



# Accident Report

Crane Failure

*Sea Harvest*

22 August 2005

Class C



## NARRATIVE

On 21 August 2005, **Sea Harvest** arrived at the Port of Tauranga and berthed port side to at No. 9 berth, Mount Maunganui. At 2330 hours New Zealand Standard Time (NZST) the vessel commenced discharging coal into hoppers for loading into road vehicles (See *Photograph 1*). Work proceeded through the night.



Photograph 1

On 22 August at 1550 hours, No. 1 crane lifted a grab filled with cargo from No. 1 hold and slewed it towards the hopper. When the grab was over the deck on the port side, the crane hoist wire parted, dropping the grab and its contents onto the narrow deck between the bulwark and hatch coaming (See *Photograph 2*).



Photograph 2

There were no injuries. The deck plating was dented to a depth of about 25 mm but was not pierced. Two steel log stanchions stowed next to the bulwarks and the stiffeners alongside the hatch coaming were bent.



Photograph 3

The ship's remaining cranes and associated cargo gear were checked and found to be in good order. The stevedores were permitted to resume discharging cargo using the remaining three cranes. The crew changed the hoist wire at No. 1 crane.

At about 2300 hours, the driver of No. 4 crane noticed that one strand of the hoist wire on his crane had parted. Discharge of cargo was suspended.

**Sea Harvest** was fitted with four IHI deck cranes, each with safe working load (SWL) 30 tonnes.

The cargo gear underwent proof testing and a five yearly thorough examination by Class NK in Auckland on 16 November 2004.

The original specification for hoist wire was: UNI ROPE U4 x SeS (48) diameter 33.5 metres with a minimum breaking strength of 777 KN (97.2 tonnes). This required 4 stranded wire rope with 48 wires per strand. The length of wires at No. 1, 2 and 3 cranes were 226.3 m and at No 4 crane was 234 m.

The ship's records showed that hoist wires had been replaced as follows:

Crane No.	Date of Change
1	11 April 2004
2	6 September 2004
3	7 October 2003
4	13 May 2003

The hoist wires fitted in 2003 were described as 4 x SeS(39), ie. 4 stranded wire rope with 39 wires per strand with a specified breaking load of 79.3 tonnes. Having 39 wires per strand, the replacement wire rope would be less flexible than wire rope of 48 wires per strand and therefore prone to suffer metal fatigue when passing through sheaves.



Photograph 4

On the basis that the hoist wires fitted to the cranes in 2003 did not meet the manufacturer's specifications and that two hoist wire ropes had failed within a few hours of each other, the Master was advised that the cranes were not to be used to work cargo until the hoist wires had been replaced. Since there were only three replacement hoist wires on board, only three cranes were permitted to discharge or load cargo. The new wire rope fitted to No. 1 crane met the manufacturer's specification, but the other two wire ropes did not. They were 4 stranded ropes with 39 wires per strand and Class NK permitted their use for a maximum of one year.

Hoist wire ropes were rigged to pass through eight sheaves as follows: from the end secured at the head of the crane, the rope was rove between two sheaves to left of centre of the jib and two sheaves at the head of the crane to form a two-fold purchase, then to the outer block at the left side of the jib, down through the cargo block and back up to the outer block at the right side of the jib, and from there to a block at the crane head and down to the hoist winch. No. 1 crane hoist wire failed near the right hand sheave at the top of the crane whereas No. 4 hoist wire failed in the part on the left side of the jib.

The stevedore's estimate of weight lifted was as follows:

Tare weight of the grab:	12 tonnes
Weight of cargo	15 tonnes
Weight of grab and cargo	27 tonnes

After the accident the stevedores placed the grab full of coal on a container flat base and took it to the Port of Tauranga weighbridge to be weighed. Weighbridge docket indicated that the grab, its contents and the base weighed 30.52 tonnes. The weight of the empty base, after the grab had been removed, was 2.96 tonnes. Thus the total weight being lifted by No. 1 crane at the time of the failure as 27.56 tonnes.

**Sea Harvest** was a bulk carrier with the following particulars:

<b>IMO Number:</b>	9222546
<b>Flag:</b>	Liberia
<b>Type of Ship:</b>	Bulk/Log Carrier
<b>Gross Tonnage:</b>	17 859
<b>Overall Length (m):</b>	171.93
<b>Built:</b>	2000

The ship was owned by Sea Harvest Maritime Inc and operated by Lihai International Shipping Ltd.

An International Safety Management Certificate was issued to **Sea Harvest** by Class NK on 19 May 2003, to expire on 24 April 2006.

## LESSONS LEARNT

Persons responsible for ordering wire rope for cranes should ensure that ropes comply fully with manufacturers' specifications.