## <u>Annex B</u>

#### 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.

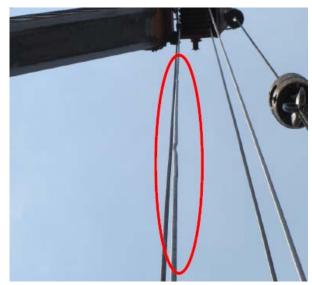


Figure 2a A kinked wire rope of a crawler crane. This is a permanent damage to the wire rope which results in a loss of strength to the rope.



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 Ioad/s	1-bern				
Overall dimensions					
Weight of load	Kgh	aline G-Known v	reight	Estimated weight	
Centre of gravity	LI Obvioga	GEstimate	d	Determined by drawing	
3. Details of the Lifting Equit	pment / Lifting	g Gears	-		
Type of the Lifting equipment		1.7.1	Chaulen Eranc		
Maximum SWL as certified on the LM cert			Date of la	Date of last certification	
M boom / Jib length		20 =	Fly jik / offset		-
Intended load radius		Dagage Servers its load and its greet	SWL at this radius		1-
Type of lifting genes		Inum Pringthelin	- 18	gi nation gi di de la Malangeme	1
Combined weight of the lifting prary		rate	Certification of lifting gears		DY
		VEncor			DN
			-		
4. Means of Communications			-		
an the operator see the loading at	sd unloading po		er ne pos	UN01	
Ta	U.N.		_		

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>&</sup>lt;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