NASA Policy Directive

NPD 8730.5B
Effective Date: October 27, 2005
Expiration Date: October 27, 2021

COMPLIANCE IS MANDATORY

Printable Format (PDF)

Request Notification of Change (NASA Only)

Subject: NASA Quality Assurance Program Policy

Responsible Office: Office of Safety and Mission Assurance

CHANGE HISTORY

Chg #	Date	Description/Comments
1	10/24/11	Text to NID_8730_98 was updated and fixed link.
2	05/15/2013	Administrative changes to update Applicable Documents, change paragraph 3.b in Attachment A, update titles in Attachment B and cancel NID NM 8730-98
3	10/2/2014	Update to Applicable Document and References to comply with NPR 1400.1; changes to ensure consistency with NPR 8735.2 and to improve clarity; and deletion of obsolete tags and links.
4	10/31/2016	Update to comply with NPR 1400.1, added a policy statement (14) and c., updated applicability statement, authorities, applicable documents, Measurement/Verification, and updated the Cancellation paragraph.
5	08/11/2017	Added the use of IPC/WHMA-A-620B-S as an alternative standard to NASA-STD-8739.4, an increment in the revision letter for the soldering standard (J-STD-001xS), and added a statement in section 1.b.(14) to ensure the accuracy of measurements.
6	01/25/2018	Added a pointer to NASA-STD-8739.12, Metrology and Calibration, transferred a responsibility from NPD 8730.1 to section 5.b(4) of NPD 8730.5, and cancelled NPD 8730.1.
7	03/23/2018	Added a paragraph under Applicability for use of more recent issues of cited documents. Corrected document titles and added revision dates for ANSI/ESD S20.20, ISO 9001, SAE AS9003, and SAE AS9100. Deleted the acronym for MTE, and added a reference that was not listed for NPR 8705.4.

1. POLICY

a. It is NASA policy to comply with prescribed requirements for performance of work and to provide for independent assurance of compliance through implementation of a quality assurance program.

b. It is NASA policy for quality assurance programs to:

(1) Be designed and implemented in a manner that mitigates risks associated with noncompliance. Determination of risk considers the likelihood of noncompliance and the consequences associated with noncompliance, including the maturity, complexity, criticality, and value of work performed, as well as demonstrated experience with past quality system or program performance.

(2) Attain confidence levels for requirement compliance that are commensurate with the severity of consequences that would be incurred in the event of noncompliance.

(3) Be reevaluated and adjusted based on changes to risk factors.

(4) Include prework assurance measures that provide increased confidence for meeting prescribed requirements (e.g., preaward surveys, qualified source selection, training), concurrent assurance measures to ensure that work is being performed in accordance with requirements (e.g., process control, process witnessing), and postwork assurance measures to ensure that work was properly performed (e.g., inspections, tests, record review, configuration control).

(5) Flow applicable quality assurance requirements down to successive levels of the supply chain to ensure control of subtier suppliers and verification of safety and mission-critical attributes at all levels of the supply chain.

(6) Continually improve through: advocacy; awareness training; teaming and sharing of quality assurance tools, techniques and data; integration of quality assurance processes to prevent duplication of effort; and dissemination/implementation of lessons learned and best practices.

(7) Ensure that customers and Government authorities are quickly notified concerning noncompliant products or failure experiences potentially affecting product safety, reliability, or functionality. Customers and Government authorities include: contracting officers, Government contract management agents, authorities responsible for assigning, managing, or overseeing work, and, where noncompliant conditions might constitute evidence of possible fraud, malpractice, or other serious misconduct, the NASA Office of Inspector General.

(8) Provide for investigative and corrective actions upon discovery or notification of noncompliance.

(a) Investigative actions identify the proximate and root cause(s) of noncompliance and the scope/population of noncompliant items.

(b) Corrective actions include the correction, replacement, repair, or authorized disposition of noncompliant items/conditions, implementation of preventive measures to eliminate the causes of noncompliance, and validation that implemented preventive measures have effectively eliminated recurrence of the noncompliant condition (recurrence control).

(9) Ensure clear and mutual understanding of prescribed quality requirements among organizations responsible for contracting or assigning work, performing work, and assuring conformity of work.

(10) Be performed by persons that are competent on the basis of:

(a) Demonstrated knowledge, skills, and experience related to quality assurance principles and practices, and related to the specific product, process, or attribute for which assurance is being provided.

(b) Meeting formal certification or qualification requirements where prescribed in required/invoked documents or where deemed necessary to ensure personnel competency to perform specialized quality assurance functions.

(11) Be performed by persons that are not assigned direct responsibility for ensuring that cost or schedule objectives are met.

(12) Be supported by records demonstrating compliance with technical/quality requirements. Records shall be legible, traceable to the applicable product, identifiable to the applicable requirement, and readily retrievable for requirement verification.

(13) Include the collection and analysis of quality data for the purpose of identifying and initiating resolution of problem areas (e.g., projects, products, processes, operations, organizations), common deficiency causes, nonconformance trends, defect anomalies, and process variations.

(14) Ensure the accuracy of measurements affecting safety and mission success through the proper selection, calibration, and use of measuring and test equipment that is traceable to the National Institute of Standards and Technology (NIST), or an institution recognized by NIST, to the International System of Units by an unbroken chain of calibrations.

(15) Be performed in accordance with a documented quality system that follows the criteria specified in Attachment A.

c. It is NASA policy to ensure that acquisition contractors implement quality requirements prescribed by contract and deliver conforming supplies and services in accordance with 48 CFR pt. 46, 48 CFR pt. 1846, and NPR 8735.2.

2. APPLICABILITY

a. This NPD applies to NASA Headquarters and Centers, including Component Facilities, and Technical and Service Centers. This language applies to the Jet Propulsion Laboratory, a Federally Funded Research and Development Center, other contractors, recipients of grants, cooperative agreements, or other agreements only to the extent specified or referenced in the applicable contracts, grants, or agreements.

b. This NPD applies to all work associated with implementation of NASA acquisitions (e.g., design, development, manufacture, test, operations, maintenance, refurbishment, sustainment, disposal) and all acquisition products, processes, and services provided by NASA Government organizations, contractors, subcontractors, and grantees, except as excluded in paragraphs 2.c and 2.d below.

> *Note: For the purpose of this NPD, the term "NASA acquisitions" is intended to include work performed in-house by NASA civil servants.*

c. The requirements of this NPD apply to NASA acquisition contracts initiated following promulgation of this NPD. Retroactive application of this NPD to existing acquisition contracts is at the discretion of the applicable NASA program manager and is to be based on a determination of risk related to the retention of existing quality assurance requirements versus implementation of the requirements of this NPD.

d. In this directive, all document citations are assumed to be the latest version unless otherwise noted. Use of more recent versions of cited documents may be authorized by the responsible Technical Authority.

e. This NPD does not apply to: management system processes as defined by NPD 1280.1, where such processes do not directly affect product configuration; information technology and institutional infrastructure projects as defined by NPR 7120.7; software assurance as defined by NPR 7150.2 and NASA-STD-8739.8; procurement of commercial-off-the-shelf (COTS) items; or to contractor support services where such services do not directly affect product configuration.

3. AUTHORITY

a. The National Aeronautics and Space Act, 51 U.S.C. § 20113.

b. Guidance on Federal Conformity Assessment, 15 CFR pt 287.

c. NPD 8700.1, NASA Policy for Safety and Mission Success.

4. APPLICABLE DOCUMENTS AND FORMS

a. Federal Acquisition Regulations, Quality Assurance, 48 CFR pt. 46.

b. NASA FAR Supplement, Quality Assurance, 48 CFR pt. 1846.

c. NPR 8705.6, Safety and Mission Assurance (SMA) Audits, Reviews, and Assessments.

d. NPR 8735.2, Management of Government Quality Assurance Functions for NASA Contracts.

e. NASA-STD 8739.1, Workmanship Standard for Polymeric Application on Electronic Assemblies.

f. NASA-STD 8739.4, Workmanship Standard for Crimping, Interconnecting Cables, Harnesses, and Wiring.

g. NASA-STD 8739.5, Workmanship Standard for Fiber Optics Terminations, Cable Assemblies, and Installation.

h. NASA-STD 8739.6, Implementation Requirements for NASA Workmanship Standards.

i. NASA-STD-8739.12, Metrology and Calibration

j. ANSI/ESD S20.20-2014, Standard for the Development of an Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices).

k. IPC® J-STD-001F, Requirements for Soldered Electrical and Electronic Assemblies.

l. IPC® J-STD-001FS, Joint Industry Standard, Space Applications Electronic Hardware Addendum to IPC® J-STD-001F Requirements for Soldered Electrical and Electronic Assemblies (Chapter 10 of IPC® J-STD-001FS does not apply).

m. IPC® IPC/WHMA-A-620B, Requirements and Acceptance for Cable and Wire Harness Assemblies

n. IPC®/WHMA-A-620B-S, Space Applications Electronic Hardware Addendum to IPC®/WHMA-A-620B

o. ISO 9001: 2015(E), Quality Management Systems - Requirements.

p. SAE AS9003A (2012), Inspection and Test Quality Systems, Requirements for Aviation, Space, and Defense Organizations.

q. SAE AS9100D (2016), Quality Management Systems - Requirements for Aviation, Space and Defense Organizations.

5. RESPONSIBILITY

a. The Chief, Safety and Mission Assurance:

(1) Establishes NASA quality assurance program policies related to NASA work.

(2) Provides technical guidance on the type and extent of quality assurance program requirements that are required and appropriate for NASA work.

(3) Facilitates implementation of quality assurance program requirements.

(4) Oversees Center implementation of quality assurance program requirements, including: review and approval of Center Quality Assurance Program implementation, verification of compliance with the requirements of this NPD, adequacy of quality assurance professional and technical staffing, and adequacy of quality assurance training.

(5) Facilitates continual improvement of the Agency's quality assurance program through: advocacy; awareness training; integration of quality assurance processes; dissemination of lessons learned and best practices; teaming; and sharing of quality assurance tools, techniques, and data.

b. NASA Center Directors:

(1) Delegate authority for managing the quality assurance program to an organization not responsible for the cost or schedule of performing NASA work. This will typically be the Safety and Mission Assurance (SMA) organization.

(2) Assure that the Center SMA Director is provided the needed staffing and skills to implement a quality assurance program that complies with the requirements of this NPD, including Center program/project activities conducted at remote locations.

(3) Obtain approval from the Chief Safety and Mission Assurance for use of any alternative quality system model that does not conform to the quality system requirements identified in Attachment A of this NPD.

(4) Designate a qualified representative to the NASA Metrology and Calibration Working Group (MCWG) to provide Center representation and input at MCWG meetings, workshops, and other designated activities. The MCWG serves as a collaborative forum for the development of Agency requirements, guidance, and tools for effective metrology/calibration program implementation.

c. NASA Center SMA Directors (or other delegated quality assurance organization):

(1) Support program/project offices in the determination of quality assurance requirements to be invoked/applied to the program/project, including identification of the applicable quality system (see Attachment A), quality risks, and associated risk mitigation actions.

(2) Support procurement offices in identifying applicable quality assurance requirements to be incorporated into procurements contracts.

(3) Assure NASA Center compliance with prescribed technical/quality requirements.

(4) Assure tenant NASA program/project compliance with prescribed technical/quality requirements as delegated by the program/project responsible NASA Center.

(5) Support NASA initiatives related to improving quality assurance practices, resolving quality problems, analyzing quality risks, and sharing lessons learned and best practices.

(6) Maintain adequately trained civil service personnel necessary to satisfy the requirements of this NPD and NPR 8735.2.

d. Mission Directorate Associate Administrators:

(1) Provide necessary program dollars for costs associated with Government and contractor implementation of the requirements prescribed by this NPD and NPR 8735.2.

(2) Ensure program planning and acquisition documents incorporate applicable requirements of this NPD, including specification of applicable quality system requirements identified in Attachment A of this NPD.

(3) Identify safety critical attributes and associated Government mandatory inspection points.

(4) Initiate corrective actions upon discovery or notification of noncompliance.

e. Procurement officials:

(1) Incorporate quality assurance requirements identified in Attachment A of this NPD into procurement contracts utilizing input provided by the program/project and Center SMA office.

(2) Identify safety-critical attributes and associated Government mandatory inspection points.

6. DELEGATION OF AUTHORITY

None.

7. MEASUREMENT/VERIFICATION

Compliance with the requirements contained within this NPD is continuously monitored by the Centers and by the SMA Technical Authority. Compliance may also be verified as part of selected life cycle reviews, and by periodic Quality Audit, Assessment, and Review conducted in accordance with NPR 8705.6.

8. CANCELLATION

a. NASA Interim Directive: NASA Quality Assurance Program Policy, NID 8730.98.

b. NPD 8730.1C, Metrology and Calibration, June 27, 2011.

c. NPD 8730.5B, NASA Quality Assurance Program Policy, October 27, 2005..

UPDATED W/CHANGE 7 - 03/23/2018, ORIGINAL SIGNED BY:

/s/ Michael D. Griffin
Administrator

ATTACHMENT A: Quality System Requirements for Organizations Responsible for Performance of Work

A.1 NASA solicitations, contracts, and work-tasking documents invoke and specify the quality requirements identified in paragraphs 1.a through 1.d below. Determination of applicability includes identification of the required quality document and may include, where considered appropriate, tailoring of the quality document requirements to identify the specific quality requirements within the document that apply to the solicitation, contract, or work tasking document. Where tailoring is chosen, the tailoring process is documented, providing objective evidence of rationale for excluding specific requirements identified within the quality document.

a. Work that is both critical and complex is performed in accordance with the quality management system requirements of SAE AS9100.

(1) Critical work is any hardware task that, if performed incorrectly or in violation of prescribed requirements, could result in loss of human life; serious personal injury; loss of a Class A, B, or C payload (see NPR 8705.4); loss of a Category 1 or Category 2 mission (see NPR 7120.5); or loss of a mission resource valued at greater than $2M.

(2) Complex work involves either: a) the design, manufacture, fabrication, assembly, testing, integration, maintenance, or repair of machinery, equipment, subsystems, systems, or platforms; or b) the manufacture/fabrication of parts or assemblies which have quality characteristics not wholly visible in the end item and for which conformance can only be established progressively through precise measurements, tests, and controls applied.

b. Critical, but not complex, work is performed in accordance with the quality management system requirements of SAE AS9100 or ISO 9001, or the inspection and test quality system requirements of SAE AS9003. Noncomplex work includes manufacture of "build to print" piece parts or performance of a discrete manufacturing/test operation such as plating, heat treating, non- destructive testing, or laboratory testing for chemical composition or mechanical properties.

c. Complex, but not critical, work is performed in accordance with the quality system requirements of SAE AS9100 or ISO 9001.

d. Work that is neither critical nor complex is performed in accordance with the quality system requirements of SAE AS9100, ISO 9001, or SAE AS9003, or in accordance with test and inspection requirements that are specified or

approved by the contracting agent and that are supported by records evidencing their performance and outcome.

A.2 Work that is both critical and complex is performed in accordance with the following workmanship standards: NASA-STD-8739.1; NASA-STD-8739.4 or IPC®/WHMA-A-620B and its space addendum IPC®/WHMA-A-620B-S; NASA-STD-8739.5; NASA-STD-8739.6; J-STD-001F and its space addendum J-STD-001FS; ANSI/ESD S20.20.

A.3 Calibration of Measuring and Test Equipment shall be performed in accordance with NASA-STD-8739.12.

A.4 NASA solicitations, contracts, and work tasking documents specify quality standards listed as reference documents and as considered appropriate.

ATTACHMENT B: REFERENCES

B.1 NPD 1200.1, NASA Internal Control.

B.2 NPD 1210.2, NASA Surveys, Audits, and Reviews Policy.

B.3 NPD 1280.1, NASA Integrated Management System Policy.

B.4 NPD 8730.2, NASA Parts Policy.

B.5 NPD 9800.1, NASA Office of Inspector General Programs

B.6 NPR 7120.5, NASA Space Flight Program and Project Management Requirements.

B.7 NPR 7120.6, Knowledge Policy on Programs and Projects.

B.8 NPR 7120.7, NASA Information Technology and Institutional Infrastructure Program and Project Management Requirements.

B.9 NPR 7150.2, NASA Software Engineering Requirements.

B.10 NPR 8000.4, Agency Risk Management Procedural Requirements.

B.11 NPR 8705.4, Risk Classification for NASA Payloads.

B.12 NASA-STD-5009, Nondestructive Evaluation Requirements for Fracture Critical Metallic Components.

B.13 NASA-STD-8739.8, Software Assurance Standard.

B.14 NAS 410, Aerospace Industries Association National Aerospace Standard for Certification and Qualification of Nondestructive Test Personnel.

B.15 SAE ARP 9009, Aerospace Quality Clauses.

B.16 SAE AS5553, Counterfeit Electrical, Electronic, and Electromechanical (EEE) Parts; Avoidance, Detection, Mitigation, and Disposition.

B.17 SAE AS9016, Notification of Change (NOC) Requirements.

B.18 SAE AS9102, Aerospace First Article Inspection Requirement.

B.19 SAE AS9110, Quality Management Systems - Requirements for Aviation Maintenance Organizations.

B.20 SAE AS9120, Quality Management Systems- Requirements for Aviation, Space, and Defense Distributors.

(URL for Graphic)

None.

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