

27 July 2017

## **Possible Safety Issues – Sermac Concrete Placing Unit Booms and Periodic Inspections**

This letter has been sent to alert your members to a specific concern with a critical component on Sermac manufactured truck-mounted Concrete Placing Units, and to provide relevant prevention guidance applicable to all concrete pumping units.

An incident occurred in Melbourne in 2015 involving the failure of a Sermac Model Z 41 concrete placing unit's boom. A boom linkage failed that resulted in the boom's collapse. Assessment of the failed linkage by an independent consultant engaged by the owner identified inadequate weld penetration of an external weld that may have contributed to the failure.

The triangular linkages are located at some joints between boom sections, as depicted in the Photograph 1.

A similar incident occurred in 2012 involving the failure of a boom triangular linkage component on a Sermac concrete placing unit. Welds on the component were identified to have failed, allowing the boom section to partially collapse.

Initial analysis of the failure by the manufacturer and consultants engaged by the unit operator identified the following issues with the boom linkage component;

- insufficient penetration of external welds, and
- incorrect or missing internal welds in comparison to the manufacturer's design drawings.

Additionally, an annual inspection had been carried out on the unit earlier in the year, however non-destructive inspection was not specifically conducted on the component that failed. The Sermac manual described general periodic checks of the boom, including inspection of welds and structural components for the presence of cracks; however specific non-destructive inspection requirements were not provided for the triangular linkage components.

Furthermore, the closed box construction of the triangular linkage means that the internal welds were not readily accessible for inspection. Disassembly of the boom section to access the triangular linkages (including creation of an inspection opening, as specified, verified and made by a suitably

competent person, to allow for internal weld inspection) and/or the use of more advanced non-destructive testing techniques, such as radiographic (x-ray) testing, are likely to be needed for a thorough inspection of the linkages.

Inspection of a limited number of other Sermac concrete placing unit triangular linkage components was conducted by the owner which identified similar problems to that of the failed unit, indicating the faults may not be an isolated issue.

It should be noted that AS 2550.15-1994 "*Cranes – Safe use Part 15: Concrete Placing equipment*" (the 'Australian Standard') specifies that non-destructive inspection of all critical areas for evidence of cracking is to be considered for annual inspections. AS 2550.15-1994 represents the minimum expected safety risk control measures for use of concrete placing units.

Additionally, the Australian Standard describes the conduct of major inspections to assess units for continued service, and notes that the major inspection should include further non-destructive examination of all critical areas for evidence of cracking.

Inspection of a limited number of triangular linkage components on other Sermac concrete placing units has also identified similar problems to that of the failed unit.

Accordingly, WorkSafe recommends that operators of Sermac units contact their supplier for further advice, or engage a suitably competent person experienced in crane and concrete placing unit inspections to examine their unit's boom components in accordance with inspection criteria listed in the Australian Standard, including non-destructive inspection of all welds on the boom triangular linkages.

As general guidance for all concrete placing unit operators, where manufacturers do not specify critical component non-destructive inspection requirements, WorkSafe Victoria recommends that operators should engage suitably competent persons to assess their units to identify critical components, and then develop and specify non-destructive inspection requirements as part of the annual and major inspection schedule.

If units have had major inspections carried out without inspection of critical components, WorkSafe Victoria recommends that operators should contact their suppliers for further advice, or engage a suitably competent person experienced in crane and concrete placing unit inspections to examine their units in accordance with criteria listed in AS 2550.15, including non-destructive inspection of critical components.

Based on any findings and recommendations from the supplier or competent person engaged, operators should ensure that any rectification works deemed necessary are carried out.

If you require further information from WorkSafe Victoria, please contact Dermot Moody, Construction Program Manager on 03 9641 1845 or Les Kriesfeld, Engineering Unit Manager, on 03 9641 1555.

Yours sincerely



Dermot Moody - Construction Program Manager  
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Victoria



Triangular Linkage

Photograph 1