

## Main Crane failure during load test

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At maximum load, the crane main block wires broke and the testing load fell into the water.

### What happened?

While performing the overload load test at maximum load plus 10% on a heavy lifting offshore crane, a major failure occurred. At maximum load, the crane main block wires broke and the testing load (two cargo barges) fell, along with the main block, into the water. As a result of the loss of load, the vessel listed to approximately 9 degrees. There were no injuries.

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### What went wrong?

- Mechanical failure on the clutches of certain of the main hook double drums. Since the main hook wires were reeled on four drums, when the load at the hook reached maximum (barges completely out of water) the clutches of two drums, #3 & #4 (starboard side of the hook ) slipped on the transmission disk and the drum lost torque, while the other two drums, #5 & #6 (port side of the hook) were still pulling. This generated an unbalanced load on the main hook, beyond any normal compensation system, with concentration of stress on the port side half of the block assembly where the load ultimately exceeded the wire Maximum Breaking Load with consequent breaking of wires and the total loss of the load.
- Clutch pad failure. The recently installed clutch pads lost their holding properties at maximum crane load. During the investigation it was found that the failure of the clutch pads was linked to the lack of proper burnishing of new pads.

### Lessons

- Perform burnishing of clutch pads as per manufacture's procedure.
- Implement a clutch torque test to verify the holding torque of the pads as per new manufacture's procedure.
- Include in the planned maintenance systems the pads burnishing procedure and torque test with the frequency recommended by the manufacturer.
- Revision of crane FMEA, including review by competent persons.

Members may wish to refer to IMCA Information Note 1664 which outlines the caution to be taken when renewing brake frictional components (i.e. brake/clutch pad/discs) that are integral to the safe functioning of a crane.

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