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NASA Policy Directive

COMPLIANCE IS MANDATORY

NPD 8730.5

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Request Notification of Change

(NASA Only)

Subject: NASA Quality Assurance Program Policy

Responsible Office: Office of Safety and Mission Assurance

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. NASA quality assurance programs shall:

(1) Be designed and implemented in a manner that mitigates risks associated with noncompliance (Requirement). 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 (Requirement 42128).

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

(a) For circumstances where noncompliance cannot result in loss of life or loss of mission, statistically-based sampling plans or 100 percent inspection shall be employed based on determination of risk (Requirement 42130).

(b) For circumstances where noncompliance can result in loss of life or loss of mission, Government Mandatory Inspection Points (GMIP) shall be performed to ensure 100 percent compliance with safety/mission critical attributes (Requirement 42131). Safety/mission critical attributes include hardware characteristics, manufacturing process requirements, operating conditions, and functional performance criteria that, if not met, can result in loss of life or loss of mission.

(3) Be reevaluated and adjusted based on changes to risk factors (Requirement 42132).

(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) (Requirement 42133).

(5) Flow applicable quality assurance requirements down to successive levels of the supply chain to ensure control of subtier suppliers and verification of safety/mission critical attributes at all levels of the supply chain (Requirement 42134).

(6) Continually be improved 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 (Requirement 42135).

(7) Ensure that customers and Government authorities are quickly notified concerning noncompliant products or failure experiences potentially affecting product safety, reliability, or functionality (Requirement 42136). 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 (Requirement 42137).

(a) Investigative actions shall identify the proximate and root cause(s) of noncompliance and the scope/population of noncompliant items (Requirement 42138).

(b) Corrective actions shall 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) (Requirement 42139).

(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 (Requirement 42140).

(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 (Requirement 42142).

(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 (Requirement 42143).

(11) Be performed by persons that are not assigned direct responsibility for ensuring that cost or schedule objectives are met (Requirement 42144).

(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 (Requirement 42145).

(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 (Requirement 42146).

(14) Be performed in accordance with a documented quality system that follows the criteria specified in Attachment A (Requirement 42147).

c. Government quality assurance organizations are to ensure that contractors implement quality system requirements and deliver conforming product in accordance with Federal Acquisition Regulations (FAR), the NASA FAR Supplement, and NPR 8735.2, Management of Government Safety and Mission Assurance Functions for NASA Contracts, Chapters 1 and 2.

2. APPLICABILITY

a. This NPD applies to NASA Headquarters and Centers, including Component Facilities, and to the Jet Propulsion Laboratory and other NASA contractors and grantees as specified in their contracts or grants.

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 shall 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. This NPD does not apply to: management system processes as defined by NPD 1280.1, where such processes do not directly affect product configuration; institutional projects as defined by NPR 7120.5, Chapter 7; software assurance as defined by NPD 2820.1 and NPR 7150.2; 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 Part 287 ."

c. Federal Acquisition Regulations (FAR), Quality Assurance, 48 CFR Part 46 .

d. NASA FAR Supplement, Quality Assurance, 48 CFR Part 1846.

4. APPLICABLE DOCUMENTS

- a. NPD 1280.1, NASA Integrated Management System Policy.
- b. NPR 7120.7, NASA Information Technology and Institutional Infrastructure Program and Project Management Requirements..
- c. NPR 7150.2, NASA Software Engineering Requirements.
- d. NPR 8705.6, Safety and Mission Assurance Audits, Reviews, and Assessments.
- e. NPR 8735.2, Management of Government Safety and Mission Assurance Surveillance Functions for NASA Contracts.
- f. ISO 9001, Quality Management Systems - Requirements.
- g. SAE AS9003, Inspection and Test Quality System.
- h. SAE AS9100 Quality Management Systems - Requirements for Aviation, Space and Defense Organizations.
- p. Recommended Aerospace Quality Clauses (see URL:
http://www.hq.nasa.gov/office/codeq/quality/qa_clause/frameset.htm).

5. RESPONSIBILITY

a. The Chief, Safety and Mission Assurance shall:

- (1) Establish NASA quality assurance program policies related to NASA work (Requirement 42178).
- (2) Provide technical guidance on the type and extent of quality assurance program requirements that are required and appropriate for NASA work (Requirement 42179).
- (3) Facilitate implementation of quality assurance program requirements (Requirement 42180).
- (4) Oversee 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 (Requirement 42181).
- (5) Facilitate 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 (Requirement 42182).

b. NASA Center Directors shall:

- (1) Delegate authority for managing the quality assurance program to an organization not responsible for the cost or schedule of performing NASA work (Requirement 42184). 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 (Requirement

42185).

(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 (Requirement 42186).

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

(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 Appendix A), quality risks, and associated risk mitigation actions (Requirement 42188).

(2) Support procurement offices in identifying applicable quality assurance requirements to be incorporated into procurements contracts, in verifying contractor satisfaction of contract qualification requirements (quality system, product, process, personnel), and by providing/analyzing contractor quality performance data (Requirement 42189).

(3) Assure NASA contractor compliance with invoked technical/quality requirements, including the performance of GMIPs (Requirement 42190).

(4) Assure NASA Center compliance with prescribed technical/quality requirements (Requirement 42191).

(5) Assure tenant NASA program/project compliance with prescribed technical/quality requirements as delegated by the program/project responsible NASA Center (Requirement 42192).

(6) Assure delegated agency and support contractor compliance with prescribed direction concerning performance of quality assurance support services (Requirement 42193).

(7) Support NASA initiatives related to improving quality assurance practices, resolving quality problems, analyzing quality risks, and sharing lessons learned and best practices (Requirement 42194).

(8) Maintain adequately trained civil service personnel necessary to satisfy the requirements of this NPD and NPR 8735.2, including performance of safety/mission critical GMIPs, assuring that delegated agencies and support contractors effectively perform quality assurance functions in accordance with prescribed direction, and accepting delivery of contractor products (Requirement 42195).

d. Program/project managers shall:

(1) Provide necessary program dollars for costs associated with Government and contractor implementation of the requirements prescribed by this NPD and NPR 8735.2 (Requirement 42197).

(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 (Requirement 42198).

(3) Identify safety/mission critical attributes and associated Government mandatory inspection points (Requirement 42199).

(4) Initiate corrective actions upon discovery or notification of noncompliance (Requirement 42200).

e. Procurement officials shall:

(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 (Requirement 42202).

(2) Ensure that prospective contractors meet contract qualification requirements (quality system, product, process, personnel) (Requirement 42203).

6. DELEGATION OF AUTHORITY

None.

7. MEASUREMENTS/VERIFICATION

Compliance with this NPD will be determined in accordance with NPR 8705.6, Safety and Mission Assurance (SMA) Audits, Reviews, and Assessments.

8. CANCELLATION

None.

Revalidated 6/29/11

Original Signed by

/s/ Michael D. Griffin
Administrator

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

1. All work contracted by NASA shall be performed in accordance with Federal Acquisition Regulation (FAR) and NASA FAR Supplement (NFS) quality assurance requirements/clauses (Requirement 60394).

2. NASA solicitations, contracts, and work-tasking documents shall invoke/specify the quality system requirements identified in paragraphs 2.a through 2.d below, as applicable (Requirement 60395). Determination of applicability includes identification of the required quality system document and may include, where considered appropriate, tailoring of the quality system 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 shall be documented, providing objective evidence of rationale for excluding specific requirements identified within the quality system document (Requirement 60396).

a. Work that is both critical and complex shall be performed in accordance with the quality system requirements of SAE AS9100 (Requirement 60397).

(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 injury, loss of mission, or loss of a significant mission resource (e.g., Government test or launch facility).

(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 shall be performed in accordance with the quality system requirements of SAE AS9100 or ISO 9001, or the inspection and test quality system requirements of SAE AS9003 (Requirement 60402). 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 shall be performed in accordance with the quality system requirements of SAE AS9100 or ISO 9001 (Requirement 60403).

d. Work that is neither critical nor complex shall be 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 (Requirement 60404).

3. NASA solicitations, contracts, and work tasking documents shall invoke/specify the following, as applicable and appropriate (Requirement 60405)

a. Aerospace quality clause requirements adopted as a NASA recommended practice, where such provisions do not duplicate or conflict with quality assurance requirements prescribed by FAR or NFS (Requirement 60406). See URL http://www.hq.nasa.gov/office/codeq/quality/qa_clause/frameset.htm.

b. Electrical, electronic, and electromechanical parts workmanship standards (see paragraphs 4.g through 4.l of this NPD) (Requirement 60407).

c. Aerospace standards (AS) related to quality assurance functions (see Attachment B) (Requirement 60408).

ATTACHMENT B: Related Reading

1. NPD 1200.1, Internal Management Controls and Audit Liaison and Followup.
2. NPD 1210.2, NASA Surveys, Audits, and Reviews Policy.
3. NPD 8700.1, NASA Policy for Safety and Mission Success.
4. NPD 8730.2, NASA Parts Policy.
5. NPR 7120.5, NASA Space Flight Program and Project Management Requirements.
6. NPR 7120.6, Lessons Learned Process.
7. NPR 8000.4, Risk Management Procedural Requirements.
8. NPD 9800.1, NASA Office of Inspector General Programs
9. NASA-STD 8739.1, Workmanship Standard for Staking and Conformal Coating of Printed Wiring Boards and Electronic Assemblies.
10. NASA-STD-8739.2, Workmanship Standard for Surface Mount Technology.
11. NASA-STD 8739.3, Soldered Electrical Connections.
12. NASA-STD 8739.4, Crimping, Interconnecting Cables, Harnesses, and Wiring.
13. NASA-STD 8739.5, Fiber Optics Terminations, Cable Assemblies, and Installation.
14. NASA-STD-8739.8, Software Assurance Standard.
15. ANSI/ESD S20.20, Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices).
16. SAE AS9102, Aerospace First Article Inspection Requirement.
17. SAE AS9110, Quality Maintenance Systems - Aerospace - Requirements for Maintenance.
18. SAE AS9120, Quality Management Systems- Aerospace Requirements for Stockist Distributors.
19. NASA Government Mandatory Inspection Point (GMIP) Independent Assessment Final Report, January 22, 2004.

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None.

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