



# Tower Crane Working Conditions Best Practice Guidance

**STRATEGIC**  **FORUM**  
FOR CONSTRUCTION

## Strategic Forum for Construction Tower Crane Group

Association	Representing
Allianz Engineering	Safety Assessment
Barrett Homes	Home Builders Federation
Battersea Crane Disaster Action Group	Public Opinion
Bovis Lend Lease	Strategic Forum
Bovis Lend Lease	Major Contractors Group
Carillion	Contractors
City Lifting	Tower Crane Suppliers
Construction Confederation	Construction Confederation
ConstructionSkills	ConstructionSkills
Construction Plant-Hire Association	Construction Plant-Hire Association
Falcon Tower Cranes	Tower Crane Suppliers
Galliford Try	Major Contractors Group
Home Builders Federation	Home Builders Federation

HSB Engineering Insurance	Safety Assessment Federation
Health and Safety Executive	Health and Safety Executive
HTC	Tower Crane Suppliers
Kier	Major Contractors Group
Manitowoc Crane Group	Tower Crane Manufacturers
McCarthy and Sons	Construction Clients
Mitsui Insurance	Insurers
Select Tower Cranes	Tower Crane Suppliers
St. George Plc.	Construction Clients
Stephensons	Contractors
UCATT Convenor, Bovis Lend Lease	UCATT
United Crane Operators Association	Tower Crane Operators
Vertical Transportation	Tower Crane Suppliers

## Tower Crane Operator Working Conditions Group

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Construction Confederation	Construction Confederation
UCATT Convenor, Bovis Lend Lease	UCATT
T&G UNITE	T&G UNITE
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United Crane Operators Association	Tower Crane Operators

## Foreword by Stephen Williams



**Chief Inspector of Construction, Health and Safety Executive, Chair of the Health and Safety Commission's Construction Industry Advisory Committee (CONIAC)**

The UK construction industry relies on the use of tower cranes to move materials around site. Tower cranes are an essential part of the construction process and can help solve some of the problems on site arising from a lack of space. They are a valuable tool when used and managed properly.

Sometimes, during the buzz of activity and the need to meet deadlines or targets, the person operating the tower crane is overlooked. However, the safety critical nature of the tasks that they perform means that in addition to being qualified and competent it essential for employers to ensure operators are in good health, fit for the job and that proper attention is given to their welfare at work.

This guidance is aimed at all those involved in crane operations and provides information on occupational health management and acceptable working conditions for tower crane operators. It has been produced by representatives of different parts of the construction industry and gives a clear commitment to improving working conditions and occupational health management of tower crane operators. Implementation of the standards set out here can only be achieved by collaboration between operators, hirers and those in control of work on site. The industry must take responsibility for its own progress.

This guidance is simple but comprehensive and easy to adopt. It represents good practice and is a useful reference for those who are unsure of the legal requirements for occupational health and welfare. I thank those who have been involved in its preparation and commend this guidance to anyone who owns supplies, controls or operates tower cranes. Please read the publication and turn the advice into action.

## Foreword by Shelley Atkinson-Frost



**Director of Health and Safety, Construction Confederation, Chair of the Strategic Forum Tower Crane Operator Working Conditions Group**

This group is passionate about improving the working conditions of tower crane operators. All construction workers, including tower crane operators, should be respected and respect others.

We will do all we can to ensure that industry adopts this simple best practice. We also look forward to working with tower crane operators to raise the standards across the whole of the industry.

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# Summary

## Rights and Responsibilities

### 1. Responsibilities of those in control of operations

- Ensure a safe system of work is in place before operations commence.
- Keep a site file of relevant information for safe operation of tower cranes to be held by the appointed person including lifting plan, method statements, thorough examination and inspection certificates, licenses to operate etc.
- Provide necessary information, instruction and training for safe operation of tower cranes including to whom the operator reports.
- Provide adequate working conditions including welfare facilities
- Ensure that the tower crane has been thoroughly examined and/or inspected at the necessary time intervals and is safe to use.
- Provide suitable and sufficient communication routes for and between all involved in operations and the site management.
- Facilitate and encourage open discussion on safe and unsafe practices
- Ensure adequate resources including competent supporting operatives such as banksmen, slingers etc
- Ensure co-ordination on multi-crane sites including anti-collision procedures
- Use only licensed radios with an isolated frequency to avoid public interference

### 2. Rights of Operators

- Authorised to operate the machine
- Authorised to make final decisions to ensure safe lifting operations taking into account external factors such as wind speeds, other site activities etc
- Provided with suitable and sufficient breaks to ensure they can maintain concentration and combat fatigue.
- Informed of and provided with mechanisms for worker engagement and consultation
- Provided with adequate working conditions including welfare facilities

### 3. Responsibilities of Operators

- Operate the crane in a correct, safe and efficient manner in accordance with the manufacturer's manual
- Keep the manufacturer's manual in the cab at all times
- Follow all site safety rules
- Carry out basic maintenance duties including pre and post start checks
- Keep all areas of the crane including the crane cab, walk ways, rest platforms and back jib clear of obstructions and debris
- Immediately report any breakdown or faults to supervisor
- Immediately report any health or safety issues including incidents or change in external factors which could affect safe operation
- Accurately complete all documents such as timesheets, check sheets and training log book.
- Ensure not under the influence of alcohol or drugs during working hours.
- Not to operate override keys/limit switches
- Not to use mobile phones (or other mobile devices) when operating the crane
- Be competent in authorised communication (e.g radio)



# Information, Instruction and Training

## 1. Training and Experience

- As a minimum, should hold a CPCS certificate and be adequately trained for the type of equipment being operated and have sufficient knowledge of the machine and its safety devices. Evidence of training must be provided to the site management.
- Must be familiar with the controls of the particular crane being operated. This should be confirmed by the provision of record of familiarisation training provided by the crane supplier prior to commencing work on site.
- Should have been trained sufficiently in the mechanics of their machine so as to be able to carry out daily checks and weekly inspections.
- Should have been trained in the hand-signalling system to be used and, where necessary, in the use of radios for receiving instructions.
- Should be familiar with the use of any fire fighting appliances fitted to the equipment.
- Should only carry out roles they are trained to undertake and under the direct instruction of an appropriate person.

## 2. Provision of Information etc.

Operators should:

- Be familiar with the emergency procedure and means of escape, where relevant.
- Attend regular site co-ordination meetings to keep abreast of current activities.
- Be provided with lifting plan, method statement on the safe operation of the crane.
- Be familiar with the method and system for inspection and maintenance of the crane and lifting equipment.
- Be familiar with the crane manufacturers operation and service manuals.
- Have understanding of the electrical safety procedures.
- Be aware of the procedures to be adopted in the event of an accident or injury.





## Health Issues

### 1. Fitness for Work

Tower crane operations are 'safety critical' meaning that a safety failure of the task could have significant impact on the health and safety of the operator and/or others. It is vital therefore that the tower crane operator is sufficiently healthy to carry out his operations safely.

- Particular emphasis may need to be paid to the following:
  - Medical fitness which should include good:
    - Eyesight.
    - Hearing.
    - Reflexes.
    - Head for heights.
  - Contractors should be able to confirm that their tower crane operators have no known condition that would prevent them from operating the plant safely. This could be achieved through requesting a fit for task medical certificate.
  - The Constructing Better Health website provides information on occupational health standards, which also include suggested test procedures such as Electrocardiograms (ECG's) -

<http://www.constructingbetterhealth.co.uk/standards.asp>

- Periodic medical examinations would usually be every 3 years (but may be more frequent depending on individual circumstances).
- Aptitude for judging distance, height, speed and perspective.
- Operators may be subject to random on site drug and alcohol testing supported by an internal disciplinary and grievance procedure for positive results.
- Operators should be physically capable of operating the controls and climb efficiently without undue fatigue.

For employed operators, the delivery of the fitness for task health assessment can be addressed through the employer contracting with a registered Constructing Better Health (CBH) occupational health provider. For the self employed there are other sources - see <http://www.constructingbetterhealth.co.uk> for more details

### 2. Thermal Comfort

There are legal requirements to ensure workers are provided with adequate protection from adverse weather. Industry should seek to achieve a range between 16-25 degrees to be maintained at all times. This can be attained by providing adequate ventilation and shading (via windows/fans, etc) for summer months and adequate heating arrangements for winter periods. Alternatively, crane owners should consider specifying air conditioning for new plant as a practicable solution when purchasing new equipment.

**Prior to erection checks should be made that:**

- Doors and windows are free from draughts.
- Glazing is free from cracks or scratches.
- Window stays are fitted and guarding is in place.
- Window wipers are fully operational.
- Shading provided where necessary.
- The heater and air circulation fan operates properly.
- The floor mat is free from any trip hazard (such as cuts, tears or debris).
- The seat is comfortable, provides proper support and it adjusts properly.
- If fitted, that air conditioning equipment is maintained and working properly.

Maintenance of these thermal control systems should be incorporated into a preventive maintenance plan to ensure that the operators thermal comfort is assured at all times.



## Conditions of Operation

### 1. Affects of Long Hours and Fatigue

Workers often view the opportunity of paid overtime as a means of supplementing their salaries.

Employers view long hours as means of getting the maximum benefit out of limited resources, however the reverse is the more likely outcome including increased sickness absence, low morale, lower productivity and quality of work outputs, greater health and safety risks and fatigue.

An operator who is fatigued is unable to perform tasks effectively and will be less alert, less able to stay alert, process information and will have slower reaction times and less interest in working compared to a person who is not fatigued. It is often a root cause of major accidents.

Sites should focus on the system for controlling excessive working hours and shift patterns likely to cause fatigue. The legal duty is on employers to assess and manage risks from fatigue, irrespective of any operator's willingness to work extra hours or preference for certain shift patterns for social reasons.

Employers/those in control should avoid early morning starts before 07.00am, and take into account a crane operator's commute to work time, since both can reduce sleep and increase the risk of fatigue. Daily split shifts, should also be avoided as they often do not allow enough recovery time between shifts. If split shifts cannot be

avoided, then the operators must have access to suitable on-site catering and rest facilities. Employers should assess the risks of making any changes to shift patterns before they are implemented.

### 2. Hours of Work (per operative)

To ensure that tower crane operators are not subject to long periods of operating without a break, and the consequent risk of fatigue and loss of concentration, each site with a tower crane is required to provide a relief operator where necessary to ensure that the criteria below can be met.

For these purposes – the following definitions apply:

#### WORK PERIODS

*Operation time* – time in the cab functioning the crane.

*Site time* – time at work from arrival on site to departure.

#### BREAK PERIODS

- Breaks should be pre-planned and taken every 2-3 hours.
- No other tasks to be carried out during this period.
- The period does not include climbing time.

*Rest break* – non-operation time which could be taken in the cab.

*Lunch Break* – non-operation time to be taken away from the cab.

### 3. Hours of Work Breakdown

OPERATION	PERIOD
Maximum period of operation time (it is advisable to allow within this time, short periods of rest away from the crane controls)	4 Hours
Minimum rest break	15 mins
Minimum lunch break	45 mins
Maximum period of operation in any day	8 hours
Maximum weekly hours of operation	40 hours
Maximum weekly hours of site time	48 hours

#### 4. Numbers of Operators Breakdown

The table below gives the minimum number of operators required for a given number of tower cranes in continuous use on a site:

Number of Tower Cranes	Number of operators
1	2
2	3
3	5
4	6
5	7
6	9

In addition to the above, on sites with multiple crane activities, a competent crane co-ordinator must be provided to implement the lifting plan developed by the Appointed Person.



#### 5. Climbing

The industry aims to reduce the amount of climbing undertaken by plant operators. Achieving this will have a two-fold benefit; it will reduce the length of time necessary for operators to access their place of work and may

introduce a cost saving due to a reduction in downtime for the crane operating.

- Where practically possible, climbing should be kept to a minimum. A specific target would be impractical as it would not take into account the operators physical fitness or other factors which would affect the operators' ability to climb.
- Crane operating companies should consider, during the selection of crane, how best to incorporate walkways where cranes are tied into the building. This would have the effect of minimising the climbing to be done by the crane operator.
- Climbing time should be considered as part of the working day, and calculated when considering breaks, etc. This target can be achieved in several ways, one such method is the inclusion of hoists on the crane to effectively eliminate the need to climb at all. Hoists would need to be designed with their purpose in mind and take into account the dynamic effects of being coupled to the crane so as to ensure adequate stability.
- Crane manufacturers should continue to develop crane design in an attempt to eliminate all climbing in the future.

#### 6. Welfare

There are legal requirements for welfare facilities on construction sites. Tower crane operators should be provided with the same level of welfare facilities as all other site operatives with the opportunity to use them when required taking into account the working hours requirements above.

It is not acceptable to expect tower crane operators to use toilet facilities which fall below the basic legal standards.

In summary the following welfare facilities should be available for use by tower crane operators:

- Suitable and sufficient toilets which are clean, adequately ventilated and lit.
- Suitable and sufficient washing facilities close to the toilets with clean hot and cold or warm running water. These should be clean, well ventilated and lit, and include soap and towels.
- Adequate supply of clean drinking water at suitable places with cups, or from a jet.
- Suitable and sufficient rest rooms or rest areas with tables and seating with backs. There also needs to be arrangements to ensure meals can be prepared and

eaten, facilities for boiling water and the facilities to be kept at the appropriate temperature.



- Special arrangements for first aid including mobile first aid kits.
- Arrangements for emergencies should be established and the relevant people trained.

## 7. Lone Working

Lone workers are those who work by themselves without close or direct supervision. Lone working on tower cranes should be avoided where possible.

In the exceptional circumstances where lone working is necessary, it is vital to ensure that the lone worker is not put at any higher risk than other workers. A specific risk assessment should be carried out which states any control measures needed to protect the operator's health and safety. Principally it is important to consider whether the risks of the job can be properly controlled by one person. Other considerations should be given to whether:

- All equipment and substances can be safely handled by one person.
- There is the possibility of violence from others.
- The operator is medically fit and suitable for working alone.

Protective control measures could include:

- Devices to raise the alarm.
- Periodic visits from a supervisor/manager.
- Checks that the operator has returned safely home on to their base/workplace.

## Disciplinary and Grievance Procedures

Operators will at all times be subject to their employer's disciplinary and grievance procedures as appropriate.

Additionally in the event of a matter involving a tower crane operator where a decision has been made to remove the operator from site, the following general procedures should be invoked:

- The site based worker representative should immediately be advised.
- The crane operator is informed by the person in control of the need for his/her removal with a full explanation in writing of:
  - the circumstances surrounding the decision; and
  - details of the appeals procedure.
- The appeals procedure should provide the opportunity for two hearings:
  - Between the crane operator and a representative of his/her choice and person making the complaint.
  - Between the senior manager of the main contractor, the person making the complaint, the crane operator and a representative of his choice.
- When the crane company is informed of the operator's removal, the crane company should check to ensure that the appeals procedure has been followed.
- Where it is clear that such procedures have not been followed, the crane company must insist that the operator cannot be removed until such a process has been undertaken.
- In the event of significant and serious allegations, an agreement must be struck between the crane company and main contractor. Serious allegations may include, but are not limited to:
  - Serious disregard for safety.
  - Switching off safety limits or tampering with safety devices.
  - Being under the influence of alcohol or drugs.
  - Violent conduct.





The Strategic Forum for Construction Health and Safety Group is a sub group of the Strategic Forum for Construction. It is the only construction forum that seeks to represent the whole of the construction community. It comprises senior industry figures who are committed to addressing the health and safety issues of the construction industry through ownership, leadership and partnership. The forum's activities are both proactive and reactive but at all times seek to work in partnership across the industry to achieve long term improvements.

The Tower Crane Group was formed to produce industry best practice guidance to improve the planning, management, operations and communication of tower crane activities across the whole of the construction industry.

For more information visit  
[www.strategicforum.org.uk](http://www.strategicforum.org.uk)