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Lifting Industry Standards

CICA-Endorsed ENGINEER'S COMPETENCIES

1. Introduction

This document states the eligibility criteria for applicants seeking CICA recognition in the specific area of practice of Crane Major Inspection Certification, Repairs and Modification, Design Verification, Engineered Lifts, Lifting gear - Engineer. The scope of practice will be expanded into other areas after the program is established and running effectively.

The guideline has been prepared by the Crane Industry Council of Australia (CICA).

i) STANDARDS & ADMINISTRATION

The setting of standards and administration of the registration scheme is the responsibility of the CICA competency panel.

ii) ASSESSMENT

Assessment of applications is the responsibility of the CICA-endorsed engineer's assessment panel.

iii) PURPOSE

The guideline is intended to help owners and operators of cranes to choose who to engage for specific tasks such as major inspections, repairs and modifications, design verification, engineered lifts, and lifting gear.

2. Background

Cranes are used by businesses that have a high expectation that they will be able to do so safely. In Australia, state and territory governments are responsible for the regulation of occupational health and safety, which includes the use of cranes in workplaces and construction sites.

Crane owners and operators relocate, assemble, check, and operate their equipment in accordance with manufacturers' instructions and procedures, and those recommended in the relevant part(s) of AS2550. However, the technical expertise of the engineering profession is essential for major inspections, repairs and modifications, design verification, engineered lifts and lifting gear.

3. Guidelines

Eligibility Criteria and Procedure for Recognition in the Specific Area of Practice.

3.1 Areas of Practice

The following areas of practice apply:

i) Major Inspections

ii) Repairs and modifications

iii) Design Verification

iv) Engineered lifts

v) Lifting gear

3.2 Crane Classes

The following classes of cranes are covered, but not limited to under this scheme

i) Mobile Cranes
ii) Vehicle Loading Cranes
iii) Concrete Placement Booms
iv) Self-Erecting and Tower Cranes
v) Overhead Travelling Bridge Cranes

3.3 Endorsement

Applicants will be endorsed by the assessment panel for the areas of practice and cranes as stated in Section 3.1 & 3.2.

4. Competency Requirements

Applicant shall be able to demonstrate core competencies as listed in the sections following and other competencies as applicable.

4.1 General

A. **Legal and Regulatory Requirements**

i) Work within Acts and Regulations and Standards in force in the jurisdiction where the crane is installed, set up, design registered or is item registered.
ii) Understand the nature of due diligence and the legal consequences of practice in this area
iii) Implement appropriate risk management strategies and have adequate professional insurance
iv) Develop relationships with regulatory bodies to acquire knowledge of current regulations, requirements and incidents.
v) Demonstrate working knowledge of the appropriate standards that apply to cranes.
vi) Demonstrate that no conflict of interests exist with owners/users of cranes being assessed.

B. **General Competencies**

i) Demonstrate an understanding of the relevant areas relating to cranes in general: i.e. Stability, Strength, Fatigue, Crane Classifications, Dynamic Effects, Power and Control Systems, Safety Devices and Interlocks.
ii) Be sufficiently competent to provide specific direction to personnel more qualified in certain disciplines than the applicant. Be sufficiently competent to interpret the result of other third parties contracted during and inspection or repair. For example, it is not expected that the engineer conduct the NDT inspections, but they must be able to direct the NDT technician to critical inspection areas for inspection and make judgment on the reported results.
iii) Be able to diagnose the cause of faults or defects that arise from time to time and develop appropriate procedures to mitigate their effect.
iv) Demonstrate a sufficient understanding of welding techniques and processes as may apply to various materials.

4.2 Cranes (As listed in Item 3.2)

i) Demonstrate an understanding of lifting, rigging, and load handling techniques that are used on all cranes

ii) Demonstrate an understanding of load charts, their construction use and limitations.

iii) Demonstrate an understanding of the operation and application of load indicators, rated capacity limiters, limit switches, and other safety devices.

iv) Demonstrate an understanding of expected design life, remaining life before, and after, a major inspection.

4.3 In-Service Inspection Competencies

The following core competencies are considered essential to practice as a CICA-endorsed crane engineer:

A. **Scope of Inspection**

i) Agree with the owner or lessee the scope of work to be undertaken and develop a documented scope of work for the specified task.

ii) Investigate and take into account the existence of previous Crane**Safe** or similar third party independent inspection results, maintenance records, mechanical repairs, crane loadings, whether complete or partially complete where available

iii) Select appropriate testing techniques (including test loading) and establish reporting criteria for inspection

iv) Select and facilitate external testing

B. **In-Service Inspection**

i) Take account of transportation and assembly conditions when inspecting cranes in operation

ii) Inspect cranes at different phases of assembly

iii) Make reasonable appraisal of crane's dynamic behaviour, load paths and stability

iv) Observe and record the effect of start-up, balance, steady operation, stopping and emergency responses

v) Direct operation of equipment in test modes

vi) Assess safety and reliability of power and control equipment

vii) Make reasonable appraisals of electrical and electronic control devices and their operability

viii) Identify critical components, especially components critical to personnel safety, and closely examine them

ix) Examine repair work or modifications (the existence of which has been advised by the operator, maintenance records, owner or noted during inspection)

x) Direct disassembly or surface preparation to aid inspection

xi) Determine the effect of stiffness, backlash and clearances on the principal load paths during all phases of operation

xii) Identify and understand the significance of alterations and repairs to equipment

xiii) Understand the implications of site installation and to take account of ground conditions and the possible effects of wind and water

xiv) Understand the service and wear tolerance recommendations of the original equipment manufacturer

C. **Reporting**

i) Report anomalies

ii) Interpret the results of external testing

iii) Report faults using a clear component identification system

iv) Make recommendations for rectification and/or provide reasons for refusing certification

v) Certify repair work on the basis of appropriate inspections.

vi) Certify modifications on the basis of an assessment of design implications.

vii) Use appropriate minimum reporting techniques

viii) Recommend future major inspection schedule

ix) State status of crane for continued safe use

D. **Continuing Professional Development**

i) Compile information including manuals, drawings, inspection reports, photographs, alerts and notifications relating to cranes

ii) Review owner's and operator's written and verbal reports of incidents, repairs and inspections and draw conclusions based on engineering principles

iii) Consult colleagues to broaden knowledge of equipment

iv) Make links with industry associations to provide ongoing input for operators.

4.4 Eligibility Requirements for Registration

A. Registered as a Member under the Institution of Engineers Australia (MIEAust); or preferably

B. Registered as a Chartered Professional Engineer under the Institution of Engineers Australia (CPEng); or

C. Registered on the National Professional Engineers Register (NPER); or

D. Registered Professional Engineer of Queensland (RPEQ) and

In addition to their qualifications and experience, applicants will need to demonstrate:

E. That inspection, design validation, engineered lifts, and/or designed lifting gear for cranes is a regular part of their professional employment or practice.

F. Their competencies (Section 4 above) on cranes of the class to be inspected

G. That they practise independently or under general direction as an in-service inspector.

H. That they would exercise due diligence in supervising technologists or reviewing inspections carried out by proprietors' staff or Crane**Safe** assessors.

NOTE: Registration for a class of crane does not guarantee that the registered practitioner is familiar with a particular crane. The Code of Ethics constrains practitioners from working outside their area of competence (see 3.2 above).

5. Application and Assessment Process

The following sections indicate the action you must take to gain certification and to register as a cranes engineer.

5.1 Registration in a General Area of Practice

A. Registered as a Member under the Institution of Engineers Australia (MIEAust); or preferably

B. Registered as a Chartered Professional Engineer under the Institution of Engineers Australia (CPEng); or

C. Registered on the National Professional Engineers Register (NPER); or

D. Registered Professional Engineer of Queensland (RPEQ)

5.2 Registration in the Specific Area of Practice

A. You must provide a statement summarising recent responsibilities in the area of practice you are seeking endorsement in.

B. Your Statement of Experience must clearly show that you have the competencies listed in Section 4 above and a working knowledge of the equipment for which you will provide services. You must demonstrate an awareness of any requirements for transport; assembly, maintenance; post assembly inspection, site establishment inspection and daily inspection and test run procedures for equipment you will inspect or provide engineering services for. If applying to perform Major Inspections, you must show that you have participated in non-destructive testing and annual in-service inspection for cranes..

C. You must submit at least two examples of reports that you have prepared. Your examples must show a systematic approach to the task and to question records provided by the owner or operator and to understand what is important to safety.

D. Where you have inspected a crane for the first time or a repair or modification has been encountered, you must show how additional specialised competencies have been gained to suit the specific case.

E. You must have your documents reviewed by an experienced professional engineer and endorsed as being a true representation of your work.

F. Include with your application the names and contact information for three persons who can substantiate your involvement in the crane areas of practice for which you seek endorsement in.

G. Finally, you must complete and sign an application for registration in the specific crane industry area of practice.

6. Assessment

Your application, statement of experience, and examples of prior work will be analysed for evidence that you have exercised the competencies of an in-service inspector of cranes. The CICA assessment panel will examine the submitted examples and review your statement of experience. Where competency is not evident, your application will be returned to you for further work and substantiation.

If your application is made in accordance with Sections 5.2, the assessment will be based on the Australian Engineering Competency Standards and will normally include a professional interview conducted by an assessment panel having expertise in in-service inspection of cranes. At the discretion of the CICA assessment panel, interviews may also be conducted if the applicant is already a Chartered Member of Engineers Australia or registered in a general area of practice.

The interview enables a quality assurance check of the educational and professional experience detailed in your application and may include some technical questions on the relevant examples you submitted.

7. Conflict of Interest

7.1 A person directly or indirectly associated with undertaking the on-going general repair & maintenance of a particular crane is not eligible to inspect that crane under this agreement.

7.2 In addition, no engineer shall conduct inspections for any Equipment Distributor, whether new, used or rented, that they have any direct or indirect association with.

8. Insurance Requirements

8.1 CICA-endorsed engineers must have a minimum of $20,000,000 public liability insurance.

8.2 CICA-endorsed Engineers must have professional indemnity insurance. $5,000,000 is sufficient for normal engineering activities but this insurance needs to be increased to the value of the crane being inspected if the unit exceeds $5,000,000.

9. CICA Indemnity

CICA-endorsed engineers shall indemnify CICA and any other associated advisory groups for any damages arising from their own negligence, mistakes or omissions arising from the provision of any crane engineering services.