

Excerpts from Applicable Standards that apply to all Lifting Devices and Equipment used in support of NASA Operations (not all inclusive)

NASA-STD-8719.9 Standard for Lifting Devices and Equipment

1.3 Applicability “Compliance with this standard is mandatory for all NASA-owned and NASA contractor-supplied equipment used in support of NASA operations at NASA installations.....”

10. SLINGS and RIGGING

10.2.1“Sling design shall be in accordance with industry standards and meet the applicable requirements of OSHA and ASME. Sling design shall maintain the minimum design factors listed in Table 10-1.” *For structural slings this design load safety factor is “lesser of 3 times yield or 5 times ultimate” . For shackles, D-rings, turnbuckles, lifting lugs, etc. this design load safety factor is “5” based on ultimate material strength.*

10.3 Testing“Turnbuckles shall be tested at the open position as a minimum. It is recommended that turnbuckles be tested at the open, closed, and midway positions.”

10.3.1 Proof Load Test “Before first use, all new, extensively modified, repaired, or altered slings shall undergo a proof load test at a specified factor.....” *See Table 10-2. “Proof load tests performed by the manufacturer prior to delivery are acceptable, if the necessary load test papers are provided to verify the extent and thoroughness of the test on the specific item.” “All components shall be tested together as a system, if practical.”*

10.3.5 Test Reports a. “Written, dated, and signed test reports shall be prepared after each test.” b.”All load bearing components shall be traceable to the most recent test. This may be accomplished by clearly marking/coding or tethering all components of the assembly, through configuration control, or other procedures. (NOTE: Load bearing components not traceable to load test will invalidate the load test of the whole assembly.)”

10.4.1 “Inspections shall be performed according to this section, the manufacturers’ recommendations, and ASME B30.9.”

10.4.7 Inspection Reports “Written, dated, and signed inspection reports shall be prepared after each periodic inspection.”

10.7 Operations g.”The following materials and techniques shall not be used in slings or rigging hardware to hoist personnel or loads: natural rope, wire rope clips, the fold back metal pressed sleeve or clip technique.”

GPR 8719.1 Certification and Recertification of Lifting Devices and Equipment and Its Operators

P.2 Applicability a. “This directive is applicable to all LDE at Greenbelt, Wallops Flight Facility, and other areas under GSFC cognizance, regardless of ownership, that are operated or used by NASA

employees or GSFC support service contractors, to the extent required in their respective contracts, unless specifically excluded by this directive or by the RECERT Manager.”

1.2 RECERT Manager shall j. “Ensure that certification and/or recertification tests and inspections are performed by personnel properly qualified and certified in accordance with applicable codes and standards.” m. “Review and concur/nonconcur with waiver requests per GPR 1400.1.”

1.7 Certified Crane Operators shall b. “Verify the GSFC RECERT certification status of the LDE is current before commencing lifting operations (using uncertified LDE is a violation of Center Policy);”

2.1.1 Items Subject to RECERT Included in the list are “Wire Rope Slings”, “Structural Slings”, “Lifting assemblies”, “Shackles, Turnbuckles, Swivel Joints, Connecting Links, and other lifting hardware components”

2.2.1 LDE Certification a. “LDE shall be certified, before first use, by the RECERT Manager based upon verification and acceptance of design safety factor, load testing, and nondestructive testing reports and by compliance with NASA-STD 8719.9 and this directive. It shall then be recertified periodically.” b. “All components comprising a critical LE assembly shall be uniquely identified and controlled.....”

2.3.4 Transfer of LDE a. “LDE and associated certification documentation transferred to GSFC shall be reviewed for certification by RECERT.”

2.4.1 Load Testing “Certified test weights or calibrated load cells and test equipment shall be used for all LDE load testing activities.”

2.4.2 Nondestructive Testing b. “All LDE designated for Critical Lifts shall be subjected to NDT inspection”

3.1 Personnel Performing NDT “Personnel performing LDE NDT, including visual inspections, shall be qualified and certified by their employer in accordance with.....ASNT SNT-TC-1A.....”

4. Waivers b. “If a mandatory requirement of this directive cannot be met, a detailed waiver request package shall be prepared.....”

540-PG-8719.1 Lift Sling Design

P.2 Applicability “This document applies to the Mechanical systems Division: Code 540.”

D. Lift Sling Components “Turnbuckles that contain an OEM warning of “not recommended for lifting” shall not be used.”

G. Materials not Permitted”The fold back metal pressed sleeve or clip technique also shall not be used in slings or rigging hardware.”

L. Certification and Tagging of Slings “Only the Recertification Program Manager’s Office (or his designee) can certify, and tag lift slings for use at GSFC.”