Safe Use of Lorry Crane

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Engineering Safety Branch
1. Crane-related Statistics
2. Sharing of Case Studies
3. Safe Use of Lorry Crane
4. Good Practices
Dangerous Occurrences from Jan – Sep 2017, compared to 17 same period last year.

Crane-related Dangerous Occurrences – 2009 to 2017

- 2009: 21
- 2010: 26
- 2011: 20
- 2012: 18
- 2013: 19
- 2014: 12
- 2015: 22
- 2016: 19
- 2017: 12

12 Dangerous Occurrences from Jan – Sep 2017, compared to 17 same period last year.
Crane-related Dangerous Occurrences – 2014 to 2017

Looking at Lorry Cranes


- Outriggers not extended/deployed, 63%
- Mechanical Failure 21%
- Ground Failure 11%
- Unsafe Operation 5%

- Lorry Crane DO

Looking at Lorry Cranes
Case Studies
A lorry crane had toppled on its side along the road while lifting an excavator, weighing approximately 5 tons.

The lorry crane was seen to have extended its outriggers on the side where the lifting operations was carried out but it collapsed on the side where the outriggers were not extended. No injuries was reported.
A lorry crane operator was lifting a 5-meter tall palm tree weighing around 800kg to facilitate the planting process when the lorry crane collapsed to its right side. There was no injury as a result of the incident. It was observed that the outriggers of the lorry crane were not fully extended.
The lorry crane operator was unloading a 3 ton forklift when the lorry crane collapsed to the passenger side of its cabin. There was no injury as a result of the incident. Outriggers were not fully extended.
The lorry crane was lifting a 1.5 cubic meter concrete bucket for the casting of the outer wall of the lift shaft. As the concrete bucket was reaching the casting location, the lorry crane started to tilt on its left side and finally collapsed onto the ground. There was no injury as a result of the incident.
A lorry crane operator was lifting a container from a trailer parked on its right side. He was tasked to lift the container to the left (passenger) side of the lorry crane to be placed on the ground. When the load was lifted slightly off the trailer, the lorry crane toppled to its right (driver) side. Outriggers were not fully extended.
Safe Use of Lorry Cranes

- Planning of Lifting operation
- Roles and Responsibility of Lifting Team
- Operation of Lorry Crane & Safety Devices
- Maintenance, Checks and Inspection
Lifting Plan
Reg 4(1) of the WSH (OOC) Regulation states where any lifting operation involving the use of any crane is carried out in a workplace by a crane operator, it shall be the duty of the responsible person to establish and implement a lifting plan which shall be in accordance with the generally accepted principles of safe and sound practice.

Risk Assessment and Safe Work Procedure
Risk Assessments shall be conducted to address the safety and health risks posed to any person who may be affected by the activities in the workplace. In particular, employers have a duty to provide an effective management and control system for the use and operation of lorry cranes, including the need to develop and implement a safe work procedure (SWP) for the works.

- Risk due to Traffic Movement
- Risk involve in Operation of Lorry crane
- Risk due to work at heights
- Risk due to contact with Obstruction
Safe Use of Lorry Cranes: Roles & Responsibility of Personnel

Crane operator
- Operator has to be Trained and Competent.
- Mandatory Lorry Crane Operation Course & Specific Training on the brand and model lorry loader
- to ensure that any outrigger when it is required is fully extended and secured
- before the start of every workshift, to carry out operational tests on all limiting and indicating devices under no load conditions before any lifting operation is carried out and shall enter the results of such tests in a log book or log-sheet;

Lifting supervisor
- to brief all crane operators, riggers and signalmen on the lifting plan
- if any unsatisfactory or unsafe conditions are reported to him by any crane operator or rigger, take such measures to rectify the unsatisfactory or unsafe condition or otherwise ensure that any lifting operation is carried out safely.

Rigger and Signalman
- Needed for any lifting operation involving the use of mobile and tower cranes
Safe Use of Lorry Cranes: Operation

Outrigger and Stabilizer Set Up
- Full Extension of Outriggers on both sides
- Load Chart and Capacity Indicators only works with full extension of outriggers & deployment of stabilizer

No raising of vehicle tires (Front and/or Rear)
- Vehicle suspension must take some weight
Safe Use of Lorry Cranes: Operation

Levelling of Crane
– Ensure stable ground of not more than 5 degree inclination

Lorry Crane utilities Outriggers and Stabilizers for support.

Ground Condition should be firm and Level.

Ensure there are no hollow spaces such as manhole covers.
# Safe Use of Lorry Cranes: Operation

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<th>Barricade Work Area</th>
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<tr>
<td>– Cordon off Lifting Area</td>
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<td>– Proper Diversion of Traffic</td>
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</table>
Safe Use of Lorry Cranes: Operation

- No Lifting From Front of Cabin
- No Lifting Over Public Area, Across Roads or over people
- No Lifting Below Ground Level (Based on Manufacturer recommendation)

*Picture from Stomp Website
Safe Use of Lorry Cranes: Safety Device

From 2017, all lorries with cranes are required to be fitted with an audio warning system to reduce the risk of collision with overhead road structures.

This device emits an audio alarm when the crane boom is not fully stowed or raised above its maximum stowed height when the driver attempts to drive off.

MOM Authorised Examiners (AEs) would be required to extend their scope during the yearly statutory examination with effect from 1 October 2017, to include functional checks on the boom stow limit switch, angle sensors and to ensure that the system is in proper working order.

A technical circular was developed and issued by ES Branch to guide AEs on this extended scope.
Safe Use of Lorry Cranes: Maintenance and Inspection

- **Statutory Inspection** – Every 12 Months (or 6 Months for Man-Basket)
- **Daily and Regular Inspection**
- **Maintenance Regime** to ensure the integrity of the Lorry Crane
Safe Use of Lorry Cranes: Daily Checks

- Daily Checks by the Crane operator and the lifting team before starting of each workshift
- Documentation
- Environment and Surrounding Conditions
- Crane Physical Checks
- Crane Functional Checks

### Daily Pre-Operational Checklist for Lorry Crane Operators

#### General Information
- Name of Operator: 
- Lorry Crane LM Number: 
- LM Certificate Expiry Date:

#### Documentary and Procedural Checks

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<tr>
<th>No.</th>
<th>Task Description</th>
<th>Yes</th>
<th>No.</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>1</td>
<td>Check that a proper Risk Assessment (RA) has been conducted in relation to the lifting operation by the lorry crane.</td>
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<td>Check that you have identified the relevant hazards and control measures based on the RA conducted.</td>
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<td>3</td>
<td>Check that Procedure (SWP) are established for the lifting operation to be carried out.</td>
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<td>4</td>
<td>Check the ground condition and proximity hazards.</td>
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<td>5</td>
<td>Check the availability of the permit to lift.</td>
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<td>6</td>
<td>Check the load chart for safe lifting parameters for e.g., the maximum allowable safe working load (SWL) corresponding to the boom length.</td>
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<td>7</td>
<td>Check with Responsible Person on the details of the lifting Plan and SWP established for the lifting operation.</td>
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Good Practices

• **Operator has to be Trained and Competent.**
  - Mandatory Lorry Crane Operation Course
  - Training on the brand and model lorry loader

• **Lifting Plan including Risk Assessment and Safe Work Procedure**
  - Traffic Management
  - Ground Assessment
  - Outriggers Fully Extended and Deployed

• **Proper Inspection and Maintenance of Lorry Loader & Lifting Gear**
  - Daily Checks
  - Statutory inspection,
  - Regular Inspection
  - Maintenance Regime

• **Boom of Crane in Stow Position before driving**
Safe Use of Lorry Cranes: Technology Advancement

With the recent lorry crane accident cases, the National Crane Safety Task Force, WSHC and MOM is looking into the use of technology to prevent accidents.

One of the possible solution is the Stability Control System as stated in EN12999.

The Stability Control System allows the lifting operation of certain load to be carried out at half or no extension of outriggers.

Ensure Stability and automatics cut-off at unsafe zone to prevent overloading or toppling.