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NASA Procedural Requirements

COMPLIANCE IS MANDATORY

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Subject: Management of Government Quality Assurance Functions for NASA Contracts

Responsible Office: Office of Safety and Mission Assurance

| [TOC](#) | [Preface](#) | [Chapter1](#) | [Chapter2](#) | [Chapter3](#) | [Chapter4](#) | [Chapter5](#) |
[Chapter6](#) | [Chapter7](#) | [Chapter8](#) | [AppendixA](#) | [AppedixB](#) | [AppendixC](#) | [ALL](#)

Chapter 8. Government Mandatory Inspection Points (GMIPs)

8.1. General

8.1.1 GMIPs are NASA-mandated product assurance actions that are performed at, or prior to, a specific point in the product's life by NASA or a delegated agent of NASA. Product assurance actions include product examination, process witnessing, and record review (often referred to as "verification"). Delegated agents include non-NASA Government agencies and quality assurance support contractors that are independent of the contractor under surveillance.

Note: Government inspection is performed in addition to, not as a substitute for, contractor inspection and does not relieve the contractor of its responsibilities to perform contractually required inspections (e.g., 100 percent inspection of safety critical attributes).

8.2 Selection and Assignment of GMIPs

8.2.1 Program/project offices, with NASA SMA Lead and SMA office support, shall determine and assign GMIPs based on an analysis of risks related to contract noncompliance in accordance with the following (Requirement):

a. Safety-critical GMIPs are performed in order to assure conformance to hardware characteristics, manufacturing process requirements, operating conditions, and functional performance criteria that, if not met, can result in loss of human life. Except as exempted below, program/project offices shall assign a safety-critical GMIP for every (i.e., 100 percent) product/process/ performance attribute where noncompliance could credibly result in loss of life (Requirement). Exemption of safety-critical attributes from GMIP assignment/performance requirements may be based on statistical process controls and/or formally documented risk analysis.

(1) Exemption based on statistical process controls is allowed for repetitive work processes where all of the following apply: GMIPs are performed in accordance with a statistically meaningful sampling plan; contractor process controls are applied to achieve acceptably low levels of process variation; and Government oversight validates effective contractor process controls.

(2) Exemption based on documented risk analysis is allowed where technical analysis of risk factors indicates acceptably low probability of noncompliance. Risk analysis may include factors such as the following:

- (a) Contractor inspection results.
- (b) Government inspection results.
- (c) Hazard analysis controls/mitigation.
- (d) Failure modes and effects analysis controls/mitigation.
- (e) Design complexity.
- (f) Technology maturity.
- (g) Process maturity.
- (h) Contractor quality system controls.
- (i) Metrics related to contractor past performance.
- (j) Probabilistic risk assessment.

b. For circumstances where noncompliance could not credibly result in loss of human life, but could result in 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, program/project offices shall assign GMIPs on a discretionary risk-informed basis to attain satisfactory confidence of contract compliance (Requirement). Confidence levels are to be commensurate with the severity of consequences that would be incurred in the event of noncompliance.

c. Where analysis indicates an unacceptable likelihood of conformance with a key product attribute or process requirement, program/project offices shall assign GMIPs on a discretionary risk-informed basis to attain satisfactory confidence of contract compliance (Requirement). Factors indicting potential elevated likelihood include process maturity, complexity, and contractor past performance.

d. Program/project offices shall evaluate the following sources of information during the GMIP definition process (Requirement):

- (1) Design, safety, drawing, engineering, configuration, and technical document reviews.
- (2) Reliability, maintainability, and system safety tests and analyses.
- (3) Development, qualification, certification, and acceptance tests.
- (4) Failure Mode and Effects Analysis/Critical Items List and Hazards Analysis.
- (5) Interface and interchangeability requirements.
- (6) Contractor fabrication procedures, process control instructions, and design standards/manuals.
- (7) Performance of root cause analyses and implementation of preventative and corrective actions.
- (8) Nonconformance reports and records of contractor/supplies/services history.
- (9) Feedback from the NASA Center or the delegated agency.
- (10) Critical item and critical characteristic lists developed by the contractor.

(11) Contractor quality assurance manuals, requirements, and selected quality system documents.

e. Program/project offices shall evaluate the following conditions, operations, and quality assurance functions during the GMIP definition process (Requirement):

(1) Validation of critical process controls.

(2) Qualification, certification, and first article tests.

(3) Acceptance tests and/or inspection of hardware end items and selected nondeliverable hardware and tooling. This includes test readiness.

(4) Preshipment review (data package review, shipment readiness, and shipping/acceptance document sign-off).

(5) Inspection and test of repaired, reworked, or modified supplies.

(6) Teardown, buildup, test, and inspection of Government equipment returned for overhaul or refurbishment.

(7) Failure analyses.

(8) Refurbishment of previously accepted supplies.

(9) Products/processes that have a history of frequent configuration changes or frequent fabrication, inspection, and test nonconformances.

(10) Configuration verification.

(11) Hazardous or critical industrial operations such as lifting operations, contamination inspections, shipping operations.

8.2.2 The delegated agency or the quality assurance support contractor, as approved by the NASA SMA Lead, may create and assign GMIPs on a temporary basis based on a determination of elevated risk or adverse trends.

8.3 Performance of GMIPs

Program/project office and/or SMA office personnel responsible for the administration and performance of GMIPs shall (Requirement):

a. Perform 100 percent of all assigned GMIPs in strict accordance with the prescribed technical criteria.

b. Request formal disposition/authorization for GMIP omissions, waivers, or deviations from the designated NASA technical authority. The designated technical authority will normally be the person or office that selected and defined the GMIP requirement and may reside in the Center SMA office, program office, or engineering office in accordance with local Center governance procedures.

c. Indicate as acceptable only those characteristics that have been personally examined, witnessed, or verified.

d. Perform GMIPs after contractor personnel have made their acceptance decisions, except in those cases where concurrent inspections/tests are necessary to avoid the need for destructive testing or to prevent excessive costs or potential time delays.

e. Perform GMIPs as late as practicable in the material fabrication/installation/delivery cycle for circumstances where GMIP attributes can be altered (e.g., contamination).

f. Perform GMIPs at subcontractor facilities only when required in the Government's interest, as specified in FAR 46.405.

g. Attest to the completion of GMIPs in accordance with the requirements of paragraph

2.6.2.4 of this NPR.

h. Sign a statement indicating that they understand that their signature, application of a stamp, or data entry is a professional, individual warranty (guarantee) that they personally examined the product, witnessed the process, or verified the record as literally stated for the GMIP acceptance criteria.

i. Maintain positive controls which assure that all assigned GMIPs are incorporated into planning documents, where applicable, and accomplished.

j. Report, track, and ensure proper resolution of nonconformances identified during the conduct of GMIPs in accordance with paragraph 2.6.5 of this NPR.

k. Where GMIP accomplishment is attested to by stamps/signatures on contractor developed/maintained planning records or data, verify that such records are readily retrievable.

8.4 Special Requirements for Safety-Critical GMIPs

8.4.1 Safety-critical GMIPs may only be performed by Government personnel or under the direction and supervision of Government personnel.

8.4.2 When safety-critical GMIPs are assigned to non-Governmental personnel, NASA program and project offices and Center SMA offices shall perform periodic/random spot checks of GMIP performance, and other measures as necessary, to ensure that such persons are properly trained and qualified and are carrying out these inspections in an objective and competent manner (Requirement).

8.4.3 Personnel responsible for planning the performance of safety-critical GMIPs shall specify product examination or process witnessing versus record review whenever practicable (Requirement).

8.5 Contractor Interface for Performance of GMIPs

8.5.1 Onsite Government representatives (i.e., NASA, delegated agency, or support contractors) working with the contractor shall:

a. Incorporate GMIPs as hold points on contractor work planning documents (Requirement).

b. Develop a GMIP notification process that assures sufficiently advance Government notification of work operations involving GMIPs, that results in timely performance of GMIPs, and that results in minimal disruption to contractor work operations (Requirement).

c. Establish specific guidelines and requirements regarding contractor continuance of work operations in the event that the Government does not arrive within a specified agreed-to time frame to perform an assigned GMIP (Requirement).

| [TOC](#) | [Preface](#) | [Chapter1](#) | [Chapter2](#) | [Chapter3](#) | [Chapter4](#) |
[Chapter5](#) | [Chapter6](#) | [Chapter7](#) | [Chapter8](#) | [AppendixA](#) | [AppedixB](#)
| [AppendixC](#) | [ALL](#) |

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