



**ALL AUTHORISED EXAMINERS, APPROVED CRANE CONTRACTORS,
AND ALL OTHER INTERESTED PARTIES**

LIMIT ON THE YEARS OF SERVICE OF MOBILE CRANES
EXTENSION CRITERIA FOR THE SERVICE LIFE OF MOBILE CRANES

The circular LE 2/01 dated 20 Mar 2001 on the "limit on the years of service of mobile cranes" is hereby revised as follows:

2 The Occupational Safety and Health Division (OSHD) had over the years investigated several crane accidents in which the crane failed even though it was operating within the safe working load. Investigation revealed that these cranes failed due to fatigue stresses as a result of prolonged years of service.

3 In one case, a worker was killed when the boom of a truck mounted mobile crane collapsed and hit him during a lifting operation. Investigation revealed the boom of the crane failed at the load bearing-supporting end due to fatigue stresses.

4 Such failures of mobile cranes if left unchecked will lead to unnecessary lost of lives and property. OSHD has initiated a study into the service life of mobile cranes. Extensive consultation was also made with authorised examiners and industries representatives such as SCAL and ASMI. **OSHD has decided to limit the allowable years of service of mobile cranes.**

5 With **effect from 1st Jun 2002**, no authorised examiner shall approve **crawler, truck or wheel mounted mobile cranes** (of a similar construction to that shown in the attached Appendix) for use if it has exceeded the maximum allowable years of service from its year of manufacture as shown in Table A below, without the written approval of the Commissioner for Workplace Safety and Health.

Table A

Design Safe Working Load (Maximum Capacity)	Maximum allowable years of service from the year of manufacture
50 tons and below	20
Above 50 tons but not more than 100 tons	25
100 tons and above	30

Date of Issue	Rev 01	Classification	Circular No	CIF A32.4.1
21 May 2002	27 March 2007	Mobile Cranes	OSD/ ENG CIR / LE 3/02	Page 1 of 8

5 For mobile cranes that have a valid certificate issued on or before **1st June 2002**, the owner can continue to operate the crane until the expiry of the current certificate. An Authorised Examiner is not to re-certify and issue a LM certificate for a crane that has exceeded the maximum allowable years of service.

Extension Criteria

6 The Commissioner for Workplace Safety and Health may grant extension for cranes to be used beyond the maximum allowable years of service if he is satisfied that the crane may be used safely beyond the stipulated maximum allowable years of service. The extension criteria for the service of mobile crane is attached in the following pages.

Yours faithfully,



SILAS SNG WEE KIAT

for COMMISSIONER FOR WORKPLACE SAFETY AND HEALTH

Note: This circular LE 3/02 supersedes the following circulars:

- LE 9/99 dated 23 December 1999
- LE 2/01 dated 20 March 2001
- LE 5/01 dated 8 June 2001
- LE 7/01 dated 29 August 2001

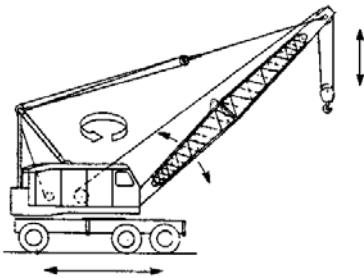
Date of Issue	Rev 01	Classification	Circular No	CIF A32.4.1
21 May 2002	27 March 2007	Mobile Cranes	OSD/ ENG CIR / LE 3/02	Page 2 of 8

APPENDIX 1

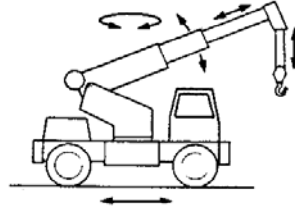
TYPES OF MOBILE CRANES AFFECTED BY THE POLICY

Mobile Crane (Non-Hydraulic)

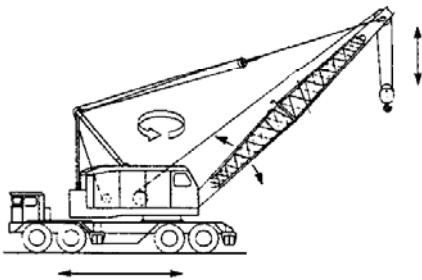
Mobile Crane (Hydraulic)



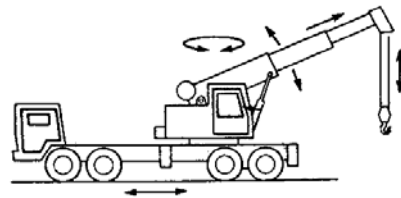
Wheel-mounted Crane



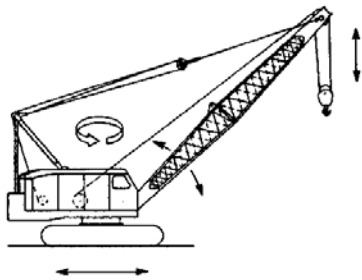
Wheel-mounted Crane
Telescoping Boom



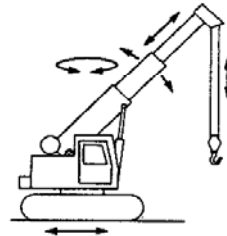
Truck Crane



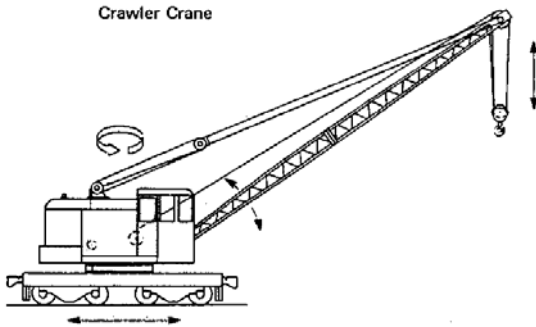
Truck Crane
Telescoping Boom



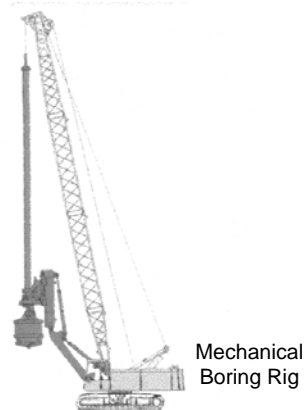
Crawler Crane



Crawler Crane
Telescoping Boom



Locomotive Crane



Mechanical
Boring Rig

Date of Issue	Rev 01	Classification	Circular No	CIF A32.4.1
21 May 2002	27 March 2007	Mobile Cranes	OSD/ ENG CIR / LE 3/02	Page 3 of 8



EXTENSION CRITERIA FOR THE SERVICE LIFE OF MOBILE CRANES

1. INTRODUCTION

1.1. With effect from 1st Jun 2002, the maximum service life of crawler, truck or wheel mounted mobile cranes (of a similar construction to that shown in the attached Appendix from SS CP 37) shall not exceed that as shown in Table A below.

Table A

Design Safe Working Load (Maximum Capacity)	Maximum allowable years of service from the year of manufacture
50 tons and below	20
Above 50 tons but not more than 100 tons	25
100 tons and above	30

1.2. The maximum service life of such a crane may be extended subject to the prior approval of the Commissioner for Workplace Safety and Health.

1.3. If the Commissioner for Workplace Safety and Health is satisfied that the crane is safe for use during the period of extension, he may, subject to conditions, extend the service life of the crane to a period specified in the extension approval document.

2. EXTENSION CRITERIA FOR THE SERVICE LIFE OF A MOBILE CRANE

2.1. The owner of a mobile crane who wishes to extend the service life of his crane may apply for the extension by submitting to the Commissioner for Workplace Safety and Health a **Proposal for Extension of Service Life of a Crane**. This proposal shall comprise:

- (a) A **Case Proposal**;
- (b) An **Inspection and Testing Report**;
- (c) A **Final Assessment and Recommendation Report**.

2.2. The owner of the mobile crane shall prepare the Case Proposal. The owner shall engage an **Approved Third Party Inspection Agency for lifting equipment** to carry out the inspection, arranged for testing, conduct an

Date of Issue	Rev 01	Classification	Circular No	CIF A32.4.1
21 May 2002	27 March 2007	Mobile Cranes	OSD/ ENG CIR / LE 3/02	Page 4 of 8

assessment, recommends the estimated remaining service life and proposed an inspection / maintenance scheme.

2.3. The elements of the Assessment Procedures are outlined as follows:

<i>Elements of the Assessment Procedures for Extension of Service Life of a Crane</i>	<i>To be performed by</i>
<p>I) Case proposal:</p> <p><u>Part 1</u> of the Case Proposal is a written record of the crane detailing the following:</p> <ul style="list-style-type: none"> (a) Usage patterns (e.g. number of operating cycles per hour at certain loading condition); (b) Records of any past accidents, failures, defects that could affect the structural integrity of the crane, and replacement carried out; (c) Records of maintenance carried out; (d) Possible modes of failure. <p><u>Part 2</u> of the Case Proposal consist of a proposed scheme to evaluate the remaining service life of the crane and shall include the following:</p> <ul style="list-style-type: none"> (e) The methodology and assessment employed including testing and inspection to be carried out to address the potential fatigue stresses experienced by the crane; and (f) The acceptance criteria adopted. The criteria shall be based on an acceptable code and standard such as <i>British Standards 7910: "Guide on the methods of assessing the acceptability of flaws in fusion welded structures"</i> and any other codes / standards acceptable to the Commissioner for Workplace Safety and Health. 	<p>Owner (can be assisted by the Third Party Inspection Agency)</p>

Date of Issue	Rev 01	Classification	Circular No	CIF A32.4.1
21 May 2002	27 March 2007	Mobile Cranes	OSD/ ENG CIR / LE 3/02	Page 5 of 8

<p align="center">Elements of the Assessment Procedures for Extension of Service Life of a Crane</p>	<p align="center">To be performed by</p>
<p>II) Inspection of the mobile crane:</p> <p>The inspection of the mobile crane shall be carried out in a suitable testing environment and shall include but not limited to the following:</p> <ul style="list-style-type: none"> (a) A thorough visual inspection shall be carried out on the mobile crane. Critical load bearing parts such as the boom section and areas that are not accessible during the annual inspection shall be dismantled so as to facilitate inspection. (b) Welding at critical load bearing parts (e.g. hinges) shall be inspected and any defects shall be recorded. (c) Direct a testing agency to conduct the necessary testing such as NDT or mechanical testing. 	<p align="center">Third Party Inspection Agency</p>
<p>III) Non-Destructive Testing and Mechanical Testing:</p> <p>The following load bearing parts shall be tested using an appropriate testing method to ascertain its mechanical integrity:</p> <ul style="list-style-type: none"> (a) Main Jib/Boom (b) Fly Jib and / or other attachments; and (c) Slew rings (d) Hook Blocks (e) Wire ropes, etc <p>The Third Party Inspection Agency may specify other parts of the cranes to be tested if he has reason to believe that there are possible defects, which can only be detected by NDT.</p>	<p align="center">SAC- SINGLAS accredited testing laboratory</p>
<p>IV) Inspection and Testing Report</p> <p>At the end of the inspection and testing, a report shall be prepared and shall include the following details:</p> <ul style="list-style-type: none"> (a) General condition of crane based on the visual inspection; (b) Location where visible defect/s was/were found; (c) Method/s of Non-Destructive Testing used; (d) Description of the types of flaws detected (with photographs attached) (e) Recommend any corrective actions to be carried out on the crane. 	<p align="center">Third Party Inspection Agency</p>

Date of Issue	Rev 01	Classification	Circular No	CIF A32.4.1
21 May 2002	27 March 2007	Mobile Cranes	OSD/ ENG CIR / LE 3/02	Page 6 of 8

Elements of the Assessment Procedures for Extension of Service Life of a Crane	To be performed by
<p>V) Assessment</p> <p>The Third Party Inspection Agency shall thereafter review the results of the inspection and testing based on the proposed methodology and assessment carried out on the mobile crane and carry out, if his professional experience and judgement think it necessary, a stress analysis on critical locations of the crane.</p>	Third Party Inspection Agency
<p>VI) Recommendations</p> <p>The Third Party Inspection Agency shall then recommend an estimated remaining service life for the crane based on his professional experience, and the possible failure mode and mechanism stipulated in the Case Proposal.</p> <p>The Third Party Inspection Agency shall also propose an inspection / maintenance scheme for the crane for the extended service life, so that any defects or deterioration in the crane can be detected and actions can be taken to remedy any unsafe situation before the mechanical integrity of the crane is affected.</p>	Third Party Inspection Agency
<p>VII) Final Report</p> <p>At the end of the assessment, the Third Party Inspection Agency shall furnish a report to the Commissioner for Workplace Safety and Health, submitted through the owner of the crane. The report shall detailed the results of his Assessment and Recommendations as outlined above and shall be duly endorsed by the Third Party Inspection Agency.</p> <p>This final report would be used as supporting document by the owner to apply to the Commissioner for Workplace Safety and Health for the extension of the service life of the mobile crane.</p>	Third Party Inspection Agency

3. IMPORTANT NOTES

3.1. The Third Party Inspection Agency and the testing agency appointed under Section III Non-Destructive Testing and Mechanical Testing **shall be independent** of each other.

Date of Issue	Rev 01	Classification	Circular No	CIF A32.4.1
21 May 2002	27 March 2007	Mobile Cranes	OSD/ ENG CIR / LE 3/02	Page 7 of 8

3.2. The crane shall meet the requirements as stipulated in the *Factories Act* and its subsidiary legislations. It shall also comply with the requirements of the *Singapore Standard Code of Practice 37: Safe Use of Mobile Cranes: 2000*.

3.3. **The extended service life of the mobile crane if granted will be for a period not exceeding 3 years.** Owner of cranes who wish to extend further the service life of his crane is required to carry out another assessment.

Date of Issue	Rev 01	Classification	Circular No	CIF A32.4.1
21 May 2002	27 March 2007	Mobile Cranes	OSD/ ENG CIR / LE 3/02	Page 8 of 8