



Construction Plant-hire Association
Tower Crane Interest Group



Tower Crane Technical Information Note

TIN 051

Thorough Examination of Self-erecting Tower Cranes

1.0 Scope

This Technical Information Note deals with the particular issues associated with the thorough examination of self-erecting tower cranes (SETCs)

NOTE: This does not include vehicle mounted tower cranes, which are generally treated in the same way as mobile cranes

2.0 Regulatory Requirements

The Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) require that all lifting equipment, including SETCs, is thoroughly examined by a competent person in the following circumstances:

- At regular intervals (a period not exceeding 12 months, if persons are not lifted, or 6 months if persons are lifted);
- After erection on a new site;

NOTE: The need for thorough examination of SETCs when deployed on a new site or in a new position on site will depend on the extent of assembly from components (see 3.0)

- After any major alteration or exceptional circumstances have occurred.

NOTE: Exceptional circumstances include an overload, jib clash, collision, use for particularly arduous duties, failure of a structural component or being subjected to weather in excess of design parameters.

It is good practice to set maximum intervals for tower crane thorough examination (including SETCs) at less than the 12 or 6 months required by LOLER. This decision should be taken by the hirer or the competent person, taking into consideration the condition of the crane, the intensity of use and the location on which it is working.

Top slew tower cranes are invariably erected on site from a selection of components and must therefore be thoroughly examined after erection and before they are taken into use. They are then thoroughly examined at the appropriate periodic intervals for as long as they remain on that site. Thorough examination is also required when any alteration is made to the crane's structure or configuration.

3.0 Thorough Examination of SETCs

The requirement for a post erection thorough examination of SETCs will depend on the extent of assembly from components carried out during the deployment of the crane on site. In the case where a SETC arrives at site, is positioned on a prepared base, connected to a power supply, deployed by unfolding with its own winches or hydraulic cylinders, and where no additional components are put into the structure; then no thorough examination following erection will be required, as the crane will not have materially altered since its last periodic examination. The report of this thorough examination must still be current. A parallel may be drawn here with mobile cranes.

On the other hand, a SETC where, after delivery to site and positioning on a prepared base, the deployment of the crane structure requires the assembly of additional components will require a thorough examination after erection, as is the case with a top slew tower crane.

In either case checks should be carried out on site after installation to ensure that all crane motions and limits are functioning correctly.

Irrespective of the need for thorough examination, all SETC bases should be designed, constructed and inspected as set out in TIN 031 *Tower Crane Bases and Ties*. This includes the provision of a Tower Crane Foundation Approval/Completion Form (see **TIN 031, latest issue, page 3**) confirming that the base has been correctly designed and installed, before the SETC is erected.

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3.1 Particular issues

Some SETCs present particular problems for thorough examination when erected. Frequently the access up the tower, particularly through the tower head, and along the jib is very restricted. Consequently it is extremely difficult to provide the person carrying out a thorough examination on site with safe access complying with the requirements of the Work at Height Regulations. Where this is the case, the use of a MEWP should be considered to allow thorough examination to be carried out safely.

3.2 Two stage thorough examination

One approach to dealing with access issues on those SETCs which require thorough examination following erection on site, is to adopt a two-stage approach. The first stage is to carry out a thorough examination of the crane, probably in the owner's depot, paying particular attention to those areas which are inaccessible when the crane is erected. The second stage is to carry out a thorough examination on site, following erection, to ensure that the crane has been assembled correctly and that there is evidence that the base design/installation is satisfactory (see **3.0 paragraph 4**).

The first stage will focus on the condition of the crane and its components, whilst the second concentrates on the assembly of the crane, its correct functioning, and evidence of the adequacy of the supporting ground and base.

Before carrying out the first stage of the thorough examination, an assessment of the particular crane should be carried out to identify those areas of the crane with poor access when erected. It may be necessary to provide safe access to inaccessible parts of the crane during the first stage using equipment such as a MEWP. Future developments in survey equipment may allow remote examination of inaccessible parts of the crane, both in depots and on site.

For the second stage the competent person carrying out the thorough examination should be provided with a Tower Crane Foundation Approval/Completion Form for the base signed by a competent engineer as proof of the base's integrity (see **3.0 paragraph 4**).

Both stages of the thorough examination should be recorded and when the second (on-site) stage has been completed, a full report of thorough examination, including any testing, should be produced.

In the case where the two stages of thorough examination are carried out by two different competent persons it is essential that they communicate effectively and that the person carrying out the second stage raises any queries on the first stage before completing the full report of thorough examination.

Further information on the thorough examination of SETCs is given in **Annex 6** of the CPA *Best Practice Guide on Maintenance, Inspection and Thorough Examination of Tower Cranes* which can be freely downloaded at <https://www.cpa.uk.net/tower-crane-interest-group-tcig-publications/>

3.3 Planning for two-stage thorough examination

Planning for the two-stage thorough examination of an SETC should include consideration of who will carry out the thorough examination. The same competent person may carry out both stages or they may be undertaken by different competent persons. If different persons carry out each stage, it is essential that the competent person undertaking the second stage is provided with the results of the first stage so that they can take this into account during their examination and when preparing the Report of Thorough Examination for the crane.

The competent person(s) may be from a third-party inspection body or an employee of the crane supplier. Whichever option is chosen the competent person must be sufficiently independent and if the competent person is an employee of the crane company, they should be independent from the employer's line management chain. The competent person undertaking the thorough examination of an SETC should not have been involved in the erection or maintenance of the crane, except in exceptional circumstances.



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Such circumstances may include the remote location of the crane, where the provision of a competent person who has not been involved in the erection or maintenance of the crane is not reasonably practicable.

In these limited circumstances the duty holder should have:

- a. considered all the options for conducting a thorough examination;
- b. identified that it is not reasonably practicable to have the thorough examination conducted by an independent competent person;
- c. ensured that the person who is to do this work is suitably qualified and independent to the extent that would be required for another competent person; and
- d. recorded how they arrived at their decision about who should carry out the above functions, with particular emphasis on the consideration of reasonable practicability and suitable independence.

Only then, can a thorough examination be undertaken by the same person undertaking the erection and/or maintenance. In these circumstances the erection or maintenance and the thorough examination should be undertaken as separate activities. The thorough examination should be completed, and all findings recorded in the report of thorough examination before any maintenance/repair or correction of defects found during the thorough examination is undertaken.

3.4 Overload testing following erection

As with thorough examination, the need for overload testing will depend on the extent of assembly from components carried out during the deployment of the crane on site and is at the discretion of the competent person carrying out the thorough examination.

Overload testing should be carried out in accordance with Clause 9 of BS 7121-2-5:2012, Code of practice for the safe use of cranes Part 2-5: *Inspection, maintenance and thorough examination – Tower cranes*.