

AVOID VERBAL ORDERS

TO: Distribution November 16, 1997
FROM: EI-C-A/M. Glenn
SUBJECT: 11/4/97 Lifting Equipment Meeting Minutes and **"MORE"**

A meeting to discuss lifting equipment issues was held on November 4, 1997, from 10:00 am to 11:00 am in the Operations Support Building, Room 6101H.

Meeting attendees were as follows:

NAME, MAIL STOP

Malcolm Glenn, EI-C-A
William Jones, F674
Joe Degano, F674
Stephen Koca, USK-353
Michael Neuzil, USK-131
Larry Jones, PZ-D2
Ray Tuttle, BOC-035
Chuck Freed, USK-715
Andy Warren, PZ-D2
Mark Gross, USK-291
John Garrett, USK-291
Henry Tuten, USK-708
John Fraley, PK-H
Melvin Green, USK-291
Walter Szczepanik, USK-429

Meeting agenda items were as follows:

1. NSS/GO-1740.9 status
2. KHB 1710.2C, Annex G
3. Proposed chapter to NSS/GO-1740.9B on mobile aerial platforms
4. Cal/OSHA applicability to lifting equipment at DFRC, OLF-Palmdale and VAFB
5. Electromagnetic wire rope inspection device RTOP
6. USA Heavy Equipment rigging vans
7. MSFC lifting equipment review
8. Center of Excellence-lifting
9. KSC-STD-141A deviation/waiver
10. Requirements for load testing lifting lugs affixed to shipping containers/boxes

11. 'The Crane Corner'

A video of a crane mishap that occurred at the Air Force Astronautics Laboratory, Edwards Air Force Base, in September 1990, was shown at the end of the meeting. If anyone would like to see the video, please contact me.

Details of the meeting agenda items as well as several other items are as follows:

1. NSS/GO-1740.9 (NASA Safety Standard for Lifting Devices and Equipment) status. The current revision is B, dated November 1991, and there is a change package dated 3/93 affecting 16 pages. The significant change in the 3/93 package was to expand the operational test requirements in paragraph 702c

There were NSS/GO-1740.9B changes agreed to at the June 1993 NASA Lifting Conference held at KSC, however the changes have not been released/incorporated in NSS/GO-1740.9B

One of the changes was to include load measuring devices in Chapter 6. It is intended to issue a draft of Chapter 6, including load measuring devices, so KSC can use it as a working chapter, similar to the proposed chapter on mobile aerial platforms.

ACTION: Issue a draft of NSS/GO-1740.9B, Chapter 6, to include load measuring devices.

ACTIONEE: M. Glenn

2. KHB 1710.2C (Kennedy Space Center Safety Practices Handbook), Annex G. Annex G is the KSC supplement to NSS/GO-1740.9 and incorporates information previously in GP-1098, KHB 1710.2B, K-RQ-0002.1 (KSC List of NonLoad Test Structural Slings) and K-RQ-0002.3 (KSC List of Cranes Used for Load Testing).

I sent out a letter dated September 8, 1997, to a fairly large distribution, stating K-RQ-0002.1 and K-RQ-0002.3 were superseded by KHB 1710.2C, Annex G. Some information from that letter is repeated here:

A requirement previously in K-RQ-0002.1, paragraph 1.6c, did not get in KHB 1710.2C, Annex G, but is still in effect. The requirement is that shackles, master links, turnbuckles, wire ropes, web straps, nylon ropes and piece parts less the structural item(s) require individual periodic load tests. Exceptions will be treated as changes to the list.

Requests for changes to the lists will be by written request to Malcolm Glenn (prime) or Al Demco (backup). Changes will be approved by written response to the requester.

3. Proposed chapter to NSS/GO-1740.9B on mobile aerial platforms. A proposed chapter to NSS/GO-1740.9 on mobile aerial platforms was sent out via email on October 28, 1997. It is intended KSC use this as a working chapter; i.e., it is not mandatory.
4. Cal/OSHA applicability to lifting equipment at DFRC, OLF-Palmdale and VAFB. A question about compliance with California state safety requirements (Cal/OSHA) was recently asked about the Orbiter Lifting Frame (OLF) at Palmdale, the Mate-Demate Device (MDD) at Dryden Flight Research Center (DFRC) and Hangar A Area Cranes at DFRC. It was decided Cal/OSHA requirements apply to the OLF at Palmdale, the MDD at DFRC and Area A Hangar cranes at DFRC. Cal/OSHA requirements which exceed NSS/GO-1740.9B are an annual inspection by a state certified inspector and a quadrennial 125 percent rated capacity proof load test. A Memorandum to Record dated August 14, 1997, under Andy Warren's signature, was sent out to a fairly limited distribution on this subject which included stating the Cal/OSHA requirements will be implemented. The Memorandum is an excellent summary of the subject.
5. Electromagnetic wire rope inspection device RTOP. A final report on Research and Technology Objective and Plan (RTOP) 323-44-08, Electromagnetic Wire Rope Inspection, was sent out to a fairly limited distribution on May 27, 1997. A project summary, from the final report, is as follows:

PROJECT SUMMARY

KSC purchased an electromagnetic wire rope inspection device manufactured by NDT Technologies, Inc., for use in the LC-39 area. After familiarization, the device was used to evaluate wire ropes on the 250 ton Link-Belt mobile crane and the 55 ton hoists at the Mate Demate Device. These wire ropes were evaluated because visual inspection during regularly scheduled maintenance revealed suspect conditions; corrosion on the 55 ton hoist wire ropes and broken wires on the 250 ton mobile crane main hoist wire rope. The wire ropes on the Mate Demate Device were determined acceptable for continued use after evaluation by the electromagnetic wire rope inspection device. The wire rope on the 250 ton mobile crane was replaced after the device confirmed results of visual inspections. The new wire rope was inspected with the device and no defects were found.

Set up was found to be unique for each wire rope inspected, in particular, a means to suspend the sense head. Since set up is unique and can be time consuming for each use, it is intended to use the electromagnetic wire rope inspection device to supplement normal visual inspections when suspect conditions are found.

The electromagnetic wire rope inspection device can be a valuable tool to assist in making decisions about wire rope condition.

The device currently resides with USA Heavy Equipment Engineering and can be used as a KSC resource.

John Fraley asked if the EM wire rope inspection device could be improved to make it easier to use.

ACTION: Get with Dynacs to discuss the EM wire rope inspection device.

ACTIONEE: M. Glenn

6. USA Heavy Equipment rigging vans. A letter under my signature dated September 12, 1997, was sent out to a fairly wide distribution regarding a question. Is it okay to use 'CRITICAL LIFT' tagged equipment from the USA Heavy Equipment rigging vans to lift flight hardware? The letter concluded it was acceptable to use the rigging van equipment within the scope it has previously been used.
7. MSFC lifting equipment review. Several KSC employees (Brad Lytle, Larry Jones, Emery Lamar and Malcolm Glenn) made trips to Marshall Space Flight Center (MSFC) earlier this year to review their lifting equipment/practices per MSFC request. A presentation was made to the MSFC Center Director and a report was submitted to MSFC. Contact one of those who went to MSFC if you need more information.

As an outcome of these trips there were some questions if KSC lifting equipment/practices met the NSS/GO-1740.9B, in particular, on some requirements for mobile cranes. Mike Neuzil summarized these questions and subsequent answers quite nicely in a letter dated May 30, 1997, that was sent to a limited distribution.
8. Center of Excellence-lifting. While at MSFC (reference 7), it was suggested amongst ourselves that KSC has a lot of experience with lifting so we should submit lifting as a Center of Excellence for KSC. Subsequently, lifting has been submitted/proposed to be added to the KSC Center of Excellence Plan.
9. KSC-STD-141A deviation/waiver. A letter under my signature dated November 13, 1997, was sent to a fairly large distribution regarding a

permanent deviation/waiver to KSC-STD-141A, Load Test Identification and Data Marking Standard for. The deviation/waiver exempts non-critical lifting equipment from having quality acceptance on the load test identification tag or band.

10. Requirements for load testing lifting lugs affixed to shipping containers/boxes.
A question was recently asked about the load test requirements for eyebolts and associated D-rings on a shipping container for some International Space Station 3A flight hardware. I wrote an AVO dated October 30, 1997, stating the eyebolts/D-rings were part of the shipping container and not part of the lifting sling, therefore no load testing of the eyebolts/D-rings was required with respect to the NSS/GO-1740.9B. Although the NSS/GO-1740.9B does not specify, there are some helpful words in the Space Shuttle Payload Ground Safety Handbook (KHB 1700.7B), paragraph 4.5.1.1E:

Eyebolts which are permanently fixed to the load are to be considered exempt from proof loading and NDI requirements.

There is also a Record of Discussion dated July 31, 1987, that provides clarification.

ACTION: Determine if we can avoid memos at the last minute, like with the Flight 3A hardware. Possibly set up a meeting to discuss this.

ACTIONEE: William Jones

11. 'The Crane Corner'. The September 1997 issue of "The Crane Corner" from the Navy Crane Center is out. "The Crane Corner" provides good information regarding lifting and is available on the web at the Navy Crane Center URL:

<http://www.efdnorth.navfac.navy.mil/cindex.htm>

Also, Navy lifting requirements documents are available via the Navy Crane Center URL under Downloadable Files; e.g. DM-38, Weight Handling Design Manual and P-307, Management of Weight Handling Equipment.

AFTER THE 11/4/97 MEETING AND OTHER ITEMS OF INTEREST

1. I received a call after the meeting requesting some requirements for jacks be possibly added to NSS/GO-1740.9B. Questions about requirements for jacks have been asked before. Also, earlier this year, an issue about load test requirements for the OPF floor jacks was raised.

ACTION: Prepare a draft chapter to NSS/GO-1740.9B on jacks and send it out, similar to the process for the proposed chapter on mobile aerial platforms.

ACTIONEE: M. Glenn

2. I sent out a letter dated October 29, 1997, titled 'Use of Rotation and Handling Fixture, PMN GH5-00942'. This letter concerns planned rotation operations in the O&C building using two of the 27.5 ton cranes. A question was asked. Is a safety variance to NSS/GO-1740.9B, paragraph 206a(6) required? Paragraph 206a(6) states "Cranes shall not be used for side pulls unless specifically designed to do so." Part of the letter stated:

It is my opinion a safety variance to NSS/GO-1740.9, paragraph 206a(6), is not required for planned rotation operations with the RHF in the O&C building. It is understood these operations can impart side loads to the cranes. In my opinion the O&C 27.5 ton cranes can safely perform these operations which is the ultimate intent of paragraph 206a(6) in NSS/GO-1740.9.

However, it should be noted these particular operations can impart loads across the face of the hoist drum which all parties involved need to be aware of and particularly sensitive to. Therefore, RHF rotation operations with the O&C 27.5 ton cranes will be performed in a manner to minimize side loads to the cranes. It is recommended a qualified person be stationed on the crane trolleys, other than the crane operator, to observe wire rope spooling/movement on the hoist drum and the upper sheave nest during rotation operations with the RHF.

3. There were some questions/issues raised about the Module Vertical Access Kit (MVAK) earlier this year. A couple of the issues were; is the wire rope used large/strong enough and is extra fall protection required since a person is suspended from a single hoist/single wire rope? Numerous discussions/meetings took place and letters/memos were written trying to resolve the issues. A presentation was made to Joel Reynolds on August 19, 1997, which in summary, stated the way we operate MVAK is okay.
4. I sent out a letter dated July 30, 1997, titled 'Remote E-Stops'. A question was asked whether a remote E-stop operator is required for any crane operation or for critical lift crane operations. Bottom line, I know of no requirement in NSS/GO-1740.9B, OSHA or an industry/national standard that says there shall be a remote E-stop or that a remote E-stop shall be manned during operations. NSS/GO-1740.9B, paragraph 201g(8), under electrical design, states an assessment shall be performed to determine the operational needs for remote emergency stops. However, there may be instructions in an

implementing document like an OMI or acceptance rationale in a CIL waiver or a hazard report that state remote emergency stops shall be manned.

Also, specific lifting operations/devices; e.g., the VAB 250 ton cranes, use a remote E-stop because the crane operator(s) view is restricted/obstructed. The VAB 250 ton cranes are one example.

5. An issue was recently raised in the LC-39 area about extending a load test. A PR was dispositioned to extend the load test; however, there was a File VI OMRS requirement to perform an annual rated load test (frequency-360 days). A File VI OMRS exception was required in addition to the PR because the PR does not have precedence over the File VI OMRS.
6. Brad Lytle requested the following be included in the minutes via input received from Brad:

Malcolm,

Please send the following with your minutes of the meeting.

The ASME has just published ASME NUM-1-1996 standard, Rules for Construction of Cranes Monorails and Hoists (with bridge or trolley of the underhung type). This standard covers underhung cranes, top running bridge and gantry cranes with underhung trolleys, traveling wall cranes, jib cranes, monorail systems, overhead hoists and hoists with integral trolleys used at nuclear facilities. This standard, although containing criteria specific to nuclear facilities, also provides basic design criteria for the above listed crane, monorail and hoist equipment that is applicable to such equipment when used at any type of facility.

I have a copy of this document. The KSC Library is ordering it (I don't know how long this will take).

This document can be used for reference and possibly used as a procurement specification in the future. I urge those involved in the purchase of new equipment to get a copy and review it.

Brad

7. The following is a request. **Use me as the point of contact** for lifting equipment load test extensions; reference SPI QA-001 which states "extension of proofload requires the signature of the NASA Director, Safety Assurance."

IN SUMMARY, contact me if you have questions about the minutes, need a copy of something, would like to see the video or whatever. Thanks.

Original signed by
Malcolm Glenn