flooding casualty by processing data from both manual entry and from sensor readings to compute operational information required by the master using an accurate and detailed computer model of the entire hull, including superstructures and appendages, all internal compartments and tanks, etc. together with up-flooding/down-flooding points, cross-flooding arrangements, escape routes, ship profile and watertight door status (i.e. open or closed).

System overview

4 At least two independent stability computers should be available at all times (either two onboard, or two through shore-based support, or one each), which are capable of receiving and processing the data necessary to provide operational information to the master.

5 The onboard system should have an uninterruptible power supply (UPS) connected to both main and emergency switchboards.

Input

6 The system should be pre-loaded with a detailed computer model of the complete hull, including appendages, all compartments, tanks and the relevant parts of the superstructure considered in the damage stability calculation, wind profile, down-flooding and up-flooding openings, cross-flooding arrangements, internal compartment connections and escape routes. Each internal space should be assigned its standard regulation II-1/7-3 permeability, unless a more accurate permeability has been calculated.

7 The system should utilize the latest approved lightship weight and centre of gravity information.

8 Details of the damage location(s) and extent(s) or the damaged compartments should be input manually by the ship's staff and combined with data from electronic sensors such as draught gauges, tank level devices, watertight door indicators and flooding level sensors.

9 If it is considered at any time that a sensor or sensors are faulty, or have been damaged, the ship's staff should be able to override the sensor data with manual data. The system should clearly indicate to the operator if a sensor that should be available is being manually overridden.

10 The system should always be updated to the current loading condition which will form the basis of any damage stability calculation.

Calculation methods

The system should:

11 Utilize software (see paragraph 3) capable of analysing the damage stability following any real flooding casualty including multi-compartment, non-linked breaches.

12 Use the actual pre-damage loading state obtained from the routine operations mode.

13 Be capable of accounting for applied moments such as wind, lifeboat launching, cargo shifts and passenger relocation.

14 Account for the effect of wind by using the method in regulation II-1/7-2.4.1.2 as the default, but allow for manual input of the wind speed/pressure if the on-scene pressure is significantly different ($P = 120\ N/m^2$ equates to Beaufort 6; approximately 13.8 m/s or 27 knots).

15 Be capable of assessing the impact of open main watertight doors on stability.

16 Have the capability of using the same detailed hull model for damage control drills or to assess potential damage and stability scenarios during a flooding casualty. This should not interfere with the ability of the onboard computer or shore-based support to monitor the actual situation and provide operational information to the master.

Output

17 The system should output the residual GZ curve both graphically and numerically. It should also provide the following information: draught (forward, midships and aft), trim, heel angle, GZ max, GZ range, angle of vanishing stability, down-flooding immersion angles and escape route immersion angles.

18 The output format and units of the information supplied by the ship's staff or shore-based support team should be consistent with the format and units of the approved stability booklet in order to facilitate easy comparison. The output should be within the tolerances specified in the *Guidelines for the approval of stability instruments* (MSC.1/Circ.1229).

19 The system should show a profile view, deck views and cross-sections of the ship, indicating the flooded water-plane and the damaged compartments.

Other issues

20 An operation manual should be provided for the system software printed in a language in which the ship's staff are fully conversant. The manual should also indicate the limitations of the system.

21 At least two crew members should be competent in the operation of the system including the communication links to the shore-based support. They should be capable of interpreting the output of the system in order to provide the required operational information to the master.

22 When shore-based support is provided in accordance with regulation II-1/8-1.3.1.2, there should be a contract for the supply of shore-based support at all times during the validity of the ship's certificate.

23 When shore-based support is provided in accordance with regulation II-1/8-1.3.1.2, the shore-based support should be manned by adequately qualified persons with regard to stability and ship strength; no less than two qualified persons should be available to be on call at all times.

24 When shore-based support is provided in accordance with regulation II-1/8-1.3.1.2, the shore-based support should be operational within one hour (i.e. with the ability to input details of the condition of the ship, including structural damage, as instructed).

Strength

25 The system should have the capability of two-way communication with the shore-based team with an agreed method of specifying and transmitting details of structural loss and/or degradation.

26 The strength aspects of the shore-based computer should be in compliance with the requirements of a classification society which is recognized by the Administration.

Ro-ro passenger ships

27 There should be algorithms in the software for estimating the effect of water accumulation on deck (WOD).

Approval and testing

28 The stability aspects of the system should be initially approved and periodically checked against validated test conditions based on a number of loading/damage scenarios from the approved stability information book to ensure that it is operating correctly and that the stored data has not been subject to unauthorized alteration.

Limitations of the system

29 The system is not intended to compute transient asymmetrical flooding whereby the ship could capsize under the immediate inrush of floodwater before there is time for equalization measures to take effect.

30 The system is not intended to make any allowance for the motion of the ship in a seaway, including the effects of tide, current or wave action.

Equivalence

31 Equivalent arrangements for the provision of operational information to the master following a flooding casualty may be employed to the satisfaction of the Administration.

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MSC.1/Circ.1400
27 May 2011

GUIDELINES ON OPERATIONAL INFORMATION FOR MASTERS OF PASSENGER SHIPS FOR SAFE RETURN TO PORT BY OWN POWER OR UNDER TOW

1 The Maritime Safety Committee, at its eighty-ninth session (11 to 20 May 2011), having considered a proposal by the Sub-Committee on Stability and Load Lines and on Fishing Vessels Safety, at its fifty-third session, approved the Guidelines on operational information for masters of passenger ships for safe return to port by own power or under tow, set out in the annex, aiming at providing additional guidance for the uniform implementation of SOLAS regulation II-1/8-1, which is expected to be adopted by MSC 90 (May 2012)*.

2 Member Governments are invited to bring the annexed Guidelines to the attention of owners of passenger ships, operators and all other parties concerned.

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* The draft amendment to SOLAS regulation II-1/8-1 was approved by MSC 89, and is contained in the report of the Committee (MSC 89/25/Add.1, annex 17). Owners of passenger ships, masters, operators and all other parties concerned should prepare in advance for the adoption of the draft amendment to regulation II-1/8-1.

ANNEX

GUIDELINES ON OPERATIONAL INFORMATION FOR MASTERS OF PASSENGER SHIPS FOR SAFE RETURN TO PORT BY OWN POWER OR UNDER TOW

General

1 Stability information provided to the Master should be sourced from an approved stability computer situated on board the vessel or from a shore-based system and should be capable of providing information at any time.

2 The output format and units of the information supplied should be consistent with the format and units of the stability booklet in order to facilitate easy comparison.

3 Accuracy of programs using hull form with its subdivision models as their basis for stability calculations should have tolerances in accordance with the Guidelines for the approval of stability instruments (MSC.1/Circ.1229), when compared with the approved stability information; this applies equally to onboard and shore-based systems.

Onboard stability computers

4 At least two independent stability computers capable of processing the data and providing the necessary information should be installed.

5 Onboard stability computers should have an uninterruptible power supply (UPS) connected to both main and emergency switchboards.

6 The output should be within the tolerances specified in the Guidelines for the approval of stability instruments (MSC.1/Circ.1229).

7 Details of the loading condition of the ship at each departure should be input to the stability computer in order to encourage familiarity with the operation of the system and to save time on data input in the event of a casualty.

8 At least two crew members should be competent in the operation of the stability computer and capable of interpretation of the output in order to provide the required information.

9 An operation manual should be provided for the stability computer software. The manual should be printed in a language in which the operators are fully conversant.

Shore-based support

10 Owners or operators of passenger ships should ensure that their ships have prearranged, prompt access to computerized, shore-based damage stability and residual structural strength calculation programs. The output should be within the tolerances specified in the Guidelines for the approval of stability instruments (MSC.1/Circ.1229). Access to the shore-based calculation program should be available 24 hours a day. The computer model of the ship and its subdivision arrangements should be input at the commencement of the contract.

11 There should be a contract for the supply of shore-based support at all times during the validity of ship certification.

12 Shore-based support should be operational within one hour; whereby operational means the ability to input details of the conditions of the ship as instructed.

13 Shore-based support should be manned by adequately qualified persons with regard to stability and ship strength; no less than two qualified persons should be available to be on call at all times.

14 At least two independent computers capable of carrying out stability and global strength calculations should be available at all times.

15 The ship should be fitted with sufficiently reliable equipment to allow for communication with the supplier of shore-based support for all intended areas of operation.

Minimum stability and additional information requirements

16 Taking into account the most recent known loading and flooded condition of the ship and taking into account any measures that may be proposed to improve or affect the survivability of the ship, the following information should be provided:

.1 GM transverse in any loading condition;

.2 GZ and range;

.3 area under the GZ curve;

.4 maximum and actual values of free surface moments of all tanks and spaces below the bulkhead deck;

.5 location of flooding level indicators within tanks;

.6 draughts forward, midships and aft;

.7 angles of heel and trim;

.8 the effect of flooding and heel and trim angles on:

.1 operation of essential equipment;

.2 escape routes and evacuation times; and

.3 effective deployment of life saving appliances;

.9 profile areas of the ship both above and below the waterline, and means to establish their centres, in order to estimate the effects of wind pressure;

.10 currently applied global bending moment and sheer force;

.11 fuel consumption data accounting for estimates of increased resistance due to flooding; and

.12 ship specific particulars relating to the Guidelines for damage control plans and information to the master (MSC.1/Circ.1245).

Survey of Safe Return to Port (SRtP) Compliance

SOLAS Regulations II-1/8-1, II-2/21 and II-2/22

Name of Ship:

IMO Number:

The Company has established a system to confirm the continuing operational compliance of the equipment and systems that form part of the ship's SRtP capability. Compliance is demonstrated by scenario testing, confirmation of individual system capability or by equipment or component renewal or a combination of the above. The system confirms the ship's SRtP capability over a five-year period.

The system has been reviewed as part of the PSSC Survey.

Signed: Date:

Name of [Administration] Surveyor: Stamp:

Signed: Date:

Name of [Administration] Surveyor: Stamp:

Signed: Date:

Name of [Administration] Surveyor: Stamp:

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