The voice of steel distribution

Safety During Crane Maintenance

(Richard Carter – September 2013)

Introduction

There are many hazards associated with maintenance generally, but maintaining cranes can be particularly dangerous:

- Access may be difficult
- Working on cranes inevitably means working at height
- There may be other activity in the vicinity or adjacent bays
- In a breakdown situation, production pressures may be significant

As a result it is essential that crane maintenance is properly planned and controlled. Key issues to consider are:

Planning

Planned preventive maintenance is inherently safer than during a breakdown. Tasks can be effectively planned, people and equipment will be available and there should be less time pressure on individuals to do the work.

Consider all scenarios and decide how you would tackle each of them. Ask the question "What would we do if…?" By doing this, risks can be thought through in advance and procedures documented so people don't have to think "on the run".

Permit to Work

Due to the potential risks of crane maintenance, a formal permit to work system should be applied. A good permit will define the main controls that need to be in place such as how to access the crane, any necessary isolations, what segregation is needed and who needs to know about the work. Competence of personnel can also be checked and confirmed, as can availability and suitability of Personal Protective Equipment (PPE)

Segregation

The work area needs to be segregated effectively to prevent injury or damage. A number of risks may be present and should be considered:

Potential for items, tools or equipment to fall from the crane
Potential for mobile plant or other equipment to collide with the crane (or access equipment

such as mobile elevated work platforms (MEWPS)
Potential for cranes on the same gantry to collide with the crane being maintained
Potential for cranes or loads on adjacent gantries to collide with workers (e.g. maintenance on end carriages, long-travel wheels or gantries
Potential for overhead issues – e.g. goliath cranes with other cranes running on a higher gantry

The 20' rule (originating in the old Factories Act) is a good guide for the segregation distance but this should be regarded as a minimum. The method of establishing the "exclusion zone" may vary but could include banners lowered from the crane, barriers or lights at floor level, using lookouts or in some cases, installing physical stops on crane rails to prevent other cranes encroaching on the working area.

Isolation / Immobilisation

Isolations need to be specified. This may be isolation of the crane itself, isolation of the whole bay or even adjacent bays. Working on or near live conductors, particularly downshop conductors or rails should be considered. Isolations need to be allocated to named competent individuals and wherever possible, isolators should be locked off. Equipment should be "checked for dead" before work commences, as with any electrical isolation.

Access

- Access to cranes can be problematic, particularly in breakdown situations as stock or process lines may obstruct access equipment. As highlighted in "planning" above, consider all scenarios and decide on the best method to access the crane. Document the method and train relevant people.

- Permanent access steps or ladders should be provided where possible, particularly in locations where planned maintenance would take place. In other areas, MEWPs may be used but note that it is strongly recommended that people should not climb out of a MEWP to gain access onto a crane.

- Use of one crane to gain access to another crane may be considered, but only in exceptional circumstances. In such cases, both cranes should be engineered to facilitate safe passage from one crane to the next – climbing over rails etc should be avoided.

- Use of portable ladders should be considered only in exceptional circumstances and if no other safer alternative is practicable. As with crane – to – crane access, the crane needs to be engineered appropriately to allow transfer from the ladder to the crane as necessary.

- Do consider how tools and equipment will be taken onto the crane. Workers should not carry items in their hands while climbing ladders.

Fall protection

The Work at Height Regulations have number of provisions but in this context, employers are required to prevent falls or, if this is not possible, mitigate the consequences of a fall. Falls can occur when accessing the crane as well as when working on it, so all circumstances need to be considered.

- Tall, vertical access ladders pose a risk – traditional "hoops" are now known to be relatively ineffective so proprietary fall protection / fall arrest systems similar to those in use on tower cranes may be required

- Many cranes have working platforms complete with fencing barriers – these are ideal for some tasks (e.g. work on crane electrical panels if situated appropriately) but consider how people get to / from them.

- Some tasks, such as work on cross travel components, inevitably require people to go near an unprotected edge. In these circumstances, fall protection / prevention measures are necessary. Dependent on circumstances a whole range of equipment is available – harnesses, lanyards (fixed length, telescopic, some with fall arrest cushioning built in), wire fall arrest systems or fixed anchorage points).

- Businesses should seek advice from competent people as to the most appropriate type of equipment for their scenarios. There are stringent requirements for maintenance and inspection of such equipment, and any users need to be adequately trained.

Functional testing

It is often the case that tests need to be carried out with the power on and, occasionally, with guards removed or panels open. This may be part of the fault-finding process or testing following repair. Such tests need to be properly controlled.

- Ensure responsibilities are clearly allocated and understood – who is in charge, who will control the crane, what is the communication protocol, who will act as lookout etc.
- The test should be formally authorised through the permit system
- If the test is done with someone on the crane, consider their safety and implement effective controls. Consider such issues as fall prevention, potential to strike overhead objects such as roof stanchions / trusses, stability of tools and equipment etc.

Rescue from height

The Work at Height Regulations require suitable emergency procedures to be in place. Where fall restraint (i.e. prevention) can't be used and fall protection (i.e. fall arrest) equipment is in use, procedures need to be in place to rescue anyone who has fallen and is suspended from the crane.

Note that The Health & Safety Executive will not accept the use of the emergency services (Fire & Rescue) as the sole method of rescue so additional systems need to be established. A variety of equipment is available – some is self-activated, others need to be set up and operated by one or more rescuers. Once again, it is recommended that advice be sought from competent people to ensure the equipment selected is suitable.

Additional information is available on the HSE website:

Working at height
http://www.hse.gov.uk/falls/index.htm

Maintenance, including isolation & permit to work
http://www.hse.gov.uk/safemaintenance/