



Accident Report

Crane Failure

Global Wind

16-November-2006

Class B



NARRATIVE

On 15 November 2006 at 2209 hours NZDT (New Zealand Daylight Saving Time), **Global Wind** berthed port side to at No. 9 berth Mount Maunganui. At 2300 hours, one gang of stevedores boarded the vessel and commenced discharging a bulk cargo of soya bean meal from No. 2 hold.

The ship's cranes were used, with cargo grabs provided by the stevedores.



Photograph 1 **Global Wind**

On 16 November, at 0330 hours, the stevedores changed shifts, after which cargo was discharged from holds Nos. 2 and 5.

An excavator weighing about 15 tonnes was lifted into No. 5 hold using No. 4 crane. Part of the excavator can be seen in Photograph 1.

At 1530 hours, the stevedores changed shift and continued discharging cargo from Nos. 2 and 5 holds.

At 1630 hours, No. 4 crane had just started to lift a grab full of cargo from No. 5 hold when its hoisting wire parted, allowing the grab to fall back into the cargo (see Photograph 2). There were no injuries or damage.



Photograph 2 - cargo in No. 5 hold



Photograph 3 – No. 4 crane after the wire parted

After checking the ship's lifting appliances and documentation, a Notice of Imposition of Conditions was issued, prohibiting the use of the cranes to work any further cargo until they had been assessed as safe to use by a competent person.

The ship's crew replaced the hoisting and luffing wire ropes on No. 2 crane with certificated new wires.

On 17 November, at 1230 hours, discharge was resumed using No. 2 crane only.

Global Wind left Tauranga for Melbourne on 17 November, at 2349 hours.

During the passage the ship's crew changed the hoisting and luffing wire ropes on the remaining three cranes.

On 23 November, in Melbourne, ClassNK conducted an occasional survey on Cargo Handling Gear and noted that all hoisting and luffing wires had been replaced by certificated new wires and verified by the surveyor. A visual examination of the wire ropes for their full length was carried out and found in order and test certificates for wire ropes were issued.



Photograph 4 – No. 4 cargo block



Photograph 5 – No. 4 jib and No. 3 crane pedestal

COMMENT AND ANALYSIS

Global Wind was fitted with four Mitsubishi Heavy Industries (MHI) deck cranes, each with a Safe Working Load (SWL) of 30 tonnes.

The ship's register of lifting appliances showed that the last annual thorough examination of cargo gear had been carried out by Nippon Kaiji Kyokai on 31 May 2006. Certificates of test, with proof load 35 tonnes and thorough examination were issued on 7 April 2003, when the ship was new.

The MHI crane operation manual specified hoisting and luffing wires as follows:

Hoisting – 258m of 33.5mm 4 stranded wire rope of 39 wires per strand with minimum breaking load 810 KN

Luffing – 106m of 28mm 6 stranded wire rope of 29 wires per strand with minimum breaking load 531 KN.

All wire ropes fitted to the cranes on board **Global Wind** had Certificates issued by Kiswire Ltd, of Pusan, Korea on 24 October 2002. The Certificates for the hoisting wires indicated: 33.5mm 4 stranded right hand lay rope, 39 wires per strand with fibre core.

The test Certificates for hoisting wires showed that the sample wire broke at 804.0 KN, which was 6 KN less than that specified by the MHI crane manual. The test Certificates for luffing wires showed that the sample broke at 566.04 KN, which was greater than that specified.

The vessel's ISM Certificate, issued by Nippon Kaiji Kyokao on 25 November 2003, was valid until 24 September 2008. The latest ISM audit was conducted on 5 September 2006.

Section 9-2 of the ship's ISM Maintenance Manual (Second Edition 2004) specified maintenance of deck cranes and required the Chief Officer to report on the condition of crane wire ropes at the end of April and October each year. A Cargo Fall Report was forwarded to Sato Steamship Company Ltd on 1 November 2006, stating: *Maintained regular visual inspection to all wires and sheaves and found in good condition.*

The ship's maintenance programme and records showed that crane wires and sheaves had been greased every three months. It also showed an interval of 2 years for changing wires, but the wires had not been changed since April 2003.

The Chief Officer's daily work notes showed that greasing of cranes took place between 30 September and 4 November 2006.

The ISM Maintenance Manual indicated that wire ropes should be replaced if:

1. In case the wires are cut 10% over the total wires between one twist of the rope
2. In case that the decrease of diameter is 7% of the original diameter.
3. In case there is a kink, the loss of shape or remarkable corrosion.

No time limit for wire ropes was specified in the ISM Maintenance Manual.

Note: *one twist of the rope was estimated to be approximately 0.3 m.*

The hoist wire ropes on board **Global Wind** were well greased. The vessel was discharging soya bean meal at the time and the ropes were coated with cargo. Point inspections along the wire rope away from the part that was damaged by the breakage indicated that it was in satisfactory condition. From this it may be concluded that a visual examination of the rope may not have been sufficient to detect that it was about to fail.



Photographs 5 - the broken hoisting wire rope



Photograph 6 – section of No. 4 hoisting wire

Between **Global Wind** arriving in Tauranga and the accident, No. 4 crane was in use for about 20 hours, including 2 hours during which work was suspended due to rain.

The crane was lifting soya meal with a grab belonging to the stevedoring company.

The weight of the grab, including fuel was 13.02 tonnes. Its maximum capacity was 18.3 cubic metres. Given a stowage factor of soya bean meal of 50 cubic feet per tonne, the maximum cargo lifted would have been 12.4 tonnes. The total weight of grab and cargo would have been about 25.4 tonnes.

Global Wind had previously carried cargoes of logs, coal and fertilizer.

FINDINGS

The hoisting wire rope of a 30 tonne crane on board **Global Wind** parted while it was lifting about 25.4 tonnes. The wire rope had been in use for three and a half years.

Apart from the test sample breaking at 5 KN less than required, the wire met the manufacturer's specification. The ship's ISM system provided guidance on replacement of wire ropes but did not place a time limit on their use.

The lifting appliances on board **Global Wind** complied with Maritime Rule Part 49.

The ship's ISM system included procedures for the routine maintenance and inspection of lifting appliances. Records indicated that these procedures had been observed.

There was no specified maximum life for wire ropes. Their continued use depended on their appearance during six monthly visual inspections by the ship's crew and annual examinations by classification society surveyors.

The four cranes on board **Global Wind** were rigged with a total length of 1456 metres of wire rope. The reliability of an inspection on that length of rope, coated in lubricants, while it is in place on ship's cranes is questionable.

SAFETY RECOMMENDATIONS

1. It is recommended that the ship's operators use other means, in addition to visual inspections by crew, to ensure the reliability of wire ropes used in ships' cranes. This may include a policy to replace wire ropes used for lifting after a reasonable interval determined by the use to which it has been put and any conditions such as the carriage of abrasive or corrosive bulk cargoes which may affect their integrity.
2. Maritime New Zealand issue of a Safety Bulletin for ships' masters, agents and stevedores, advising them to exercise caution in ships' that have carried abrasive or corrosive bulk cargoes, where the crane wires are more than two years old.
3. Maritime New Zealand should send copies of the final report to the International Maritime Organization (IMO), the Tokyo MOU Secretariat and the International Association of Classification Societies (IACS) and request that they consider providing guidance on the maximum life of wire ropes for use in ships' cranes.

VESSEL DETAILS

Ship Name:	Global Wind
Ship Type:	Bulk Carrier
Certified Operating Limit:	International
Port of Registry:	Port Vila
Flag:	Vanuatu
Built:	2002
Construction Material:	Steel
Length Overall (m):	188.50 m
Maximum Breadth:	32.26 m
Gross Tonnage:	29350
Registered Owner:	Stevens Line Ltd
Ship Operator/Manager:	Sato Steamship Co., Ltd
Classification Society	Class NK
Maritime Safety Inspector:	Ian Clarke