

TOWER CRANE INCIDENT REPORTING

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Summary of Incident

Whilst unloading scaffold tubes from the delivery lorry using the tower crane, the tower crane's main winch paid out in an uninstructed and uncontrolled manner. The load subsequently impacted the ground after a fall of approximately 2 meters. The crane was immediately taken out of service pending the completion of a full and rigorous investigation.

Subsequent investigations by the tower crane provider, supervised by independent tower crane safety engineers, discovered that the mechanical parts of the winch, winch motor and brake were in perfect working order, and that the winch failure was due to incorrect control parameters having been uploaded into the electronic **inverter drive** which controls the main winch and braking mechanism. This caused an intermittent fault in the control of the winch that only manifested under certain conditions. The incorrect parameters were unknowingly uploaded some weeks earlier when the inverter drive was newly fitted to the tower crane during its previous use, prior to erection on the site where the incident happened.

The fault was only positively diagnosed by technicians carefully checking the parameters programmed into the inverter drive against the manufacturer's listed parameters for the specific type of winch that it was controlling. This process took 5-6 hours. Incorrect parameters were discovered which affected the correct operation of the winch motor and brake.

Cause

Electronic failure (although human error may have been a contributory factor when the inverter drive was replaced).

Action taken

- The correct parameters were re-programmed, checked and double checked.
- The tower crane was then re-tested in the presence of independent safety engineers with multiple operations in all scenarios that had previously caused the fault to manifest. No fault was observed (whereas the fault occurred approximately once in every 30 operations during the technical investigation tests).
- The parameters entered within the inverter drive controlling the luffing function of the crane were also checked as a precaution, and found to be correct.
- The tower crane was then put back into service.
- Procedures revised to require check of inverter drive integrity prior to erection of any tower crane on site.