

**Information about main contraventions**

**(1) Failure to Maintain Cranes in Good Working Condition**

Cranes are complex machines consisting of many moving parts, each of which performs its own specialised function. Each of these parts, from the slewing table to the motor, has to be properly maintained as failure of any component may lead to catastrophic consequences, such as overturning or collapse of the crane. It is therefore imperative that crane owners establish and implement a comprehensive maintenance regime to ensure the mechanical and structural integrity of the cranes at all times. Some of the key findings for this category are detailed below:

- i) Failure or malfunction of the safety devices of cranes
- ii) Damaged, corroded or kinked wire ropes
- iii) Defective or damaged safety latches of main hooks and auxiliary hooks
- iv) Poorly maintained cranes



*Figure 1. A malfunctioned control panel of a crawler crane. The crane operator of this crane would have to bypass safety features to operate the crane, thus increasing the risk of an accident.*



*Figure 2a A kinked wire rope of a crawler crane. This is a permanent damage to the wire rope which results in a loss of strength to the rope.*



*Figure 2b A deformed wire rope of a crane which may result in uneven stress distribution in the rope.*



*Figure 3 A defective safety hook latch of a crane (circled) which makes it ineffective in retaining of slings or other lifting devices.*



*Figure 4 A badly corroded wedge socket used to terminate the wire rope. Corrosion can lead to early failure of crane components.*



*Figure 5 Improvised locking pin. Original locking pins, usually provided by the crane manufacturers, are purpose-built and designed to withstand the strains of lifting operations. Improvised equipment like this is prone to failure during lifting operations.*

## (2) Failure to Establish and Implement Lifting Plans

2 Another common contravention uncovered during “Operation Skylark” was the failure to establish and implement a Lifting Plan in accordance with the Workplace Safety and Health (WSH) (Operation of Cranes) Regulations. Such a Lifting Plan must be developed and implemented for any lifting operations using a crane. The industry should refer to the Approved Code of Practice (ACOP)<sup>4</sup> on Safe Lifting Operations in the Workplaces published by the WSH Council. The approved code of practice provides recommendations on the key elements required in a Lifting Plan.

3 The enforcement operation revealed that certain key elements required in a Lifting Plan were not identified and considered in the development of the Lifting Plan. Some examples of such key elements were:

- i) Details of the load
- ii) Details of the lifting equipment/lifting gears used
- iii) Physical and environmental considerations
- iv) The zone of operation

2. Details of the Load's			
Description of load's	I-beam		
Overall dimensions			
Weight of load	Kg/tonne	<input checked="" type="checkbox"/> Known weight	<input type="checkbox"/> Estimated weight
Centre of gravity	<input type="checkbox"/> Observed	<input checked="" type="checkbox"/> Estimated	<input type="checkbox"/> Determined by drawing
3. Details of the Lifting Equipment / Lifting Gears			
Type of the Lifting equipment	Crawler crane		
Maximum SWL as certified on the LM cert		Date of last certification	
boom / jib length	20 m	Fly jib / offset	
Intended load radius	Distance between the load and the crane	SWL at this radius	✓
Type of lifting gears	hoist/singledrum	SWL rating of hoist/singledrum	
Combined weight of the lifting gears	Kg/tonne	Certification of lifting gears	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4. Means of Communications			
Can the operator see the loading and unloading point for the load from his position?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Means of communication between the lifting crew?			

Fig 6 A lifting plan for a crawler crane without the Weight of Load indicated. The weight of load must be taken into account when planning the lifting operation to prevent the crane system from being overloaded.

<sup>4</sup> Under Section 40B of the WSH Act, the WSH Council may issue one or more Codes of Practice to provide practical guidance to duty-holders with respect to the requirements of the Act.

### (3) Defective Lifting Gears or Lifting Gears without Certification

4 Another crucial component of Crane Safety is the selection of Lifting Gears, which are used to secure the loads to the Cranes. It is paramount that the Lifting Gears are properly maintained and subjected to tests and examinations by the Authorised Examiners at regular intervals in accordance with the WSH (General Provisions) Regulations. Some common findings from the operation were:

- i) Poorly maintained or defective lifting gears
- ii) Lifting gears not tested and certified by Authorised Examiners



*Figure 7a A poorly maintained lifting gear which could result in pre-matured failure of the lifting gear.*



*Figure 7b A defective safety hook latch of a lifting gear which is ineffective in retaining slings or other lifting devices.*



*Figure 8 Lifting Gears found to have no identification tags and certifications. Such tags and certifications are necessary to ensure that only lifting gears tested and examined by Authorised Examine*