

TRIPARTITE 2019 TOKYO



18 October

Session 8 Design safety

CONVERSIONS

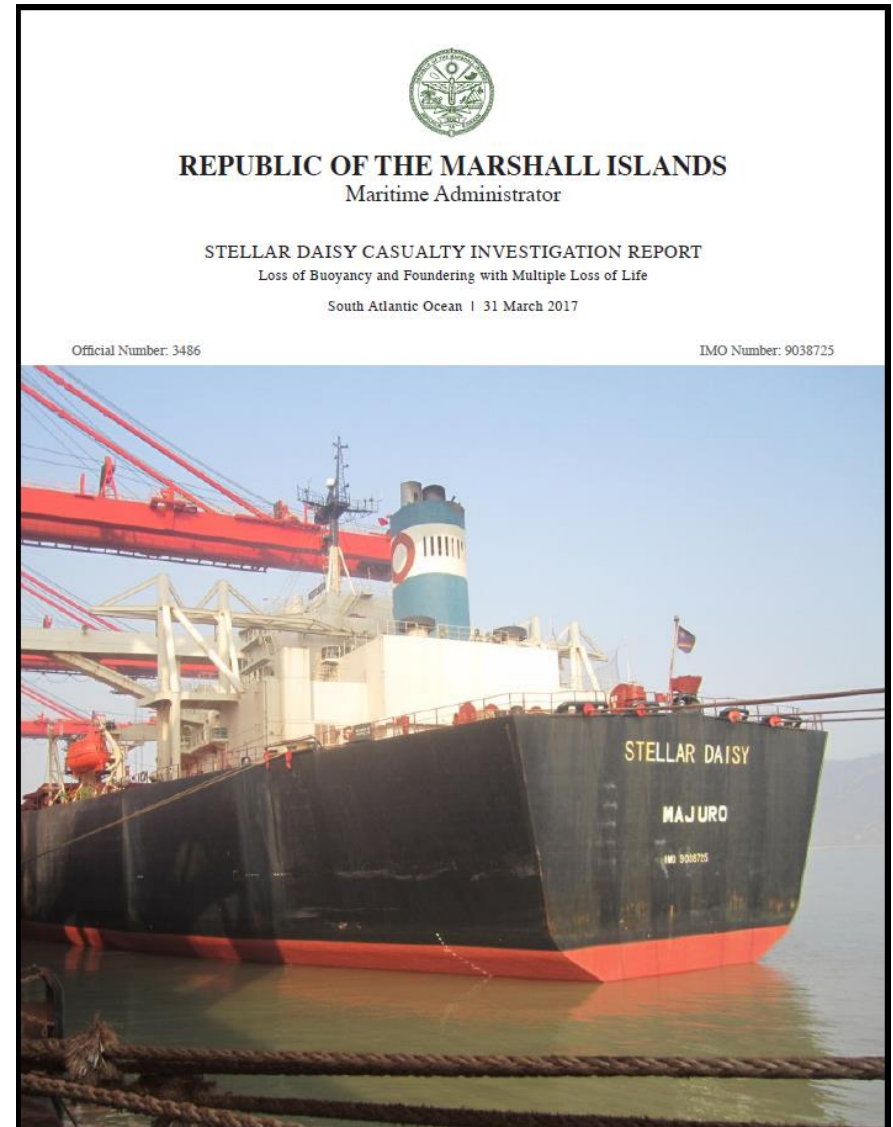
STELLAR DAISY

Built as a VLCC 1993 > Converted to VLOC 2009

Change of Class in 2008

Change of Flag > On completion of conversion

Foundered on 31 March 2017, enroute from Brazil to China – 22 lives lost



CONVERSIONS

STELLAR DAISY

“Based on the information available, a possible sequence of events leading to the loss of buoyancy and foundering of STELLAR DAISY within approximately five minutes was:

1. structural failures in the No. 2 P WBT and simultaneous, or near simultaneous, structural failures in the No. 3 P WBT resulting in a breach of the bottom plate and very rapid, uncontrolled flooding of both tanks;
2. rapid, progressive structural failures of the transverse structure, collapse of the cross deck between multiple cargo hatches and cracks in the main deck resulting in down flooding of port side wing tanks and cargo holds;
3. failure of longitudinal bulkheads resulting in cargo spilling into the port side wing tanks and flooding of cargo holds adjacent to flooded wing tanks;
4. flooding of the Nos. 5 and 6 P Voids due to failures of the deck and side shell between frames Nos. 48-50; and
5. flooding of the accommodation block.”

From the MI report

CONVERSIONS

The hull failure was likely due to:

- Fatigue
- Corrosion
- Unidentified defects
- Multiport loading
- Forces imposed on hull due to weather

Likely casual factors

- Large WBTs – increase potential for structural failure and loss of buoyancy
- SOLAS Ch XII Reg 5 does not require double skinned Bulk Carriers of 150m or more that carry solid bulk cargoes of 1000 kg/m³ or more that have parts of the longitudinal bulkhead more than B/5 or 11.5 m, whichever is less, inboard from the ship's side at a right angle to the center line can withstand flooding in any one wing tank in all loading and ballast conditions.
- Ineffective assessment of structural damage identified during dry-docking

From the MI report

CONVERSIONS

Recommendations for Class include

- review scantling and design approval requirements for ships with a high GM0
- review and if applicable revise its procedures for analyzing structural failures that are not the result of collisions or groundings that occur within five years of a ship being taken into class;
- review and if applicable revise its Rules/Procedures for:
 - (1) reviewing and approving conversion designs
 - (2) verifying that for foreseeable damage conditions, that double bulk carriers of 150 m or that carry cargoes of density of 1,000 kg/m³ have sufficient strength to withstand flooding of any space, or spaces, located between adjacent transverse bulkheads assuming that the transverse extent of the damage is equal to B/5 or 11.5 m, whichever is less, in all loading and ballast conditions; and
 - (3) assessing structural damage to ensure that the cause of the failure is identified and that potential design defects are identified and corrected

From the MI report

CONVERSIONS

Flag	# ships
China P.R.	1
Greece	2
Hong Kong	3
Isle of Man	5
Liberia	6
Marshall Is.	11
Panama	9
South Korea	4
Grand Total	41

Clarksons

VLCCs to VLOCs

41 Ships

Age 24 to 29 years

Converted 2008 to 2011

Classed by at least 3 different IACS members

CASUALTIES

Year	Handysize 10k-34999 dwt	Handymax 35k-49999 dwt	Supramax 50k-59999 dwt	Panamax 60k-79999 dwt	Capesize 80k+ dwt	Total
2009	6	3	0	1	0	10
2010	1	1	2	0	2	6
2011	6	2	1	1	1	11
2012	1	0	1	1	0	3
2013	1	3	2	0	1	7
2014	1	1	0	0	0	2
2015	2	0	1	1	0	4
2016	0	1	0	0	2	3
2017	0	0	1	0	1	2
2018	0	0	0	0	0	0
Total	18	11	8	4	7	48

Total losses - Bulk carriers by size² and year

CASUALTIES

Losses by cause

Reported cause	Losses of life	Losses of ships	Likely root cause	Losses of ships
Cargo shift/liquefaction	101	9	Cargo failure	9
Collision	0	4	Machinery failure	1
			Unknown	2
			Human element	1
Fire/explosion	16	3	Unknown	2
			Cargo safety	1
Flooding	0	6	Unknown	5
			Machinery failure	1
Grounding	10	19	Machinery failure	4
			Navigation	3
			Unknown	3
			Weather	1
			Human element	8
Structural	0	1	Collision	1
Unknown	61	6	Unknown	5
			Machinery failure	1
TOTAL	188	48		48

CASUALTIES

Flag State Reporting

Flag	No. of cases	GISIS with Reports	Average Months*	GISIS without report
Bahamas	1	1	7	
Belize	1			1
China	2			2
Comoros	1			1
Cyprus	2	1	42	1
Hong Kong, China	5	4	62.5	1
Korea	3	1	12	2
Liberia	2			2
Malta	3	3	42	
Marshall Islands	1			1
Mexico	1	1	37	
Mongolia	1			1
Panama	21	12	23	9
Turkey	3	1	12	2
Vietnam	1	1	12	
Total	48	25	33.0	23

CASUALTIES

Flag State Reporting

CODE OF THE INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES FOR A SAFETY INVESTIGATION INTO A MARINE CASUALTY OR MARINE INCIDENT (CASUALTY INVESTIGATION CODE)

Chapter 25

DRAFT AND FINAL REPORT

25.1 Marine safety investigation reports from a marine safety investigation **should be completed as quickly as practicable.**