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**REPORT OF THE
INVESTIGATION INTO THE
LOSS OF THE
BRIGANTINE SAILING SHIP
STV "ASGARD II"
ON THE
11th SEPTEMBER 2008**

**REPORT No. MCIB/161
(No. 10 of 2010)**

Report MCIB/161 published by The Marine Casualty Investigation Board
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1. SYNOPSIS

- 1.1 On 10th September 2008 the STV “Asgard II” departed Dournenez, France bound for La Rochelle, France with 5 crew and 20 trainee crew onboard. At approximately 01:00 hrs GMT¹ on 11th September 2008 when off St. Nazaire in the Bay of Biscay at position 47° 18.3' N, 003° 33.02' W water ingress was observed in the Trainee Mess. At 01:05 hrs a PAN PAN² message was broadcast. At about 01:15 hrs a Mayday Relay³ message was received by French Search and Rescue (French SAR) as the water in the Trainee Mess continued rising rapidly. The crew attempted to pump the flood water without success. The ship was abandoned by liferaft at approximately 01:50 hrs. Two French lifeboats rescued all 25 persons from the liferafts. During the abandonment the floor of one of the three liferafts launched failed and the persons onboard were successfully transferred to the other liferafts. No loss of life occurred and there were no injuries reported.

1 All times stated in report are given in GMT unless stated otherwise.

2 A PAN PAN radio broadcast is used to signify that there is an urgency on board but that for the time being at least there is no immediate danger to anyone's life or to the ship itself.

3 A Mayday relay radio broadcast is made by one ship on behalf of a different ship, which is in distress. If a ship makes a Mayday call and it is not acknowledged by the coastguard after a single repetition and a two-minute wait a ship receiving the Mayday call should attempt to contact the coastguard on behalf of the Mayday ship by broadcasting a Mayday relay on their behalf.

2. FACTUAL INFORMATION

2.1 Particulars of the ship “Asgard II”:

Owner: Minister of Defence
Parkgate,
Infirmary Road,
Dublin 7

Builder: John Tyrrell & Sons
South Quay,
Arklow,
Co. Wicklow

Engine: Gardiner & Sons

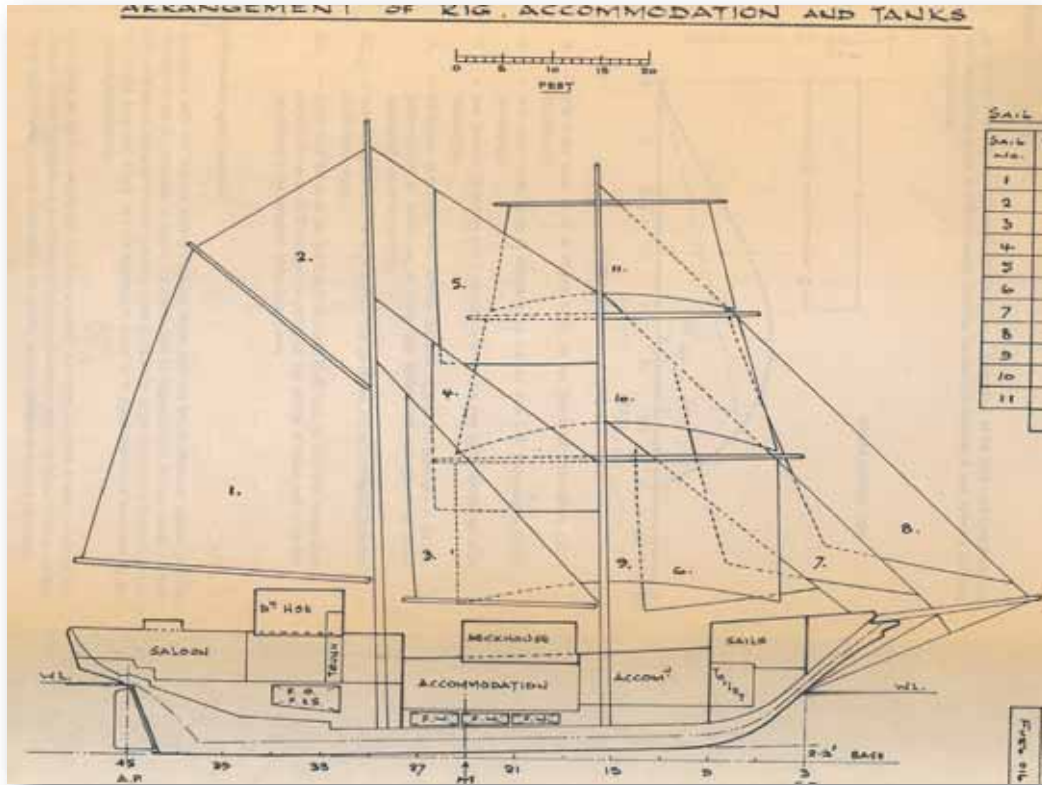
Year of Build: 1981

Port of Registry: Dublin

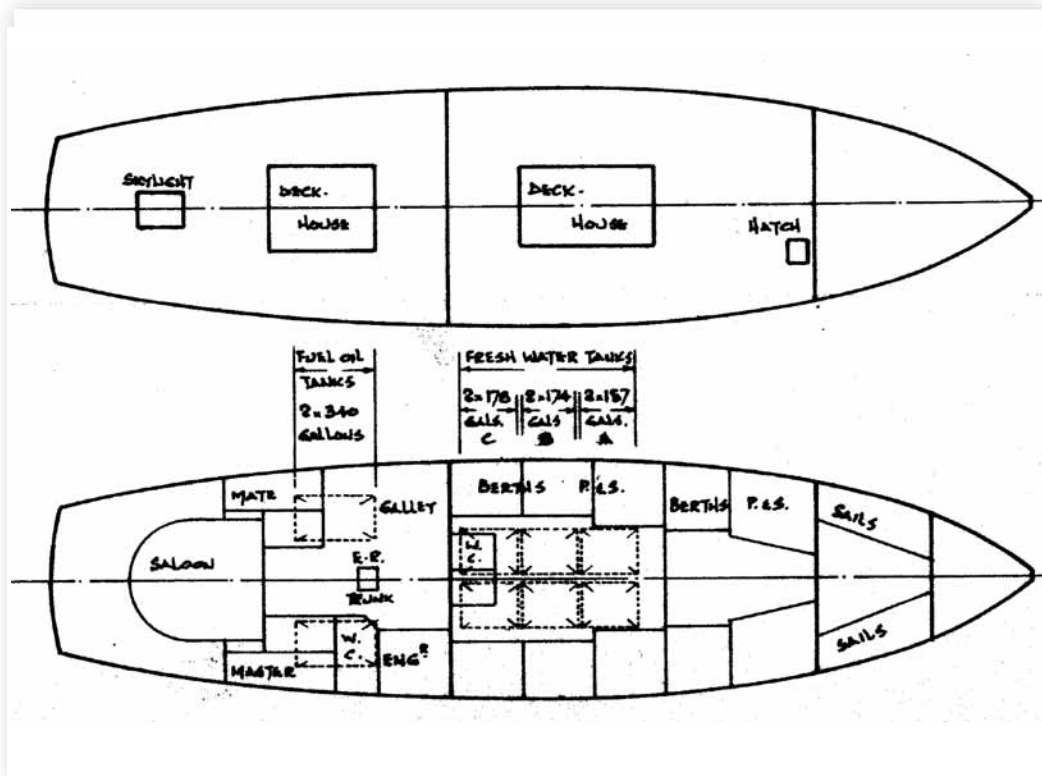
2.2 Registered Dimensions:

Length	81.7 ft
Breadth	21.0 ft
Depth	9.4 ft
Gross Tonnage	92.67 tons
Registered Tonnage	50.06 tons
Load Line Length	22.45 metres





General Arrangement - Profile View



General Arrangement - Plan View

2.3 Details of Statutory Certification issued by the Department of Transport:

Irish Load Line Certificate.
Minimum Safe Manning Document.

Appendix 10.2 contains a copy of the above documentation.

2.4 Classification Details:

Classification Society: Lloyd's Register of Shipping (LR)
Classification Notation: 100A1 Yacht LMC

Appendix 10.3 contains a copy of the current Classification Certificate. The ship was built to Lloyd's Register Class and maintained in Class since building.

2.5 Location of Incident:

The location is given as 47° 18.3' N, 003° 33.02' W, see chartlet below.



Extract from UK Admiralty Chart No. 2646 indicating location of incident.

2.6 History of “Asgard II”:

STV (Sail Training Vessel) “Asgard II” was a brigantine sailing ship, which was specially designed for sail training purposes by the late Mr. Jack Tyrrell, and was built in Arklow, Co. Wicklow for the Minister of Defence. The ship was commissioned on 7th March 1981.

2.7 Details of Lifesaving Appliances:

Equipment Item:	No. of
Liferafts	4 x 12 man RFD, 2 x 16 man RFD
Lifejacket with lights	37
Inflatable lifejackets	2
Immersion Suits	27

2.8 List of Radio Equipment:

Equipment Item	No. of
VHF Installation	SAILOR HC4500B
MF Installation	SAILOR HC4500B
MF/HF Installation	SAILOR HC4500B
COSPAS-SARSAT	JOTRON TRON OHU07584
SART	JOTRON TRON SART SN. 13075

2.9 List of Crew:

Mr. Colm Newport	Master
Mr. Cathal O’Sullivan	Chief Engineer
Mr. Graham Harwood	Chief Mate
Ms. Finola Goggin	Boatswain (Bo’sun)
Mr. Otto Kunze	Cook
Trainees	20 in total incl. 3 Watch Leaders

3. EVENTS PRIOR TO THE INCIDENT

- 3.1 STV “Asgard II” entered service in 1981 and had sailed extensively in Northern European waters and had completed two return transatlantic voyages.
- 3.2 In the days leading up to the incident the ship was on a voyage from Falmouth, UK bound for La Rochelle, France. The itinerary was as follows:

- 3rd Wed: Trainees arrive Falmouth.
- 4th Thur: Weatherbound. Remained alongside in Port Pendennis Marina, Falmouth. Full day instructions with trainees (Falmouth).
- 5th Fri: Day Sail in Falmouth Bay (Falmouth).
- 6th Sat: Leave Falmouth am. (At sea).
- 7th Sun: Arrive Brest, France pm. (France).
- 8th Mon: Sail to Cameret Sur Mer (Cameret).
- 9th Tues: Sail to Dournenez (Dournenez).
- 10th Wed: Sail from Dournenez approx. around Midday local time (at sea) bound for La Rochelle.

Based on interviews with the crew and trainee crew questionnaires no significant incident had occurred in the days leading up to the incident.

4. THE INCIDENT

- 4.1 The ship sailed from Dournenez at 12:00 hrs local time on 10th September 2008. At the time of the incident the ship was motor sailing with fore and aft sails rigged and was sailing with approximately 40 degs. apparent wind.
- 4.2 On 11th September 2008 at about 01:00 hrs the Chief Mate while on watch in the wheelhouse heard the bilge alarm in the Trainee Mess sound. The Mate walked through the Trainee Mess and looked under bunks and found no evidence of water ingress. He then returned to the wheelhouse and was then notified by a Trainee Crew Member that there was water in the Trainee Mess. The Mate then entered the Master's cabin to inform him that the bilge alarm in the Trainee Mess was sounding and that he had called the Chief Engineer to pump the space. Initially the Master thought the water was caused by over spill from the fresh water tanks located below the floor in the Trainee Mess, which had previously occurred following refilling of the fresh water tanks. The Master's cabin was located aft over the Engine Room.
- 4.3 While this conversation was ongoing the Master and Mate heard the Bo'sun shouting that there was water in the Trainee Mess. The Master immediately ran to the Trainee Mess and noted the floor of the cabin floating and the level of water was rising. The Bo'sun had been in her cabin when she heard water in the Trainee Mess. The Bo'sun's cabin was located in the aft corner of the Trainee Mess (starboard). The Master immediately ordered all hands to muster on deck with lifejackets and warm clothing. The Master instructed the Mate to broadcast a PAN PAN message. The bilge pump fitted in the Trainee Mess was switched on at this stage.
- 4.4 The crew then set about setting up the portable diesel powered salvage pump that was located on deck. The suction pipe was led through a deck vent to the Trainee Mess. The Master instructed the Engineer to set up the engine driven pump to pump out the Trainee Mess and the Master instructed the Bo'sun to set up the deck mounted manual bilge pumps. The Master observed the water continuing to rise in the Trainee Mess and ordered the Mate to broadcast a MAYDAY message.
- 4.5 The portable salvage pump engine started but failed to obtain suction. The Master instructed the sails to be struck⁴ at this time. Further attempts were made during the course of the incident to get the salvage pump to prime but with no success. The manual bilge pumps were used to pump the Trainee Mess and the forepeak during the course of the incident.
- 4.6 Two liferafts were launched to the starboard side (windward) and one liferaft was launched to the port side (leeward) and the Master ordered the Mate and the Cook to board the 2 liferafts to starboard. The Master had decided to use the

⁴ Taken down

starboard liferafts as he considered that there was a danger of the ship capsizing to port. The Mate boarded one liferaft and the Cook boarded the other liferaft first. The Engineer and Bo'sun assisted the trainees boarding the liferafts. The Master continued to monitor the water level in the Trainee Mess and operated the Global Maritime Distress Safety System (GMDSS) Radio equipment to contact the French Authorities.

- 4.7 The Engineer returned to the engine space a number of times during the course of the incident to check the pumps were still operating. The pumps continued to operate and the Engineer switched on the 2 electrical bilge pumps in the Engine Room as he observed the water level in the machinery space was rising although not at a rapid rate. At some stage the Engineer reported changing over the engine driven pump to pump the Engine Space as the Trainee Mess was flooding at a rapid rate and the bilge pumps were having little or no effect on the level of flood water in the Trainee Mess.
- 4.8 The Master continued to observe the water level rising in the Trainee Mess and the water level eventually reached main deck level. The Master noted some leakage through the aft bulkhead door during the course of the incident.
- 4.9 The Bo'sun and Engineer remained on board with the Master. The Bo'sun and Engineer tethered the liferaft painters. The Bo'sun informed the Master that the liferaft with the Cook onboard had suffered damage and the people in it had fallen though the floor of the liferaft. The Master pulled the portside liferaft around the stern to the starboard side (windward side) and it was made secure alongside the other 2 liferafts in the water. The Master then ordered the Bo'sun and Engineer into the liferaft and the Master returned to the GMDSS station and informed the French Authorities that the ship was being abandoned. The Master boarded the liferaft and cut the painter free.
- 4.10 Once the ship had been abandoned the trainee crew and Cook who were in the damaged liferaft were transferred to the empty liferaft successfully. One crewmember remained in the damaged liferaft.
- 4.11 The crew reported that, when the vessel was abandoned, the lights remained on with the engine running. French Navy helicopter footage shows the lights on at the time of rescue by the Belle Ile lifeboats.

5. EVENTS FOLLOWING THE INCIDENT

5.1 Details of Rescue Operation:

Following broadcast of PAN PAN and MAYDAY RELAY the French SAR tasked two lifeboats from Belle Ile. Two ships in the vicinity were diverted to the area, MV “Haldoz” and MV “Arklow Venus”. The lifeboats from Belle Ile rescued all persons from the liferafts and landed all persons ashore to Belle Ile. The people of Belle Ile responded immediately and formed an adhoc “welcoming” committee. The committee welcomed the crew and ensured all were clothed, fed and found accommodation. Medical assistance was also provided although neither the crew nor trainees sustained any injuries. The Irish Embassy immediately dispatched a representative to Belle Ile to assist the crew.

5.2 Details of the Investigation:

The MCIB instigated an investigation in accordance with the provisions of the *Merchant Shipping (Investigation of Marine Casualties) Act, 2000*.

During the course of the investigation the following tasks were undertaken by the MCIB:

- Establishment of communication with the French *Bureau d'Enquêtes après Accident, (BeaMer)*, in accordance with the provisions of the International Maritime Organisation (IMO) Resolution A.849(20).
- Review of the statutory certification issued by the Department of Transport.
- Review the Marine Survey Office (MSO) files relating to the ship.
- Review of the Classification Society File from Lloyd’s Register of Shipping.
- Review of the Construction Drawings.
- Obtain the weather conditions at time of the incident.
- Examine the French SAR transcript and obtain a translation of the document.
- Interview the available crew members.
- Prepare and forward a questionnaire for the Trainee Crew. Review the completed questionnaires.
- Attended the ROV⁵ survey undertaken by the ships insurance company and owners.
- Review of ROV footage.
- Examined the damaged RFD liferaft on Belle Ile and liase with RFD Beaufort Limited in relation to testing the damaged liferaft.
- Consult with timber expert Gordon Knaggs regarding the ROV footage.
- Review of the structural plans.
- Meet Lloyd’s Register to discuss the incident and review their survey records.
- Carry out continuous flooding calculations using TRIBON stability software.
- Investigate the failure of the portable salvage pump.

⁵ Remotely operated underwater vehicle

6. FINDINGS

6.1 Certification:

Background

STV “Asgard II” was a Class VII⁶ cargo ship, which was used for sail training purposes. The crew consisted of 5 permanent crewmembers and up to 20 trainee crewmembers. The 20 trainee crew were classed as crew and when booking they had to acknowledge that they would “be a member of the voyage crew and will sign on as such under current statutory regulations”. The practice of trainees signing on as crewmembers is common practice for sail training ships.

Classifying the trainees as crew has a significant effect on the statutory certification of the ship. Persons onboard any ship are generally defined as crew or passengers. Ships engaged in the carriage of more than 12 passengers are defined as passenger ships and are required to comply with significantly higher design standards.

6.2 Statutory Certification:

Load Line

As a ship less than 24m in length (Load Line Length) and less than 300 gross tonnage, the “Asgard II” was required to have an *Irish Load Line Certificate* in accordance with the *Merchant Shipping (Load Line) Rules 2001*. Load line requirements relate to the strength of the hull, intact stability, closing appliances (hatches, doors, air pipes, ventilators, freeboard, ship side valves etc.) and crew safety (railings and bulwarks). The “Asgard II” had applied for and been issued with an Irish Load Line Certificate which was valid at the time of the incident and is contained in Appendix 10.2. The certificate was issued on 4th March 2005 and was valid until 5th March 2010. Periodical load line inspections had been carried out on 1st June 2006, 13th March 2007 and 14th March 2008.

6.3 Manning:

As a Class VII cargo ship less than 500 gross tonnage, the ship did not require a *Minimum Safe Manning Document* to be issued by the Department of Transport. This document sets out the required manning level and qualifications required to safely navigate the ship.

However, the owners applied for and were granted a *Minimum Safe Manning Document*. The Marine Survey Office (MSO) issued a *Minimum Safe Manning Document*, a copy of which is in Appendix 10.2. The ship sailed with a

⁶ Class VII cargo ship“ as defined under Irish statutes means ships other than tankers engaged on voyages any of which are long international voyages.

complement of 5 permanent crew and 20 trainee crew including 3 watch leaders.

The ship had a Muster List, which set out the duties of the 5 permanent crew in the event of an emergency. The trainee crew were not assigned specific duties in the muster list and were not required to undergo any safety training. The MSO, in agreement with the owners, required the trainee crew to undergo comprehensive familiarisation training by the permanent crew. This familiarisation training proved very useful during the course of abandonment.

At the time of the incident the ship was manned in accordance with the provisions of the *Minimum Safe Manning Document*.

6.4 Radio Equipment:

The ship was equipped in accordance with the provision of the GMDSS requirements. As a cargo ship of less than 300 gross tonnage it did not require to be surveyed in accordance with the provisions of the GMDSS regulations. However, in agreement with the owners the Maritime Radio Affairs Unit (MRAU) of the Department of Transport undertook an annual inspection and issued a record of the equipment.

6.5 Other Statutory Requirements:

The ship was also certified to comply with various other statutory requirements (e.g. lifesaving appliances, fire fighting equipment, collision regulations etc.) although the ship did not require to be surveyed and certified in accordance with these requirements.

The MSO issued a *Safety Equipment - Record of Equipment* (SUR 183), which relates to the provision of lifesaving and fire fighting appliances. During the course of the annual periodical load line surveys the MSO inspected the safety equipment although this was not a statutory requirement.

6.6 Lloyd's Register of Shipping Classification:

The ship was built to Lloyd's Register Classification standards and was maintained in Lloyd's Register class by the owners since new building. It is important to note that classification is not a statutory requirement and the maintenance of Class was the owner's decision. Appendix 10.3 contains a copy of the Classification Certificate and was valid at the time of the incident.

6.7 Review of the Marine Survey Office File:

The MSO files relating to the ship were examined. The survey records were

examined and no reports of any hull structural problems were found. In 2003 the foremast was replaced following discovery of fungal decay.

The MSO files contained the original construction drawings. It was noted that various changes had been made to the onboard systems over the years but that the original drawings were not updated.

The ship underwent an extensive refit in 2006 in the UK. Works included an extensive upgrading of the electrical system and stripping back of the hull to bare wood and repainting.

6.8 Review of Construction Drawings:

Construction

The ship was carvel⁷ planked with iroko planks on double sawn oak framing.

Details of Scantlings ⁸	
Main Hull Planking	2"
Bilge stringers:	7 ¹ / ₂ " x 3"
Double Sawn Frames	siding ⁹ 3 ¹ / ₂ " moulding ¹⁰ 5" at head 6" at middle 7" at centre

The planks were fastened to the oak frames with a combination of hot dipped galvanised spikes and bolts.

Referring to Lloyd's *Register's Rules and Regulations for the Classification of Yachts and Small Craft* iroko is described as most suitable for planking above and below the waterline and is described as a very durable timber species.

6.9 Construction Drawings:

The following diagrams indicate the construction section in way of the foremast. Three partial steel bulkheads were located in way of foremast. Fig 1 shows the construction section in way of the foremast and Fig 2 shows the profile view of the construction arrangement in way of the foremast.

7 A wooden ship in which the sides of the planks are all flush, the edges laid close and caulked to make a smooth finish.

8 "Scantlings" dimensions and thickness of primary structural members.

9 "Siding" width of a structural member.

10 "Moulding" depth of a structural member.

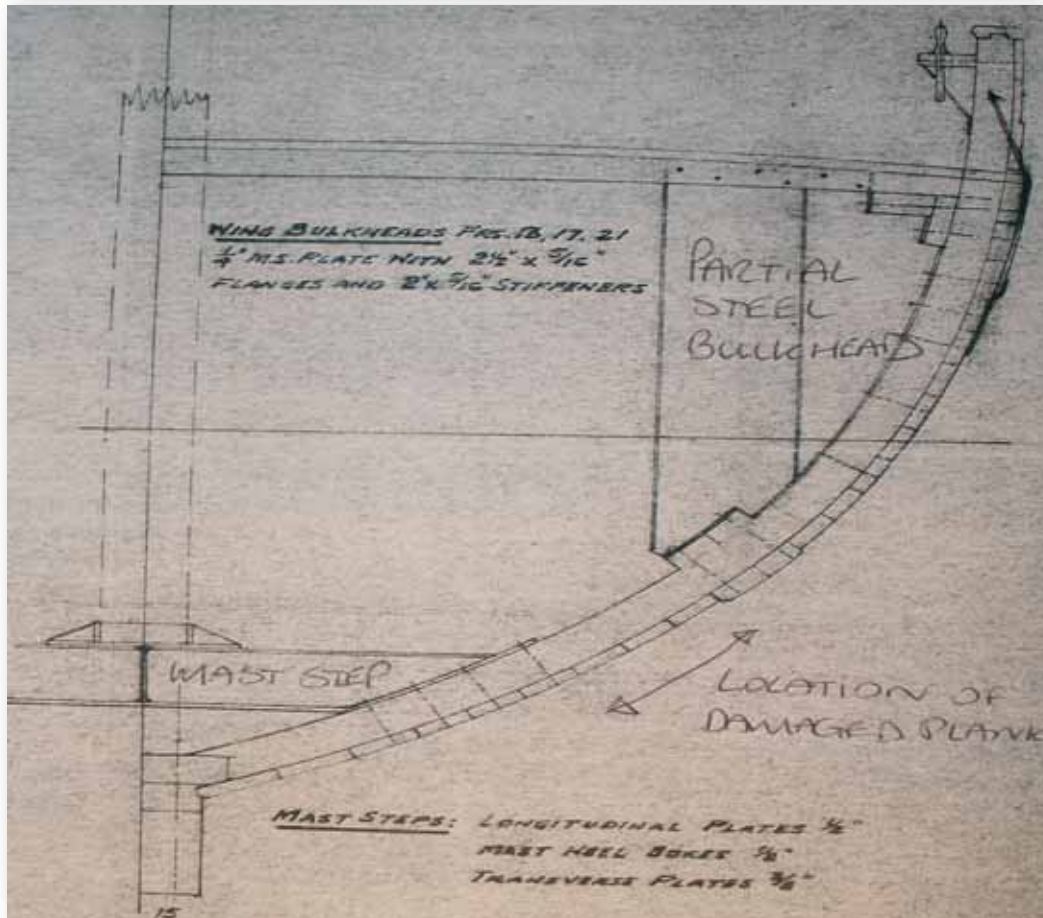


Fig 1 Construction Section in way of foremast (the heavier bilge plank is shown)

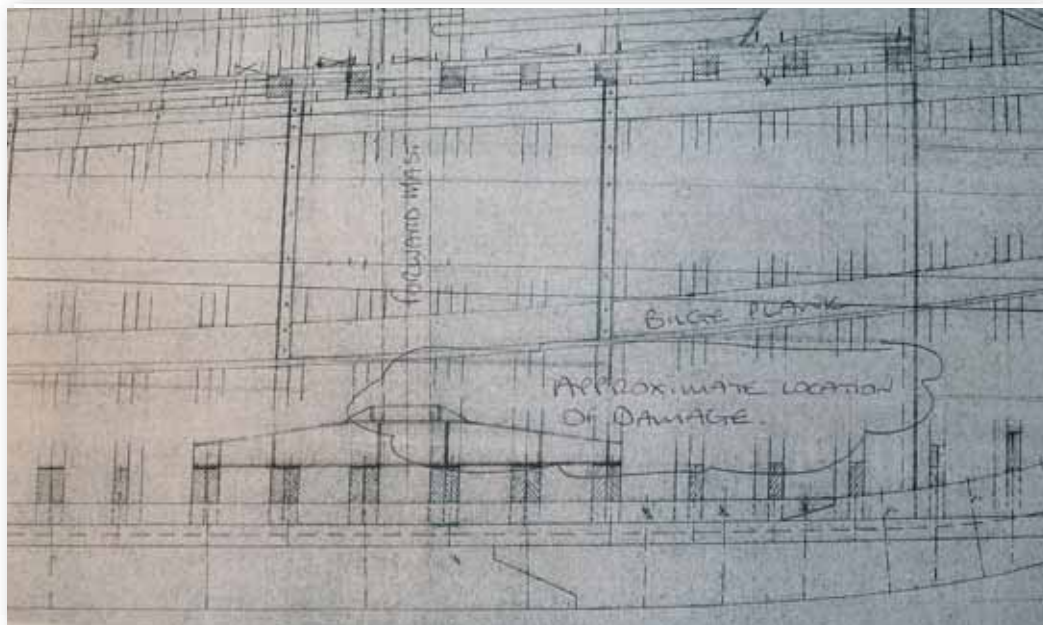


Fig 2 Construction Profile in way of foremast (location of three partial bulkheads are shown)

6.10 Arrangement of Ship:

The ship was fitted with 2 watertight doors located in the watertight bulkheads at either end of the Trainee Mess. Both doors were originally double dogged¹¹. The owners in agreement with the MSO approximately 10/12 years ago changed the door in the forward bulkhead to a forward opening single action mechanism hinged watertight door. This door was kept closed at sea and the heads (toilets) located forward of the bulkhead were only used in port.

6.11 Arrangement of Bilge System:

The ship was arranged into three watertight compartments. A valve chest was fitted in the Engine Room, which was connected to a Glykes (10ft head/59 gallons per minute) engine driven bilge pump. The valve chest was fitted with non-return valves to prevent back flooding from one compartment to another compartment. The valve chest was capable of pumping from the Forepeak, Trainee Mess and Engine Room. The suction piping of the main engine driven pump had a "L" ported changeover valve to enable direct suction from the sea for use as a deck wash.

Two Rule 24V pumps (3000/5000 gallons per hour¹²) were fitted in the Engine Room with direct suction from the Engine Room. An additional Rule 24V pump was fitted in the Trainee Mess. The forward Engine Room pump shared a common discharge with the pump located in the Trainee Mess and changeover valve was fitted on the discharge line. The changeover valve was normally set to pump the Trainee Mess.

Each of the three spaces were fitted with through deck mounted 4" manual bilge pumps capable of pumping each space. These pumps were operated manually from above the main deck.

In addition, a portable salvage pump, (single cylinder Lister Diesel engine, Spate pump with 4" discharge) was also carried.

6.12 Details of Seacocks (Shut off valves fitted on inlets and discharges):

The Trainee Mess had a total of 6 seacocks, 2 x 1¹/₄", 2 x 3³/₄" and 2 x 1¹/₂". Appendix 10.1 contains a list of all the seacocks fitted throughout the ship.

6.13 Dry Docking:

In accordance with the *Merchant Shipping (Load Line) Rules 2001* the ship is required to be dry docked twice in the 5 year Load Line period (at renewal inspection and at year 2 or 3 of the 5 year Irish Load Line Certificate period). The owner exceeded this requirement and dry docked the ship every year in line with passenger ship requirements.

¹¹ "Double Dogged" - two handles to lock the door.

¹² It could not be established the exact pump rating and may have been either 3000 gph or 5000 gph.

A shipwright that was involved in the building of the ship attended each dry docking to examine the hull. Each year the valve bodies of the seacocks were examined and a certain amount opened for survey in addition to the normal survey items.

6.14 Intact Stability:

As a Class VII cargo ship “Asgard II” was required to comply with intact stability criterion contained in the *Merchant Shipping (Load Line) Rules 2001*. In addition the stability had been examined in accordance with the intact stability requirements published by the Maritime Coastguard Agency relating to sailing ships.

As a cargo ship there was no requirement to assess the damage stability capability of the ship. Approximately 10 years prior to the incident compliance with damage stability was discussed with the owner and the MSO. It was deemed by the owner at the time not to be practicable. Damage stability relates to the ability of the ship to sustain prescribed damages and to remain afloat and stable in the damaged condition.

6.15 Weather at time of Incident:

The French *Bureau d'Enquêtes après Accident* advised the following weather at the time of the incident:

Wind 190° Force 4 on the Beaufort scale is 20 to 25 knots (35 to 45 km/h) accompanied by trough 1.25 to 2.5 metres, visibility 20 km.

6.16 French SAR Transcript:

The transcript described the SAR operation and using the transcript a time line was established as follows:

01:05 hrs	Issue of PAN PAN
01:15 hrs	MAYDAY RELAY (unclear what ship broadcast MAYDAY RELAY)
01:37 hrs	Initial liferaft boarding takes place
01:50 hrs	“Asgard II” abandoned all crew onboard liferafts

The time from initial detection of water at floor level in the Trainee Mess to final abandonment by the Master was estimated to be 45 minutes.

6.17 Interview with Crew:

Following the incident the Master, Chief Mate, Engineer and Bo’sun were interviewed. Section 4 describing the incident was written using the description of events as described by the crew during the course of these interviews.

The crew members interviewed did not report any unusual occurrences prior to the incident other than the Bo'sun. The Bo'sun described how she had been sleeping and had been woken up by a knocking sound after about 00:00 hrs although she could not be precise about the time. The Bo'sun had sailed on "Asgard II" for 9 years and although the Bo'sun was not exactly sure what she heard it was a sound not normally associated with the normal operation of a wooden sailing ship at sea. The Bo'sun's cabin was located in the aft starboard quarter of the Trainee Mess.

6.18 Trainee Crew Comments:

Following the incident the trainee crew were circulated a questionnaire relating to the incident see specimen at Appendix 10.5.

In total 15 completed questionnaires were returned. All 15 completed questionnaires highlighted the professionalism and bravery of the crew during the course of the incident and approach to the safety of the crew in general. Appendix 10.5(a) contains extracts of comments received.

Two trainee crew reported hearing unusual noises prior to the incident. The first trainee, who was in their bunk sleeping in the trainee mess states:

"At approximately 2 am (local Time) I was awakened by a sudden noise, one quite unlike the unusual noises which are a common feature when one is below deck on one's bunk. Normally these are to a pattern and rhythmic, whereas this was a sudden noise, which disturbed me somewhat, and led me to wonder if something out of the ordinary had occurred.

Unable to get back to sleep, I decided, at about half past two, to go up on deck. This in itself was unusual, as I was due on watch at 4pm and one doesn't usually give up one's sleep".

The second trainee, who was sleeping in their bunk in the Trainee Mess, stated:

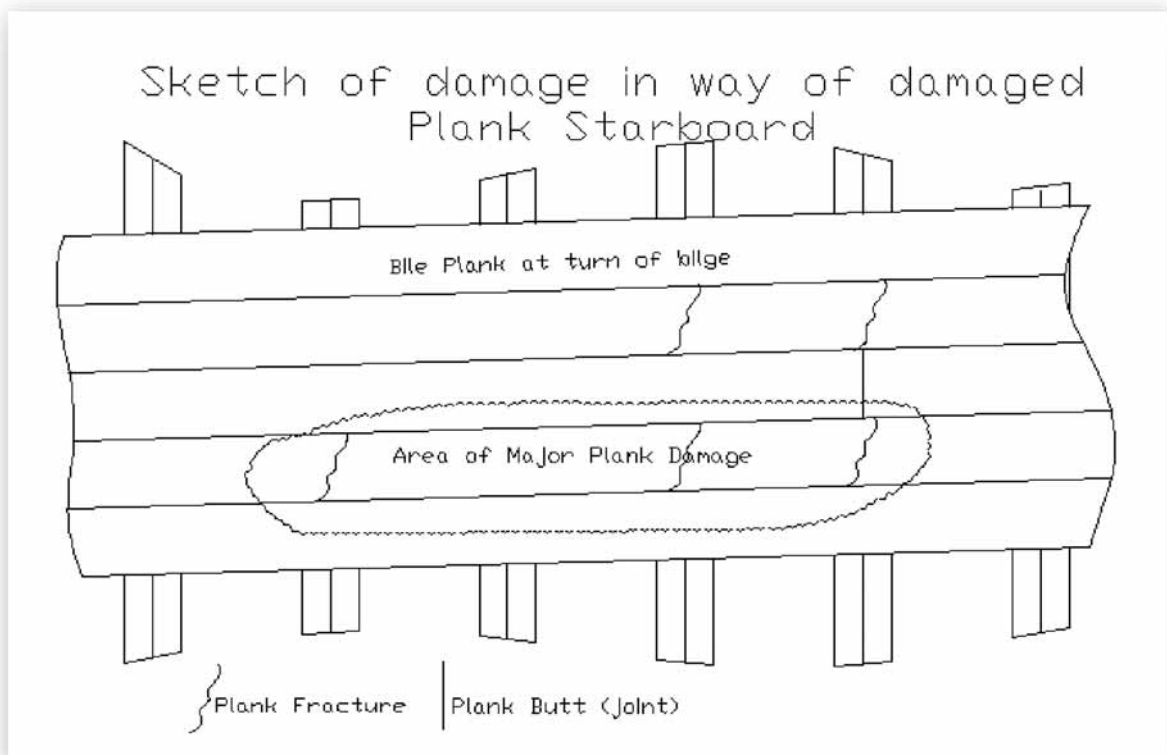
"I went to my bunk at 8 pm (Local Time) on the evening before the incident. I was very sea sick at that stage. I was due to be on watch from 12 to 4 am (Local Time) and was hoping that by resting in the evening the seasickness would get better.

During the night, prior to the incident, I heard a series of loud bangs. I thought that what I was hearing were sails being lifted and I tried to get up as I knew that my watch were likely to be working and would need extra hands. I was too sick to get up. I cannot give any time line on the bangs although they were not immediate one after the other. There was a time lapse between them, I was dozing. The next thing I know I was being told to wake up."

6.19 ROV Survey of the Wreck:

The ship was found upright and with approximately $\frac{3}{4}$ of the keel embedded in the seabed. The favourable orientation of the ship allowed a comprehensive external examination of the hull planking. The deck of the ship could not be examined by the ROV due to the presence of rigging.

During the course of the ROV survey significant plank damage was found in the third plank below the turn of bilge plank starboard side in way of the forward chainplates. Additional damage was found in the two planks located above the plank with significant damage. Diag. 1 contains a sketch of the location of the damage. Photo's 1 & 2 were obtained from the ROV video footage.



Diag. 1 - Sketch of the location of the damage.



Photo 1 - Fractured Hull Plank (Starboard Side) in way of forward chainplates (the white item is a bed sheet).



Photo 2 - Close up photograph of fractured Hull Plank (Starboard Side) in way of forward chainplates.¹³

¹³ "Chainplates" are the items by which the hull or deck is attached to the lower end of the Standing Rigging, usually a Turnbuckle

The ROV footage shows that the spikes remained in the oak frame in way of the plank fracture and one frame aft of the fractured plank. It was not possible to see if the spikes remained in the other frames in way of the fractured plank.



Photo 3 - Plank fastenings.

Following a detailed review of the ROV footage an additional cracked plank was found on the portside, see photo 4 below. The exact longitudinal location of the cracked plank could not be established. However, it was established to be in a similar location to the damaged starboard plank.



Photo 4 - Cracked Hull Plank (portside).

Slightly forward of this location an object was found which appears to be embedded in a plank seam, see photo 5 below.



Photo 5 - Embedded object in plank portside just forward of cracked plank (disturbed seams can be observed in this photograph).

It was noted the antifouling covering the plank seams was disturbed/cracked throughout the ship.

No other hull damage was observed other than outlined above.

The starboard anchor was found on the seabed with approx. 1m of chain withdrawn from hawse pipe. Vertical surface marks were found on hull in way of the anchor. The distance from the fractured plank to the hawse pipe is significantly greater than the length of anchor chain withdrawn.

6.20 Examination of the Plank Fracture:

Gordon Knaggs and Associates examined the ROV photographs and video footage and advises:

“The break in the hull plank is rather brash (non-fibrous) and could be indicative of slight decay or more (likely) of the presence of “tension wood” in the timber, which I understand is of iroko and which species frequently contain small amounts of tension wood and has interlocked grain. It is not an indication of severe decay or of attack by marine borers.”

“You will understand that these comments are made on the basis of the footage (ROV), and should not be regarded as definitive.”

Tension wood in hardwoods is found mainly in trees growing on steep inclines and is caused by abnormal growth in their efforts to stand vertically.

6.21 Meeting with Lloyd’s Register of Shipping:

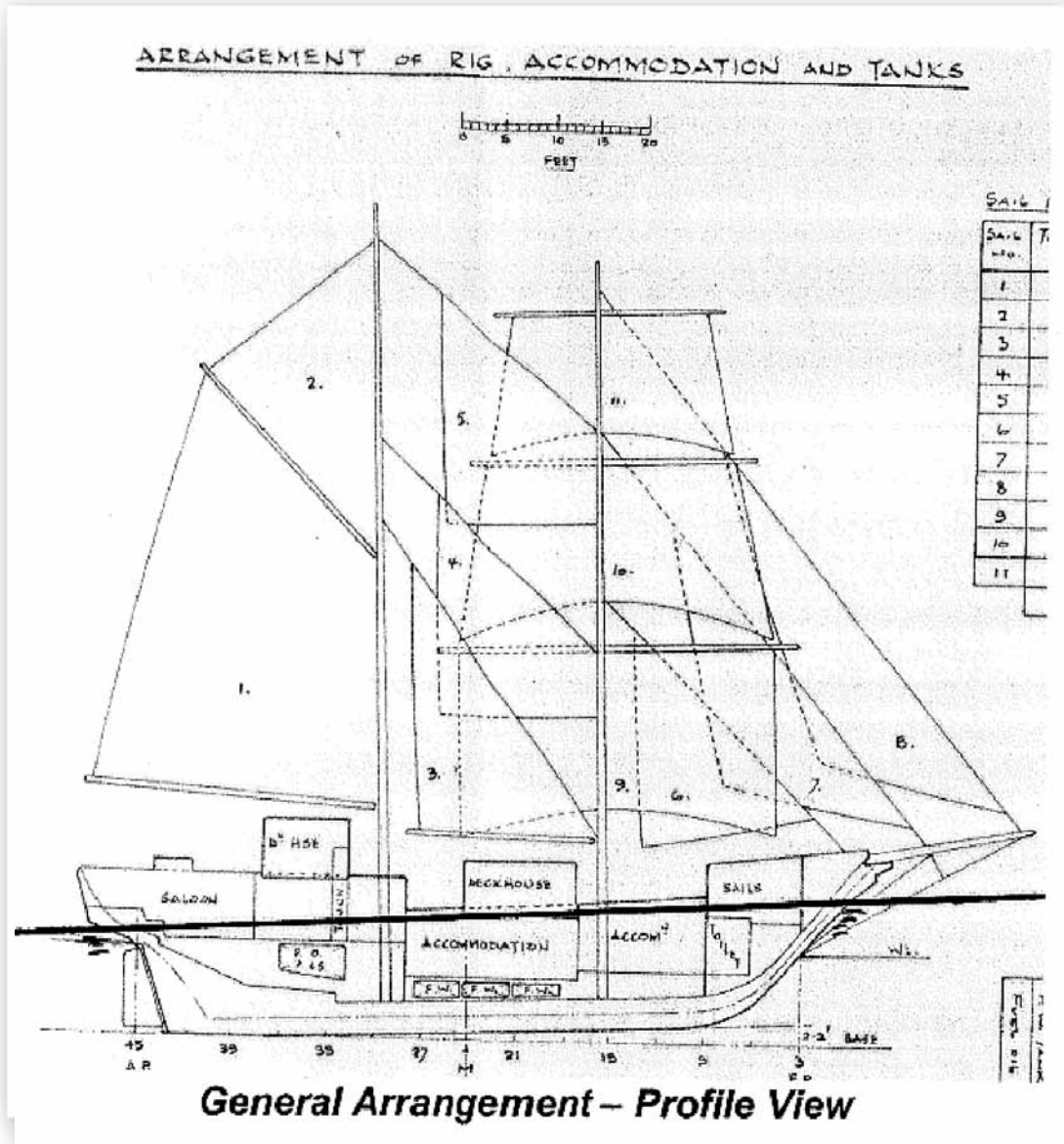
A meeting was arranged with Lloyd’s Register in London to discuss the loss of the ship and review their survey records.

Lloyd’s Register advised they had reviewed their survey records and advised they had found no reports of the presence of rot in the planking or framing or any reported problems with the planking or fastenings. Plank renewals had been carried out in the upper bow region following a head on collision with a quay wall a number of years prior to the incident. Lloyd’s Register noted a lack of information in their file and commented they were undertaking a review of the survey procedures for wooden classed ships.

6.22 Calculation of water ingress using TRIBON:

A stability model of the ship was generated using TRIBON stability software. The hull and internal spaces were modelled. Using TRIBON Calc the time required to flood the Trainee Mess was calculated for various sized openings in way of the detached plank. This type of calculation is called continuous flooding.

Based on the French SAR transcript the time between the initial PAN PAN broadcast and final abandonment by all persons is estimated to be 45 minutes. When the Master finally abandoned the ship the water was observed exiting from the Dog House on the main deck. By reference to the French Navy video that was available online which had been taken at the time of arrival of the lifeboats and based on information supplied by the crew the approximate waterline at the time of abandoning the ship is shown in the diagram following.



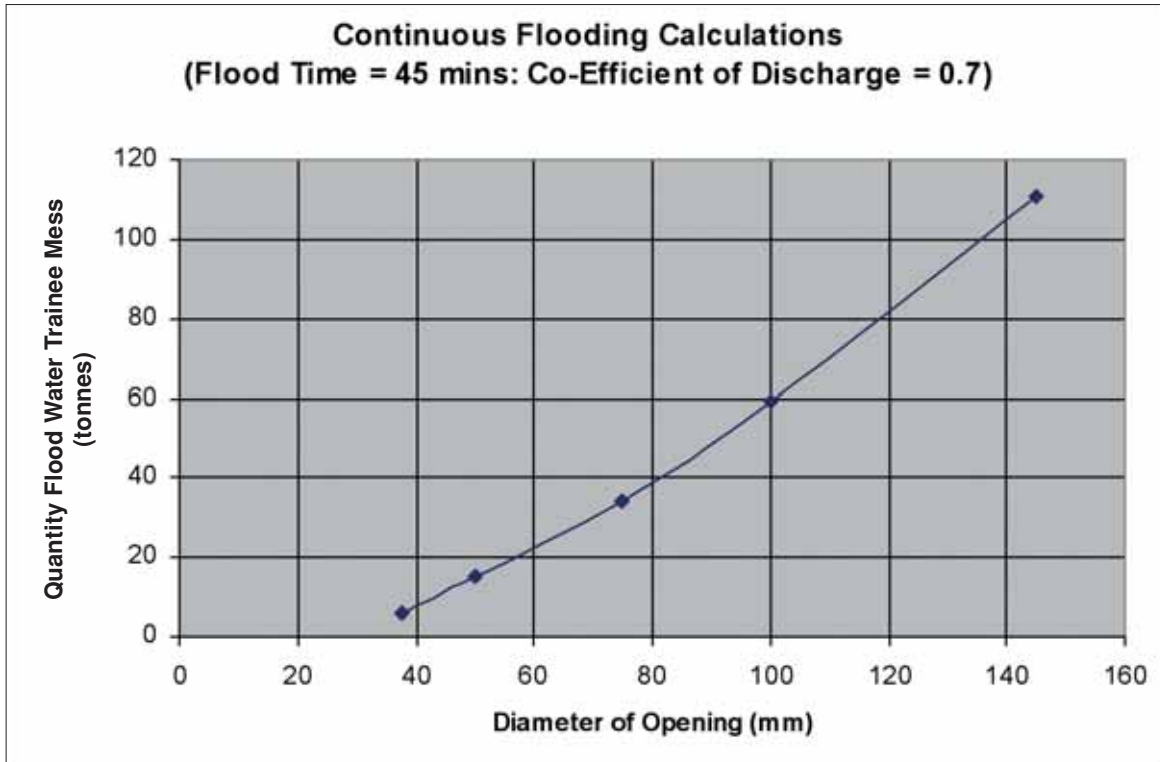
Diag. 2 - Showing the assumed waterline for initial calculations to be calculated.

By adjusting the permeability¹⁴ of the Trainee Mess with the space assumed to be flooded, at 80% permeability, the ship remains afloat at approximately the waterline shown in the above diagram. The required volume of floodwater can be estimated, as the gross volume of the space x 0.8 equals 110 tonnes.

Based on an assumed flooding time of 45 minutes of the Trainee Mess and an assumed permeability of 80%, the quantity of floodwater in the Trainee Mess was determined for various sized openings. A curve was derived from these calculations and is presented overleaf.

¹⁴ Permeability” means is the percentage of volume of the space, which may be occupied by seawater if the space is flooded. The remaining volume [not filled with seawater] being occupied by machinery, cargo, accommodation spaces, etc.

The results indicate an opening of 37.5 mm (1½") in diameter would result in 6 tonnes of water in the Trainee Mess at the end of 45 minutes. It is estimated that an opening of 145 mm (0.017 m²) in diameter would result in 110 tonnes of water in the Trainee Mess at the end of 45 minutes.



The maximum seacock diameter in the Trainee Mess was 37.5 mm (1½") in diameter and based on these calculations the failure of a single seacock in Trainee Mess was insufficient to flood the Trainee Mess in 45 minutes.

These calculations are based on a circular opening, an assumed co-efficient of discharge of 0.7, no bilge pumping of the Trainee Mess and no leakage of water into adjacent spaces. The values presented should only be considered as indicative but clearly show the flooding was not as a result of the failure of a 1½" seacock.

Examining the fractured starboard plank it appears that the damaged plank occurs over approximately 3 frame spaces. Each frame space measures approximately 7½" x 7" (190.5 mm x 177.8 mm) giving a total area of (190.5 mm x 177.8 mm) x 3 = 0.1 m². This value is significantly larger than the area determined by the continuous flooding calculations (0.017 m²).

6.23 Failure of the Portable Salvage Pump:

The portable salvage pump started readily during the course of the incident and the suction hose was placed down a vent pipe on the portside of the Dog House leading to the Trainee Mess. The salvage pump failed to obtain suction and the

crew made an attempt to prime the pump unsuccessfully during the course of the incident.

The portable pump was tested and the suction hose placed overboard prior to each voyage for demonstration and testing purposes. During watch leader training, which occurred about 4 times a year, the suction hose of the salvage pump was placed down the vent pipe leading to the Trainee Mess and was used to pump water from the bilge for demonstration purposes.

6.24 Manufacturers Testing of Liferaft:

All three liferafts used to abandon the ship were recovered and the damaged liferaft was identified. The damaged liferaft was examined on Belle Ile and then returned to the manufacturer, RFD Beaufort Limited, in Belfast. In consultation with the MCIB the liferaft underwent a series of tests. The conclusion of the testing is as follows (a copy of the full report is contained in Appendix 10.4);

“The floor on the “Asgard II” liferaft became detached due to a degradation of adhesive bond between buoyancy and floor. Such degradation can occur in presence of moisture and high humidity. Adhesive degradation to date has always been identified in the service station during routine servicing.

The testing we have carried out has demonstrated that the current Floor Seam Test as specified in IMO Resolution A.761 (18) may not always detect the presence of degraded bonds in the floor joints of a liferaft.

However, if the inspection of the floor seam for slippage and edge lifting as specified in the IMO Resolution A.761 (18) is undertaken rigorously then a floor joint in which adhesive degradation has occurred will be identified.

RFD Beaufort Ltd will take action to alert the service station network as to the importance of the floor seam slippage and edge lifting check as specified in IMO Resolution A.761 (18).

This will be done in the form of Service Bulletin No. 18/08 Marine, which will elaborate on the inspection of the floor seam for slippage and edge lifting with additional measures. This will ensure that any such adhesive degradation is highlighted at service.

The Service Bulletin will instruct that liferafts which are found to have degraded joints be removed from service immediately.

Further investigations of liferafts of similar age will be undertaken by RFD Beaufort Limited.”

7. DISCUSSION OF FINDINGS

7.1 Condition of the Hull Prior to the Incident:

The owner, in agreement with the MSO, applied higher safety standards to the ship than required by legislation.

7.2 Flooding of the Trainee Mess:

The findings indicate the ship, at the time of the incident, complied with all relevant statutory provisions, was in class with Lloyd's Register and was well maintained with no indication of any structural problems or previous history of any structural problems.

Based on the evidence of the crew, the Trainee Mess flooded rapidly with the bilge system unable to cope with the rate of ingress. With the Trainee Mess flooded water leaked through the watertight bulkhead to the engine room slowly as witnessed by the Engineer. This is not unexpected for a wooden ship fitted with steel bulkheads fastened to wooden frames which are difficult to make watertight.

Based on the evidence flooding occurred as a result of the fractured plank (starboard) as no other significant plank damage was found and the TRIBON calculations indicate failure a 1¹/₂" seacock would not cause such rapid flooding.

It is important to note that bilge systems in ships are not designed to deal with water ingress into compartments laid open to the sea. Bilge systems are designed to pump from adjacent compartments to the damaged space to prevent slow flooding of undamaged compartments by leakage through the bulkheads, which would endanger the ship. The bilge system was initially set to pump the Trainee Mess and was subsequently changed over to pump the forepeak and the Engine Room.

7.3 Cause of Fractured Plank (Starboard):

The ship was positioned well on the seabed allowing a full examination by the ROV. ROV footage covered all the external planking surface.

There are a number of possibilities to consider that may have caused the fractured plank and surrounding damage on the starboard side and the cracked plank on the portside:

DEFECT FROM NEW BUILD

The ship was built in 1981 and had operated extensively throughout European waters and further afield. It is considered likely any inherent defects would have presented in this period of time.

Gordon Knaggs' opinion indicates the fracture was "brash" (non-fibrous) which he states could possibly indicate slight decay, although not considered likely, or the presence of "tension wood" from new building although this cannot be regarded as a definitive opinion. The opinion is based on review of the ROV footage and cannot be regarded as definitive.

Tension wood in hardwood is found mainly in trees growing on steep inclines and is caused by abnormal growth rings in their efforts to stand vertically. Tension wood should be avoided in hull planking timber.

PRESENCE OF ROT

As outlined above the owner maintained the ship to a high standard, the ship was maintained in Lloyd's Register Class and was dry docked annually and surveyed by the MSO.

As outlined in the findings the spikes remained in place and the plank detached over the head of the spikes indicating the fastenings were secure in the oak framing. Reviewing the MSO files and Lloyd's Register Classification files no evidence of any issues relating to the presence of rot were found.

The ROV footage and video review by Gordon Knaggs is inconclusive in relation to the presence of rot although the fractured plank is brash (non-fibrous) in nature which can be associated with timber decay as outlined in Gordon Knaggs report.

The presence of the cracked plank on the portside as reported in the findings is located in a similar longitudinal location to the fractured plank on the starboard side. It is considered unlikely for rot to be present in the same location port and starboard side.

GROUNDING

Based on the evidence of the crew and the location of the incident (80m water depth) grounding was not a factor in the loss of the ship.

SEACOCK FAILURE

Based on the continuous flooding calculations a full bore failure of a 1 1/2" seacock does not result in the flooding of the Trainee Mess in 45 minutes.

WEATHER

The prevailing weather conditions were relatively benign and not considered to be a factor in the incident.

COLLISION WITH AN UNDERWATER OBJECT

As detailed above the Bo'sun and two Trainee Crew reported unusual noises. No visible marks were found on the planking to indicate a collision between the hull and an external object. One possibility is that the ship struck an underwater object on the underside of the keel causing the fracture of the planking visible on port and starboard. Anecdotal evidence suggests that flotsam from ships is found in the general vicinity of the incident.

At the time of the incident the ship was motor sailing at 40 degs. apparent wind with the fore and aft sails rigged. Assuming the waves were in the general direction of the prevailing wind the vessel would have been experiencing a rolling and pitching.

Examining the construction section, the three planks containing cracks on the starboard side are located between the toe of the partial steel bulkhead and the outboard toe of the mast step. A force applied to the underside of the keel would be transmitted through the hull framing and planking and possibly dislodging the plank on the starboard side and fracturing the plank on the portside.

IMPACT WITH THE SEABED

The starboard anchor was found withdrawn from the hawse pipe and the anti-fouling covering the plank seams throughout the vessel cracked/disturbed. This evidence may suggest that the impact with the seabed was significant and may have resulted in damage additional to the damage that occurred on the surface. This may also explain the results of the continuous flooding calculations that indicate an opening of 145 mm diameter results in the flooding of the Trainee Mess in 45 minutes whereas the estimated opening visible on the seabed is significantly larger.

The fractured plank (starboard) failure, for whatever reason, occurred at the weakest point in the plank. The spikes hold the plank in place, however, they do reduce the cross sectional area of the plank locally.

8. CONCLUSIONS

8.1 Certification:

The ship complied with the relevant statutory requirements at the time of the incident.

The survey regime and operational procedures adopted were over and above the minimum statutory requirements. These practices had evolved over time by the owners and the MSO.

8.2 Cause of Planking Failure:

The investigation was unable to establish the exact cause of the initial plank failure.

Based on the findings it is probable the ship struck an underwater object causing the major planking failure on the starboard side.

8.3 Abandonment:

Based on the completed trainee questionnaires, the 5 permanent crew dealt with the situation in a professional and brave manner from the initial detection of water in the Trainee Mess to final abandonment and return of the trainee crew to Dublin. In particular, the Master displayed professionalism, courage and bravery throughout the course of the incident.

The response of the 5 permanent crewmembers to the emergency situation demonstrates the importance of the human element in an emergency situation and the effectiveness of having crew qualified in accordance the provision of the Standards of Training, Certification and Watchkeeping for Seafarers (STCW) onboard. In agreement with the owners the MSO required the highest level of STCW certification over and above the statutory requirements.

8.4 Lifesaving Appliances and Radio Equipment:

The provision and readily availability of the lifesaving appliances is very important as demonstrated by this incident. The MSO in agreement with the owner undertook an annual survey of the lifesaving and radio equipment over and above the statutory requirements relating to this size of vessel.

The Radio equipment operated in accordance with the requirements of the GMDSS requirements and continued to function until the Master finally abandoned ship.

8.5 Condition of Hull:

The owners maintained the ship to a high standard. The survey regime was in excess of the minimum statutory requirements. There were no recorded problems with the hull or fastenings at the time of the incident.

8.6 Failure of Liferaft:

The liferaft floor failed as a result the deterioration of the glue joint between the floor joint and the side tubes. The floor test carried out in Feb. 2008 failed to detect the deteriorated glue joint between the floor and the side tubes.

8.7 Flooding Mechanism:

Based on the rate of flooding as reported by the crew the flooding of the Trainee Mess was as a result of the major structural failure of the hull planking on the starboard side. Following flooding of the Trainee Mess water slowly leaked through the bulkheads into the adjacent spaces eventually leading to the loss of the ship.

The failure of the portable salvage pump did not effect the final outcome of the incident. If the pump had obtained suction the rate of water ingress would have only been marginally reduced.

8.8 Portable Salvage Pump:

No conclusion can be made regarding the failure of the portable salvage pump. The pump was tested regularly and the crew were very familiar with the operation of the pump.

Note: As the MCIB has concluded that the most probable cause of the damage to the ship was that it struck an underwater object, consideration then falls as to why such damage should have resulted in the total loss of the ship. The MCIB considers that the status of the STV “Asgard II” is a key consideration in this regard and that the classification of the ship as either a passenger ship or a cargo ship or other is an important issue. In common with other modes of transport the safety regulations for the carriage of passengers requires higher standards than for other types of carriage. Therefore, passenger transportation is regulated to ensure that a single failure should not lead to a total loss of the system. On this basis passenger ships are designed to have the capacity to stay afloat following damage to the hull leading to flooding of internal compartments. This capability is referred to as the damage stability capacity of the ship. However, in common with some international practice the STV “Asgard II” was designated as a cargo ship with the trainees “signed-on” as crew members as they were regarded as being engaged in the business of the ship. Therefore, as a cargo ship the STV “Asgard II” was not required to have the capacity to withstand the flooding of any internal compartment.

The MCIB considers that the status of trainees on board sail training vessels and thus the status of such ships requires further consideration. Consequently, the MCIB makes a recommendation that the Department of Transport should review the statutory status of such ships.

9. RECOMMENDATIONS

- 9.1 The Department of Transport should review the statutory requirements relating to sail training ships and amend the legislation if considered necessary. This should include a review of the practice of permitting sail trainees signing on as crew.
- 9.2 The Department of Transport should submit this report, particularly those elements pertaining to the failure of the liferaft, to the International Maritime Organisation (IMO), Design and Equipment (DE) Sub-Committee for information and such action as they consider necessary, as the Board feels that this is an issue affecting all liferafts.
- 9.3 The Minister should strongly encourage Lloyd's Register to complete the Review of the Survey Procedures for Wooden Classed Ships.

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Appendix 10.1 List of Seacocks.

STV "Asgard II"

Refit 2001/2002

Listing of ship side valves, by hull area, and associated inboard Non Return Valves.

FORE PEAK:		Date Removed from Hull	Sizes BSP
1	Toilet sea water inlet valve		¾"
2	Toilet overboard discharge valve		1 ½"
3	Fire pump sea water inlet valve		1 ½"
4	Bilge pump overboard discharge valve		2"
5	Shower tray overboard discharge valve		¾"
MESSROOM:			
6	Echo sounder port side		1¼"
7	Log starboard side		1¼"
8	Toilet inlet valve (under cooks cabin port side) Fwd.		¾"
9	Toilet inlet valve (under cooks cabin port side) Aft.		¾"
10	Toilet overboard disch (under Bosun's cab stb. side) Fwd	1999/00	1 ½"
11	Toilet overboard disch (under Bosun's cab stb. side) Aft	1999/00	1 ½"
CREW HEADS starboard:			
12	Shower tray overboard discharge		1"
13	Starboard generator exhaust, overboard discharge.		2" + NRV
ENGINE ROOM:			
14	Stern tube seawater inlet valve.		½"
15	Starboard generator inlet valve.		2"
16	Port generator inlet valve.	1999/00	2"
17	Fire / bilge pump sea water inlet valve		1 ½"
18	Galley seawater inlet valve.		¾"
19	Crew toilet seawater inlet valve (P).		1"
20	Crew toilet overboard discharge (S).		1 ½"
21	Main engine seawater inlet Port.	1999/00	1 ½"
22	Main engine seawater inlet Starboard.	1999/00	1 ½"
GALLEY area port: Sea Valves.			
23	Port generator overboard discharge		2" + NRV
24	Galley sink overboard discharge		1 ½"
25	Bilge pump overboard discharge		1 ½"
26	Electric bilge pump overboard discharge		1"

Appendix 10.2 Statutory Certification.

**SURVEYORS OFFICE
CERTIFIED COPY**



Irish Load Line Certificate

Issued by the Department of Transport.

Name of Ship	Distinctive Number or Letters	Port of Registry	Length (L) as defined by regulations under section 1(6) of the Merchant Shipping (Load Lines) Act, 1968.	Gross Tonnage
ASGARD II	402135	DUBLIN	22.45 metres	92.65

* Freeboard assigned as: A new ship, ~~An existing ship.~~
 * Type of ship: ~~Type A, Type B, Type B with reduced / increased freeboard.~~
 * Delete whatever is inapplicable.

	Freeboard from deck line		Load Line
Tropical	----- mm (T)		---- mm above (S)
Summer	1041 mm (S)	Upper edge of line through centre of ring.	
Winter	----- mm (W)		---- mm below (S)
Winter North Atlantic	----- mm (WNA)		---- mm below (S)

NOTE: Freeboards and Load Lines which are not applicable need not be entered on the certificate.

Allowance for Fresh Water for all freeboards. 32 mm.

The upper edge of the deck line from which the freeboards are measured is **the main deck at side.**

Date of initial or periodical survey 4th March 2005.

This is to certify that this ship has been surveyed and that the freeboards and load lines shown above have been assigned in accordance with the Merchant Shipping (Load Line) Rules, 1968.

This Certificate is valid until 5th March 2010 subject to periodical inspections in accordance with those Rules.

Issued at Dublin on 29th May 2006



Brian Hoag

 An authorised officer of the Department of Transport.

Appendix 10.2 Statutory Certification.

MINIMUM SAFE MANNING DOCUMENT

FILE COPY

IRELAND

Issued by the Department of Transport and Marine

Particulars of Ships

Name of Ship	ASGARD II
Distinctive number or letters	
IMO number	402135
Port of registry	DUBLIN
Gross tonnage.	92.65
Main propulsion power (kW)	186.5
Type of ship	CLASS VII

Periodically unattended machinery space Yes

NORTH WEST EUROPE

Appendix 10.2 Statutory Certification.

The ship named in this document is considered to be safety manned in accordance with the principles and guidelines set out in annexes 1 and 2 of International Maritime Organization Resolution A.890 (21), if, when it proceeds to sea **carrying trainees**, it has not less than the number and grades/capacities of personnel specified in the table(s) below.

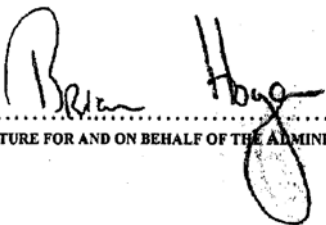
Grade/capacity	Certificate in accordance with STCW 95	Number of persons
Master	STCW 78/95 Reg. II/2 3000 gross tonnage or more	1
Chief Mate	STCW 78/95 Reg. 3000 gross tonnage or more	1
Chief Engineer	STCW 78/95 Reg. III/3 or; Specified Marine Engine Operator Licence	1
Boatswain	Category 1, STCW 78/95 Reg. II/4, Reg VI/1 & Sect A-VI/1.2	1
Cook	STCW 78/95 Reg. III/4, Reg VI/1 & Sect A-VI/1.2	1
Watch Leader	Personal Survival Techniques (effective 1 st April 2008)	Each Watch Leader

Type of Manning: -

Inter Department Flexibility, Limited Trading Area, 5 persons minimum.

Issued at DUBLIN on the 4th July 2007
(MONTH AND YEAR)

DATE OF EXPIRY: 31ST MARCH 2012
(SEAL OF THE ADMINISTRATION)



 (SIGNATURE FOR AND ON BEHALF OF THE ADMINISTRATION)

Appendix 10.3 Classification Certificate.

05/10/2008 16:52 0035316772328 COISTE AN ASGARD PAGE 03

Certificate no: DUB 0400117
Page 1 of 2

CERTIFIED COPY

Lloyd's Register Certificate of Class

This certificate is issued to	ASGARD II
LR Number	1000540
Date of build	02.1981
Port of Registry	Dublin
Gross tons	97
Geographical Limits	-

to confirm that having been surveyed by Lloyd's Register EMEA and having been found in compliance with the Rules and Regulations for the Classification of Special Service Craft, the aforesaid craft has been assigned the class

+ 100 A1 Yacht

+ LMC

Date Special Survey Assigned 31 March 2005
This Certificate is valid until* 30 March 2010

* Unless extended after completion of a Special Survey (see page 2) or in accordance with Part 1, Chapter 2, Section 4.5.11 of the Rules and Regulations (see page 3) and is subject to surveys as prescribed (see page 2) being satisfactorily completed. (See notes 1 to 3, page 2)

issued at Dublin on 04 March 2005

Initials SWW
Dublin Office
Simon Woods
Lloyd's Register EMEA
Surveyor to Lloyd's Register EMEA

A member of the Lloyd's Register Group

Note: 1. To establish the classification status of this ship, the ClassDirect Live web site and the interim Certificates issued on completion of classification surveys should be consulted in addition to this certificate. Access to ClassDirect Live is available via <http://www.cdlive.lrg.org>.
2. Where an operational envelope is assigned, it will be attached as an appendix to this certificate.

Lloyd's Register, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register Group'. The Lloyd's Register Group assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register Group entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.
Form 171735 (2004.10)

Appendix 10.4 RFD Liferaft Report/“Asgard II” Investigation Report.



Asgard
Investigation report
RFD Beaufort Ltd Surviva Liferaft Assembly
Serial number D16SU28174 Date of Manufacture 4th March
1995
RFD Beaufort Ltd Customer Complaint Number CCH 1387

1.0 Problem

The Irish Casualty Investigation Board contacted RFD Beaufort Ltd on 23rd September 2008 to report the foundering of the vessel Asgard. During the rescue operation four liferafts were deployed. An incident had occurred with one of the RFD Beaufort Ltd liferafts that had been deployed into the water.

Eight persons boarded the liferaft from approximately 0.5 metres above the liferaft, and after approximately ten minutes the floor on the raft partially detached from the lower buoyancy chamber, allowing the persons on board to become partially submerged in the water.

All persons on board the liferaft were transferred onto another liferaft and taken to safety.

2.0 Liferaft History

2.1 This liferaft was and manufactured on the 4th March 1995 – No build issues with this liferaft were recorded.

2.2 The servicing of the Liferaft has been carried out at the correct intervals by Solas Marine in Dublin, as recorded on the service history log card - See Appendix A



Asgard Appendix A.

2.3 On review of the service history there are some concerns.

1/ The NAP and floor seam test specified in IMO Resolution A761 (18) (Recommendations and conditions for the approval of servicing stations for inflatable liferafts) according to the service history log card, the NAP and the floor seam testing was not carried out until Feb 2008, yet on the certificate of re-inspection the NAP and floor seam test was recorded as having been carried out in 2006, 2007 and 2008.

2/ IMO Resolution A761 (18) also requires that the seam between the buoyancy and the floor should be checked for slippage or edge lifting. This check was said to have been done by the service station using a spatula around the floor attach. This check if conducted thoroughly will identify a joint, at annual service, similar to that which failed on the mentioned liferaft.

2.4 The liferaft was last serviced in February 2008, whereby the NAP and floor seam test were recorded to have been carried out with no concerns highlighted.

3.0 Investigation and re-creation testing

Appendix 10.4 RFD Liferaft Report/“Asgard II” Investigation Report.

- 3.1 Upon return of the liferaft it was noted that the floor at the doorway on the cylinder side of the raft had become detached. It was also noted that the adhesive joints between the floor and buoyancy were dark brown – See Picture 1.



Picture 1

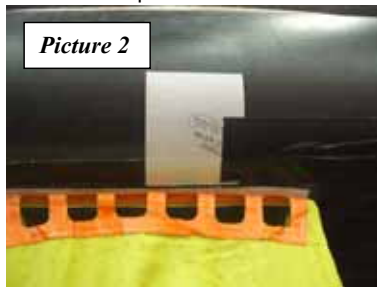
Adhesive bonds can degrade after long term oxidation resulting in a degrading of the seam strength. The oxidation process is known to be accelerated by exposure to hot humid climates and the presence of moisture within the liferaft

The towing patches, on diametrically opposed points across the lower buoyancy were instrumental in preventing the propagation of detachment.

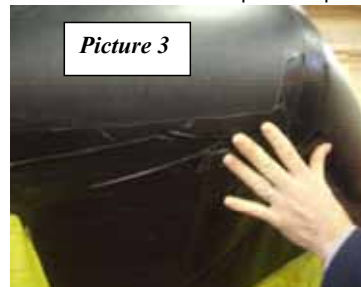
- 3.2 After inspection of the Liferaft by RFD Beaufort Ltd Technical and Quality personnel the following actions were taken to verify if the existing floor seam test, as specified in test procedure IMO Resolution A761 - 18 (Recommendations and conditions for the approval of servicing stations for inflatable liferafts), would have detected the failure in the floor during inspection at the last service.

- A patch was placed on the floor seam to stop the floor peeling any further – See Picture 2.

The detached part of the floor was stuck down with self adhesive tape -See picture 3.



Picture 2



Picture 3

- The liferaft was elevated off the floor and placed on stands – See picture 4.
- Subject one (75Kilos) boarded the raft at the area in which the floor was still in tact.



Picture 4



Picture 5

He then proceeded around the liferaft on foot applying his weight on the area of the intact floor attachment See picture 5. – No seam slippage or edge lifting was detected on the floor.

Appendix 10.4 RFD Liferaft Report/“Asgard II” Investigation Report.

-
- Subject one then crawled around the same area of the raft applying his weight on the floor attach area. See picture 6 – No seam slippage or edge lifting was detected on the floor.



- In addition to the IMO Resolution A761 test requirements subject one then climbed onto the upper buoyancy and jumped into the raft sixteen times – No seam slippage or edge lifting was detected on the floor.
- Subject two (104 Kilos) boarded the raft and carried out the same exercise. See Picture 7 – No seam slippage or edge lifting was detected on the floor.



The strenuous seam testing regime carried out as described above on the intact section of the floor attachment, showed that even though the adhesive on this side of the floor was in a similar condition as the detached side, there was no detachment or slippage and the seam remained intact during the test.

After this test, the intact side of the floor was detached using hand and finger pressure. The floor detached from the lower buoyancy showing similar observable features on the exposed surfaces as the already detached floor.

4.0 Conclusion

The floor on the Asgard liferaft became detached due to a degradation of adhesive bond between buoyancy and floor, such degradation can occur in presence of moisture and high humidity. The adhesive degradation to date has always been identified in the service station during routine servicing.

Appendix 10.4 RFD Liferaft Report/“Asgard II” Investigation Report.

The testing we have carried out has demonstrated that the current Floor seam test as specified in IMO Resolution A761 (18) may not always detect the presence of degraded bonds in the floor joints of a liferaft.

However, if the inspection of the floor seam for slippage and edge lifting as Specified in the IMO Resolution A761 (18) is undertaken rigorously then a floor joint in which adhesive degradation has occurred will be identified.

RFD Beaufort Ltd will take action to alert the service station network to the importance of the floor seam slippage and edge lifting check as specified in IMO Resolution A761 (18).

This will be done in the form of service bulletin 18/08 Marine which will elaborate on the inspection of the floor seam for slippage and edge lifting with additional measures. This will ensure that any such adhesive degradation is highlighted at service.

The service bulletin will instruct that liferafts which are found to have degraded joints be removed from Service Immediately.

Further investigations of Liferrafts of similar age will be undertaken by RFD Beaufort

Appendix 10.4 RFD Liferaft Report/“Asgard II” Investigation Report.

“Asgard II” Liferaft Service History.

Invoiced	Where Sourced	Modifications	Repairs, Replacements, Remarks, Remarks	Stamp	No. of Annual Certificate	Manager's Signature
vice 1-96	WATSON'S MARINE 17 WINDYBUSH ROAD KILLINEY, DUBLIN		Survived + Tested Replacements 4 x Cells, 2 seats + 2 belts	W 1 J	55546	T. J. H. E. (H.A.)
vice 1-96	WATSON'S MARINE 17 WINDYBUSH ROAD KILLINEY, DUBLIN		Survived + Tested Replacements 4 x Cells, 2 seats + 2 belts	W 1 J	55573	T. J. H. E. (H.A.)
vice 1-98	WATSON'S MARINE 17 WINDYBUSH ROAD KILLINEY, DUBLIN		Survived + Tested 4 x Cells, 2 SS Plus F.A. Kit 2 Flare 4 Anchors 2 Life Rafts TESTED 15 Surveys + 1 Cell	W 1 J	08307	S. Dillon
vice 1-99	SOLAS MARINE SERVICES 17 WINDYBUSH ROAD KILLINEY, DUBLIN MOBILE: 017-4405378		Survived + Tested 4 x Cells, 2 seats	Solo	43934	T. J. H. E. (H.A.)
vice 1-00	SOLAS MARINE SERVICES 17 WINDYBUSH ROAD KILLINEY, DUBLIN MOBILE: 017-4405378		Survived + Tested 4 x Cells, 2 seats	Solo	62152	C. Bann
vice 1-01	SOLAS MARINE SERVICES 17 WINDYBUSH ROAD KILLINEY, DUBLIN MOBILE: 017-4405378		Survived + Tested 4 x Cells, 2 seats	Solo	80868	C. Bann
vice 1-02	SOLAS MARINE SERVICES 17 WINDYBUSH ROAD KILLINEY, DUBLIN MOBILE: 017-4405378		Survived + Tested 4 x Cells, 2 seats	Solo		C. Bann
vice 1-03	SOLAS MARINE SERVICES 17 WINDYBUSH ROAD KILLINEY, DUBLIN MOBILE: 017-4405378		Survived + Tested 4 x Cells, 2 seats	Solo		C. Bann
vice 1-04	SOLAS MARINE SERVICES 17 WINDYBUSH ROAD KILLINEY, DUBLIN MOBILE: 017-4405378		Survived + Tested 4 x Cells, 2 seats	Solo		C. Bann
vice 1-05	SOLAS MARINE SERVICES 17 WINDYBUSH ROAD KILLINEY, DUBLIN MOBILE: 017-4405378		Survived + Tested 4 x Cells, 2 seats	Solo		C. Bann

Appendix 10.4 RFD Liferaft Report/“Asgard II” Investigation Report.

“Asgard II” Liferaft Service History continued.

Date	Where Liferaft Service	Reason for Removal	Status	Signature
2-1-07	Asgard II	1. 8 in. & 6 in. diameter holes in hull 2. 2 in. hole in hull 3. 2 in. hole in hull 4. 2 in. hole in hull	SOLAS II	S. J. [Signature]
2-5-08	Asgard II	2. 2 in. hole in hull 3. 2 in. hole in hull	SOLAS II	T. W. [Signature]

Appendix 10.4 RFD Liferaft Report/"Asgard II" Investigation Report.

Service station repair schedule

SOLAS MARINE SERVICES LTD.
The Dry Dock, Alexandra Road, Dublin 7. Tel: 01 8561320 Fax: 01 8561321 Mobile: 087 2482278

Customer: *Capt. G. Asgard* Job No: _____ Date: *14/3/08*
Ship: *Asgard II* Hull Type: *Survivor* Date of Mfg: *2001*
Type of: A V B C D E F Months Rec: *813019* Hours Rec: _____

Signature: _____ Date: *14/3/08*
Signature: _____ Date of Mfg: *05-93*

RAFT SERVICE 0555

Declaration that the work not being carried out will be charged separately.

Signature: _____ Date: _____

REPAIR SCHEDULE		Signature:	
SURVEY FEE A/C:	Signature:	Date:	
1. MAIN BUOYANCY			
a1 Buoyancy Chamber	<input checked="" type="checkbox"/>		
a2 Thrust	<input checked="" type="checkbox"/>		
a3 Airline	<input checked="" type="checkbox"/>		
a4 Life-line Patches & Trimming	<input checked="" type="checkbox"/>		
a5 Tie Tapes	<input checked="" type="checkbox"/>		
2. CANNOPY			
a1 Outer Canopy	<input checked="" type="checkbox"/>		
a2 Inner Canopy	<input checked="" type="checkbox"/>		
a3 Removable sections	<input checked="" type="checkbox"/>		
a4 Water activated lights	<input checked="" type="checkbox"/>		
a5 Entrances	<input checked="" type="checkbox"/>		
3. FLOOR			
a1 Inner Floor	<input checked="" type="checkbox"/>		
a2 Outer Floor	<input checked="" type="checkbox"/>		
a3 Emergency Pack Tapes	<input checked="" type="checkbox"/>		
a4 CO ₂ Cylinder Packets	<input checked="" type="checkbox"/>		
a5 Valve Protection Paper	<input checked="" type="checkbox"/>		
a6 Water Pockets	<input checked="" type="checkbox"/>		
a7 Nighting Strap	<input checked="" type="checkbox"/>		
4. GLASS FIBRE CONTAINER			
a1 Container	<input checked="" type="checkbox"/>		
a2 Baffles	<input checked="" type="checkbox"/>		
a3 Baffle Board	<input checked="" type="checkbox"/>		
a4 Painter	<input checked="" type="checkbox"/>		
a5 Seat	<input checked="" type="checkbox"/>		
a6 Gasket	<input checked="" type="checkbox"/>		
5. CORDAGE			
a1 Lifelines	<input checked="" type="checkbox"/>		
a2 Boarding Ladder	<input checked="" type="checkbox"/>		
a3 Entrance Drain Covers	<input checked="" type="checkbox"/>		
6. INFLATION EQUIPMENT			
a1 CO ₂ Cylinders	<input checked="" type="checkbox"/>		
a2 Operating Heads	<input checked="" type="checkbox"/>		
a3 High Pressure Heads	<input checked="" type="checkbox"/>		
a4 T-Connections	<input checked="" type="checkbox"/>		
a5 Diffusion Plug	<input checked="" type="checkbox"/>		
a6 All Valves	<input checked="" type="checkbox"/>		
7. VALVE			
a1 Handles	<input checked="" type="checkbox"/>		
a2 Keys & Paces Bails	<input checked="" type="checkbox"/>		
a3 Patches & Pockets	<input checked="" type="checkbox"/>		
8. STANDING EQUIPMENT			
a1 Knives	<input checked="" type="checkbox"/>		
a2 Springs	<input checked="" type="checkbox"/>		
a3 Hammers	<input checked="" type="checkbox"/>		
a4 Rescue Line	<input checked="" type="checkbox"/>		
a5 Inner Lights	<input checked="" type="checkbox"/>		
a6 Instruction Card	<input checked="" type="checkbox"/>		
a7 Bednets	<input checked="" type="checkbox"/>		
a8 Rope Kit	<input checked="" type="checkbox"/>		
a9 Spare Aircraft	<input checked="" type="checkbox"/>		
a10 Pyralites	<input checked="" type="checkbox"/>		
a11 Lights	<input checked="" type="checkbox"/>		
a12 Leak Stoppers	<input checked="" type="checkbox"/>		
a13 Distress Keys	<input checked="" type="checkbox"/>		
a14 Ribbon Stoppers	<input checked="" type="checkbox"/>		
9. SAFETY EQUIPMENT VALVE TEST			
Blow Off	Done	Blow Off	Done
Blow On	Done	Blow On	Done
FLOOR TEST DRY & WET			
Blow On	Done	Blow On	Done
Blow Off	Done	Blow Off	Done

EMERGENCY PACK

a1 Box

a2 Spine

a3 Torch

a4 Wipes

a5 First Aid Kit Expiry Date *5/2010*

a6 Morphine/Codeine

a7 First Aid Kit

a8 First Aid Kit

a9 First Aid Kit

a10 First Aid Kit

a11 First Aid Kit

a12 First Aid Kit

a13 First Aid Kit

a14 First Aid Kit

a15 First Aid Kit

a16 First Aid Kit

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a94 First Aid Kit

a95 First Aid Kit

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a97 First Aid Kit

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a99 First Aid Kit

a100 First Aid Kit

PANEL REPLACEMENTS

a1 Door Kit

a2 Door Kit

a3 Door Kit

a4 Door Kit

a5 Door Kit

a6 Door Kit

a7 Door Kit

a8 Door Kit

a9 Door Kit

a10 Door Kit

a11 Door Kit

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a93 Door Kit

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a95 Door Kit

a96 Door Kit

a97 Door Kit

a98 Door Kit

a99 Door Kit

a100 Door Kit

MODIFICATIONS

a1 NO CARD FITTED

a2 T.P.A.

a3 S.I. TEST

a4 LIFE SMOKE

a5 MAP TEST

a6 F.S. TEST

LABELS

a1 PACKING MATERIAL

a2 CARBAGE

Present carrying equipment

Marked equipment

Received by: *[Signature]* Packaged by: *[Signature]*

Appendix 10.4 RFD Liferaft Report/“Asgard II” Investigation Report.

RFD Beaufort Limited Service Bulletin

DUNMURRY - BELFAST - NORTHERN IRELAND

No. 18/08 Marine

Transmittal

This page transmits the issue of the above numbered Marine Service Bulletin, which consists of this transmittal sheet plus nine pages.

Title: Enhanced inspection of adhesive seams on Marine liferafts

Service Bulletin Number 18/08 has technical approval by RFD Beaufort Ltd.

Name:..... Date:.....

Tommy Scott
Marine Design Manager
RFD Beaufort Limited

Original Issue: Dec/08

UNCONTROLLED

Appendix 10.4 RFD Liferaft Report/“Asgard II” Investigation Report.

RFD Beaufort Limited Service Bulletin

DUNMURRY - BELFAST - NORTHERN IRELAND

No. 18/08 MarineTitle: **Enhanced inspection of adhesive seams on Marine liferafts****1. Introduction**

RFD Beaufort Limited has received reports from two service stations relating to degradation of some adhesive bonds on Surviva / Seasava liferafts manufactured in 1995.

The locations of the bonds in question are restricted to the joint between the floor and the buoyancy tube. In addition, on Davit-launchable type liferafts, the bond between the outer lifting strap and the floor may be affected.

Adhesive bonds in other areas are not affected.

A degraded adhesive bond may not be immediately obvious and can be difficult to detect.

The test specific to floors outlined in IMO resolution A.761(18) 'Recommendations on Conditions for the approval of Servicing Stations for inflatable liferafts', are designed to detect weakened floor to buoyancy joints.

IMO resolution A.761(18), Annex section 5.8 states that 'The seams between floor and buoyancy tube should be checked for slippage or edge lifting.' This inspection is to be undertaken at first service and each subsequent service.

This service bulletin provides more detail on exactly how to perform this inspection to ensure the condition of adhesive bonds can be determined reliably.

2. Action

In addition to the requirements of IMO resolution A.761(18) it is necessary to undertake the following steps during the inspection on liferafts, at next service.

The liferaft should be removed from its container and inflated in accordance with the RFD service instruction.

During the inspection of the seams of the floor and the buoyancy in accordance with IMO resolution A.761(18), service stations should examine these seams as follows;

Appendix 10.4 RFD Liferaft Report/“Asgard II” Investigation Report.

RFD Beaufort Limited Service Bulletin

DUNMURRY - BELFAST - NORTHERN IRELAND

No. 18/08 Marine

Throw-over rafts

Identify the side of the floor where the cylinder is attached, (FIGURE 1).

Identify the two corners of the floor edge as shown in, (FIGURE 2). Attempt to separate each of these two corners of the floor from the buoyancy using a spatula to lift the edge of the floor. The spatula should be used to initiate separation, to allow further examination by hand and finger pressure.

NOTE: Excessive force should not be used whilst using the spatula.

The floor should be separated from the buoyancy over a distance of 50mm. This allows the adhesive joint between the floor and the buoyancy to be inspected, (FIGURE 2).

How to distinguish Degraded adhesive bonds;

DEGRADED ADHESIVE BONDS:

Degraded adhesive has a dark brown shiny appearance and is brittle. It can be scraped off using fingernails, (FIGURE 3).

ACCEPTABLE ADHESIVE BONDS:

Adhesive which is in good condition, is beige in colour and feels rubber-like. Bonds which appear like this are difficult to separate and are resistant to peeling, (FIGURE 4).



Throw over cylinder side of liferaft
FIGURE 1

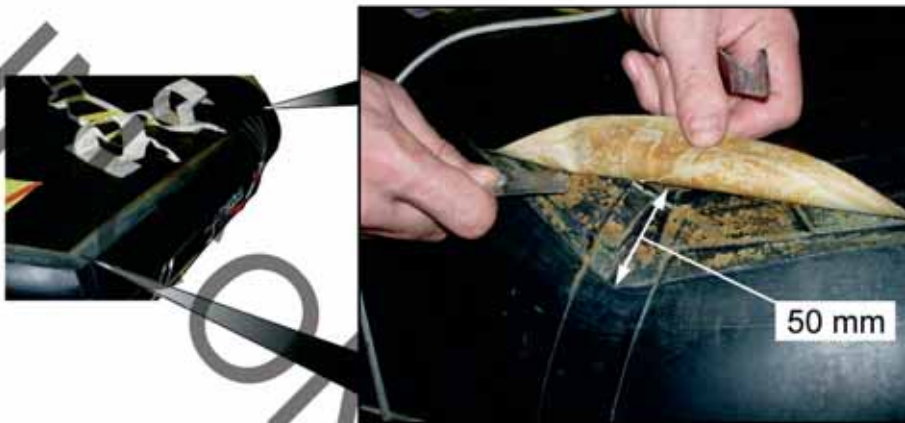
Appendix 10.4 RFD Liferaft Report/“Asgard II” Investigation Report.

RFD Beaufort Limited

DUNMURRY - BELFAST - NORTHERN IRELAND

Service Bulletin

No. 18/08 Marine



Attempt to separate floor from buoyancy
FIGURE 2



Degraded adhesive - dark brown shiny appearance
FIGURE 3

Appendix 10.4 RFD Liferaft Report/“Asgard II” Investigation Report.

RFD Beaufort Limited Service Bulletin

DUNMURRY - BELFAST - NORTHERN IRELAND

No. 18/08 Marine

Davit Launch liferafts

Identify the edge of the floor where the cylinder is attached, (FIGURE 5).

Identify the two corners of the lifting patches as shown in, (FIGURE 6). Using a spatula, attempt to separate each of these two corners from the floor. The spatula should be used to initiate separation, to allow further examination by hand and finger pressure.

NOTE: Excessive force should not be used whilst using the spatula.

The lifting patch should be separated from the floor over a distance of 50mm. This allows the adhesive joint between the lifting strap and the floor to be inspected.

How to distinguish Degraded adhesive bonds;

DEGRADED ADHESIVE BONDS:

Degraded adhesive has a dark brown shiny appearance and is brittle. It can be scraped off using fingernails, (FIGURE 3).

ACCEPTABLE ADHESIVE BONDS:

Adhesive which is in good condition, is beige in colour and feels rubber-like. Bonds which appear like this are difficult to separate and are resistant to peeling, (FIGURE 4).



**Adhesive in good condition - beige in colour
FIGURE 4**

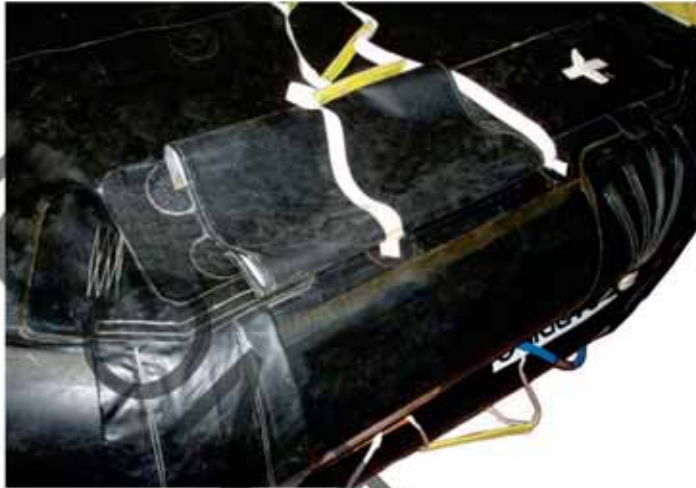
Appendix 10.4 RFD Liferaft Report/“Asgard II” Investigation Report.

RFD Beaufort Limited

Service Bulletin

DUNMURRY - BELFAST - NORTHERN IRELAND

No. 18/08 Marine



Davit launch cylinder side of liferaft
FIGURE 5



IDENTIFY TWO CORNERS
AT FLOOR EDGE



Corners with lifting patch
FIGURE 6

Appendix 10.4 RFD Liferaft Report/“Asgard II” Investigation Report.

RFD Beaufort Limited Service Bulletin
DUNMURRY - BELFAST - NORTHERN IRELAND

No. 18/08 Marine



Inspect along the floor edge between the two lifting straps
FIGURE 7



AREAS OBSERVED &
REPAIRED, MARKED WITH
50 mm DIAMETER PATCH

Repair patches applied
FIGURE 8

Appendix 10.4 RFD Liferaft Report/“Asgard II” Investigation Report.

RFD Beaufort Limited Service Bulletin

DUNMURRY - BELFAST - NORTHERN IRELAND

No. 18/08 Marine

If the adhesive in the joint between the lifting strap and the floor, is in good condition then inspect the floor further as follows;

The floor to buoyancy joint, must be inspected along the area between the two lifting straps, (FIGURE 7).

Identify the floor edge as shown in, (FIGURE 6). Attempt to separate the floor edge from the buoyancy, using a spatula to lift the edge of the floor. The spatula should be used to initiate separation, to allow further examination by hand and finger pressure.

The floor should be separated from the buoyancy over a distance of 50mm. This allows the adhesive joint between the floor and the buoyancy to be inspected, (FIGURE 3).

How to distinguish Degraded adhesive bonds;

DEGRADED ADHESIVE BONDS:

Degraded adhesive has a dark brown shiny appearance and is brittle. It can be scraped off using fingernails, (FIGURE 3).

ACCEPTABLE ADHESIVE BONDS:

Adhesive which is in good condition, is beige in colour and feels rubber-like. Bonds which appear like this are difficult to separate and are resistant to peeling, (FIGURE 4).

For both Throw-over and Davit Launch type liferafts

The test areas in which the adhesive is observed to be in good condition, must be repaired using repair techniques defined in the service manual. The areas which have been repaired must be marked by applying a 50mm diameter RFD 1015/1 fabric patch. The patch is applied so that the textile surface of the patch is facing outward, (FIGURE 8).

The inspection detailed in this service bulletin is to be undertaken at each service. The inspection at subsequent services, is to be conducted on joints not previously inspected.

Appendix 10.4 RFD Liferaft Report/“Asgard II” Investigation Report.

RFD Beaufort Limited Service Bulletin

DUNMURRY - BELFAST - NORTHERN IRELAND

No. 18/08 Marine

3. Equipment affected

Surviva, Seafarer and Seasava liferafts which have a DOM before 2002.

4. Tools required

Spatula

5. Testing

No additional testing is required.

7. Recording

Record SB18/08 on the liferaft log card, the certificate of re-inspection (if applicable) and on the “Life raft Service Record” Card (fitted inside container I.D. tube).

8. Reporting

Liferafts found to have adhesive joints which are degraded, must be condemned using the online condemnation form.

This form is available on the Survitec Group Ltd, Certificate of re-inspection online database. Please see sample form on page 9.

Section 28 of the condemnation form to be completed with the statement, ‘Liferaft condemned in accordance with SB 18/08’

Appendix 10.4 RFD Liferaft Report/“Asgard II” Investigation Report.

RFD Beaufort Limited Service Bulletin
DUNMURRY - BELFAST - NORTHERN IRELAND

No. 18/08 Marine

Serial No. 000001

CONDEMNATION FORM FOR INFLATABLE LIFERAFTS

Shipowner:	Name of Ship:	Flag State of Ship:	IMO No. of Ship:
------------	---------------	---------------------	------------------

STATISTICAL INFORMATION (Mark (X) in all appropriate boxes in the column farthest to the right)		
TYPE OF SHIP	Code	(X)
Passenger Ship (stowage height of liferaft > 4 meters)	1	
Passenger Ship (stowage height of liferaft < 4 meters)	2	
Passenger Cruise Ship (Oceans / International)	3	
High Speed Passenger Ship	4	
Cargo Vessel over 600 G.R.T.	5	
Cargo Less than 600 G.H.T.	6	
Tanker	7	
Offshore Supply Vessel or Standby vessel	8	
Fishing Vessel	9	
Pleasure Boat / Yacht	10	
Training liferaft on board (note ship type)	11	
Training liferaft kept onshore & Serviced onshore	12	

CAUSE OF CONDEMNATION	Code	(X)
Oxidation (copper Oxidation) - Beyond economical repair	13	
Leakage - beyond economical repair	14	
Wear / Chafing	15	
Condemned after vessel casualty	16	
Customer's request (describe reason under 28)	17	
Damaged during demonstration	18	
Damaged by strong heat (e.g. fire on board)	19	
Vandalism	20	
Water damaged (water in the container/valise)	21	
Damaged by mould	22	
N A P test negative	23	
Floor Seam Test (FS) negative	24	
Separation of adhesive, or Welded seams	25	
Other causes (describe them under 28)	26	
The liferaft was not packed in its container when received at the Servicing Station	27	

28. Detailed Remarks Concerning The Condemnation <i>Liferaft condemned in accordance with SB 18/08</i>	Service Station Stamp
	Date:
	Signature:

RFD Limited, Kingsway, Dunmurry, Belfast BT17 9AF, Northern Ireland.

Telephone: +44 (0) 1232 301531 Fax: +44 (0) 621765

Distribution: Original to be returned to Technical Services RFD Limited Photo Copy for Service Station File.

Appendix 10.5 Trainee Crew Questionnaire.

Questionnaire relating to the incident that occurred off St. Nazaire, France at about 02:00 hrs GMT on 11th September 2008, which resulted in the loss of the vessel Asgard II

Name:

Address:

Contact Details: - Email:

Phone:

Please indicate the watch you were assigned to on joining the vessel (Delete as appropriate).
--

(Port / Middle / Starboard) Watch

What bunk number were you assigned on joining the vessel?
--

Were you on duty at the time of the incident? If so, please indicate the duty you were assigned.

Appendix 10.5 Trainee Crew Questionnaire.

Where were you on board when the incident occurred? How were you made aware of the flooding?

What did you observe?

Do you recall anything that occurred prior to the incident that may be relevant to the investigation?

Appendix 10.5 Trainee Crew Questionnaire.

Do you consider the briefing given by the permanent crew on joining the ship was sufficiently detailed to assist you in the abandonment of the vessel.

Please advise your opinion in relation to the permanent crew handling of the incident and abandonment.

Appendix 10.5 Trainee Crew Questionnaire.

Were you in the Liferaft that failed? If so can you please describe what happened.

Please advise any other information that you may consider to be relevant to the incident.

Appendix 10.5(a) Extracts of comments received in response to Trainee Crew Questionnaire.

Please advise your opinion in relation to the permanent crew handling of the incident.

“Never once felt in danger”

“Everything was done in double quick time all the instructions given were clear and precise”

“I believe due to the permanent crews leadership, skills, bravery and professionalism a tragedy was averted. The captains confident disposition instilled a sense of calmness and composure in all trainees aboard during the incident and abandonment”

“Crew members kept up a running commentary so everyone knew what was happening. Instructions were given in a calm clear manner and repeated”

“When the incident did happen there was never one shred of doubt in my mind that the permanent crew knew exactly what they were doing”

“The captain at various stages during the evacuation was shouting encouraging words telling us all that we were doing the right thing and that there was no need to panic”

“The sail training did exactly what it said on the tin - it stood up to its most rigorous test and passed with flying colours”

“The crew were absolutely AMAZING”

“Their voices remained calm throughout as they gave us the orders and tasks that needed to be done”

“The Captain was excellent once the alarm went off and took full control of the situation”

Do you consider the briefing given by the crew on joining the ship was sufficiently detailed to assist you in the abandonment of the ship?

“Yes a very thorough safety program from our first embarkation at Falmouth and this was reiterated by the crew and watch leaders for the remainder of the voyage”

“Yes it given the first couple of hours on the ship - when the incident occurred we knew our stations, where our lifejackets were, how to put them on and all about the liferafts”

“On this occasion as on all others when I sailed on “Asgard II” all aspects of training was to the highest standard and we listened to what we were asked to do and did what we were asked quietly and without any fuss”

“The captain went through what would happen in the event of an alarm going and abandon ship he explained what was in the liferaft -- he made a joke about seasickness drugs in the liferaft-- for those of us in that liferaft - we all took the tablets and none of us got sea sick.”

“A full morning in Falmouth given over to emergency drills, muster stations, evacuation, fire including fire flaps, galley and engine room carbon dioxide systems, liferaft, use of handling flares. Emergency beacon, handheld VHF”

“I believe every possible scenario was covered”

“Yes very clearly heard in my head that if the alarm sounded to get on deck as fast as possible to our watches and to wear shoes ... lifejackets were clearly explained felt very reassured ... that there was over 200% liferaft capacity onboard”

11. CORRESPONDENCE RECEIVED	PAGE
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MCIB Response	65
11.3 Mr. James Keating	66
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MCIB Response	72
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11.12 Mr. Michael Grose	85
MCIB Response	85

Note: The address and contact details of individual respondents have been obscured for privacy reasons.

REDDIN Evelyn

From: Sile Mongey
Sent: 21 May 2010 13:46
To: Marine Casualty Investigation Board
Subject: Asgard 11 - Draft report

A Chara,

Attention: Ms Eve Reddin, Marine Casualty Investigation Board.

Thank you for forwarding the report to me. I have read it and have found nothing with which I would have cause to disagree, therefore I do not have need to make comments or observations.

I will send a copy of this by mail if you email me with a request.

With best wishes,

(Cecily) Sile Mongey

MCIB RESPONSE

The MCIB notes the contents of this letter.

Ms. Eve Reddin
Secretariat
Marine Casualty Investigation Board
Leeson Lane
Dublin 2

12th May, 2010

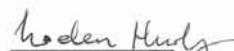
**DRAFT Report of the Investigation into the sinking of the STV "Asgard II" off
the French Coast on 11th September, 2008**

Dear Ms. Reddin,

I would like to thank you for forwarding a copy of the above to me on 30th March, 2010.

I am writing to you as requested to confirm that I have no comments or observations to offer in relation to this report.

Yours sincerely,


Noeleen Hurley



MCIB RESPONSE

The MCIB notes the contents of this letter.

Marine Casualty Investigation Board

From: james keating
Sent: 11 May 2010 14:31
To: Marine Casualty Investigation Board
Subject: MCIB/161 Asgard 2

Dear Sir/Madam,

I have read fully the draft investigation report in the sinking of the Asgard 2 on 11th Sept 2008 in the Bay of Biscay.

I have two areas for concern regarding the report.

I believe the report is unsatisfactory as it does not clearly outline what struck the vessel on the night in question. I presume this question will never be fully answered as was the nature of the event.

I believe the failing of the life-raft was caused mainly by chaffing, friction and abrasion between the bottom of the raft (rubber) and the side of the vessel (painted timber) as the crew were getting on board during the course of the abandonment. The abrasive effect of this chaffing was increased due swell of the sea and the weight of the crew inside the life-raft. I don't think the report properly questioned the suitability of the aforementioned life-raft for that particular vessel.

Regards

James Keating

Hotmail: Powerful Free email with security by Microsoft. [Get it now.](#)

REPLY TO RESPONSE RECEIVED FROM MR. JAMES KEATING DATED 11th MAY 2010

The MCIB disputes the contention that its report is unsatisfactory. As stated in Conclusion 8.2, *“The investigation was unable to establish the exact cause of the initial plank failure. Based on the findings it is probable the ship struck an underwater object causing the major planking failure on the starboard side”*. No evidence was found to indicate the type of object that might have collided with the “Asgard II”. Without such evidence it is impossible for the MCIB to *“outline what struck the vessel”*.

The RFD Beaufort Limited Investigation Report clearly states *“the floor of the liferaft detached due to a degradation of adhesive bond between buoyancy and floor”*. The RFD Beaufort Limited Investigation Report presents no evidence of *“chaffing, friction and abrasion”* of the liferaft. The specification of the liferaft was in accordance with the statutory requirements for a vessel of the size of the “Asgard II” and was serviced annually by an approved service station in accordance with the manufacturers instructions and IMO Resolution A.761 (18) *“Recommendations on Conditions for the Approval of Servicing Stations for Inflatable Liferafts”*.



COISTE AN ASGARD

IRISH SAIL TRAINING COMMITTEE

Coláiste Caoimhín, St. Mobhi Road, Glasnevin, Dublin 9.

Tel: +353 1 679 2169 Fax: +353 1 677 2328

Email: info@asgard2.ie Web: www.irishsailtraining.com



10 May 2010.

Ms Eve Reddin
Secretariat
Marine Casualty Investigation Board
Leeson Lane
Dublin 2.

Dear Ms Reddin,

I wish to refer to your letter dated 30 March 2010 requesting comments and observations on the Draft Report into the sinking of STV Asgard II by 27 April 2010 and the notification of extension from Mr Kieran Baker dated 21 April 2010 which extended the comment period to 13 May 2010.

The Board of Coiste an Asgard would like to make the following comments/observations to the Draft Report:

- (1) On page 4 (2.1) and page 6 (2.6) please replace 'Department' with 'Minister'
- (2) Page 7 (2.9) Otto Kinze should be Kunze.

The Board is satisfied with the report in general and its conclusion into the likely cause of the accident. We are happy that it recognises that the vessel was equipped and maintained in excess of the statutory requirements. We are also glad to see that it acknowledges the leadership shown by the Master Colm Newport and commends his and the crew's handling of the emergency on board.


However, there is concern and disappointment at the manner in which the failure of the liferaft has been handled. This matter is one of the most significant issues surrounding the incident and one which could have resulted in the loss of life. The reports from RFD indicate discrepancies in the records for this raft (see page 45 para 2.3 .1 and 2.3.2). The log for the raft suggests that the required inspection of the bond between the floor and the raft and the buoyancy tubes had been carried out in February 2008 but it is difficult to believe that a proper inspection would not have revealed the condition which led to the failure in September.

The crews of ships rely totally on liferafts operating as expected in an emergency and complete trust is placed in the adequacy of the servicing of the rafts. Furthermore, owners of the vessels, who have the responsibility of providing life-saving equipment which is fit for purpose and who pay the servicing costs, are also entitled to rely on the completeness of the servicing at the service station. In this case, your investigation has highlighted a number of very serious deficiencies in the procedures at the service station.

We would request that the procedures relating to the inspection of life rafts, their certification and procedures for oversight and auditing of servicing firms be reviewed and a full investigation be carried out to establish if, in light of your findings, a more robust system is required. But for the quick thinking of our Master and the benign weather conditions, the outcome of events on the night in question may not have ended so well with no injury or loss of life.

Thank you for giving the Board the opportunity to furnish its comments and observations in this regard.

Yours sincerely,


Tom Connick
Company Secretary.



REPLY TO RESPONSE RECEIVED FROM COISTE AN ASGARD DATED 12th MAY 2010

The MCIB notes the contents of this response and has made the necessary amendments. The MCIB disputes the contention that its report is unsatisfactory in relation to the handling of the failure of the liferaft.

In relation to the liferaft servicing procedures the MCIB Investigator did not find any problems with the servicing of the liferaft by the service station. IMO Resolution A.761 (18) specifies the standard for the current floor seam test. The post accident testing by RFD highlights the fact that the floor seam test as specified in IMO Resolution A.761 (18) may not always detect the presence of degraded bonds in the floor joints of a liferaft. As per recommendation 9.2 the MCIB recommends that the report into the failure of the liferaft should be submitted to the IMO (DE) Sub-Committee for information and any action they consider necessary.

MCIB
Leeson Lane
Dublin 2

11/05/10

Dear Ms Reddin,

I wish to acknowledge receipt of the Draft Report into the sinking of the STV "Asgard 11" on the 11/09/08. As far as I can recall, the time the ingress of water was first noticed was approximately 02:00 GMT.

Yours sincerely


Frank Bourke



REPLY TO RESPONSE RECEIVED FROM MR. FRANK BOURKE DATED 11th MAY 2010.

The MCIB notes the contents of this response and the necessary amendments have been made.

The transcript of the French SAR was re-examined and the statements by the Master Chief Mate, Engineer and Bo'sun. The French SAR documentation indicates the initial PAN PAN PAN was received at 01.05 hrs. GMT which equates to 03.00 hrs. local time (GMT +1hr/+1hr Day Light Saving) and 02.00 hrs. Irish time (GMT +1hr Day Light Saving).



Ms Eve Reddin
Secretariat
Marine Casualty Investigation Board
Leeson Lane
Dublin 2

Lloyd's Register

Classification Group
71 Fenchurch Street
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EC3M 4BS
United Kingdom

Telephone +44 (0)20 7709 9166
Direct line +44 (0)20 7423 2457
Facsimile +44 (0)20 7423 2056
Email psg-class@lr.org

<http://www.lr.org>

Date 16 April 2010
Your ref MCIB/161
Our ref 1-25627204

Dear Ms Reddin

DRAFT Report of the Investigation into the sinking of the STV "Asgard II" off the French Coast
on the 11th September 2008

We would like to take this opportunity to thank the MCIB for forwarding a copy of the draft report on the above mentioned ship to Lloyd's Register.

We would also advise that we have no comments or observations to submit for consideration.

Yours sincerely

C P Ratcliffe
Head of Classification Services
Classification Group
Fleet Services



Lloyd's Register is an exempt charity
under the UK Charities Act 1993

MCIB RESPONSE

The MCIB notes the contents of this letter.

25th April 2010

Marine Casualty Investigation Board,
Lesson Lane,
Dublin 2.

Dear Mr. O'Donnell,

Having read the draft report of the investigation into the sinking of the ^{STV} Asgard II off the French coast, on the 11th of September, 2008, I am happy that the account is accurate and fair. I have no further observations to make, and am happy for the full report to be published.

Yours sincerely,
Holly Clarke.



MCIB RESPONSE

The MCIB notes the contents of this letter.

23rd April 2010

John G. O'Donnell
Chairman
M.C.I.B.
Leeson Lane
Dublin 2

Re: Draft Report into S.T.V. "ASGARD" Sinking 11 September 2008

Dear Mr. O'Donnell,

I acknowledge receipt of and thank you for copy of above report. In general I would concur with the findings contained therein. However, in my opinion, there are a number of items which I feel require clarification.

The vessel was approx. 27 years old at the time of her sinking. She had sailed through two hurricanes and was built to the requirements of the M.S.O. of the Department of Transport and to Lloyds Classification. She was also slipped and surveyed annually which I understand was in excess of requirements. In effect, owners – Department of Defence – maintained the vessel to a standard which was well in excess of the Statuary requirement.

In the light of the foregoing, to suggest that the sinking was due to a latent defect after 27 years of service, is highly unlikely.

Various other suggestions for the cause of the sinking have been put forward but, to my mind, they are not based on any realistic evidence.

Timber experts, Knagg and Associates have also been consulted, but, apart from indicating a number of possible scenarios in relation to iroko, seemed to think that any of these were unlikely.

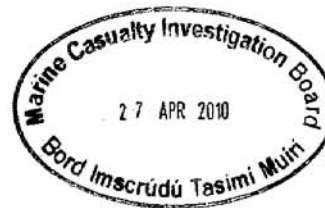
In summary, I am as baffled as to cause of the sinking as most other knowledgeable people in the marine sector are.

Should you require any clarification of above, please do not hesitate to contact me.

Yours sincerely,



MICHAEL TYRRELL



MCIB RESPONSE

The MCIB notes the contents of this letter.

20th April 2010

Marine Casualty Investigation Board
Leeson Lane
Dublin 2

For the attention of Mr. John G. O'Donnell

Dear Sir,

I acknowledge receipt of your letter of the 30th March 2010 enclosing draft report of the investigation into the sinking of the STV "Asgard II" off the French Coast on the 11th September 2008.

I have two comments to make about the draft report:

1. Paragraph 6.17 of the report, entitled Trainee Crew Comments, contains an extract from the reports of two trainee crew who reported hearing unusual noises prior to the incident. The second trainee report is an extract from my report of the 30th October 2008. I note that in the first paragraph of the extract the words "local time" have been inserted after the times I refer to (I have no objection to this). In addition, the final sentence of the last paragraph has been changed. The original paragraph read:

"During the night, prior to the incident, I heard a number or series of load bangs. I thought that what I was hearing were sails being lifted and I tried to get up as I knew that my watch were likely to be working and would need extra hands. I was too sick to get up. I cannot give any timeline on the bangs although they were not immediately one after another. There was a time lapse between them, I was dozing. The next I knew Oisín was telling me to wake up."

The last sentence in your report has been changed to read
"the next thing I know I was being told to wake up"

I request that you amend the draft report to reflect my actual words. I consent to the use of Oisín Cahill's name even if that identifies me as the writer of the report in question.

2. I refer to paragraph 6.16 of the draft report and note the contents namely, *"Following the incident the Master, Engineer and Bosun were interviewed. The section above describing the incident was written using the description of events as described by the crew during the course of these interviews"*. I assume that the section referred to here is section 4 of the draft report entitled "THE INCIDENT"

I am somewhat surprised at the content of paragraphs 4.2 and 4.3 of section 4 of the draft report which deal with how the alarm came to be raised on the night in question.

My report, in response to the questions *"where were you on board when the incident occurred? How were you made aware of the flooding?"* states that:

"I was in my bunk but sleeping only very lightly.

My husband Oisin Cahill came over to my bunk, woke me up and said that he thought there might be a problem, he told me to wake up, put on my glasses. He told me not to get up but be ready. He said that he would be straight back. In the time it took me to put on my glasses (which were beside me) and start to put on my socks (that were in the sleeping bag) he was back. I didn't see him this time, I heard him shout to me "Liz, get up, get dressed and go up on deck" I think he may have said water was coming in. Seconds later (in the time it took me to sit up and reach for outer clothes) I heard Finn's voice shouting "All hands on deck ..." repeatedly. The alarm went off just after her voice. As we struggled to pull on clothes and shoes I again heard Finn shout that we were to bring lifejackets."

Immediately after the incident Oisin Cahill told me that he had woken up, heard water and saw a film of water on the floor of the trainee's mess. He told me that he ran to my bunk to wake me up and then ran up to the wheelhouse to tell the Mate (who was on duty) that there was water coming into the trainee mess. At that point, the Mate was in the wheelhouse and did not appear to be aware that there was any problem. On being told of the water in the mess the Mate came down, the Bosun came from her cabin and the alarm was raised.


There is no mention in your draft report of the fact that a trainee crew member raised the alarm, I am concerned about this omission. In light of the contradiction between the content of section 4 of your draft report and the reports made by Oisin Cahill and myself, I am surprised by the fact that interviews were not undertaken with the Mate, Graham Harwood, Oisin Cahill or myself.

I am concerned about the safety implications of the fact that, whatever precautions or alarms in use on the Asgard II that night, there was no alarm raised prior to a trainee crew member waking up and seeing water on the floor of the mess. It appears to me that the

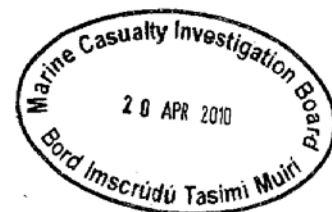
bilge filling with water should have triggered alarms, this does not appear to have happened and there may be safety implications for other ships in this regard.

I look forward to hearing from you.

Yours faithfully



Elizabeth Neary



REPLY TO RESPONSE RECEIVED FROM MS. ELIZABETH NEARY DATED 20th APRIL 2010.

The MCIB notes the contents of this response and would like to state that the statement of Elizabeth Neary was altered to remove the reference to “Oisin” as throughout the text of the report there are no references to individual names.

See also MCIB reply to Lt. Col. Cahill’s letter dated 20th April 2010.

20th April 2010

Marine Casualty Investigation Board
Leeson Lane
Dublin 2

For the attention of Mr. John G. O'Donnell

I acknowledge receipt of the draft report on the Investigation into the loss of the Brigantine Sailing Ship STV "ASGARD II" on the 11th September 2008 received by me on the 30th March 2010. I wish to make the following comments:

In regard Para 4 "THE INCIDENT" I note the contents of Para 4.2 and 4.3 and note also that they are based on interviews with the Captain, Bowson and Engineer. I consider that, while the paragraphs may be factually correct as recalled by the Captain Engineer and Bowson, they do not deal with what happened immediately before these three crew members were made aware of the emergency.

I refer you to my report of October 2008. When I discovered water shooting up from a floor panel in the Trainee's Mess, those below deck were sleeping and nobody was on notice of what was happening. I got up and I first called my wife (See Elizabeth Neary report) and then ran up to the wheelhouse where I informed the first mate that there was water in the trainees mess. At this time, the Mate seemed entirely unaware that there was any problem at all. He was not in the Captains cabin at this time and there was no sign of the Captain or the Bosun both of whom were (I understand) asleep. The Mate followed me back down to the Trainee's mess where the water level had increased from my first observation (when there was a film of water on the floor upon which my flip-flops were floating) to in the region of one to one and a half feet and a number of the floorboards had been blown open. It was only at this stage that the Bosun appeared and set off the alarm. The Captain appeared at this point (he was not wearing a shirt so I assume had been woken from sleep.

In light of the statement above I have serious concern about the accuracy of the following:

1. In the draft report Para 4.2 on "On the 11th September 2008 at about 00:00 hrs the Mate entered the Masters cabin to inform him that the bilge alarm in the Trainee Mess was sounding"
2. The report states (in Para 4.3) that "While this conversation" (as stated in 1 above) was ongoing the Bosun was heard by the Captain and the Mate shouting that there was water in the Trainee's Mess"

I suggest that the inaccuracy may arise because of the fact that the conclusion is based on interviews with only three people, neither of whom were in the wheelhouse when the alarm was raised by me.

It may be that there is no actual or foreseeable harm in leaving the inaccuracy. However, I think that there might be questions to consider around the value of whatever bilge alarms were being used in the Asgard II that night and whether other vessels using the same systems might benefit from further investigation.

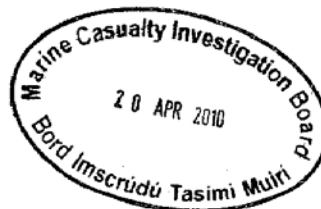
I agree fully that the permanent crew dealt with the situation (after the flooding was pointed out to them) in a professional manner, if their actions are to be categorised as brave I suggest that this should apply to most of the trainee crew on board that night.

I have no objection to this letter being published in your investigation report nor do I object to my earlier report being quoted from.

I refer to letter dated 20th April 2010 from my wife Elizabeth Neary which I have read. I consent to the use of my name in section 6.7 of the report where an extract from Ms. Neary's report appears so that the extract accurately reflects what was written in the original report.

I look forward to hearing from you.

Lt Col Oisin Cahill



**REPLY TO RESPONSE RECEIVED FROM LT. COL. OISIN CAHILL DATED
20th APRIL 2010.**

The MCIB notes the contents of this response and the necessary amendments have been incorporated into Section 4.

The Chief Mate was interviewed during the course of the investigation.

The Chief Mate stated during the course of the interview that while on watch the bilge alarm sounded in the wheelhouse. The Mate stated he had walked through the Trainee Mess and looked under the bunks and found no evidence of water ingress. He then stated he had returned on deck and was then notified by the Trainee crew member that there was water in the Trainee Mess. It is unclear of the time interval between the examination of the Trainee Mess and notification of water ingress by the Trainee crew member.

Lt. Col. Oisín Cahill returned a completed questionnaire and stated in response to the following question:

Do you recall anything that occurred prior to the incident that may be relevant to the investigation?

“During the night, before I noticed the water, I woke up (time unknown) and saw the first mate with a torch about two meters from my bunk. He told me he was looking for water. I did not think much about this at the time and went back asleep.”

In the opinion of the Board this statement is consistent with the statement as given by the Chief Mate.

“Asgard II” had undergone an extensive electrical refit in 2006. All system alarms were integrated into a single panel and included the installation of bilge alarms in the Trainee Mess, Forepeak and Engine Space.

Based on the evidence of the Chief Mate there is no indication that the bilge alarm did not function correctly.

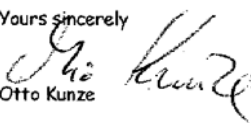
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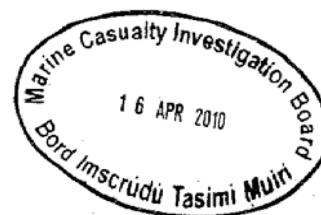
Ms. Eve Reddin
Secretariat
Marine Casualty Investigation Board
Leeson Lane
Dublin 2

Re: Draft Report of the Investigation into the sinking of the "Asgard II"

Dear Ms. Reddin,
in my opinion the draft report is in all aspects correct except of the spelling of my name on the list of crew.

Yours sincerely


Otto Kunze



MCIB RESPONSE

The MCIB notes the contents of this letter and has made the necessary amendment.

13/4/2010

Marine Casualty Investigation Board
Leeson Lane
Dublin 2

Loss of STV Asgard II

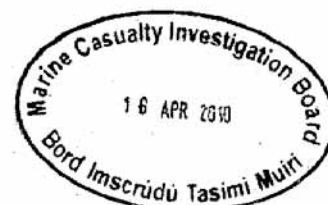
Dear Ms. Reddin

Thank you for the copy of the Draft Report of the loss of the Asgard II. It only confirms my thoughts at the time; the water came in very fast as is shown by the broken plank. I sailed several times on her and the standard of maintenance was always high. The Captain Colm Newport did a fanatic job that night and this should be recognized publicly. I don't think there is anything I can add to the report.

Yours

Michael Grose

Michael Grose



MCIB RESPONSE

The MCIB notes the contents of this letter.

