## MAJOR ASSESSMENT REPORT

### Company Details

| | | | |
|---|---|---|---|
| Company Name | | | |
| Company Contact | | | |
| Contact email | | | |

### Independent Engineer

| | | | |
|---|---|---|---|
| Service Provider | FIELD Engineers | | |
| Engineering Oversight | Jonn Grimmond | Date Completed | 04/2/2019 |
| Engineering Approval | Slawek Drabot | Date Completed | 06/2/2019 |

### Statement of Safe Use

The cranes, identified here in, owned and operated by JSIS Engineering have undergone a major assessment according to the requirements of Australian Standard AS2550.1- 2011. The cranes identified are considered safe to use within the requirements noted.

### Requirements for Continued Safe Use

- The cranes are maintained as per OEM procedures (including daily checks and hour-based service intervals),
- Cranes have a current third party annual inspection certificate,
- The load indicating and limiting system are functional and calibrated to relevant Australian Standard,
- The cranes are scheduled for Major Inspections as outlined by FIELD Engineers within this report,
- The outlined inspection schedules are reviewed to be consistent with any revision to AS2550.11 during the operating life of the cranes.

### CRANE DETAILS

| Unit ID | Manufacturer | Serial number | Year of Commissioning | Model | Classification |
|---|---|---|---|---|---|
| JS-02 | Tadano | EU7059 | 2009 | ZE 293 HRS | C1/M1* |
| JCS-07 | Tadano | EU7236 | 2011 | ZE 294 HRS | C1/M1* |
| JS-08 | Tadano | EU7207 | 2011 | ZE 295 HRS | C1/M1* |
| JCS-50 | Tadano | EU7060 | 2010 | ZE 294 HRS | C1/M1* |

* Determined from AS1418.1-2001 Appendix D

| SUMMARY OF COMPETENCIES | |
|---|---|
| **FIELD Engineers** | **Independent Engineer** |
| FIELD Engineers is ISO9001 certified for the provision of professional engineering design, product development and project management services. Major inspection of cranes is performed under the oversight of Registered Professional Engineers in Queensland. FIELD Engineers is an active member of the Crane Industry Council of Australia and has CraneSafe inspectors undertaking crane inspection activities | |
| **600 Cranes** | **Maintenance supplier** |
| 600 Cranes offer a full range of servicing, work-shop facilities and sales in Melbourne, Sydney, Perth and Brisbane including remote and off-shore servicing, maintenance and inspections for Tadano vehicle loading cranes. 600 cranes are also an accredited repairer for Tadano products | |
| **CraneSAFE** | **3rd Party Inspector** |
| The CraneSAFE program provides crane owners and operators with a process for third party assessment of the safety aspects of their cranes that complies with the requirements of Parts 1, 3, 4, 5, 11, 19 and 20 of AS2550 for annual inspection. The annual inspection completed for JSIS previously have been undertaken by James Galea from JRG services. Each crane has been in the CraneSAFE program since commissioning | |

| Ref # | REFERENCE REQUIREMENTS DOCUMENTS | |
|---|---|---|
| R01 | **AS2550.1 Cranes hoists and winches – safe use Part 1 – General requirements** | **Standards Australia** |
| | Definition of major assessment requirements for practical and theoretical components of cranes for continued safe use | |
| R02 | **AS2550.11 Cranes hoists and winches – safe use Part 11: Vehicle-loading cranes** | **Standards Australia** |
| | Definition of major inspection requirements for inspection, test and documentation activities | |
| R03 | **Guide to 10 Year Major Inspection** | **Crane Industry Council of Australia** |
| | Definition of major inspection requirements for the competency of personnel undertaking major inspections as well as further explanation of requirements for inspection, test and documentation activities | |
| R04 | **Major Inspection Key Issues Forum Minutes** | **Work Health & Safety QLD** |
| | Quantitative criteria for assessment of structural integrity of crane components. This document was developed during a forum conducted on the 25/2/2015 by Work Health & Safety QLD. Participants included regulatory technical experts, crane manufactures, repairers and representatives from the Crane Industry Council of Australia | |
| R05 | **AS1418.1 Cranes, Hoists and Winches Part 1: General requirements** | **Standards Australia** |
| | Requirements within Australia for the design and construction of cranes and similar lifting appliances | |
| R06 | **AS1418.11 Cranes, Hoists and Winches Part 11: Vehicle-loading Cranes** | **Standards Australia** |
| | Design requirements for mobile cranes (EN 12999:2011, MOD) | |

## DEFINITIONS

| Periodic Third-Party Inspection | | AS2550.1 – 2011 Section 7 | |
|---|---|---|---|
| **Tasks** | **Description** | **Competency** | **Frequency** |
| Review of maintenance records | Review of historic data to confirm maintenance regime and compliance to Australia Standard in regards to inspections | Competent person | Annually |
| Visual inspection and functional testing | Practical inspection of the plant to confirm that the unit is safe for continued use including the function of the load limiting devices | | |

| Major Assessment for Continued Use | | AS2550.1 – 2011 Section 9 | |
|---|---|---|---|
| **Tasks** | **Description** | **Competency** | **Frequency** |
| Review of lifting plant documentation | Review of historic data to confirm that the maintenance regime is suitable and that the unit is compliant to Australia Standards in regards to inspections and compliance to design standards | Professional engineer | As determined by periodic inspection |
| Analytical estimate of design life | Design working period calculation to determine theoretical remaining design life | | |
| Reporting | Development of documentation outlining the findings of the assessment including, current condition, life projection and maintenance strategy | | |
| Visual inspection and functional testing | Practical inspection of plant to confirm that unit is safe for continued use including the function of the load limiting devices | Competent person | |

| Major Inspection | | AS2550.11 – 2016 Section 6 | |
|---|---|---|---|
| **Tasks** | **Description** | **Competency** | **Frequency** |
| Definition of scope | Outlining required inspections to be undertaken of critical components for continued use | Suitable qualified person | After 10 years of operation and every 5 years thereafter |
| Review of compliance to current Australian Standard | Confirm that outstanding manufactures upgrades have been completed and that the item is complaint to the current Australian standards were practical | | |
| Reporting | Development of individual reports outlaying the works conducted including any limitations or non-conformances found during the inspection | | |
| Component review | Strip down and inspection of critical component's outlined within the scope of inspection. Where applicable, the Major Inspection shall include removal, dismantling and inspection of the following items:<br>• Crane structure, fasteners and welds,<br>• Mechanical items inclusive of gearboxes & bearings,<br>• Hydraulic cylinders, hoses & values,<br>• Electrical control, power and safety components. | Competent person experienced in each of the following:<br>- Fabrication trade<br>- Mechanical trade<br>- Hydraulic systems<br>- Electrical trade | |

## Competencies

| Name | AS2550.11 – 2016 |
|---|---|
| Experienced technician | A person who, due to their vocational background and experience, has sufficient skill and knowledge in the field of cranes and is sufficiently familiar with the relevant regulations to determine deviations from the proper conditions |
| Suitable qualified person | A professional engineer or independent crane inspector competent to manage a major inspection |
| | **AS2550.1 – 2011** |
| Competent person | A person who has acquired through training, qualification, experience or a combination of these, the knowledge and skill enabling that person to correctly perform the required task |
| Professional engineer | Is defined in the Australia Standard as one of the below:<br>• A person registered in a relevant area of practice on the National Professional Engineers Register;<br>• Where applicable, a Member of a Scheme established under Professional Standards Legislation in the relevant jurisdiction,<br>• A Chartered Professional Engineer (CPEng),<br>• Other person providing satisfactory evidence to a responsible authority that they have the qualifications and experience to be competent to independently perform the required tasks. |

## SUMMARY OF RECCOMENDATIONS

| Unit Number | Action | Year to be completed |
|---|---|---|
| JS-02 | Complete major inspection as per AS2550.11 | 2024 |
| JSC-07 | Complete major inspection as per AS2550.11 | 2026 |
| JS-08 | Complete major inspection as per AS2550.11 | 2026 |
| JSC-50 | Complete major inspection as per AS2550.11 | 2025 |

## RECCOMENDED INSPECTION SCHEDULES

| Unit | Routine Inspection | 3rd Party Inspections | Major Inspection | Replacement [1] |
|---|---|---|---|---|
| JS-02 | 3 Monthly | Annually | 15 years then every 5 years* | 2048 |
| JSC-07 | 3 Monthly | Annually | 15 years then every 5 years* | 2064 |
| JS-08 | 3 Monthly | Annually | 15 years then every 5 years* | 2064 |
| JSC-50 | 3 Monthly | Annually | 15 years then every 5 years* | 2034 |

**Comments**

* Initial major inspection recommended at 15 year from commissioning based on DWP assessment of the highest utilisation. Additional Major Inspection schedules recommended to be conducted at 5 year intervals to align with the expected environmental deterioration of the hydraulic system.

## RISK MANAGEMENT FOR NON-CONFORMANCE

| Unit ID | Non-conformance | Risk Management Method |
|---|---|---|
| | | |
| | | |
| | | |

## SUMMARY DESIGN WORKING PERIOD ASSESSMENT

| Information | | | Structure | | | | Mechanism | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Unit ID | Years in service | Load spectrum factor | Class | Estimated utilisation (%) | Remaining life | DWP use per year (%) | Class | Estimated utilisation (%) | Remaining life | DWP use per year (%) |
| JS-02 | 10 | L1 | C2 | 25 | > 25 years | 2.5 | M1 | 21 | > 10 years | 2.1 |
| JSC-07 | 8 | L1 | C2 | 9 | > 25 years | 1.1 | M1 | 11 | > 10 years | 1.4 |
| JS-08 | 8 | L1 | C2 | 10 | > 25 years | 1.2 | M1 | 11 | > 10 years | 1.4 |
| JSC-50 | 9 | L1 | C2 | 27 | > 25 years | 3.0 | M1 | 38 | > 10 years | 4.2 |

Usage history for DWP calculation has been supplied by client based on job history. Factor for duty estimation has been applied to this data in line with AS2550.1 – 2011 Table 9.6.2

[1] Replacement date based on estimated of complete utilisation of design life by either structural or mechanical components whichever comes first.

## INSPECTION SUMMARY

| | |
|---|---|
| **Unit Number** | **JS-02** |

### Load Testing

| | | | |
|---|---|---|---|
| Test Date | 20/11/2018 | Reference Document | VLC A 135736-8 |
| Test Type | Line Pull | Load Measurement Method | Load Cell |
| Test Load | 3100 kg | Test Status | Pass |
| | | | |
| Test Type | Stability | Load Measurement Method | Load Cell |
| Test Load | 690 kg | Test Status | Pass |

Test Description – CraneSAFE assessment conducted at JSIS Engineering Mackay.

### Comments

Testing observed by FIELD Engineers on 20-11-2018 also included:

1. Braking test to 100 % of line pull.
2. Motion limits of the RC limiter.

FIELD ENGINEERS

| | | | |
|---|---|---|---|
| PROJECT: | 00502-001 | DOCUMENT #: | 00502-001-C001A |
| CLIENT: | | DATE: | 4-01-2019 |
| SUBJECT: | | BY: | J.Grimmond |

## Machine Particulars

| | |
|---|---|
| Assessment Date: | 04-01-19 |
| Client: | |
| Crane Owner | |
| Crane Model: | ZE293 HRS |
| Crane Serial # : | EU7059 |
| Date of Manufacture: | 2009 |
| Years in operation: | 10 |
| Maximum Rated Capacity: | 3.03 |
| Main Hoist Model Number: | ZE293 HRS |
| Factor for Duty Estimation : | 1.5 |

### Overview

The Design Work Period (DWP) assessment has been carried out per the requirements of AS2550.1-2011 clause 9.2.2 (e). This document uses lift information supplied to calculate the winch hours. Conservative estimation included installing the baulk head to each gate once per year, including work box movements for maintenance.

## Crane Structure

OEM supplied the crane classification.

| OEM Design Classification | *Name* | *Value* | *Unit* |
|---|---|---|---|
| Crane Class | | C2 | |
| Design Working Period | S.DWP | 16000 | [cycles] |

| DWP Calculation | | | |
|---|---|---|---|
| Design Life | S.DL | 25 | [yrs] |
| Calculated Duty History | S.DH | 4062 | [cycles] |
| Percentage Usage of DWP | S.DWP.pc | 25% | [%] |
| Projected DWP Usage per year | S.DWP.pca | 2.5% | [%/yr.] |
| Remaining Design Cycles | R.DWP | 11938 | [cycles] |
| Projected Remaining Life at current utilisation | S.PL | > 25 Years | [yrs] |

### Findings

The crane structure appears to be operating at duties far below its assumed classification. At current usage rates the structure the will be effected more by deterioration of its mechanical seals and the electrical system exposure to environmental factors. Regulator maintenance is to be upheld, structrual inspection to be completed due to crane age.

FIELD ENGINEERS

PROJECT: 00502-001
CLIENT:
SUBJECT:

DOCUMENT #: 00502-001-C001A
DATE: 4-01-2019
BY: J.Grimmond

## Main Hoist - Mechanical

The Design Work Period (DWP) assessment has been carried out per the requirements of AS2550.1-2011 clause 9.2.2 (e). This document uses lift information supplied to calculate the winch hours.

OEM Supplied the winch classification.

| | *Name* | *Value* | *Unit* |
|---|---|---|---|
| **Design Classification** | | | |
| Hoist Serial Number | | ZE293 HRS | [#] |
| Hoist Classification | | M1 | |
| Design Working Period | M.DWP | 100 | [hrs] |
| Line Pull Capacity | | 0.7575 | [t] |
| Reeving | | 4 | |
| Hoist Lifting Capacity | | 3.03 | [t] |
| **DWP Calculation** | | | |
| Design Life | M.DL | 10 | [yrs] |
| Calculated Duty History | M.DH | 21 | [hrs] |
| Percentage Current use of DWP | M.DWP.pc | 21% | [%] |
| Projected DWP Usage per year | M.DWP.pca | 2.1% | [%/yr.] |
| Remaining design hours | R.DWP.h | 79 | |
| Projected Remaining Life | M.PL | > 10 Years | [yrs] |

**Findings**

The DWP shows that the winch will not exceed its design life prior to the next major inspection. Regulator maintenance is to be upheld.