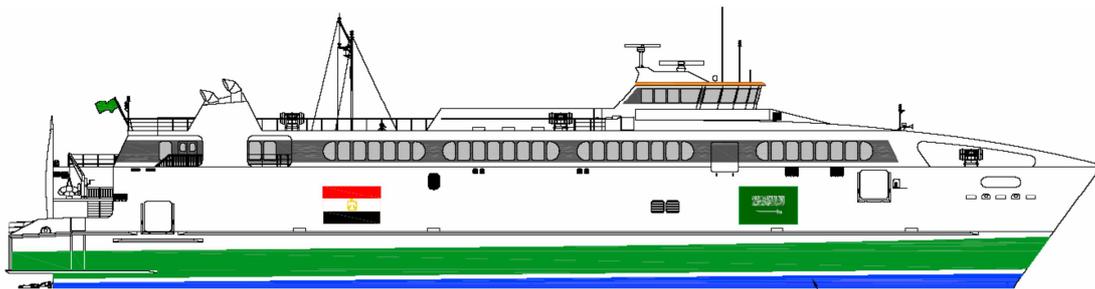


*The development strategy of the  
passenger ships on the maritime line  
between Egypt and Saudi Arabia using  
the HSC*



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The marine line that exists among the Red Sea ports, especially between Egypt and Saudi Arabia, is considered to be the most vital and important lines which are allocated for transferring passengers whereas 250 000 passenger travel between Egypt and Saudi Arabia. So the vessels that exist in this line were considered as the most important means of transportation.

Here when we see the companies that work on this marine line, we will find that nowadays there are two companies. They are:-

- Nama company for maritime, it has 4 passenger vessels:
  1. M/V Mahba built in 1971, carries 1050 passengers
  2. M/V Mauda , built in 1973, carries 1100 passengers.
  3. Masara vessel, built in 1976, carries 800 passengers.
  4. Rahma vessel, built in 1976, carries 900 passengers.
  
- The national maritime, it has 2 passenger vessels:
  1. M/V Dahab, built in 1986, carries 1000 passengers.
  2. M/V Wady El Nile vessel, built in 1987, carries 900 passenger.

We can elicit from the previous information that all the passenger vessels that exist in that marine line are worn-out as their ages exceeded 20 years. So, there is no safety for the passenger `when they travel on them. On the other hand, we see the passengers' categories; most of them are old and illiterate. So it's difficult for them to understand and use the vessels safety equipment easily. Also, the crew number is great, it's about 90-100 person, this number is too great to be trained on the safety equipment.

On a ship engaged on a voyage where passengers are scheduled to be on board for more than 24 h, musters of the passengers shall take place within 24 h after their embarkation. Passengers shall be instructed in the use of the lifejackets and the action to take in an emergency.

Whenever new passengers embark, a passenger safety briefing shall be given immediately before sailing, or immediately after sailing. The briefing shall include the instructions required by regulations 8.2 and 8.4, and shall be made by means of an announcement, in one or more languages likely to be understood by the passengers. The announcement shall be made on the ship's public address system, or by other equivalent means likely to be heard at least by the passengers who have not yet heard it during the voyage. The briefing may be included in the muster required by paragraph 2.2 if the muster is held immediately upon departure. Information cards or posters or video programmes displayed on ships video displays may be used to supplement the briefing, but may not be used to replace the announcement(SOLAS, safety of life at sea, III/19-2.2,III/19-2.3,p306.,).

As we saw the convention of safety of life at sea 1974 affirmed that during 24 hours from the departure, the abandon ship drill must be done, and the safety equipment places must be known. If we see the land distance between Suez port, Egypt and Jeddah port, Saudi Arabia on the Red Sea coast is 640 n.m. if we suppose that the passenger ship that exist in that maritime line speed is 15 knots, so the distance will be taken in 48 hours. Here the drill could be done during 24 hours. But the distance between Safaga port, Egypt and Debbaa port, Saudi Arabia is 150 n.m, so the distance will be taken during 7 hours, so the drill should be quick and right after the departure. That was the difficulty to make the formalization for the passenger and also if there is change in the crew. That occurred in the dire accident of Salam 98, which lost 1044 victims including some of the crew. Its trip was from Debbaa port, Saudi Arabia to Safaga port Egypt. The investigations affirmed that the passengers could not use the life raft or even open it, also the life jacket. They could not deal with that equipment easily.

All these factors and accidents of these vessels led to think in easier equipment in order to facilitate using that safety means on the vessel. Also the passengers should not travel with these worn-out ships and travel on the high speed craft (HSC). The first one worked in Egypt was in 2000; it was "Naser travel", carries 550 passengers, and works between the Hurghada port and Debbaa port. Then the companies started to work with the HSC. For example, the ship "Fares El Salam" in 2003, it passengers.

Firstly, the categories of the HSC should be clarified as follows:

- Category A craft is any high-speed passenger craft:

1. Operating on a route where it has been demonstrated to the satisfaction of the flag and port states that there is a high probability that, in the event of evacuation at any point of the route, all passengers and crew can be rescued safely within the least of:

- The time to prevent persons in survival craft from exposure causing hypothermia in the worst intended conditions,

- the time appropriate with respect to environmental conditions and geographical features of the route, or

- 4 hours; and

.2 carrying not more than 450 passengers.

- Category B craft is any high-speed passenger craft other than a category A craft, with machinery and safety systems arranged such that, in the event of any essential machinery and safety systems in any one compartment being disabled, the craft retains the capability to navigate safely. The damage

scenarios considered in chapter 2 should not be inferred in this respect.(HSC, high speed craft code, 2008, I/1.4.12,I/1.4.13,p9.,)

As we saw the HSC types, we can say that the previous HSCs were type B as the distance between Hurghada port and Debaa is 120 n.m hours. Here, we find that the duration is reduced and we will start to explain the safety equipment and how to use them easily through an example. Firstly, the HSCs do not have cabins. They contain three departments, the bridge, the passenger board and the engine room. The focus will be on the passenger board. It contains a chair for each passenger. There is a life jacket under each chair. Each place in the board has a television to present films to explain the safety equipments and how to use them to facilitate using them. The crew number should not exceed 16 persons to be easy to be trained on the safety equipment. The life raft should be marine evacuation system to be controlled in the bridge to facilitate the ship evacuation.

Because of this marine line importance, the Saudi Arabian government gave the Egyptian government two new HSC, their names are "Cairo" and "El Riyadh". We will explain one of them.

The first explain must be know all information for HSC " El Riyadh ":

Built: oct 2007 dry dock austal

Gross tong: 8566.52

Imo NO.:9441776

Passenger capacity :1000 person

Hull NO.:340

Now will be explain the safety equipment and MES marine evacuation system The following MES equipment is installed:

- (i.) 2 x 9m MES evacuation slide with associated 128-person Open Reversible Liferaft (ORL), including HSC Emergency pack installed on the aft main deck (one port and one starboard).
  - (ii.) 2 x 14m MES evacuation slide with associated 128-person ORL, including HSC Emergency pack installed on the fwd upper deck (one port and one starboard)
  - (iii.) 2 x 17m MES evacuation slide with associated 128-person ORL, including HSC Emergency pack installed on the fwd mezzanine deck (one port and one starboard)
  - (iv.) 5 x additional 128-person ORL link life rafts including HSC Emergency pack (three port and two starboard), to be used in conjunction with the above installed MES units
- The life rafts are linked to their respective MES Units by permanently rigged lines. These life rafts also provide the required extra reserve

Each of the MES slides is SOLAS approved and is a twin-track evacuation slide, designed to transfer people from the embarkation area on the vessel directly into a 128-person life raft.

The slides are constructed from nine longitudinal tubes, each separately inflated for maximum compartmentation.

The cross section of the slide is an isosceles triangle, with three longitudinal tubes bonded together at the apex, the RH and the LH corner of the triangle. The longitudinal tube stacks are held apart by a series of paired diagonal struts, which are inflated from alternate longitudinal tubes. The inflatable structure of the slide is manufactured from polyurethane coated fabric using high frequency welding and adhesive bonding techniques.

A full length netting slide path is fitted (close to the base of the isosceles triangle) within the slide. The use of netting allows for drainage of water and contributes to the control of descent speed.

Contouring of the slide path at the base of the slide enables descent speeds to be reduced immediately prior to transfer into the life raft.

Attachment of the slide to the stowage cradle is by high strength webbings, which also run over the full length, and on each side of the slide to absorb the tensile loads placed on the slide. Webbings are also used to attach the slide/life raft interface units to the slide. The interface units provide for manual and hydrostatic release of the life raft from the slide.

Slide inflation is achieved by a number of high-pressure inflation cylinders feeding a carbon dioxide/nitrogen gas mix to the slide via hoses and manifolds. A manually controlled inflation facility is also fitted which provides in excess of 50% top-up capability. Each slide compartment is fitted with a high flow relief valve to vent excess inflation gas

Operation of each of the slides is completed by trained crew members who work in teams, with each team under the direction of one crew member, who is nominated as the "Controller".

Upon the command from the Master to abandon ship, the nominated crew will muster at their designated Evacuation Station where the Controller deploys the slide as detailed in the MES Manual Each life raft is operated as a link raft unit, or in conjunction with a marine evacuation slide.

A life raft used in conjunction with an evacuation slide is specially adapted for use with the slide and inflation is initiated during the latter part of the slide inflation sequence. Failure of the automatic inflation system can be overcome by the crew of the rescue boat manually pulling the inflation lanyards, which are readily accessible when the slide is fully inflated and/or unrolled.

The additional life rafts fitted to this vessel are of the link raft type and although they are rigged for use with their respective slide/life raft unit, they are deployed separately from the slide system.

Each of the systems utilise a "Hammar" vacuum release system to enable the life rafts and slides to be deployed. A hand-operated vacuum pump is provided adjacent to the equipment. In the event of

the vacuum system failing, the release unit cord is cut by use of an emergency knife, which is stowed adjacent to each unit. With each of the types of life raft, the deployment systems are rigged with hydrostatic release units so that in the event of the vessel sinking, the life rafts will be released and will float to the surface. As the life raft floats to the surface, inflation is initiated and if the boat sinks to a depth greater than the painter line length, the painter is released from the vessel by an in-built weak link. (CRAFT OPERATING MANUAL for El Riyadh, Australia, oct2008, 8.2.1, 8.2.2, 8.2.3, pp8.7-8.8.,)

We can deduce from the previous information that there are 9 life rafts distributed as port & star board to carry 1152 passenger and they are controlled manually. Also they can be operated by any one on the ship through the crew supervising easily. Or operate them automatically via control board in the bridge, from the evacuation area, or the evacuation area of every life raft. This will facilitate the abandon ship successfully.

### **Rescue Boat**

Each of the two Zodiac (or Bombard) Rigid Inflated Rescue Boat type RIBO 420 P Sling SOLAS approved Rescue Boats is powered by a 30hp Tohatsu outboard motor.

Each boat is approved to carry a maximum of 6 persons or 450kg, giving a maximum fully loaded weight of 781kg.

Each boat is supplied with a four-legged sling, which is designed to lift the rescue boat complete with a full complement of personnel. This load must not be exceeded.

When launching, it is recommended that you activate the release hook just prior to the rescue boat touching the water. If this is not done, the rescue boat could be pulled along by the ship and caused to capsize.

The inflatable Rescue Boat **MUST** be fully inflated at all times. Refer to Manufacturer's Manual for full details.

Ensure the Rescue Boat bilges are free of water.

The crew **MUST** occupy the nominated seating positions at all times.

The Rescue Boat **MUST ONLY** be operated by suitably trained crew.

(CRAFT OPERATING MANUAL for El Riyadh, Australia, oct2008, 8.2.4, p8.10.,)

### **Life Jackets**

The following quantities of life jackets are supplied onboard the vessel:

- 1278 x Rigid Foam, folding Adult Life Jacket Lalizas. Code 70289
- 120 x Rigid Foam, folding Child Life Jacket Lalizas type Poseidon code70167 (child – for persons of under 32kg).

All of these life jackets are fitted with a whistle and an automatic selfactivating light. The light may also be activated manually

An adult life jacket is stowed under each fixed passenger seat, with the child life jackets and extra adult jackets stowed in clearly marked

lockers at the Embarkation Stations. Crew life jackets are stowed in the bridge and other crew areas. There are also three life jackets stowed at each Rescue Boat station, for use by the boat crews. The donning instructions for the life jackets are shown on the safety card stowed in each seat back and table insert. Crew members should be totally familiar with these instructions (CRAFT OPERATING MANUAL for El Riyadh, Australia, oct2008, 8.2.5, pp8.10-8.11.,)

We can deduce from the previous information that there are 2 rescue boats; one in each side. They are unshipped easily to rescue the man over board, and also in the process of the abandon ship to make the towing process. We will explain the ship evacuation as follows:

### **Evacuation Procedure**

1. Master sounds General Alarm
2. Master makes “**PREPARE TO EVACUATE**” announcement and sends the appropriate Distress Signals
3. Passengers are instructed to don lifejackets, and to ensure they are not carrying any hard or sharp objects that may either injure themselves, or cause damage to the slide or life raft.
4. Designated Crew to perform duties in accordance with the Muster List. Crew at Assembly Stations prepare for deployment of the MES.
5. Rescue Boat crew prepares Rescue Boat for launch
6. Master gives “**ABANDON SHIP**” order
7. MES crew member confirms that “Drop Zone” below each MES is clear, and then deploys the MES.
8. Chief Engineer ensures machinery is shut down and fuel lines, etc. are closed.
9. Rescue Boat is launched and takes up position
10. Once each MES slide and main raft is fully deployed, inflated, bowed and boardable, the raft crew descend into their designated raft, and prepare to receive passengers.
11. At this time, the link raft is deployed and bowed alongside the main raft by a crew member in the main raft. That crew member then pulls the painter to inflate the link raft.
12. When the main MES raft is ready to receive passengers, the evacuation crew member at the top of the slide will begin evacuating the passengers.
13. On reaching the bottom of the slide, passengers will be shown their respective raft positions by the raft crew.
14. Once the evacuation crew have confirmed that all passengers have boarded the rafts, they themselves then descend to the rafts.
15. The Master confirms that all necessary Emergency Equipment, i.e. EPIRB, SARTs, and VHF GMDSS Hand Held Radios, have been removed from their respective locations on the vessel and are with the crew in the life rafts. He then descends to a previously designated raft.
16. A crew member in each life raft will instruct the Rescue Boat to

pick up the towline, and will then initiate the release of that life raft from the MES(CRAFT OPERATING MANUAL for El Riyadh, Australia, oct2008, 8.5.1, pp8.18-8.19.)

**(fig.2 safety evacuation pla**



### **Fire Detection System**

The Consilium Fire Detection System is a fully automatic fire detection monitoring system. The main command control and alarm panel is located at the Engineer's Console in the Bridge, and is fully explained in the Consilium Fire Alarm System User's Guide. Reference should also be made to Drawing Number: 340-804-001 – "Fire Control Plan".

The system:

- (i.) Displays fire, fault, and pre-alarm conditions
- (ii.) Sounds pre-programmed audible/visual alarms
- (iii.) Gives precise information on location and nature of incident

### **Fire Protection Insulation**

**Bridge Deck:** - Bridge access 60-minute door fitted

- Deckhead under Bridge fitted with 30-minute fire protection
- Bridge forward bulkhead fitted with 60-minute fire protection
- Bridge aft bulkhead fitted with 30-minute fire protection

**Upper Deck:** - Electrical room bulkheads fitted with 30-minute fire protection

- Deckhead under Bridge fitted with 30-minute fire protection
- Crew Accommodation bulkheads fitted with 30-minute fire protection

**Vehicle Space:** - Deckhead fitted 60-minute fire protection

- Bulkheads fitted with 60-minute fire protection
- 60-minute fire doors fitted

**Engine Rooms:** - Deckhead fitted with by 60-minute fire protection

- Bulkheads fitted with 60-minute fire protection
- Access doors are steel watertight doors

(CRAFT OPERATING MANUAL for El Riyadh, Australia, oct2008, 8.1,8.1.2,8.1.4, pp8.3-8.4.,)

### **(fig.1 fire control plan)**

We can deduce from the previous information the fire protection system on the ship as it has fire indications at everywhere and its control board is in the sprinkler & drencher in the driving and engine room. This gives high protection from the fire on the ship whether in the in the garage or with the passengers.

Finally, the researchers put the best thinking of developing the maritime line between Egypt and Saudi Arabia. The recent studies confirmed the HSC value and its high safety equipment. Also how to deal with the passengers on this line to reduce the accidents on this line comparing with the past and also reduce the journey time to economic saving as the ordinary passengers ships on that line as we mentioned in this research are worn-out and need high maintenance and the journey take long time, so it leads to spend a lot. So we can see clearly the good features of HSC so the Egyptian government started to think in this subject carefully.

