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COMMISSION STAFF WORKING DOCUMENT

For the Council Shipping Working party

IMO – Union submission to be submitted to the 6th session of the Sub-Committee on Ship Systems and Equipment (SSE 6) of the IMO in London from 4 – 8 March 2019 concerning concerning review of relevant recent accident investigation reports from the EU

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PURPOSE

The document in Annex contains a draft Union submission to the 6th session of the Sub-Committee on Ship Systems and Equipment (SSE 6) of the IMO in London from 4 – 8 March 2019, concerning review of relevant recent accident investigation reports from the EU based on significant fires that have occurred in the ro-ro decks of ro-ro passenger ships and which have been investigated by EU accident investigation bodies. It is hereby submitted to the appropriate technical body of the Council with a view to achieving agreement on transmission of the document to the IMO prior to the required deadline of 30 November 2018¹.

Article 6(2)(a)(i) of Directive 2009/45/EC applies SOLAS, as amended, to Class A passenger ships. Moreover, Directive 2009/45/EC, Annex I, Chapter II-2 Fire Protection, Detection and Extinction lays down various and extensive requirements for Class B, C and D passenger ships when engaged in domestic voyages, therefore the said draft Union submission falls under EU exclusive competence.

¹ The submission of proposals or information papers to the IMO, on issues falling under external exclusive EU competence, are acts of external representation. Such submissions are to be made by an EU actor who can represent the Union externally under the Treaty, which for non-CFSP (Common Foreign and Security Policy) issues is the Commission or the EU Delegation in accordance with Article 17(1) TEU and Article 221 TFEU. IMO internal rules make such an arrangement absolutely possible as regards existing agenda and work programme items. This way of proceeding is in line with the General Arrangements for EU statements in multilateral organisations endorsed by COREPER on 24 October 2011.

**REVIEW SOLAS CHAPTER II-2 AND ASSOCIATED CODES TO MINIMIZE THE INCIDENCE
AND CONSEQUENCES OF FIRES ON RO-RO SPACES AND SPECIAL CATEGORY
SPACES OF NEW AND EXISTING RO-RO PASSENGER SHIPS**

Review of relevant recent accident investigation reports from the EU

Submitted by the European Commission on behalf of the European Union

SUMMARY

Executive summary: This submission intends to present all relevant accident investigation reports and particularly any safety recommendations that could be useful to the work on this agenda item.

Strategic direction:

High-level action:

Output:

Action to be taken: Paragraph 47

Related documents: FSI 21/5, SSE 5/17, SSE 5/WP.4, III 5/4, SSE 6/6/XX

Introduction

1 This document is submitted in accordance with section 6.12.3 of the *Guidelines on the Organization and Method of Work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies* (MSC-MEPC.1/Circ.5/Rev.1).

2 Since the submission of FSI 21/5, significant fires have occurred in the ro-ro decks of ro-ro passenger ships which have been investigated by EU accident investigation bodies. This paper intends to present extracts from the relevant accident investigation reports and particularly safety recommendations that could be useful to the work on this agenda item. More specifically, the accidents that are included in this submission are those of the NORMAN ATLANTIC, the SORRENTO, the STENA SPIRIT, the URD, the VICTORIA SEAWAYS and the KRITI II.

3 It should be noted that the accident investigation reports may also be downloaded through the EMCIP portal: <https://emcipportal.jrc.ec.europa.eu>

Accidents and safety recommendations

4 In the following paragraphs, which have been extracted from the accident investigation reports, there is a brief description of each accident followed by the safety recommendations that are relevant to this agenda item.

Norman Atlantic (See also III 5/4, Annex 1.13)

5 *In the night between the 27th and 28th December 2014, during the navigation from Igoumenitsa to Ancona, a very serious fire broke out in the ship M/V NORMAN ATLANTIC, carrying on board 417 passengers, 55 crew members and at least 3 ascertained illegal immigrants. Overall 452 people were rescued and the bodies of 11 victims were recovered (nine victims, who died at sea because of hypothermia or drowning, were found in water during the rescue operations, while two completely burnt bodies were found on board of the ship, respectively on the 2nd and 13th February 2015), while 16 passengers and presumably 6 illegal immigrants are still missing.*

6 *The smoke was first seen through the bridge windows. An AB was sent to check the condition and the AB informed the bridge that a truck had its engine running and was generating some smoke (engine running for the reefer container). There was a fire alarm from the Deck 4 garage. The master saw flames coming out the windows abaft of the lifeboat. The master ordered the activation of the drencher pump. The first engineer confirmed the drencher pump was started. However, based on the evidence collected during the investigation, the valves of Deck 3 instead of those of Deck 4 were opened. Then the first distress signal was launched. The fire team could not approach the fire scene because of smoke and heat.*

7 *The engine staff left the engine room themselves, and not by the master's order. The quick closing valves were closed. The main engine was then stopped due to fuel oil cutting off. At the time of the accident, No. 1 and No. 2 generator engines were working in parallel. The generator engines stopped due to the engine room being full of smoke and there not being sufficient oxygen for the combustion of the engines, thus resulting in a blackout. The emergency generator started automatically, but could not be on load to supply electricity. The chief engineer and the electrician tried to put the emergency generator on load manually, but in vain.*

8 *The fire developed and spread into a severe situation within a short period of time at the starboard side and therefore all starboard side evacuation means could not be used. The port side lifeboat carrying 88 persons was launched into the sea by some crew members without a specific order by the master. Also, the port side liferafts were launched into the sea directly by the passengers without being ordered by the master.*

Relevant Safety Recommendations

9 004/2015-09 A study / analysis shall be carried out to develop solutions, which are different from the existing ones, concerning the aspects and structural/constructive criticalities mentioned above:

- Fire detection systems in the deck garages, which, considering the openings in the hull, shall be placed and designed/calibrated pursuant to the openings;

- Side openings of open cargo decks of ro-ro ships, to prevent/mitigate the devastating effects produced by the uncontrolled inflow of external air;
- Passive protection of the areas where collective rescue means (including the MES and evacuation stations as defined by the Solas) are placed. Their placement shall also be made considering any hull opening of ro-ro areas, so as to prevent direct contact with open flames in case of fire;
- Review of fixed fire-fighting systems protecting garages on decks, the implementation of alternative extinguishing/containment systems (Ex.: water barriers/water mist etc..) is recommended;
- The passive protection of cables and electric circuits running through the garage shall be improved so as to extend the activity of emergency systems;
- Obligatory installation of an adequate video surveillance system (equipped with temperature detectors) in the garages so as to enable a continuous and immediate remote control (navigation bridge, ECR, etc.);
- For the existing ships, evaluate the redundancy of electric systems supplying the pumps for the fixed extinguishing system of “Drencher” type so as to ensure the full operation of the system also in emergency conditions;
- FSS code, chapter 9 – par. 2.3.2.1, should be amended in order to include also the technical specifications for smoke detectors to be installed inside open ro-ro cargo spaces.

10 004/2015-13 The minimum distance among the vehicles lashed in the garage and for enabling the operational and safe passage of the fire-fighting team on board shall be established;

11 004/2015-15 Introducing the possibility to have a feedback, also from the navigation bridge, on the status of valves and on the functioning of the Drencher;

12 004/2015-16 Providing in advance, while considering the ship operative nature, a detailed list of the cargo which shall be loaded, including also sizes and weight and any further technical requirements (for ex. electrical connection on board etc...) so as to enable the compilation of the cargo plan before departing;

Sorrento

13 *156 passengers and crew were evacuated and rescued from lifeboats, and 4 crew members were hospitalised (one in serious condition) when the passenger/ro-ro ferry Sorrento was in danger of sinking as a result of damage caused by a major blaze on board when it was around 17 n-miles west of the western Mediterranean island of Majorca, Spain, while outbound from Palma to Valencia at around 13.50 on 28th April 2015. The blaze began on the port side of the ferry on deck 4, following which the captain did not initially consider it necessary to evacuate the ferry, but when it became clear that the crew was unable to control the fire, the captain gave orders for those on board to get into the life rafts positioned on the starboard side.*

Relevant Safety Recommendations

14 The relevant Safety Recommendations (SR) from the Sorrento accident are almost identical to the ones of the Norman Atlantic as they stem from the same accident investigation

body and relate to similar ships. More specifically, SR 004/2015-09 (without the bullet point on passive protection of the areas where collective rescue means), 004/2015-13 and 004/2015-16 are repeated since they are also applicable following this accident.

15 The following is the only additional SR: 004/2015-08 According to the criticalities evidenced at para 5.8 (*of the accident investigation report*), EU COMMISSION and IMO are invited to consider a review of the rules/legislation applicable to the reefer trucks and the refrigerating units installed on-board.

Stena Spirit

16 *On 31 August 2016 the Stena Spirit was underway her regular voyage from the port of Karlskrona, Sweden, to the port of Gdynia, Poland. Some minutes before reaching the "GD" buoy, a fire alarm was activated at the bridge as a result of a smoke detected on the car deck No. 3 in the aft part of the ship. A watchman was sent to the indicated location who, after arriving there, determined that the smoke was caused by a refrigerator truck parked next to the left ramp.*

17 *At 06:47, after on passing the "GD" buoy, the master arrived at the bridge. The chief officer informed about activation of a fire detector. Additionally, an electrician and safety officer were sent to check the refrigerator truck. They reported to the bridge that the smoke comes from the V-belts of the truck refrigerator unit's drive and that the refrigerator had been disconnected from the ship's electrical supply and that there was no fire hazard. For the removal of the smoke from the cargo bay, the ventilation system was activated.*

18 *After several minutes, the watchman who remained on the car deck next to the truck noticed fire on the truck's roof, next to the refrigerator unit. He tried to put out the fire with a powder fire extinguisher, but did not succeed. Due to thick smoke, he left the car deck and reported by phone to the bridge that the refrigerator truck caught fire. The ferry crew commenced the fire-fighting operation. To put out the fire, a drencher system (water sprinklers) for fire protection of car decks was used. The fire on board of the ferry was reported to the fire department and the Gdynia Harbour master's Office.*

19 *Due to a very thick smoke on decks and in staircases as well as at assembly points inside the ship, the ferry passengers were evacuated to external decks Nos. 10, 11 and 12 in the fore part of the ship. At 07:35 the fire had been suppressed. The ship moored at the wharf without mooring winches which were inoperative due to damages caused by fire. The fire brigade boarded the ship and went to the fire location.*

20 *At 07:57 the passengers were allowed to leave the ship. After 20 minutes, the stern ramps were opened to allow firemen waiting on the wharf to board the ship and to fully extinguish the fire of the refrigerator truck. At 08:20 the last passengers disembarked the ship and the firefighting operation was completed within 20 minutes. In the evening on the same day the Stena Spirit left Helskie II wharf and sailed to the ship repair yard in Gdańsk to carry out an inspection and repairs after the fire.*

Relevant Safety Recommendations

21 It is noted that several of the recommendations to the ship-owner are ship specific and some are ISM related. However the following recommendation regarding training could be generally applicable: 6.1.8 Provide the crew additional firefighting training and fire drills, delivered by an institution certified to carry out such training, focusing the firefighting action in the spaces used to transport cars, and in particular on the extinguishing of fires of electrical installations and the refrigeration units of the transported vehicles, as well as how to operate and shut-off ventilation in order to prevent smoke penetration into passengers spaces, including: turning off ventilators, remote closing of fire damper, manual closing of inlets and outlets of passenger rooms ventilation – shown at the ship's fire protection plan;

22 6.3 [...] The (*port state control*) inspection should include a check of the structures of the divisions bounding the vehicle spaces as well as the passages and closure of the openings in those divisions, bearing in mind the fact that during the fire, smoke from the vehicle space spread to accommodation areas and the passenger muster stations. During the inspection, it is recommended to check the ship's fire protection documentation, such as the fire control plan, the maintenance plan of the fire protection systems and appliances, and to check the records of periodic firefighting trainings and drills.

23 6.4.1 In all ro-ro cargo spaces – all electrical wires, hydraulic system piping as well as cables from other systems having a significant impact on ship safety, run under the ceiling, should be secured with steel casing against damage as a result of fire of vehicles in these premises; instead of using casing for electric cables, such cables can be made as being fire-resistant;

24 6.4.2 In all ro-ro cargo spaces, for vehicles, separate rows should be indicated for parking (placing in order) of refrigerator vehicles and the relevant number of spaces should be ensured for access for the handling (inspection) of these vehicles while the ship is at sea; the path on one side of the indicated row of vehicles should be at least 600 mm so that it would facilitate easy access to the vehicle by fire fighters in special breathing apparatuses and protective clothing during rescue and fire extinguishing operations in emergency situations, such as vehicle fire.

Urd

25 *On 4 March 2014 at 0320, URD departed from Liepaja, Latvia, with fully loaded car decks and 110 passengers on board, bound for Travemünde, Germany, according to the ship's regular schedule. At 0740, two crew members, randomly passing the main car deck, discovered a fire on top of a lorry. The bridge was alerted and the car deck sprinkler system was quickly activated. Ten minutes later, the sprinkler system was stopped in order to allow the crew to assess the effect of the extinguishing operation. As the fire was not completely extinguished, the firefighting crew tried to extinguish it by means of a fire hose. Meanwhile, assembly of the passengers was initiated in the ship's reception area on deck 6.*

26 *Approximately 30 minutes after the initial detection of the fire, it had been extinguished and normal operation was resumed. A fire watch was established on the car deck for the remainder of the voyage. URD continued towards Travemünde and arrived as scheduled on 5 March 2014 at 0730. The origin of the fire turned out to be a fluorescent light fixture installed on the car deck.*

Relevant Safety Recommendation

27 The fire originated in a fluorescent light fixture. The burned fixture and a randomly chosen fixture from the car deck showed clear signs of deterioration caused by ageing and exposure to an unfavourable environment. On this background DMAIB recommended the company that all fixtures installed on the ship's car decks are subject to an examination to ascertain the need for repair or replacement.

Victoria Seaways

28 *The on-board fire alarm of VICTORIA SEAWAYS ship tripped on Tuesday, April 23, 2013 at 1:53 AM ship time on voyage Kiel - Klaipeda. A starboard sensor on Deck 3, between ribs 40 and 50, detected a fire. The number of tripped fire sensors rapidly increased and there was visible smoke in the view from a video camera located on the stern of Deck 3. The ship ventilation was stopped at 1:54 AM. The decision was made to activate drencher sections 7 and 8 on Deck 3.*

29 *The ship speed was reduced and power supply cut off to Decks 3 and 4. The passenger service crew started evacuation of the passengers from the cabins to the points of assembly by life-saving equipment. Section 7 and 8 of the drencher system activated on Deck 3 at 2:05 AM. No smoke leaks to the external decks and living quarters were detected. At 2:10 AM the reconnaissance teams found a hot spot above the seat of fire on Deck 4 and cooling of the deck started with fire fighting hoses from the stern and the head.*

30 *At 2:25 AM, to ensure fire prevention on Deck 3, two additional fire pumps were started and connected to the drencher systems; sections 9 and 10 of the drencher system were activated on Deck 3. At 3:00 AM sections 7 and 10 of the drencher system were deactivated while sections 8 and 9 remained active. At 3:25 AM Deck 4 had completely cooled at the seat of fire. The reconnaissance team checked Deck 3 and confirmed there were no open flames but considerable smoke. The drencher system was deactivated and reconnaissance of Deck 3 and cooling and checks of Deck 4 were performed on a regular basis.*

31 *Water from Deck 3 was successfully drained through scuppers and the lurch caused by water accumulated on starboard side gradually decreased. At 3:45 AM sections 8 and 9 of the on-board drencher systems were reactivated on Deck 3 to ensure the fire was completely extinguished. At 4:00 AM the seat of fire had been extinguished. At 4:25 AM the ship resumed her voyage towards Klaipeda seaport.*

Relevant Safety Recommendation

32 As a result of this accident there were recommendations to the ship owner, one of which is considered relevant: 6.1 We recommend to issue an order to ferry captains to appoint members of their crews responsible for checking if the batteries of all transported second-hand cars are disconnected before the ship leaves the port.

Kriti II

33 *At approximately 2333 on 19 November 2012, a fire broke out at the fore section of the main vehicle deck on ROPAX "KRITI II" flying the Greek Flag while she was on passage from*

Igoumenitsa to Patras carrying 113 passengers, 87 crew members, 92 freight trailers and 18 cars. By the time of the marine accident KRITI II was 4 nm W off the port of Patras and the crew was under preparation for the arrival and berthing procedures. Following the breaking out of the fire, the fire alarm was activated and an AB was ordered by the OOW to check no 2 fire zone at the main car deck bow section.

34 *The fire was confirmed and the master ordered the activation of Drencher fire extinguishing system. The Fire Response Team was also alerted, mustered and entered into the area of the fire from the starboard bow's main deck door. However, the heavy dense of smoke prevented the team to approach the seat of the fire. The master ordered the crew to assemble the passengers in Muster Station No 7 at the aft exterior area of deck No 7 and to prepare the lifesaving equipment for abandonment.*

35 *KRITI II entered the port of Patras and berthed alongside at 0036 in order to disembark the passengers and allow the Fire Service operational engagement. Passengers disembarkation, managed by crew and Coast Guard Officers, was completed by 0055 through the starboard stern ramp. No injuries were reported. The fire fighting and extinguishing operation primarily involved the Fire Brigade with five crewed fire trucks and the Fire Service local Special Disasters Response Unit, assisted by the crew of KRITI II, a firefighting vessel and two port tugs.*

36 *The stowage and parking configuration of the freight trailers on main car deck prevented the direct access and approach of the fire fighters to the fire seat. The freight trailers were gradually driven off board by the Officers of the Special Response Unit. The fire was extinguished at approximately 1430 on 20 November 2012.*

Relevant Safety Recommendation

37 SR 01/2012 Consider of amending or supplementing the regulations of the current legal framework, concerning loading, stowage and carrying of freight trailers on board ROPAX by:

- introducing a system of periodical inspections and certification on reefers' cooling systems equipment, operating during transportation by ROPAX
- establishing requirements for fireproof covers on trucks transported by ROPAX
- introducing regulations for the segregated stowage of reefers from general cargo trucks loaded on ROPAX
- introducing a requirement for fireproof boxes at the connection points of ship's electrical power supply cables and connectors with the reefer's electrical power sockets.

38 SR 02/2012 Consider the incorporation of the TV Surveillance system in garage spaces as a requirement for an additional measure for the early detection of fire.

39 SR 03/2012 Consider the introduction and establishment of the maximum number of simultaneously activated and operated drencher systems' zones in relation to efficient performance, as "Best Practice" to be recorded in "Fire Training Manuals".

40 SR 04/2012 Consider of conducting a “Targeted Action Plan” to assess the implementation of measures and requirements pursuant to the Circular issued by the Competent Directorate for the maintenance and periodical inspection of the Drencher systems.

41 SR 05/2012 Consider the necessity Port Authorities being equipped with a portable telescopic ladder capable for facilitating passengers’ disembarkation-evacuation from ROPAX or passenger ships upper decks in emergency situations.

Discussion

42 As can be observed, a number of the Safety Recommendations presented above are relevant to the current discussions under this agenda item and are providing useful input. As a matter of fact, the recommendations strengthen several of the items that were identified in the work of the FP WG at SSE 5 and were included in Annexes 1 and 2 of SSE 5/WP.4 which were approved by the Sub-Committee (SSE 5/17, 7.14 and 7.15). It should also be noted that a number of the safety recommendations proposed (e.g. Norman Atlantic, Sorrento) are also tackled by the FIRESAFE II study (SSE 6/6/XX). A summary of the SRs can be found in the table below.

| # | Brief Description | Item in Annex 2 (SSE 5/WP 4) | Accident | Para. no of SR |
|----|---|------------------------------|------------------------------|----------------|
| 1 | Fire detection systems on open decks | Possibly 2.3 or new item | Norman Atlantic/ Sorrento | 9 |
| 2 | Side openings | 4.2, 4.3 | Norman Atlantic/ Sorrento | 9 |
| 3 | Passive protection of LSA | 5.1 or new item | Norman Atlantic | 9 |
| 4 | Alternative fixed fire extinguishing systems | New item under 3 | Norman Atlantic/ Sorrento | 9 |
| 5 | Passive protection of cables/electric circuits | 1.3 | Norman Atlantic/ Sorrento | 9 |
| 6 | Mandatory CCTV | 2.2 | Norman Atlantic/ Sorrento | 9 |
| 7 | Redundancy of electric systems of the drencher pump | New item under 3 | Norman Atlantic/ Sorrento | 9 |
| 8 | Vehicles minimum distance | New item under 2 | Norman Atlantic/ Sorrento | 10 |
| 9 | Status of drencher system on the bridge | 3.2 | Norman Atlantic | 11 |
| 10 | Cargo plan prior to departure | New item under 1 | Norman Atlantic/ Sorrento | 12 |
| 11 | Reefer trucks standards | N/A | Sorrento | 14 |
| 12 | Additional firefighting training and drills | 3.3 | Stena Spirit | 21 |
| 13 | PSC checking fire boundaries, fire protection documentation and records of training and | New items under 3 and 4 | Stena Spirit | 22 |

| | | | | |
|----|--|---------------------------------|------------------|----|
| | drills | | | |
| 14 | Metal casing for piping and cables | 1.3 with the addition of piping | Stena Spirit | 23 |
| 15 | Separation of reefer units and minimum distance | New item under 1 | Stena Spirit | 24 |
| 16 | Light fixture check | Addition to 1.6 | Urd | 27 |
| 17 | Disconnect second hand vehicles batteries | Addition to 1.6 | Victoria Seaways | 33 |
| 18 | Inspection and certification of reefer units | N/A | Kriti II | 38 |
| 19 | Fireproof covers of trucks | N/A | Kriti II | 38 |
| 20 | Segregation of reefer units | New item under 1 | Kriti II | 38 |
| 21 | Fireproof boxes at connection points | 1.4 | Kriti II | 38 |
| 22 | Mandatory CCTV | 2.2 | Kriti II | 39 |
| 23 | Establishment of max drencher system zones in fire training manuals | Relevant to 3.3 | Kriti II | 40 |
| 24 | Targeted action plan for maintenance and periodical inspection of drencher systems | N/A | Kriti II | 41 |
| 25 | Portable telescopic ladder at ports | N/A | Kriti II | 42 |

43 As can be observed in the table, there are some points that are made by the accident investigation reports that are not included in the list of Annex 2 mentioned above (items identified with N/A). Although these items are not directly relevant to the work of this agenda item, the Sub-Committee may wish to consider if and how they could be tackled, especially since they have been reported by the accident investigation bodies and in some cases more than once.

44 At the same time the remaining SRs are directly relevant to the work that is being carried out in this agenda item and therefore it is hereby proposed that these are taken into consideration in the development of the draft interim guidelines.

Action requested of the Sub-Committee

45 The Sub-Committee is invited to consider the proposals in paragraph 43 and 44 above and take action as appropriate.
