

Rationale/Analysis for KSC List of Cranes Used for Load Testing

With the issuance of the July 1988 version of the NASA Lifting Standard, there was a provision/paragraph added to allow cranes to load test other lifting items such as slings, or lifting fixtures, based on a specified percentage of rated load of the respective crane and a safety analysis report.

The paragraph at the time read as follows: "Cranes should not be used to load test items such as slings or lifting fixtures unless specifically identified to do so based on a specified percentage of rated load and safety analysis report. This is to prevent damage to the crane due to sudden unloading should the test article fail."

As a result, KSC initiated and completed a design/safety analysis to determine what percentage of rated capacity of overhead cranes would be acceptable, such that if the device being tested completely failed, the crane would not be damaged. It was determined that 50% of the rated capacity for an overhead crane be the limit used when testing another lifting item. See attached Interdepartmental Communication.

Also, the KSC LDEM initiated meetings with mobile crane engineering and operations personnel to effectively do the same analysis for mobile cranes. The outcome of that analysis was to recommend a 75% limit of rated capacity for any given mobile crane when testing another lifting device.

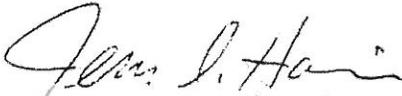
In addition, as part of the rationale/analysis at the time, KSC developed a set of requirements to follow when using a crane to load test another lifting item, initially placing same in a KSC document, and these requirements are now in Appendix D of the NASA Lifting Standard, NASA-STD-8719.9. See attached.

The above is the KSC history and rationale/analysis for those designated cranes used to load test other lifting devices.

This list is maintained by the KSC LDEM on the KSC LDE web page; <http://ksc-lde.ndc.nasa.gov/>, in accordance with KNPR 8715.3, Chapter 11, which states "Only those cranes approved by the LDEM shall be used to load test other lifting devices."


Malcolm Glenn, KSC LDEM

It needs to be emphasized that proofloading with cranes is a dangerous practice and reducing the load to 1/2 the crane capacity does not eliminate all risks, but, I feel that the risks are acceptable.



Jesse L. Harris, Supervisor
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JLH:law

cc: H. Beqley	LSO-429
M. Donahue	LSO-124
M. Glen	RT-ENG-1/enc.
E. Isley	LSO-123
J. Jamba	LSO-294
D. Kelley	TE-FAC-2/enc.
E. Lytle	DF-FED-33/enc.
H. Morrison	LSO-427
C. Parker	LSO-428
A. Stevens	LSO-291
W. Szczepanik	LSO-429

APPENDIX D

CRANE/HOIST REQUIREMENTS TO LOAD TEST OTHER LIFTING EQUIPMENT

Overhead cranes and hoists should not exceed 50% of their rated capacity and mobile cranes/derricks should not exceed 75% of their rated capacity when used to load test other lifting equipment, unless specifically designed for and dedicated for such use. The following requirements shall be followed when a crane/hoist is used to load test other lifting equipment:

- a. Crane/hoist hook and load line(s) shall only be loaded vertically.
- b. A certification of the initial proof load test or the current periodic load test shall be supplied with the lifting equipment prior to performing the load test.
- c. Items to be tested by an overhead crane shall be freely suspended from the crane hook with the height of the test not to exceed 6 inches above the floor/working surface.
- d. Items to be tested by a mobile crane shall be suspended from the crane hook and the height of the test shall not exceed 6 inches, or the lowest reasonable height based on dimension and test article configuration.
- e. No overhead crane shall be used to load test items attached to an immovable object.
- f. When a mobile crane is used to load test items attached to an immovable object, the boom angle shall be minimized as much as safely possible to prevent the boom from contacting the boom stops when load testing.
- g. For lattice boom mobile cranes, the boom shall be adequately restrained to prevent damage to the crane due to sudden unloading should the test article fail.
- h. A load-sensing device shall be installed in the lifting assembly.