'Case Study on 'Fire onboard MV Daniela off the Coast of Colombo Harbour'

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INTRODUCTION

1. A fire onboard a ship at sea is always serious and dangerous for mariners, materials onboard and the ship itself. The ship's crew and any external assistance dispatched to assist with the situation must take rapid and appropriate steps to extinguish or limit the fire with available resources. In the event of an extensive ship fire, the greatest challenges concern decisions about when to muster any passengers on the ship at its rescue stations, or even evacuate them, and how long firefighting measures are carried out before the ship must be either partly or even completely extinguished. Taking the ship to a port or place of refuge also involves great challenges for decision makers.

2. There is a limited number of crew available onboard most of the vessels in the modern era. However, the size of the vessels is getting bigger and bigger day by day and the amount and the value of cargo carrying onboard are also on the rise. Therefore, the limited number of crew onboard face a greater challenge in safeguarding their own lives, ships and the cargo onboard, especially against onboard fires. In the event of a major distress situation onboard, the limited crew onboard will not be able to manage the situation by their own and the coordinated support of every possible individual is essential to manage the situation before it gets into a disastrous situation. Hence, making the decision to call for the assistance, the readiness of the organizations involve in coordinating disasters and the timely decision making are very crucial in handling such situations.

3. In addition, deriving lessons learnt from the incidents already happened would undoubtedly help the maritime fraternity to implement necessary precautionary measures to void similar incidents in the future. Therefore, fire broke out onboard very large container ship MSC Daniela in the Indian Ocean at 120 nautical miles off Colombo port in Sri Lanka on 04th April 2017 and the coordinated firefighting mechanism of the Maritime Rescue Coordinating Centre (MRCC) were taken into the study in order to derive lessons learnt and to make recommendations for the maritime fraternity to avoid similar incidents in the future.

THE INCIDENT

4. MSC Daniela had been on her passage from Singapore to Suez Canal, when containers on the main deck in aft part had inflamed. The crew had tried to attack and extinguish the fire, however, had been unable to get control over the fire during the first minutes and the thick toxic smoke had hampered the firefighting. The crew had changed the course towards Colombo and had sent a distress signal to the local authorities, requesting immediate assistance.

5. Upon receiving a fire distress call from a container vessel, MSC 'Daniela' the Maritime Rescue Coordinating Centre (MRCC), Colombo had dispatched the Offshore Patrol Vessel Sagara on patrol and two Fast Attack Craft (FAC) of the Sri Lanka Navy (SLN) on scene for the assistance.

6. Two tugs of the Sri Lanka Ports Authority (SLPA), Rawana and Maha Wewa had also joined firefighting efforts; however, the initial efforts had also gone in vein due to the intensity of the flames. In the eventuality of spread of fire, Sri Lanka Navy had requested assistance from the Indian High Commission, as there had been a Coast Guard vessel (ICGS 'Shoor') that had been on a goodwill visit berthed in the Colombo harbour. The Indian High Commission had promptly replied to the request made by the Sri Lanka Navy dispatching ICGS 'Shoor' to assist in extinguishing fire onboard the distressed vessel.

7. The firefighting mission had also joined by the SLNS 'Sagara' patrolling in the Southern Seas. Both 'Shoor' and 'Sagara' are equipped with firefighting equipment and have had specialized firefighting personnel onboard. In addition, the Indian Navy had also directed two of their ships INS 'Darshak' and INS 'Garriel' to the location. In the similar vein, three more SLN FAC had dispatched on scene for the evacuation of 21 crew members in a situation of the fire spreading, endangering the safety and life of the crew.

8. Meanwhile, the Sri Lanka Air Force also had joined hands, providing a 'Bell 212' helicopter augmenting the combined firefighting efforts. The Indian Coast Guard further had extended its assistance, providing the 'Chetak' helicopter to the distress response efforts. The dousing operations had continued with the unprecedented assistance of the Sri Lanka Navy, Sri Lanka Air Force, Sri Lanka Ports Authority, Indian Navy and Indian Coast Guard personnel.

9. The fire existed over 10 days and the MRCC Colombo together with other stakeholder agencies had made their maximum efforts to extinguish the onboard fire. Subsequently, the SLPA had taken the vessel inside the Colombo port and had unloaded cargo operational terminal. The representatives from the Maritime Environment Protection Authority (MEPA), Cargo Owners, Fire Experts and Harbour Master of the Colombo harbour had witnessed the firefighting operations and had visited onboard MV Daniela time to time during the operation.

Particulars of the Vessel Involved

10. Basic ship particulars of the vessel involved in the incident are as follows.

a. Name of the Vessel -MSC Daniela
b. Company name -DANIELA NAVIERA CO SA
c. IMO Company Number - 4111836
   (1) Company address - Chemin, Geneva, Switzerland
   (2) Country of registration- Panama
   (3) Company status - Active

d. IMO No - 9399002
e. Flag - Panama [PA]
f. AIS Vessel Type- Cargo - Hazard A (Major)
g. Gross Tonnage - 151559
h. Deadweight - 162867 t
j. Length Overall - 366.07m
k. Breadth Extreme - 51.24m
l. Year Built - 2008

CASE STUDY

11. The study was carried out keeping two objectives in mind. The first objective was to identify the cause of fire onboard and the second was to identify the lapses and the shortcomings of the stakeholder agencies involved in the entire process of extinguishing fire onboard, including the ship's crew and the local agent.

12. This case study, takes a closer look at the firefighting efforts of the crew, which had been supplemented with external help at some stage of the extinguishing operation. Accordingly, the case analysis section examines and analyses the significance of external help during the course of the incident with a view to answering the following questions:

a. How was external help used and how did it affect the progress of the situation.

b. What were the 'lessons learnt' for the future development of combined firefighting operations?

13. The analysis draws not only on incident statistics, but also conducted interviews with experts from different stakeholder agencies involved in the incident. The report largely focuses on the operating principles of stakeholder agencies responsible for the providing firefighting assistance and cooperation among the MRCC Colombo, SLPA, Local Agent, MEPA, Sri Lanka Navy (SLN), Sri Lanka Air Force (SLAF) and the distressed vessel.

KEY STAKEHOLDER AGENCIES INVOLVED IN THE FIREFIGHTING OPERATIONS

14. In the event of a ship fire, the situation can be brought under control with the help of many different actors and functions. The major stakeholder agencies involved in this particular incident and their responsibilities are discussed below:

Maritime Rescue Coordinating Centre (MRCC)

15. Maritime search and Rescue (SAR) operations involve saving and safeguarding people in distress and danger at sea. Maritime SAR can be considered to include many kinds of tasks, such as assisting ships and boats in maritime distress, preventing accidents, searching for persons and vessels lost at sea, consultation with physicians and medical transportation from ships to shore.

16. The SLN has been vested with the SAR responsibility over the Sri Lanka's Search and Rescue Region (SRR). The Sri Lanka's SRR expands over 1.7 million square kilometers and it is approximately 25 times of the Sri Lanka's land mass. However, the number of units available with the SLN for the SAR operations are very limited in numbers.

Sri Lanka Ports Authority (SLPA)

17. The SLPA is the state-owned operator of major commercial ports in Sri Lanka. Founded in 1979, and the SLPA currently operates ports in Colombo, Galle, Hambantota, Kankesanthurai, Oluvil, Point Pedro and Trincomalee.

18. Fire and rescue services engage in maritime operations function under the SLPA based on their ordinary day-to-day capabilities to operate on water. Fire and rescue services as a rule, engage in such operations in their own area of operations. The scope of operations depends largely on a risk analysis of the area in question and the available resources. The basics of operations and the coordination and command structure are determined by the SLPA management.

The Marine Environment Protection Authority (MEPA)

19. The MEPA is the apex body established by the Government of Sri Lanka, under the

Marine Pollution Prevention Act No. 35 of 2008, with the sole responsibility to prevent, control, and manage the pollution of Sri Lanka's Marine Environment.

ANALYSIS / OBSERVATIONS

20. This section analyses the ship fire incident occurred onboard MSC Daniala on 04th April 2017, with a particular focus on evaluating whether external help was useful in minimizing the consequences of the incident and how cooperation among stakeholders could be developed in the future.

21. The analyzed incident and the rescue measures employed have been divided into three phases:

a. Start and alert phase
b. Operations on scene
c. Subsequent actions

22. Furthermore, these three phases have been examined from the perspectives of following actors:

a. The vessel in distress
b. The Maritime Rescue Coordination Centre
c. The Sri Lanka Ports Authority
d. Marine Environment Protection Authority
e. Local Agent/ Shipping Agent

23. The table below illustrates the roles of different actors in each phase of the incident.

Unit	Start and alert phase	Operations on Scene	Subsequent Actions
MSC Daniela	Fire Alarm > Assess Situation > Distress Message	Firefighting	Berthed Alongside and cargo clearance
MRCC	> Receiving Distress Message > Alerting Units	Control and Coordinating units	Continuous monitoring
SLPA	Receiving Distress Message	Preparations> Dispatch FF units	Assist Cargo Clearance
MEPA		Receiving Distress Message > Prepare suitable refuge> Be ready with pollution prevention measures	
Agent		Receiving Distress Message> Support MRCC with details	Assist Cargo Clearance

Start and Alert Phase

24. **Operations of the Vessel**. Following observations were revealed during the analysis.

a. The analysis made on the crew list and the interview conducted with the local agent revealed that the vessel and the crew qualifications complied with the STCW Convention. The IMO's STCW Convention is an international agreement on the minimum standards of training, certification and watchkeeping for seafarers.

b. The distress vessel has had STCW-compliant operating models for dealing with fires. The fire control plans of a vessel designate a separate person or persons to be responsible for tasks such as the use of the CO2 fire smothering system in the engine room, the closing of ventilation hatches and smoke diving.

c. On the basis of the analyzed ship fire, it can be noted that operations and drills on the ship's firefighting plan had been conducted regularly. The fire alarm systems had been functioning properly.

d. Human factors, the training completed by the crew and drills play a decisive role in the success of the initial measures. The Master of the ship had not appreciated the situation correctly and had not informed the incident to the appropriate authorities at the right time.

e. A vessel must be aware that it has to request external help early enough if it cannot get the fire under control immediately or if there is a delay before the fire is detected. Situational awareness is particularly significant when requesting external help; if the extent of the fire is not accurately known, it is best to be on the side of caution.

25. **Operations of the MRCC.** Following observations were revealed during the analysis

a. It was revealed that the vessel had not sent its distressed message in accordance with the Global Maritime Distress and Safety System (GMDSS). The initial information received at the MRCC Colombo was from a resident living in Colombo. After making numerous attempts the MRCC had been able to obtain the correct information on the incident.

b. According to GMDSS, a vessel should first send out a digital distress message on Channel 70 using VHF-DSC. After this, the distress vessel should tune to VHF Channel 16 to report on the situation onboard and request assistance. VHF distress communications are then automatically carried out on Channel 16.

c. Had the MSC Daniala followed the correct procedures it would have been easy for the MRCC Colombo to locate the ship and coordinate and provide immediate assistance to mitigate the situation.

d. However, on verification of the information the MRCC Colombo had responded swiftly and had coordinated the event effectively.

e. The MRCC's decisions to alert the fire and rescue services had done rapidly and clearly. At the time of the alert, the MRCC Colombo had been managed by an adequate number of staff, with four persons classified as operators and one as a Search and Rescue Mission Coordinator (SMC).

f. Adding personnel from the SLN had enabled the MRCC Colombo to divide tasks efficiently, which in turn lightened the workload of the SMC and the core staff at the control centre while dealing with the situation.

g. The representatives of cooperating parties had provided the MRCC Colombo with specialist expertise in their own fields.

h. The MRCC Colombo is supported by the National SAR coordinating Committee. The National SAR coordinating Committee consist of key representatives of almost all the agencies dealing with maritime affairs.

26. Operations of the SLPA. Following observations were revealed during the analysis.

a. Fire and rescue services functions under the SLPA and operates in liaison with the MRCC. The general operational principles are to operate the Fire Liaison Officer at the MRCC under the SMC or supports him. The liaison Officer can be invited to the MRCC solely to consult and assess the situation without alerting firefighting teams or other Fire and rescue service units to the task or even if there is no intention to use such teams and units.

b. In this particular incident, the SLPA Fire Liaison Officer had been alerted by the MRCC Colombo through the Harbour Master to be prepared to handle the task. However, physically the SLPA Fire Liaison Officer had not been called to the MRCC for the assistance. This had posed a great challenge to the appropriate coordination of the SAR situation.

c. However, the SLPA fire services had been kept standby for immediate deployment by the Fire Liaison Officer on receipt of the alert from the MRCC Colombo.

d. Most of the MRCCs maintains their own Maritime Incident Rescue Group (MIRG) consisted with the experts of all the fields to provide a swift response to the incidents. However, the MRCC Colombo has not yet formulated its own MIRGs to assist a situation.

e. Establishing accurate situational awareness helps the MRCC to make the right decisions and operating plans. However, the master of the vessel and the Local agent had been delayed to provide cargo information to the MRCC on time.

f. Rapid and professional response can often provide sufficient additional support, in accordance with the basic concept of MIRG operations, for the crew of a distress vessel dealing with a ship fire.

Operations on Scene

27. **Actions of the Vessel during the fire.**
Following observations were revealed during the analysis.

a. The Master of the ship had initially refused the assistance of the other vessels and Sri Lanka Naval Ship Sagara stating that the fire is under control and could be managed with the ship's crew themselves. Due to this action of the captain, the initial firefighting measures had been somehow delayed, and consequently the fire had over spread and the situation had become more severe. This incident highlights the importance of correct decision making. Operating models for receiving and using external help is a crucial factor in fighting in a dipterous situation and therefore it is important for the Master of the ship to know how to make efficient use of external help in firefighting.

b. However, during the event the captain and the crew had cooperated well with the MRCC Colombo and the rescue units facilitating them to engage in effective firefighting. The crew of the vessel had operated in an exemplary manner and had carried out initial firefighting measures on their own.

c. At one point of time the Master of the ship had not concurred to employ a firefighting unit without approval of the operator due to the high cost involved. However, later the Local Agent had given the consent to use the particular firefighting unit for the operation.

d. The MRCC Colombo had requested the type of cargo onboard from the local agent and the Master of the Ship and it has taken a quite long time for them to provide the required details. Had this information been provided to the MRCC on time the planning and conduct of the firefighting operation would have been much easier for the MRCC, Colombo.

e. During the firefighting operations, the Master of the Ship heaved her anchor and had started moving seaward. Subsequently, the Master had indicated his reluctance to anchor the ship once again sine the ship's company had advised the master to avoid doing so. The MRCC Colombo had instructed the Master to anchor the vessel since the firefighting operations are difficult whilst underway.

28. **SAR Operations.** Following observations were revealed during the analysis.

a. According to the maritime law, the master of the vessel has absolute authority on the vessel while it is at sea. The SMC coordinates the rescue of human lives at sea and the operations of other authorities and parties participating in the rescue operations as agreed nationally. Accordingly, when the vessel is at sea, the most important task of the MRCC coordinating the situation is to prepare for the continuity of operations and the possible evacuation of those on board in accordance with the decisions of the master of the vessel. Continuous monitoring of the status of the distressed vessel lays a solid foundation for working safely and making the right decisions.

b. A decision had been made by the Master of the ship in consultation with the ship's operator and the local agent to manoeuver the vessel towards the Colombo Harbour. Generally, bringing a vessel to a place of refuge is done by the MRCC in consultation with the relevant stakeholder agencies. In this incident, firefighting had continued in the Colombo harbour anchorage for a certain period of time, which is not at all suitable for a place for refuge.

c. The MRCC Colombo had gathered required/ additional information and had updated the threat assessment to the relevant stakeholders. The MRCC's situational awareness improves decisively when the first unit arrived on scene or the MIRG unit boarded the distress vessel. The deployed FAC had maintained communication with the ship and had provided continuous situational updates to the MRCC. In particular, more detailed information is required on the general situation and its escalation, and also on how ship firefighting is progressing.

d. Having obtained the required information, the MRCC had coordinated following agencies and their assets to effectively manage the situation.

(1) The Sri Lanka Ports Authority (SLPA)

(2) The Sri Lanka Navy (SLN)

(3) Sri Lanka Air Force (SLAF)

(4) Indian Navy (IN)

(5) Indian Coast Guard (ICG)

(6) Marine Environment Protection Authority (MEPA)

e. The SAR assistance obtained from the respective agencies are as follows.

Sr.	Unit	Assistance Obtained
1	SLPA	Firefighting Tugs - 07 Dredger - 01 Firefighting Teams Ship Surveyors
2	SLN	OPV - 01 FAC - 06 Firefighting Teams
3	SLAF	Bell 212 Helicopter
4	IN	OPV - 02 Onboard Helicopter - 01
`	ICG	OPV - 01 Onboard Helicopter - 01
6	MEPA	Technical Advice

f. The MRCC had not called the national SAR coordinating Committee to get the advice and however, the MRCC had coordinated the event very successfully by its own.

29. **SLPA Operations During the Incident.** Following observations were revealed during the analysis.

a. The amount of response time, largely determined by the geographical location of the incident and the means of transportation of the rescue units. The master's initiative to manoeuver the

vessel on his own initiative, in other way facilitated the easy reach of the rescue units.

b. The SLPA had taken its every endeavor to maintain a proper cooperation between the MRCC, Fire and rescue services teams and vessel crew at a good level throughout the operation. In addition, the SLPA had used its every possible resource for firefighting and to bring the situation under control.

c. The situation had expanded over the 10 days with intermittent fire eruption despite the heavy firefighting arrangement had been put in place. It had been evident that the external help had played a decisive role in assessing the situation and ensuring that the correct follow-up measures are taken. If not, the situation could have ended very badly indeed, maybe even in the total loss of the distress vessel and extensive environmental damage, if external professional help could not have been dispatched rapidly to the vessel.

g. Subsequently the vessel had brought inside the Colombo harbour by the SLPA even SAR Coordinating Committee and on the sole discretion of the SPLA. Once the vessel has reached the port, the situation is no longer considered as a SAR mission, but as a Fire and rescue services or salvage operation. The maritime law does not apply to saving human lives from a vessel docked at a port. In such situation, command is transferred when the vessel was brought to port.

h. According to the facts revealed by the local agent and the subsequent reports published by the shipping agent reveals that, some of the cargo had not been disclosed therefore, the units in the firefighting operation could not use the appropriate type of fighting extinguisher. This incident highlights the importance of complying with the provisions of the IMO resolutions.

30. **MEPA actions During the Incident.**

The Marine Environment Protection Authority had been kept informed by the MRCC Colombo to be prepared to mitigate anticipated environmental hazards and therefore, MEPA representative had maintained close contact with the MRCC and had visited onboard to assess the situation.

Subsequent Actions

31. **Subsequent Actions of the Vessel / Operator.** Following observations were revealed during the analysis.

a. The Vessel brought in the Colombo harbour 10 days after the initial incident and berthed in the Colombo Harbour, the Master and the crew had assisted the SLPA to clear the damaged cargo onboard.

b. On May 14, the vessel had left the Colombo harbour for Shanghai, for an estimated three-week period of repairs. However, on 08 August 2017 MSC Daniela had left Chinese Shipping Industry's Changxing yard, continuing her route to Dalian, China.

c. Fire-damaged and water-damaged cargo had been inspected and on-carried where possible. Where it had not been possible to on-carry cargo, cargo remnants had been sold as distressed cargo. Where no value, cargo remnants had disposed of locally.

32. **Subsequent Actions of the SLPA.**

Following observations were revealed during the analysis.

a. The SLPA had brought the vessel to a commercial port operation area whilst continuing the firefighting operations and even without completely removing the containers containing dangerous cargo.

However, few tugs had been kept standby for immediate assistance.

b. The Affected containers and the containers with good condition had been unloaded in different locations of the port premises; however, wonder whether the SLPA conducted a comprehensive risk analysis before unloading the containers within the port premises.

Other Relevant Observations

33. International Cargo Handling Coordination Association estimates the annual volume as 60 million packed containers with 10% or 6 million as declared dangerous goods. Out of which 20% is badly packed boxes which means 1.3 million unstable, dangerous goods containers moving across the oceans. Findings about Cargo Incident Notification System (CINS) estimates 21% of containers with misdeclared goods. Hapag Lloyd estimates more than 150,000 containers with misdeclared dangerous goods moving in the supply chain annually.

34. When a port state observes infringement of the provisions of IMDG Code they will penalize the master of the vessel under SOLAS and MARPOL conventions. Port states who observe infringement of IMDG Code can inform such infringements to the competent authority from whose territory the cargo was originated. Some container lines will start imposing penalties to shippers who misdeclares dangerous goods.

CONCLUSION

35. On the basis of the analyzed incident, it can be stated that the MRCC Colombo together with the other agencies had coordinated the incident effectively and efficiently and had been able to prevent a huge maritime disaster. External on-scene help had led to gain a better outcome, without exception.

36. Even though the MRCC could manage its all the resources, other relevant agencies and their resources and handled the incident without a danger, there are a lot of lessons learnt from the incident. In addition, maintaining a dedicated MIRG with very well-trained personnel to engage in maritime disasters had been emerged as an urgent and essential requirement to mitigate similar maritime disasters.

37. The level of skills and operational capabilities of the crew greatly affects in mitigating the distress onboard and the crew training are to be conducted in line with STCW requirements. It is mandatory that the master of the ship fully co-operate with the support agencies for efficient extinguishment of onboard fire.

38. Cargo classification and declaration is another important area of concern with respect to the fire onboard. The IMDG Code section 2.0.0.1 places the responsibility of classification on shipper/consignor 'The classification shall be made by the shipper/consignor or by the appropriate competent authority where specified in IMDG Code', in order to minimize the hazards and to facilitate appropriate handling.

LESSON LEARNT

39. On the basis of the analysis, it is recommended that the following issues be taken into consideration in handling maritime distress situation.

a. Every nation to maintain a well-trained MIRG team with light equipment that can be mobilized rapidly, and whose primary task is to take initial steps to bring the situation under control or slow down the spread of damage to the extent that the ship can be brought to a port of refuge to save the people on board or evacuated in a controlled manner.

b. The place of refuge process for the vessel is an integral part of SAR operations, therefore it is recommended to demarcate and establish a suitable place for refuge in liaison with the other stakeholder agencies.

c. Joint co-ordination models

and standard operating procedures or operational guidelines should be created to ensure safety and efficiency in joint operations.

d. The close and healthy relationship with the regional SAR services helps to obtain swift assistance.

e. Joint ship fire drills between vessels and MIRG teams should be developed in co-operation with the responsible SAR authority. The plan must be developed in co-operation between the vessel, the company, as defined in SOLAS Regulation IX/1 (owner of the ship), and the SAR services.

f. Education of shipper/consignor or the appropriate competent authority is essential to prevent hazards caused by the misdeclared dangerous goods.

j. The ability of the master to assess fire and to make timely request from the supporting agencies, if he envisages that fire cannot be brought down by the own ships crew.