Queensland Government
Department of Employment and Industrial Relations

MOBILE CRANE REPAIR OR ALTERATION AND THE ROLE OF PROFESSIONAL ENGINEERS - INFORMATION SHEET -

Background

The *Mobile Crane Code of Practice 2006* contains the following information on mobile crane alteration (19.1.3):

"Where an alteration has been made to the design of a crane, the competent person must be an engineer with suitable knowledge and experience. It is likely that the competent person will need to perform engineering calculations on the crane design to determine that it complies with relevant technical standards".

In addition section 19.8 states in part:

"All repaired or replaced parts must comply with the recommendations of a competent person, taking into account the requirements of this code and appropriate Australian Standards or any other relevant technical standard."

Section 16A(2) of the *Workplace Health and Safety Regulation 1997* also provides that:

"A certificate of registration of registrable plant design for a design of plant stops having effect if the design is changed in a way that requires new measures to control risk.

Example of change in design causing certificate to stop having effect–

A certificate of registrable plant design is in force for the design of a mobile crane. The crane's reach is increased by fitting a longer boom, which increases the risk of the crane overturning. The certificate stops being in force because of the change."

A piece of plant requiring registered plant design must not be used when the certificate of registration for plant design is not in effect.

Issues

There have been concerns raised as to when a professional engineer is to be used to provide written certification for crane alterations and repairs and whether this information should be obtained before the crane is used for lifting.

Unless repairs or alterations are undertaken in accordance with the crane manufacturer's instructions, a professional engineer is to supervise the repair or alteration process and provide written certification for the repair or alteration.

Where the design is altered, it is preferable for the crane manufacturer to specify the change in design. In some limited situations professional engineering certification may not be required depending on whether technical information has been supplied by the crane manufacturer and the type of damage or type of alteration that the crane has had.

Example 1: Localised repair to hydraulic boom – professional engineer required.
One section of the telescopic boom on a hydraulic mobile crane has received severe localised damage and requires either replacement of the steel plate in the damaged area or replacement of the complete boom section. Replacement boom sections are no longer available from the crane manufacturer. The decision is made to cut out and replace a section of the steel plate on the boom. This process also requires welding of the boom. No specific procedures exist from the crane manufacturer for this type of repair. A professional engineer is to be engaged to assess the damage and determine whether it is safe to repair, specify the repair procedure, and supervise and provide written certification for the repair of the crane. Repairs, including welding procedures, are to undertaken by competent persons. The certification should be to relevant Australian Standards including AS 1418 and AS 2550. Testing of the crane prior to final certification and operation may be required by the professional engineer.

Example 2: Alteration to crane through the addition of a boom extension – professional engineer required.
A crane owner decides they want to fit a boom extension (rooster sheave) to the final stage of a hydraulic crane. The crane manufacturer does not have design specifications for carrying out this alteration. A professional engineer must be used to specify the design for the rooster sheave after carrying out calculations in accordance with AS1418. In addition, the professional engineer will also review the design of the crane to determine if fitting the rooster sheave will affect the safe operation of the crane. Until certification from a professional engineer has been obtained, the crane must not be operated.

Example 3: Replacement of boom lacings in compliance with manufacturer's directions – professional engineer not required.
A number of lacings on a lattice boom crane have been bent and require replacement. Inspection of the boom does not identify any damage to the main chords of the boom. In the maintenance manual for the crane the manufacturer provides repair procedures for replacement of the boom lacings. The crane repairer replaces the damaged lacings in compliance with the documented repair procedure supplied by the manufacturer. The repairer ensures that a qualified welder carries out the welding in accordance with the crane manufacturer's welding procedure. The material specification for the replacement lacings has been obtained (i.e. in the form of a steel mill certificate) and is consistent with the manufacturer's specifications. Until certification from a competent person that states the manufacturer's repair procedures have been followed, the crane must not be used. Documentation for the repair procedure is to be maintained by the crane owner. The competent person does not have to be a professional engineer. Professional engineering input has already been included in the manufacturer's repair procedures.

Conclusion

The *Mobile Crane Code of Practice 2006* requires that repairs and alterations to mobile cranes are to be performed by competent persons and written verification on the adequacy of the repair is to be available. Where the repair procedure or assessment is outside of the manufacturer's written instructions, a professional engineer is to supervise and certify the repair or alteration procedure. Sufficient information to ensure the safe operation of the crane must be obtained before the crane is used for lifting.

Notes:

(1) Nothing in this information should be seen as discouraging the involvement of a professional engineer in any crane repair, if this is the crane owner's decision.

(2) Although the *Mobile Crane Code of Practice 2006* uses the term "engineer" this is considered to be a professional engineer as defined in the code of practice.

For further information

Further information on suspended slabs and mobile cranes can be obtained by accessing the Department of Employment and Industrial Relations website (www.deir.qld.gov.au), by calling Infoline (1300 369 915) or by contacting:

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