GOBIERNO DE ESPAÑA
MINISTERIO DE FOMENTO
SUBSECRETARÍA DE FOMENTO
COMISIÓN PERMANENTE DE INVESTIGACIÓN DE ACCIDENTES E INCIDENTES MARÍTIMOS

CIAIM REPORT-12/2016

Structural fault in M/V STOLT BOBCAT cargo tanks at Barcelona Port on 7 August 2015

NOTICE

This report has been drawn up by the Spanish Standing Commission for Maritime Accident and Incident Investigation (CIAIM[1]), duly governed by Section 265, Recast Wording of the Spanish National Ports and Merchant Marine Act passed into law by Legislative Decree 2/2011 dated 5 September and by Royal Decree 800/2011 dated 10 June.

The only purpose of CIAIM investigations into maritime accidents and incidents is to help prevent future accidents by ascertaining the causes and circumstances that led up to the investigated events.

This report is not written for use as evidence in any way in litigation before judicial bodies and seeks neither to adjudicate liability, nor to reach any conclusions as to fault.

This report should not be used for any purpose other than to prevent future accidents and may otherwise lead to false conclusions and erroneous interpretation.

[1] *Comisión de Investigación de Accidentes e Incidentes Marítimos*

Published by :
Centro de Publicaciones
Secretaría General Técnica
Ministerio de Fomento ©
NIPO: 161-17-031-3

www.ciaim.es
ciaim@fomento.es
Tel: +34 91 597 71 41
Fax: +34 91 597 85 96

Figure 1. M/V STOLT BOBCAT

Figure 2. Accident area

1 SUMMARY

On Friday 7 August 2015, whilst discharging the chemical product diethylene glycol monobutyl ether held in tank COT#13P on chemical tanker M/V STOLT BOBCAT to the TEPSA terminal at Barcelona airport, it was found that the aforesaid chemical compound characteristics were not as expected. The diethylene glycol monobutyl ether product had been contaminated with methyl methacrylete from adjacent tank COT#12P.

Discharging was suspended as soon as the problem was detected. The content of each of the two tanks was then separately transferred to different empty tanks on the same vessel. The diethylene glycol monobutyl ether was eventually discharged to the terminal.

Subsequent inspection by the class society revealed the existence of a crack in one welding on the bulkhead separating tanks COT#12P and COT#13P.

1.1 Investigation

The CIAIM was notified of the accident on 12 August 2015. The accident was provisionally classified as a «serious accident» on the day the event occurred and it was decided to open an investigation. On 16 September the CIAIM plenary body confirmed the event classification and instigated a safety investigation. This report was reviewed by CIAIM in the session held on 15 June 2016 and, following approval, was published on February 2017.

2 VESSEL MASTER DATA

Table 1. Vessel Particulars

Vessel Name	STOLT BOBCAT
National Flag / Registration	Flag: Liberia Registration Port: Monrovia (Liberia)
ID	Call sign: A8XZ9 IMO No.: 9511167 MMSI: 636015004
Class	Chemical Vessel
Main Characteristics	Total Length: 155.00 m Length between perpendiculars: 145.00 m Breadth: 24.80 m Depth: 13.35 m Maximum draft: 14.1 m Gross tonnage: 13526 GT Net tonnage: 7143 NT Deadweight: 23432 t Displacement at full load/in ballast: 30079 t / 6647 t Propulsion: Diesel engine (Mitsubishi 6UEC52LS) with fixed conventional propeller. Power: 7980 kW at 120 rpm Hull material: Steel. Class Society: Nippon Kaiji Kyokai – ClassNK
Ownership and management	Vessel owned by the company Stolt Tankers B.V. with headquarters in Rotterdam (Netherlands).
Construction details	Built in 2009 by shipyard Kurinoura Dockyard & Shipbuilding in Yawatahama (Japan).
Previous names	GOLDEN LEGEND until 5 January 2011, under Panama flag.
Management	Vessel owner and operator: Stolt Tankers B.V.

Table 2. Voyage details

Date	7 August 2015
Leaving Port / Port call/Arrival port	Left Tarragona port and arrived Barcelona port.
Journey type	Commercial.
Cargo information	Bulk chemical products: • Propylene glycol (UN 3082): 1260 t • Triethanolamine (UN 3259): 526 t • Ethyl acrylate (UN 1917): 284 t • Acrylonitrile (UN 1093): 6124 t

	• Butylglychol (UN 1993): 833 t • 2-hydroxy-4-methylthio-butanoic Acid: 1900 t • Phenol in solution (UN 2821): 1326 t • Vinyl acetate (UN 1301): 2101 t • Methyl methacrylate monomer (UN 1247): 758 t • Diethylene glycol monobutyl ether (UN 1149): 565 t
Crew (at the time of the accident)	Twenty six crew members are listed as: • 1 Ship's Master, Russian nationality. • 1 Chief Mate, Russian nationality. • 1 Mate, Russian nationality. • 2 Third Mates, Russian nationality. • 1 Chief Engineer, Russian nationality. • 1 Second engineer officer, Russian nationality. • 1 Third engineer officer, Russian nationality. • 1 Fourth engineer officer, Russian nationality. • 1 Electrician, Russian nationality. • 2 Firemen, Russian nationality. • 1 Warrant officer, Russian nationality. • 2 Able seamen, Russian nationality. • 2 Ordinary seamen, Russian nationality. • 1 Fitter, Russian nationality. • 2 Lubrication servicers, Russian nationality. • 1 Lubrication servicer, Ukrainian nationality. • 1 Cleaner, Russian nationality. • 1 Cook, Russian nationality. • 2 Waiters, Russian nationality. • 1 Apprentice engineer, Russian nationality. The twenty-seventh crew member, enlisted as Able Seaman and of Russian nationality, arrived at Barcelona port and disembarked there to continue his next journey to Istanbul (Turkey).
Documents	No defects in documents regarding the accident.

Table 3. Incident Data

Event type	Structural failure.
Date and time	7 August 2015, 07:00 local time
Location	41°20,0'N, 002°09,1'E
Vessel operations and point in trip	Unloading, moored in port
Where on board	Cargo tanks COT#12P and COT#13P.
Damage to vessel	Crack in bulkhead between tanks.

Persons injured/disappeared/deceased on-board	None.
Contamination	Internal between tanks, no external spillage.
Other external damage to vessel	No.
Other personal harm	No.

Table 4. Maritime and Meteorological conditions

Wind	Easterly wind, force 2 Beaufort scale.
Sea condition	Calm sea, sheltered in port.
Visibility	Good (above 10 km).
Cloud	Clear sky.
Tide	0.3 m, almost low tide.

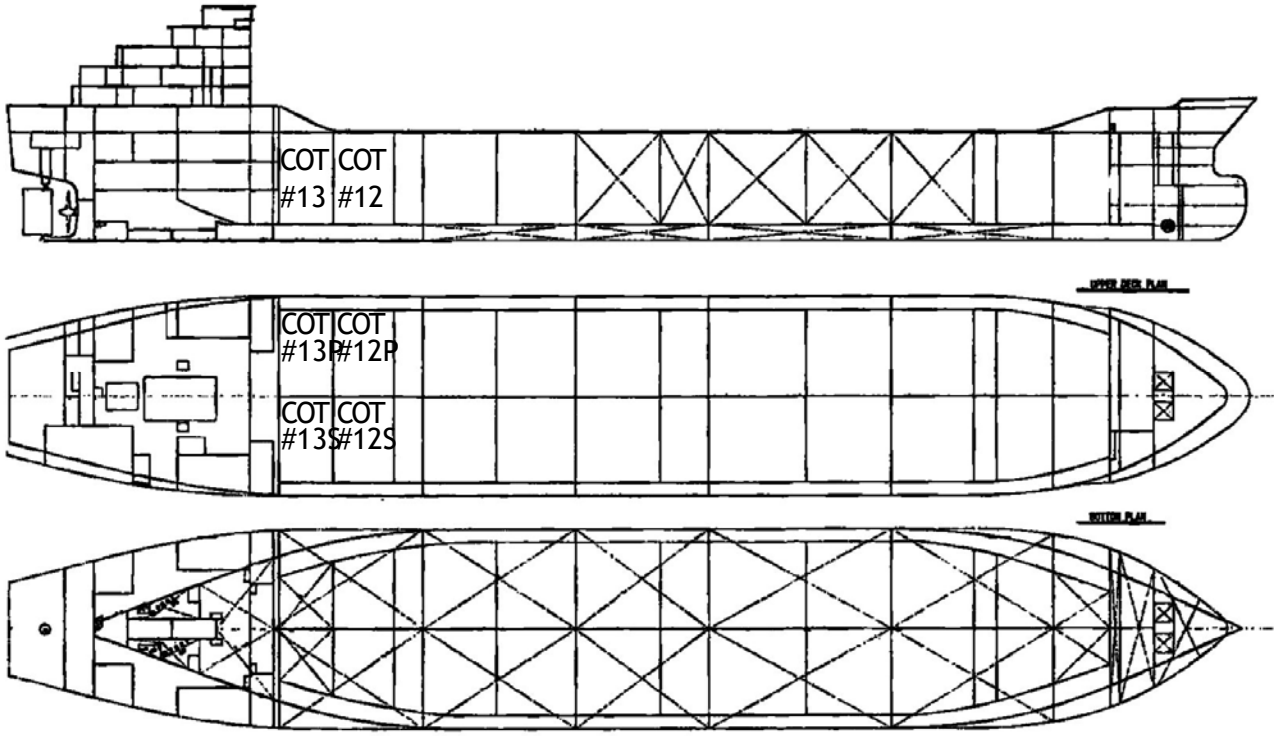

Figure 3. M/V STOLT BOBCAT General layout.

Table 5. Involvement of land authorities and emergency services response

Entities involved	Stolt Tankers B.V.	Vessel owner and operator.
	Marítima del Mediterráneo S.A. (Marmedsa)	Shipping agent.
	Tepsa	Cargo recipient[2].
	DowChemicals	Cargo owner.
	Assuranceforeningen Gard	P&I for the company.
	SGS Group Management	Tepsa inspector.
	Intertek	P&I Club inspector.
	Nippon Kaiji Kyokai (ClassNK)	Class society.
	Hispania P&I Correspondents	P&I for company in Spain.
	Barcelona Maritime Harbourmaster's Office	
	Barcelona Port Authorities	
	SASEMAR - Sociedad de Salvamento y Seguridad Marítima[3]	
	Barcelona Fire Services	
	Barcelona Port police	
	Spanish Civil Guard	
Resources used	None	
Speed of involvement	Incident not notified to the authorities for several days.	
Measures adopted	Cargo transferred inside vessel.	
Outcomes obtained	Contamination contained.	

❄ ❄ ❄

[2] Cargo held in tank COT#13P (Diethylene glycol monobutyl ether).
[3] TR. Maritime salvage and safety company

3 DETAILED DESCRIPTION

This account of events has been drawn up from available data, declarations and reports. All time references are stated in local time.

3.1 Year 2009. Delivery.

11 May 2009 Vessel launched.

29 July 2009 Vessel brought into service after delivery by shipyard (Kurinoura Dockyard & Shipbuilding) to first owner (Larissa Shipping S.A.). Delivery confirmed by class society (Nippon Kaiji Kyokai – ClassNK) the next day.

3.2 Year 2010. Starboard crack.

29 March 2010 Vessel inspected in Shanghai (China) by the class society in relation to a leak the crew had found between cargo tanks COT#12S and COT#13S (see figure 3). Cracks also found in some welding on cargo tank COT#4P. All welding cracks were repaired.

15 September 2010 Vessel hull inspected by the class society in the city of Imabari (Japan). All cargo tanks were inspected internally. Cracks and other defects were found to several welding on the lower part of corrugated bulkheads between tanks. Particular mention was made of the crack found between cargo tanks COT#12S and COT#13S, which had already been discovered earlier. All welding repaired.

3.3 Year 2011. Sale.

Vessel sold to the company Stolt Tankers B.V.

3.4 Year 2012. Starboard side crack.

17 August 2012 Vessel inspected at Nu Star terminal in the city of Texas (Texas – USA) by class society ClassNK regarding a leak from cargo tank COT#13S into cargo tank COT#12S. The inspection confirmed the existence of the leak, however it was deemed negligible. The crack was situated on the transverse corrugated bulkhead between cargo tanks COT#12S and COT#13S. The leak had not affected cargo tank BWT#5S located below the two aforementioned cargo tanks. The inspector stated that repairs should be carried out by 16 October 2012.

28 September 2012 Vessel inspected again by the class society at Rio de Janeiro (Brasil) and reference made to the exact location of the defective welding. The defect comprised two cracks measuring 20 and 8 cm, found in the corrugated transverse bulkhead between cargo tanks COT#12S and COT#13S. The deadline for permanent repair was put back to 10 November 2012 given the difficulty of repair and that the cracks did not represent an imminent risk to hull integrity. The vessel would by then have reached a port with sufficient capacity to carry out the repair.

4 November 2012 Vessel visited by an inspector from class society ClassNK in the dock at Houston city (Texas – USA) to review the cargo tanks. A crack measuring some 25 cms was found in the corrugated transverse bulkhead between cargo tanks COT#12S and COT#13S. The crack was repaired and the repair deemed a permanent repair by the class society.

3.1 Year 2015. Crack on port side.

7 July 2015 Vessel passed the most recent annual inspection prior to the accident, carried out by class society ClassNK in Houston. No defects were found in relation the crack subsequently found between cargo tanks COT#12P and COT#13P.

9 July 2015 Vessel loaded methyl methacrylete monomer at the port of Houston, into cargo tank COT#12P.

10 July 2015 Vessel loaded diethylene glycol monobutyl ether at the port of Texas city, into cargo tank COT#13P.

5 August 2015 Vessel sailed at 21:00 hours from Tarragona port, last port prior to accident, for destination Barcelona Port.

6 August 2015 Vessel arrived at 02:00 hours at anchorage area, Barcelona Port, and waited there to enter the port (figure 4).

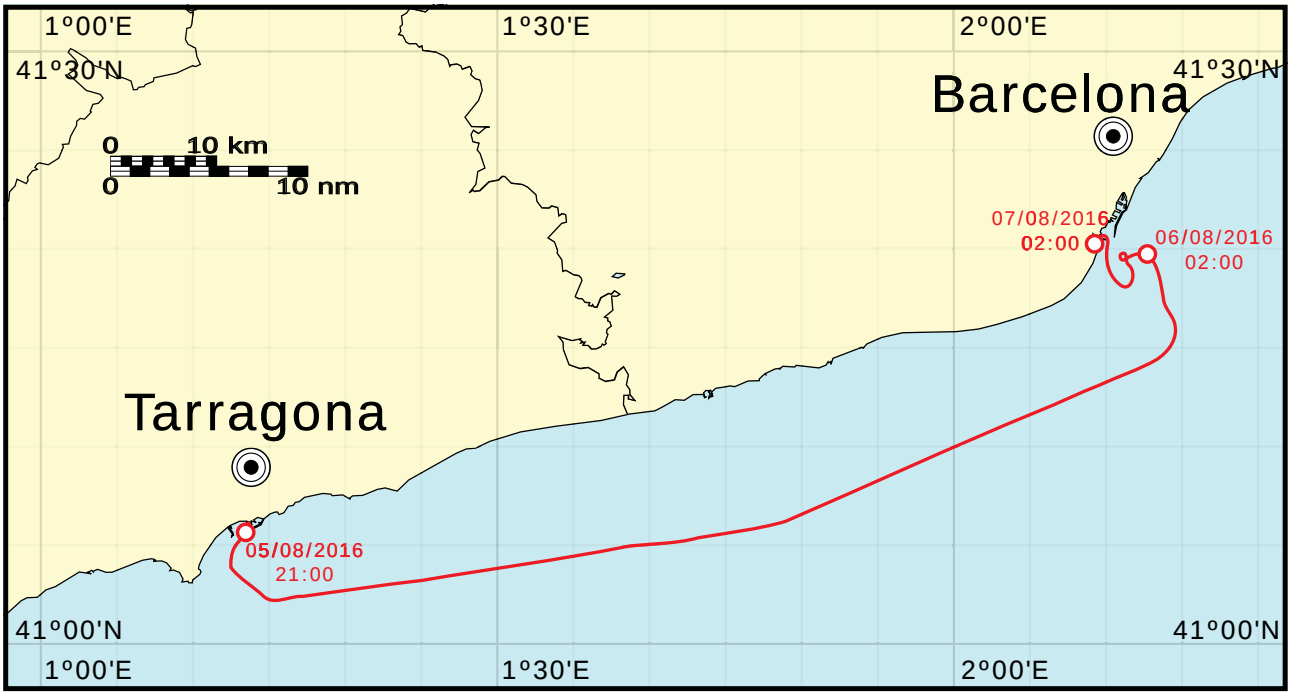

Figure 4. Route sailed by M/V STOLT BOBCAT between Tarragona and Barcelona, data taken from Automatic Identification System

7 August 2015 Vessel entered into port at 01:00 hours and by 02:00 hours had berthed at the Energy quay, Berth 32D (figure 5). Cargo tanks COT#1S, COT#1P, COT#3S, COT#5P and COT#11S were discharged to land in the early morning hours.

At 07:00 hours and whilst cargo tank COT#13P was being discharged, SGS inspectors found that the product discharged to land, diethylene glycol monobutyl ether, did not meet the expected characteristics and decided to halt discharging.

The company Stolt Tankers B.V. was notified at 10:00 hours and P&I was subsequently notified.

9 August 2015 The company proposed an internal transfer plan which was forwarded to Barcelona Port Authority, although not to the Maritime Harbourmaster's Office.

11 August 2015 Barcelona Fire Department was asked to carry out an examination regarding a leak on a vessel carrying hazardous goods at the Energy quay. At 12:30 hours the Fire Department arrived together with Port Police and the Civil Guard at the quay and confirmed that the situation was known to the vessel crew, to the owners company (Stolt Tankers B.V.), to the Shipping Agent (Marmedsa) and to the cargo recipient (Tepsa).

The fire department then notified SASEMAR[4] in Barcelona, informing the latter that the vessel was experiencing a problem of some kind involving contamination and products mixing. SASEMAR then requested information from Marmedsa, Shipping Agent for the vessel in Barcelona, as to what had happened and subsequently notified Barcelona Maritime Harbourmaster's Office.

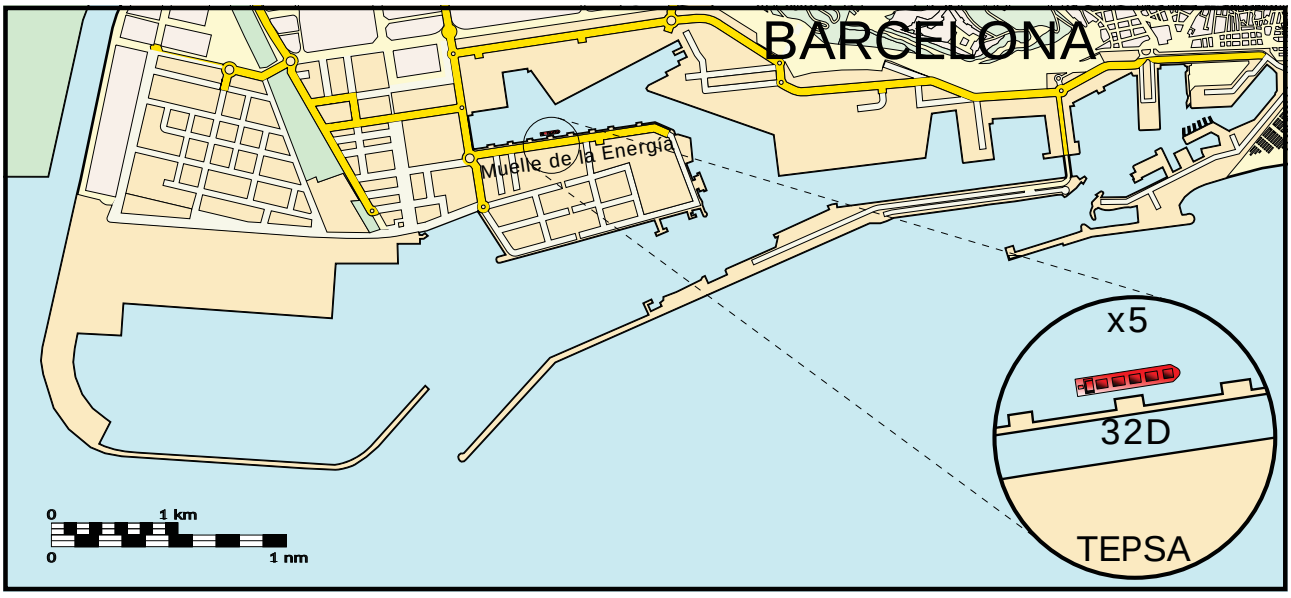

Figure 5. Barcelona Port Energy Quay.

12 August 2015 An inspector from the Maritime Harbourmaster's Office was sent to visit the vessel and ascertain the vessel safety status.

The same day, an inspector from ClassNK, the vessel class society, also arrived at the vessel to carry out an inspection. Given that it was not possible to carry out an internal inspection of the cargo tanks involved at that time, the latter inspector included a recommendation in the class certificate, stating that a subsequent inspection should take place before 11 September 2015.

[4] SASEMAR Salvage Coordination Centre

At 13:35 hours the internal transfer of diethylene glycol monobutyl ether from cargo tank COT#13P to cargo tank COT#7P and of methyl methacrylate monomer from cargo tank COT#12P to cargo tanks COT#11S and COT#1P commenced.

At 20:30 hours, transfer of diethylene glycol monobutyl ether from cargo tank COT#13P to cargo tank COT#7P was complete.

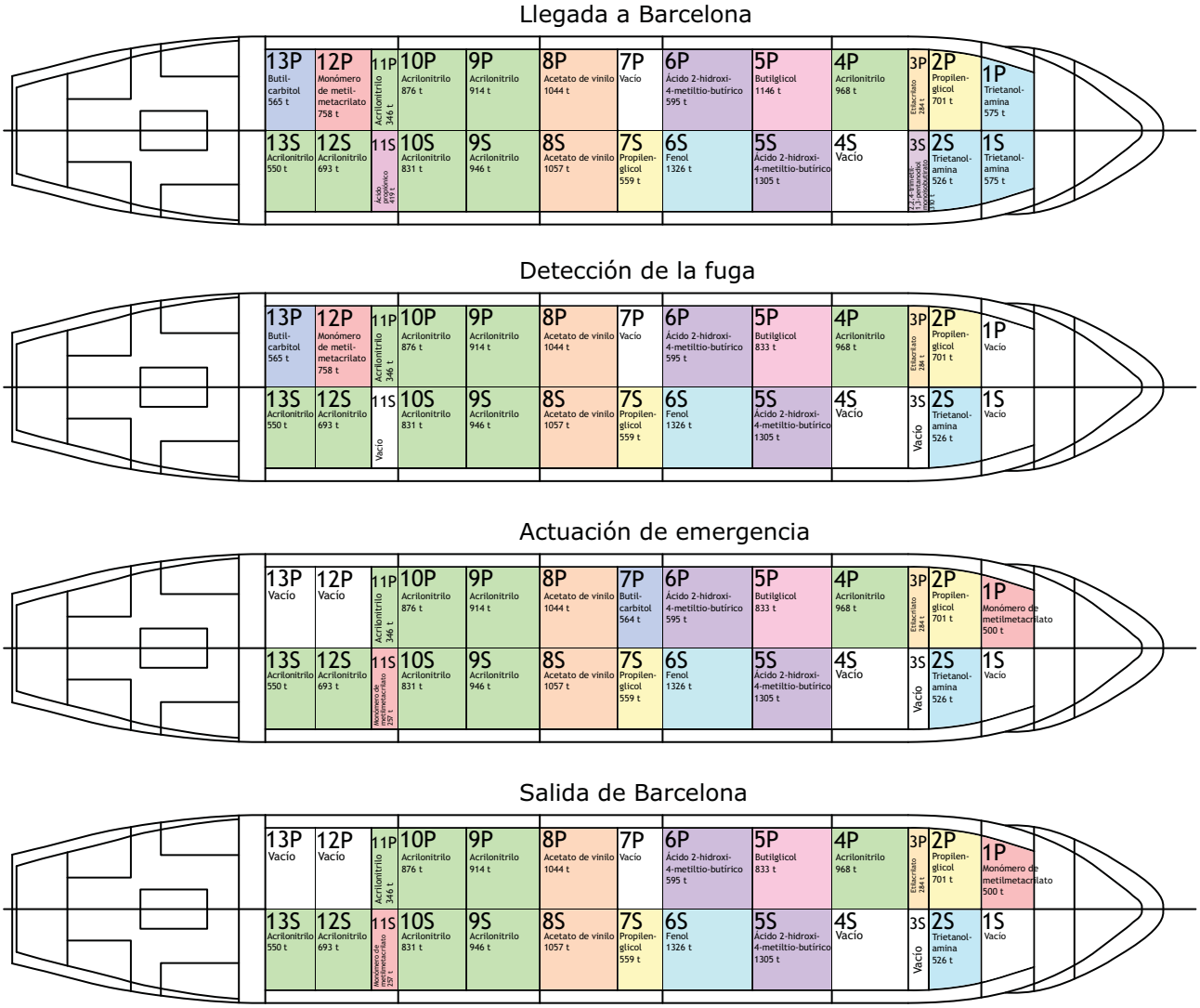

Figure 6. Content of cargo tanks whilst at Barcelona port

13 August 2015 at 10:20 hours, transfer of methyl methacrylate monomer from cargo tank #12P to cargo tanks COT#11S and COT#1P completed.

Subsequently, diethylene glycol monobutyl ether was discharged from cargo tank COT#7P to land. The methyl methacrylate monomer was left in cargo tanks COT#11S and COT#1P.

Vessel left Barcelona port for the scheduled destination of Istanbul (Turkey) at 20:00 hours.

15 August 2015 Vessel made a port call at Genoa (Italy).

20 August 2015 Vessel arrived at Ravenna (Italy). During inspection, the deadline established in Barcelona for a full inspection was put back to 20 October 2015. When the Vessel reached Turkey it would be fully unloaded and a detailed inspection carried out.

26 August 2015 A ClassNK inspector, at Izmir port (Turkey), inspected the interior of cargo tanks COT#12P, COT#13P and BWT#5. He found a crack 26 cm long in the welding seam joining the corrugated bulkhead between cargo tanks COT#12P and COT#13P and the feeder above cargo tank BWT#5. It was not possible to carry out a permanent repair because the Vessel was not fully unloaded or free of gases. The Vessel was authorised to carry on its journey to America and to proceed with the final unloading and permanent repair. The inspector changed the recommendation in the class certificate and established the necessary permanent repair date as prior to 30 November 2015.

6 October 2015 The crack was repaired and an inspection by the Class was carried out before and after the repair at the Exxon-Mobile product terminal in Baytown (Texas – USA). The Class inspector considered the repair finished and removed the recommendation from the class certificate, but a class note was established to inspect again the repaired area during next surveys.

May 2016 The ship was subject to the annual survey by the Class society. The repaired area was found in satisfactory state and the class note was removed from the class certificate.

❄ ❄ ❄

4 ANALYSIS

4.1 Crack location

The crack was located on a weld seam joining the double hull to the corrugated transverse bulkhead separating cargo tanks COT#12P and COT#13P, at a height of approximately 3.5 m above the bottom of the tanks. The crack began at one of the corrugation angles, as shown in figure 7.

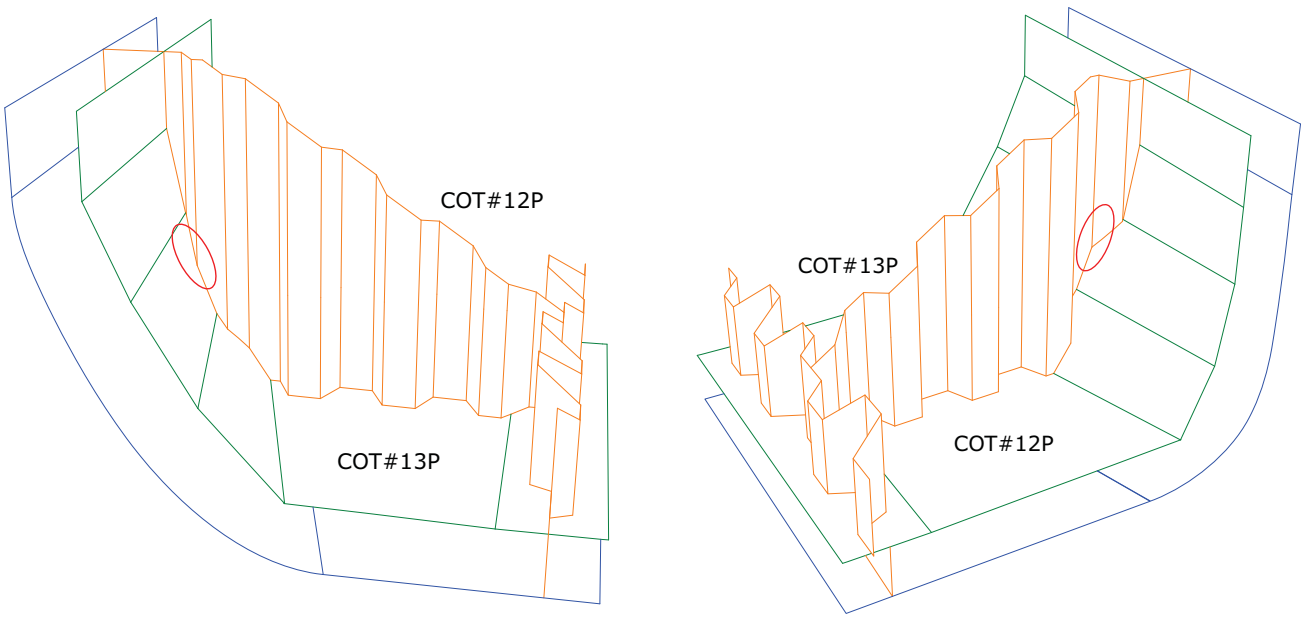

Figure 7. Location of crack between tanks.

The crack measured 23 cm long, and passed through both cargo tanks throughout its length, running along the foot of the welding (figure 8). Along the lower part of the crack, next to the corrugation angle, it continued beyond the welding and into the metal sheeting.

4.2 Earlier faults.

As stated, the class society inspection reports confirmed that the same corrugated transverse bulkhead had already previously shown signs of problems, both in 2010 and in 2012, with cracks having appeared in the welding that joins the bulkhead and the double hull. On the earlier occasions cracks were found in starboard cargo tanks, but the configuration was nevertheless identical to this crack which then occurred in the port side.

Although no mention is made in any inspection or repair docket, by observation of the welding and of the crack currently found in the port bulkhead, it was found that this welding had been repaired previously although the date cannot be confirmed.

One can therefore be certain that the same fault had occurred to this vessel on at least four occasions during its six years of active life. When one finds repeat faults of this type, it is an indication that an earlier problem exists that originated in the design and construction stages.

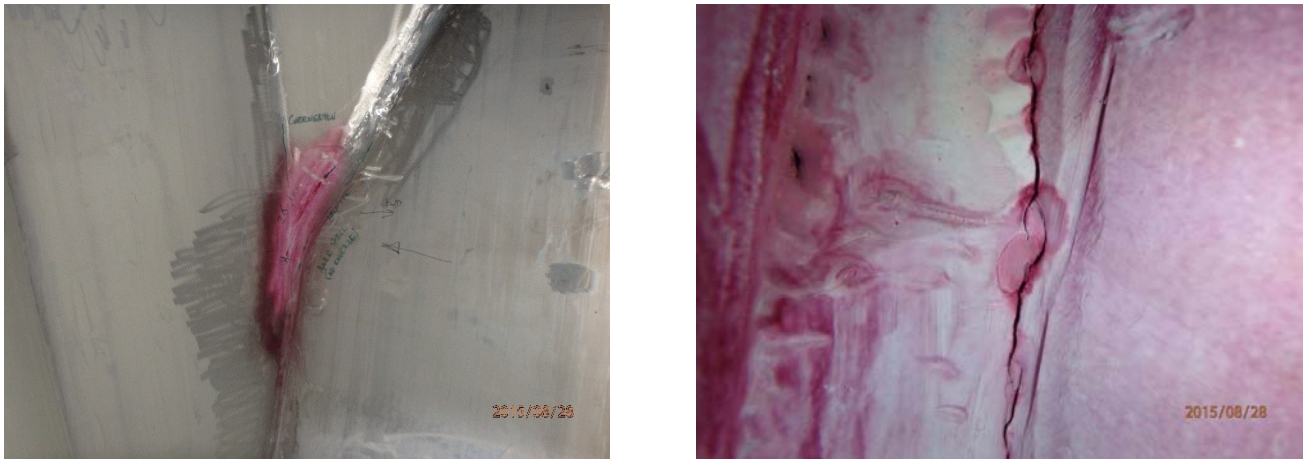

Figure 8. Current crack (seen from COT#12P) and close up of crack.

4.3 Earlier inspections

In July 2014 vessel amended its gross registered tonnage from 13517 GT to 13526 GT and, following the corresponding inspection, the class society issued a new class certificate showing that change.

As a result of that change, the next inspection became due within one year and would be recorded as «first annual inspection». That 'first annual inspection' was therefore carried out on 7 July 2015 and was the most recent

inspection before the accident occurred. The inspection found no defects relating either to cargo tanks, welding or cracks.

According to inspections carried out by class society ClassNKK (sic) there are only two possible scenarios:

- Either the crack did not exist prior to that date and occurred during the last month,
- Or the inspection was not carried out properly and failed to locate the crack although it already existed.

4.4 Load history.

2015 chemical compounds loaded in the cargo tanks damaged in the accident are set out in table 6.

Table 6. 2015 Load history for affected cargo tanks

Date	Cargo Tank COT#12P	Cargo Tank COT#13P	Loading port
03/02/2015		Xylene	Haifa (Israel)
12/02/2015	Sodium hydroxide		Fos (France)
27/03/2015		Triethanolamine	Texas City
29/03/2015	Isopropyl alcohol		Houston
23/05/2015		Sodium hydroxide at 50%	Fos
26/05/2015	Olive oil		Malaga

09/07/2015	Methyl methacrylate monomer		Houston
10/07/2015		Diethylene glycol monobutyl ether	Texas City

No incompatibility problems were found either between transported chemical compounds and the cargo tanks materials or between the compounds and residues of earlier cargoes in the same tanks.

4.5 Cleaning methods.

No chemical agents were used to clean the cargo tanks after discharging, separately to the transported product. Cleaning was always carried out using different hot water cycles and alternating freshwater and salt water.

No evidence was found that aggressive cleaning might have worn down or eroded the welding.

4.6 Reaction between the compounds held in the two cargo tanks.

Both compounds stored in the faulty cargo tanks were being transported at ambient temperature and in the liquid state, as no additional treatment was necessary. Both compounds are classified by the «International Code for the Construction and Equipment of Vessels Carrying Dangerous Chemicals in Bulk – IBC Code» with the designated hazard risk of «risk regarding security and contamination » for diethylene glycol monobutyl ether and «slight risk» for methyl methacrylate monomer.

The risks that can occur if the two products become mixed are defined as an exothermic reaction and possible polymerisation of the diethylene glycol monobutyl ether, causing it to solidify.

Soundings in both cargo tanks were measured as soon as the accident was communicated to the company and the temperature of the chemical compounds was checked regularly. No hazardous temperature increases or solidification of the compounds were found. A stabiliser was also added to cargo tank COT#13P (diethylene glycol monobutyl ether) to avoid possible reactions of any kind as a result of contamination from cargo tank COT#12P (methyl methacrylate monomer).

The cargo tanks were built with grade 316L steel, which is an austenitic general use stainless steel with good resistance against corrosion in general, good resistance (hardness), malleability and excellent weldability. The steel composition includes 2-3% molybdenum, which helps to prevent corrosion occurring and improves corrosion resistance. The steel type is recommended for welded tanks used to store chemical products and organic products.

4.7 Tug pushing area

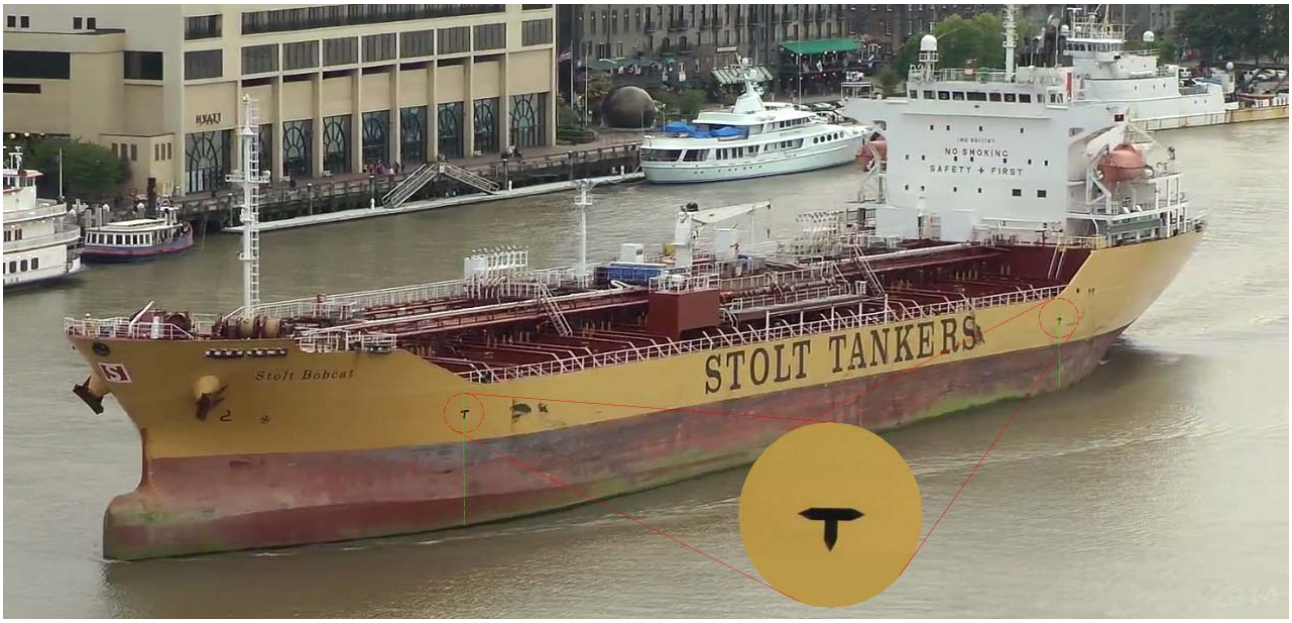

Figure 9. Tug pushing points.

The vessel has two areas marked as pushing points for tugs, located along each side: one toward the bow in construction area 172, which coincides with the corrugated bulkhead separating cargo tanks COT#2 and COT#1; the other toward the stern in construction area 52, which coincides with the corrugated bulkhead separating cargo tanks COT#13 and COT#12.

In 2009 the European Tugowners Association (ETA) published an article in conjunction with the European Maritime Pilot's Association (EMPA), highlighting the potential problems that can occur when a tug pushes a large carrier vessel during in-port manoeuvres. The article expressly referred to the considerable pressure to which vessel plates are subjected at the contact point and to whether those forces were taken into consideration during the design stage and the fact that the majority of vessels have no indication either on the sides or on-board of the maximum force the pushing points can bear.

EMPA recommends that such markings clearly define the limits for the area up to which it is safe to push and the maximum force that can be exerted.

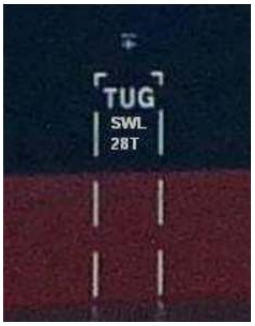

Figure 10. Recommended markings.

4.8 Port entries

During 2015 the vessel entered into a great many ports and, in most of those ports, required the assistance of pusher-tugs in order to dock. This fact (see **¡Error! No se encuentra el origen de la referencia.**) might have played a part in weakening the contact area.

Table 7. Most recent moorings

Date	Port	Date	Port
03/02/2015	Haifa	19/05/2015	Gabes (Tunisia)
12/02/2015	Fos	23/05/2015	Fos
28/02/2015	Newark (New York – USA	26/05/2015	Malaga
03/03/2015	Philadelphia (Pennsylvania – USA	07/06/2015	Newark
23/03/2015	Houston	09/06/2015	Philadelphia
27/03/2015	Texas City	13/06/2015	Baltimore (Maryland – USA)
29/03/2015	Houston	06/07/2015	Houston
15/04/2015	Barcelona	09/07/2015	Houston
17/04/2015	Genoa	10/07/2015	Texas City
22/04/2015	Brindisi (Italy)	15/07/2015	Houston
24/04/2015	Istanbul	19/07/2015	New Orleans (Luisiana – USA
03/05/2015	Alexandria (Egypt)	05/08/2015	Tarragona
07/05/2015	Corinth (Greece)	06/08/2015	Barcelona
15/08/2015	Genoa		

4.9 Design and scantling

According to the vessel construction design, tug pushing points have not been defined in any way, nor was the scantling in those vessel areas reinforced or different from the rest, as can be seen in figure 11.

One can also see that the corrugated bulkhead intersects with a surface, the double bottom, which is at an incline in the accident area. Linear tracing, cutting, bending and welding of corrugated bulkheads in areas joining other structures that are not perfectly horizontal or vertical is considerable difficult and particularly when dealing with stainless steel. Minor errors of line tracing, cutting or bending can result in irregular welding veins which can be excessive at many points and require filling with large lumps of solder.

This creates intrinsically fragile areas and if the fragile areas are located in areas that receive atypical forces, such as the tug pushing areas, then cracks will occur. Repairs usually involve filling the cracks with solder or even a small local graft. A fault of this kind would therefore be a recurring fault.

In order to avoid such problems, many vessels place support beams beneath the corrugated bulkhead where holds or cargo tanks have inclines and up to the height of the incline. This circumvents the difficulties referred to in the previous paragraph. The shipyard should have adopted similar construction practices to avoid recurring cracks appearing in these areas.

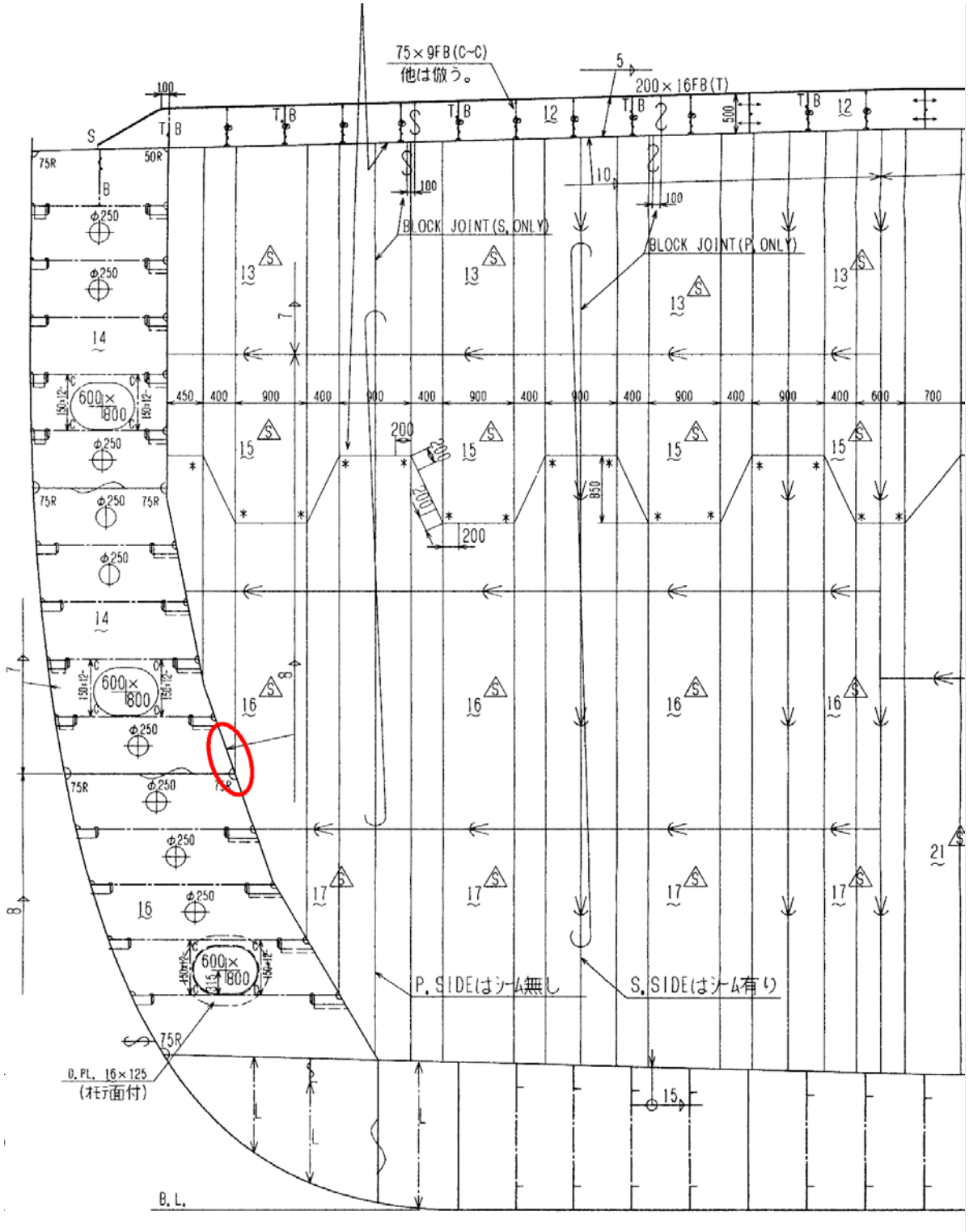

Figure 11. Internal structure of area with fault. The area where the crack occurred is marked in red.

4.10 Accident Notification

SGS detected the first signs of a problem with the cargo at 07:00 hours on 7 August 2015.

Once SGS became aware of the problem, the vessel, the owner company (Stolt Tankers B.V.) and P&I were informed in less than three hours. The Shipping Agent (Marmedsa) and the cargo recipient (Tepsa) were also subsequently informed.

However, in the course of the following days, the accident was not notified until 9 August, i.e. the date on which Barcelona Port Authority was duly informed. The Port Authority did not in turn inform the emergency services until 11 August, two days later, and did not inform the Harbourmaster's Office at any time of an incident in a chemical vessel carrying hazardous goods.

❋ ❋ ❋

5 CONCLUSIONS

One can conclude from the accident analysis that the crack between cargo COT#12S and COT#13S was caused by an error in vessel design and construction, deriving from the difficulties in joining a corrugated bulkhead and an inclined sheet, and particularly when it concerns stainless steel. An error in linear tracing or bending of the corrugated bulkhead can create a separation far in excess of admissible tolerances between the bulkhead and the inclined sheet in the vessel side. Furthermore, such errors are difficult for the shipyard to correct if the bulkhead and hull material is stainless steel. This can lead to a weakness at the welding join, which will be susceptible to cracks appearing in the vessel structure in that area. The effect is further amplified if the area concerned is the tug pushing point.

❋ ❋ ❋

6 SAFETY RECOMMENDATIONS

To the shipyard (Kurinoura Dockyard & Shipbuilding) and designer:

1. Constructive solutions must be adopted in areas where corrugated bulkheads join the sides, in order to avoid this type of fault.

To the class society (Nippon Kaiji Kyokai – ClassNK):

2. Until such a time as the warranty repair has been carried out the affected area, load limitations for tanks adjacent to areas where cracks are found should be noted on vessel certificates, prohibiting loading of incompatible products. This will avoid risks if cracks re-occur in the corrugated bulkheads.

To the owners (Stolt Tankers B.V.), the shipping agent (Marítima del Mediterráneo S.A. - Marmedsa), the cargo recipient (Tepsa), to the P&I for the company (Assuranceforeningen Gard) and the inspector acting for Tepsa (SGS Group Management):

3. Inform all employees of the obligation to notify all accidents they become aware of to the Maritime Authority.

To the class society (Nippon Kaiji Kyokai – ClassNK):

4. In view of the defects highlighted in this report and similar occurrences the class society may be aware of, to assess the need to review rules in relation to corrugated bulkheads in vessel design and building stages.

❋ ❋ ❋