

Accident Report
Tasman Independence
Cargo Gear Failure
Port of Bluff on 14 January 2004



REPORT NO.: 04 3557

VESSEL NAME: *TASMAN INDEPENDENCE*

CASUALTY DETAILS:

Date of Casualty: 14/1/2004

Time of Casualty: 1300 hours New Zealand Daylight Time (NZDT)

Casualty Type: Cargo Gear Failure

Casualty Location: Port of Bluff

Investigator: Chris Grayson, MSI, Bluff

REPORT NO.: 04 3557

VESSEL NAME: *TASMAN INDEPENDENCE*

VESSEL 1 DETAILS:

Ship Name: *Tasman Independence*

Ship Category: Multi-Purpose

Registered Length (m): 173.95

Tonnage: 18 936

Port of Registry: Majuro

Flag: Marshal Islands

Owners Name: Paradise Marine Ltd

SUMMARY

At approximately 1300 hours on 14 January a sling of dunnage, a cargo spreader and pulley frame that were attached to the No. 2 after gantry crane on *Tasman Independence* fell from their suspended position onto the quay. There was damage to the crane, cargo gear equipment and the quay. No one was injured.

1. KEY EVENTS

- 1.1 At 0824 hours, New Zealand Daylight Time (NZDT) on 14 January 2004, the general cargo vessel *Tasman Independence* berthed at No. 4 berth, Bluff, to discharge and load cargo.
- 1.2 At 0830 hours, the Chief Officer, informed the Southland Stevedoring Services (S.S.S.) Supervisor, that it would take two hours to prepare the vessel for cargo operations.
- 1.3 At 1030 hours, the crew undertook repair work on the vessel's No. 2 gantry crane. This work was completed at 1200 hours.
- 1.4 At 1100 hours, the shore labour (who had been on standby since 0700 hours), were called to the ship. One gang commenced discharging containers at No. 2 hold, whilst the other gang laid tarpaulins in No. 5 hold.
- 1.5 When preparing the ship for cargo operations, the ship's crew lifted four hatch lids at No.5 hold. Two hatch lids were lifted by the forward gantry crane and the other two by the No. 2 after gantry crane. Each hatch lid weighed approximately 35 tonnes (*See Appendix 1 – Photographs Nos. 7 and 8*).
- 1.6 Before operating the two gantry cranes, the Chief Officer requested that the stevedores who operated them do so slowly and easily. He also requested that when a sling of cargo was lifted from the quay, the crane was not to be moved forward or aft along its track on the vessel until the sling of cargo was positioned inboard and over the cargo hold. Although, this was not documented, both the ship's crew and stevedores agree that this was stated at the time.
- 1.7 At 1300 hours, the stevedores (who were now in control of the No. 2 after gantry crane) continued to prepare No. 5 hold for cargo. This included the need for a sling of dunnage to be lowered into the hold (*See Appendix 1 – Photograph No. 1*).
- 1.8 A medium density (MDF) spreader (*See Appendix 1 – Photograph Nos. 1 and 6*) with a safe working load (SWL) of 28 tonnes, which belonged to S.S.S, was slung below the pulley frame of the No. 2 after gantry crane. A sling of dunnage was then attached to the spreader. This was the first lift of the day by the stevedores with No 2. gantry crane. The gantry turntable was positioned in the athwartship position, to facilitate the movement of the sling of dunnage between the legs of the gantry crane.
- 1.9 At approximately 1305 hours, during the first lift of the day with the No. 2 gantry crane, the MDF spreader and sling of dunnage, that was connected to the pulley frame of the crane, fell onto the quay. The resulting impact caused damage to the pulley frame and spreader as well as causing damage to the quay. All four hoist wires of the crane and the electric multi core wire, were severed (*See Appendix 1 – Photographs Nos 1 & 2*).
- 1.10 After the accident, the Bluff Maritime Safety Authority (MSA) Maritime Safety Inspector (MSI) attended the scene and served a Detention Notice on the ship. The Detention Notice required the vessel's gantry cranes to be inspected by the Class Society, Det Norske Veritas (DNV), before cargo operations could resume.
- 1.11 An independent surveyor (Wood Noel Associates Ltd. Ship & Cargo Surveyors, Lyttleton New Zealand), attended the ship that evening at the request of the owners. He was acting on behalf of the Classification Society, Det Norske Veritas.
- 1.12 At 2200 hours, after the gantry cranes had been inspected, the Detention Notice was lifted. This was subject to conditions imposed by the Class Surveyor and noted in the ships Cargo Register as follows: "Damage survey Bluff New Zealand Gantry Crane (AFT) Pulley table to be repaired and load tested before use. Hoist wire to be renewed."

- 1.13 After inspection by Class, the forward gantry crane was used for cargo operations when stevedores resumed work the following morning. The No. 2 gantry crane was repaired by Bluff Engineering but was not used as the load test was due to be carried out in Tauranga. *Tasman Independence* sailed from Bluff at 0124 hours on 20th January 2004.

2. Key Conditions

2.1 Vessel and Crew Details

- 2.1.1 **Tasman Independence** is a multi-purpose general cargo vessel, built by I.H.I. Ltd in Kure, Japan in 1989. She has recently changed owners with her new owners being Paradise Marine Ltd. Majuro, Marshall Islands. The vessel managers are Kristen Marine S.A. Tasman Orient Line (Cyprus) Ltd. charter the vessel. The vessel is classed with Det Norske Veritas (DNV) and holds valid Class Certification.
- 2.1.2 **Tasman Independence** has an overall length of 173 metres, a moulded breadth of 27.60 metres and a moulded depth of 15.40 metres. She has a gross tonnage of 18 936. The vessel has two gantry cranes.
- 2.1.3 This was the first time this vessel has been to the port of Bluff under her present owners. As far as they could remember, S.S.S Ltd had not worked this vessel before under her old name, **New Independence**.
- 2.1.4 The ship's officers on deck at the time of the accident were the Chief and Second Officers.
- 2.1.5 The ship's crew were Russian. The Master had a reasonably good command of English. The Chief Officer spoke good English. However, the Bosun and the other crew members command of English was not as good.
- 2.1.6 The ship's crew had been on the ship for approximately one month and were not completely familiar with the ship. The Chief Officer had been on board longer than the rest of the crew. He had been with the previous crew (Indian) for a hand over period.
- 2.1.7 Southland Stevedoring Services (S.S.S) provided the stevedoring services on the day of the accident. They are experienced in gantry crane operation and have provided training for their employees in this regard.
- 2.1.8 The crane driver had been operating gantry cranes for approximately 10 years.
- 2.1.9 After the accident the ship's Cargo Gear Register was inspected and found to be in order.
- 2.1.10 Following the accident, conditions were imposed in the ships 'Cargo Register' as follows: "Damage survey Bluff New Zealand 14/1/2004. Gantry Crane (Aft) – Pulley table to be repaired and load tested before use. Hoist wire to be renewed."

"The crane is not to be used until such time that suitable repairs have been carried out and a load test conducted to the satisfaction of Class."

"Upon repairs and load test been satisfactorily carried out the ship's Cargo Register to be amended appropriately."

2.2 Gantry Crane Details – (See Appendix 1 – Photograph Nos. 7 & 8).

- 2.2.1 The No. 2 gantry crane wires were replaced on 11 February 2000 (See Appendix 2 - Copies of Wire Certificate).
- 2.2.2 The two Gantry Cranes were inspected and tested by DNV on 10 November 2001 in Singapore (See Appendix 2.- Test Certificate).

- 2.2.3** The No. 2 gantry crane had a SWL of 40 tonnes and had been test loaded to 45 tonnes. With the weight of the MDF spreader at 5 tonnes, the crane had been lifting 40 tonnes when moving the 35 tonne hatch lids, shortly before the accident.
- 2.2.4** Upon inspection, the sheaves on the pulley frame were found to be in good condition. No sharp edges or gaps were observed around the sheaves that could have led to the wires being caught, and/or jammed and then severed.
- 2.2.5** Although statements from the witnesses contradict each other, it appears that the gantry crane was put in the hoist mode to lift the dunnage from the quay and that the pulley frame, with the spreaders and dunnage attached, was inadvertently hoisted hard up against the housing on the underside of the gantry frame turntable, (*See Appendix 1 – Photograph No. 5 - Damage to underside of Gantry turntable*). This, in turn, probably caused the hoist wires to sever and the pulley frame, spreader and dunnage to fall onto to the quay (*See Appendix 1 – Photograph No 6 – Equipment and dunnage, on quay*). For the above to have occurred the two limit switches for park and hoist respectively, would have had to be switched off i.e. switched from ‘safe cargo mode’, with the appropriate keys, to ‘housing/ stowing mode’ (*See Appendix 1 – Photograph No. 3*).
- 2.2.6** At the time of the accident, the limit switch keys had been left in place in the operating cab by the ship’s crew (*See Appendix 1 – Photograph Nos. 3 and 4 – showing keys in place*).
- 2.2.7** There is no direct evidence to show that the limit switches were switched off at the time of the accident. However, for the pulley frame to have been hoisted hard up against the housing on the underside of the gantry frame, there can be no other logical conclusion. It is unknown whether a crew member switched them off or if the stevedore operating the gantry crane, switched them off.
- 2.2.8** If the pulley frame had been hoisted into the housing with the limit switches off, so as to be able to park or stow the pulley frame, the electric motor overload relay should have cut in after approximately five seconds. It is unknown whether this safety feature failed at the time of the accident, or if the wire parted before the electric motor overload relay was able to cut in and switch the motor off.
- 2.2.9** Damage occurred to the turntable frame at some stage during the accident. Bluff Engineering who repaired this damage, was of the opinion that the damage was recent.
- 2.2.10** The fact that the length of the wires hanging below the pulley frame after the accident was short (*See Appendix 1 – Photograph No.2 - Broken wires hanging down loose*), indicates that the pulley frame was up to or close to the turntable (upper housing) at the time the wires severed.
- 2.2.11** It is difficult to ascertain what actually caused the wires to part, given the combined weight of the spreader and dunnage at approximately only 5 tonnes.

2.3 Procedures

- 2.3.1** There were no formalised shipboard procedures in place at the time of the accident to ensure that the limit switch keys were removed from the cab before stevedores commenced using the cranes. Also, there were no formalised procedures to ensure that the safety limits on the cranes had been set and checked by the crew, to ensure that they were operational before the stevedores commenced using the cranes.
- 2.3.2** There were no formalised shipboard procedures in place to ensure that the stevedores were familiar with the operation of the ship’s gantry crane before cargo operations commenced.

2.3.3 The stevedoring company, S.S.S. Ltd, had no formalised procedures in place to ensure the gantry crane operator was familiar with the crane controls he was about to operate. There were no formalised procedures in place to request a ship's Duty Officer to confirm that any safety features of a crane were operational and had been satisfactory tested, prior to use. i.e. limit switches in place and operational.

3. CONTRIBUTING FACTORS

N.B. These are not listed in order of importance.

- 3.1 The crew had left the limit switch keys in position in the cab.
- 3.2 There was no on board procedures for pre-cargo operation check of the gantry cranes as follows:
 - A check to ensure the limits had been correctly set and that the keys were then removed and kept by a designated person.
 - A check to ensure that the set limits were correctly functioning.
 - A check to ensure the stevedores were familiar with the gantry cranes and understood the operational controls of the gantry cranes.
- 3.3 There were no shore side (Stevedoring company) procedures in place for ensuring that the gantry crane operator was familiarised with the operation of the particular crane he was about to use.
- 3.4 The inadvertent hoisting of the pulley frame, spreader and load hard up against the housing of the gantry frame.
- 3.6 The lack of timely signals from a hatchman to the crane driver to stop hoisting.

4. CAUSE

Human Factor

| | | |
|---|--|--|
| <input type="checkbox"/> Failure to comply with regulations | <input type="checkbox"/> Drugs & Alcohol | <input type="checkbox"/> Overloading |
| <input type="checkbox"/> Failure to obtain ships position or course | <input type="checkbox"/> Fatigue | <input type="checkbox"/> Physiological |
| <input type="checkbox"/> Improper watchkeeping or lookout | <input type="checkbox"/> Lack of knowledge | <input type="checkbox"/> Ship Handling |
| <input type="checkbox"/> Misconduct/Negligence | <input checked="" type="checkbox"/> Error of judgement | <input type="checkbox"/> Other . . . |

Environmental Factor

| | | | |
|--|---|------------------------------------|--|
| <input type="checkbox"/> Adverse weather | <input type="checkbox"/> Debris | <input type="checkbox"/> Ice | <input type="checkbox"/> Navigation hazard |
| <input type="checkbox"/> Adverse current | <input type="checkbox"/> Submerged object | <input type="checkbox"/> Lightning | <input type="checkbox"/> Other . . . |

Technical Factor

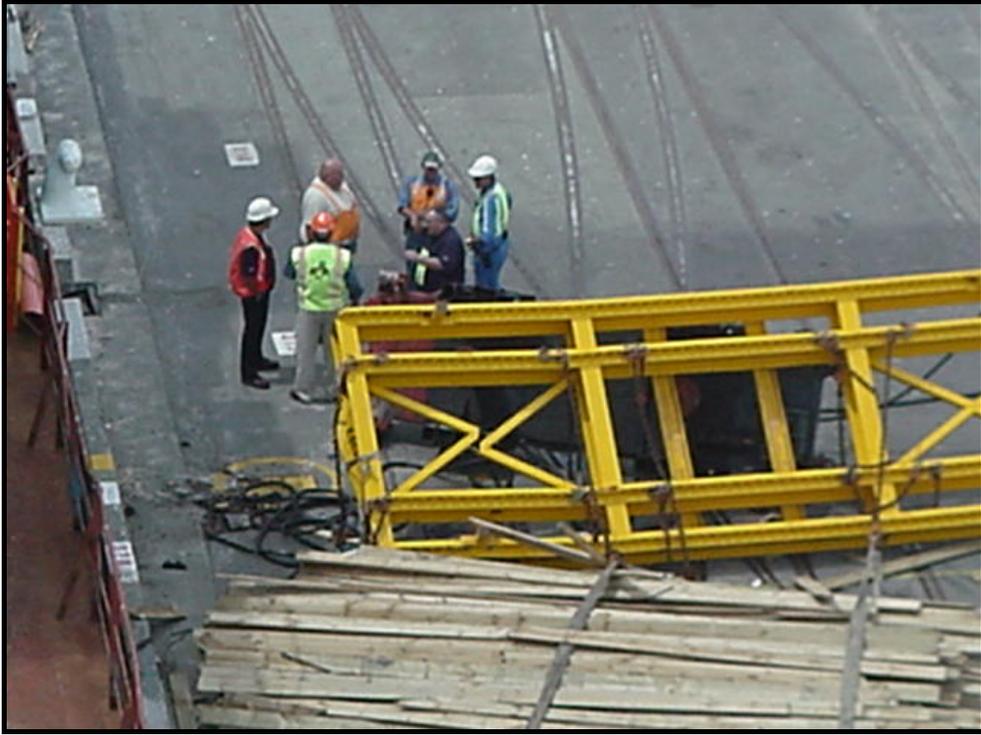
| | | |
|---|---|---|
| <input type="checkbox"/> Structural failure | <input type="checkbox"/> Wear & tear | <input type="checkbox"/> Steering failure |
| <input type="checkbox"/> Mechanical failure | <input type="checkbox"/> Improper welding | <input type="checkbox"/> Inadequate firefighting/lifesaving |
| <input type="checkbox"/> Electrical failure | <input type="checkbox"/> Inadequate maintenance | <input type="checkbox"/> Insufficient fuel |
| <input type="checkbox"/> Corrosion | <input type="checkbox"/> Inadequate stability | <input type="checkbox"/> Other . . . |

4.1 It is not possible to determine exactly what caused the accident. However, the presence of the limit switch keys in the cab at the time of the accident appears to have allowed the pulley frame to be hoisted hard up against the gantry frame housing.

5. OPINIONS & RECOMMENDATIONS

- 5.1 It is recommended that designated crews members only should hold the limit switch keys and that this should be formally documented in shipboard procedures. Limit switch keys should be removed by the said designated holders before cargo operations commence.
- 5.2 It is recommended that the operators of the vessel implement on board procedures to ensure the safe operation of gantry cranes by stevedores. This is to include the instruction that safety limits switches are correctly set prior to stevedore operations.
- 5.3 It is recommended that stevedoring companies implement formalised procedures to check that gantry cranes are in good working order before cargo operations commence; this is to include that safe working of limit settings.
- 5.4 It is noted that since the accident both the ship and stevedores have commenced implementing these new procedures.

APPENDIX 1



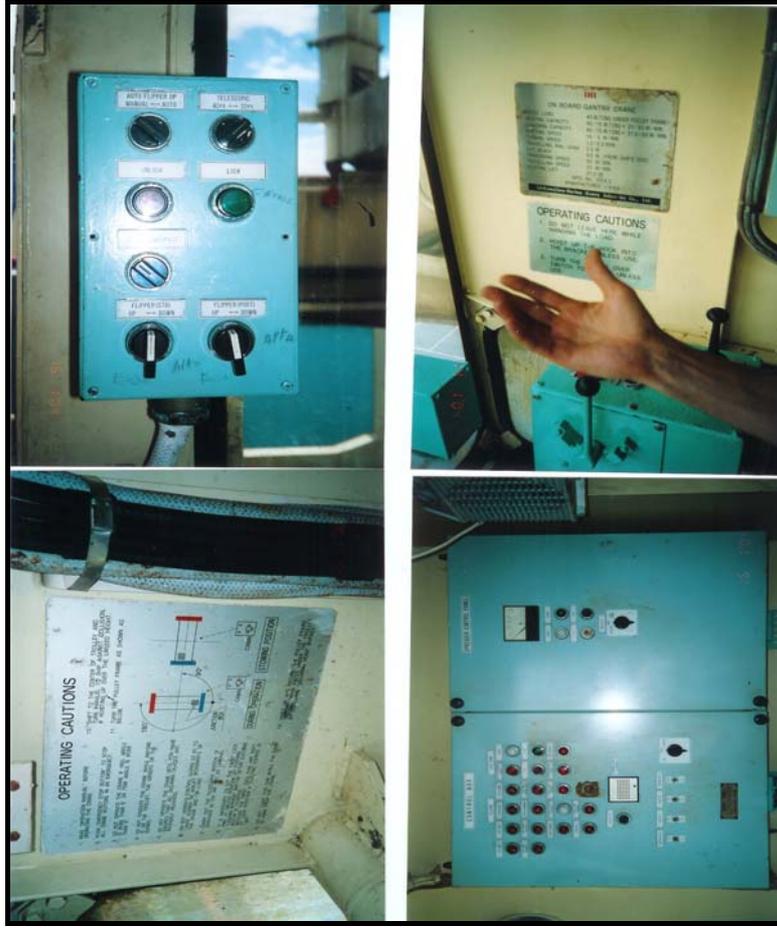
PHOTOGRAPH 1



PHOTOGRAPH 2



PHOTOGRAPH 3



PHOTOGRAPH 4



PHOTOGRAPH 5



PHOTOGRAPH 6



PHOTOGRAPH 7



PHOTOGRAPH 8

