



AF 9100:2026

Aerospace Quality Management System

FORM

Production Route and First-Article Accountability

AF-FR-9100-021

FIRST EDITION

30 September 2026 | English master text

Publication identity and application

Control	Publication value
Title	Production Route and First-Article Accountability
Document code	AF-FR-9100-021
Edition / language	FIRST EDITION / English master text
Companion edition identity	30 September 2026
Controlling source	AF 9100:2026 — FIRST EDITION — 29 September 2026
Responsible owner function	Responsible record owner
Primary source anchors	8.5, K, D
Delivery status	Prepared implementation companion. Actual approval, adoption, effectivity and operational decisions are recorded separately.

Use and document-control boundary

This companion implements the supplied AF 9100 requirement basis without changing the original standard. Its process allocation, examples, checklists and record design are authored implementation material. Actual mission or product limits, specialist procedures, permissions and genuine observations must be completed before consequential use. Applicable source minima and independent decision conditions cannot be reduced by this companion.

The printed edition date identifies the companion series; it is not evidence that later preparation, review or operational decisions occurred on that date. New support codes in this set are proposed allocations for controlled registration. Established AF-IG-9100-001, AF-FAQ-9100-001 and AF-TR-9100-001 identities are retained; earlier files, the corporate master list and ASTRA codes are not overwritten.

Equivalent combined or digital records are permitted when all required fields, relationships, authority and history remain intact. A completed PDF field or typed name is not evidence of an authenticated approval. Blank records in this delivery contain no invented applicant, signature, event or result.

Interactive fields are blank by default. Save a working copy, use continuation records where necessary and preserve raw supporting evidence outside the PDF through controlled references. Separate issued PDFs are the authoritative interactive copies; the combined reading edition is flattened.

Contents and reading route

Publication identity and application	2
Contents and reading route	3
1 Purpose, source identity and completion rules	4
2 Common identity and record control	4
3 Form-specific evidence and decisions	6
4 Detailed continuation record	8
5 Completeness and receiving review	9
Appendix A — Source requirements and complete field payload	10
Source tables — complete field and decision payloads	14

Select actual scope → complete application criteria → use the applicable procedure and technical book → capture authentic evidence → evaluate every applicable condition → obtain the required independent decision. Document availability does not establish implementation or conformity.

1 Purpose, source identity and completion rules

This additional implementation form organizes the detailed record needs of the identified AF 9100 provisions. It supplements the twelve source form modules without renumbering them or creating a new assessment route.

Complete the applicable fields with authentic information. Record unknown, unavailable and not-yet-demonstrated conditions explicitly. An exclusion needs an approved applicability rationale. Use linked continuation records for multiple items, sources, tests, people or decisions. Keep source attachments under controlled custody; do not rely on this PDF alone where raw evidence is required.

2 Common identity and record control

Record ID and continuation link

Template/code and controlled version

Case/applicant/asset identity

Route, scope and application profile

Object configuration and relevant period

Actual creation/event time and time zone

Author and role

Reviewer and approval responsibility

Current state and original history

Original evidence and source location

Access classification and permitted recipients

Retention basis, duration and preservation hold**Correction: original value, reason, author and approval****Authenticated approval/workflow reference (typed name is not a signature)**

3 Form-specific evidence and decisions

Order/article/lot/serial

Full or partial trigger

Actual site/line/route

Tool/machine/software identity

Material/process/source evidence

Operation sequence and actual performer

Concealed-step evidence

Characteristic ID/design location

Requirement/units/criticality

Method/equipment/uncertainty

Actual result and rule

NCR/rework/repair

Changed/unchanged rationale**Complete-characteristic review****Production-readiness resources****Release and early monitoring**

4 Detailed continuation record

Use this section for each additional independently testable condition or actual event. A form-level summary cannot remove a required field, earlier failed result or unresolved item.

Parent form and continuation/item ID

Exact object / configuration / performer / event time

Source requirement / approved profile / condition

Numeric criterion with units or observable attribute

Method / validity / uncertainty / essential step

Original evidence and actual result

Conclusion and limitations / rejected or contrary evidence

Required protection / action / responsible owner / actual due event

Reviewer / approval reference / receiving acknowledgement

5 Completeness and receiving review

Check	Required review
Identity and scope	Every record belongs to the actual object, evaluated configuration and relevant period.
Evidence and validity	Required original data, method, actual results and limitations are traceable.
Decision separation	Technical disposition, independent attestation, employer task authority and public permission are not merged.
History and time	Earlier failed states and original notification clocks are preserved; no manufactured observations.
Approval and custody	Actual competent authority and receiving responsibility are established; typed names are not authenticated signatures.

Actual reviewer / conclusion / unresolved items

Authenticated approval instrument or workflow reference

Receiving custodian / access / retention / accepted residual duties

Appendix A — Source requirements and complete field payload

Source: AF 9100:2026, Aerospace Quality Management System, FIRST EDITION, 29 September 2026; supplied 131-page PDF. Source page references below locate the original publication. These excerpts are read with the complete applicable standard; local implementation sequences do not replace it.

8.5 Production and service execution

SOURCE p. 24 | Normative when applicable

8.5(a) The organization shall apply 8.5.1–8.5.6 to the controlled execution, identification, preservation, support and modification of its outputs. Special processes and first article verification shall be triggered by the actual work rather than omitted because a supplier or customer performs part of the activity.

Required evidence: Controlled work routes; actual execution; identity, preservation, support and change records.

8.5.1 Controlled production and service execution

SOURCE p. 24 | Normative when applicable

8.5.1(a) Production and service work shall use approved instructions, suitable equipment, competent personnel and defined environmental conditions. Instructions shall identify required characteristics, sequence, workmanship criteria, inspection points, process limits and authorized alternatives.

8.5.1(b) The organization shall maintain accountability for quantities and configuration through split lots, rework, scrap and partial completion. Critical items and key characteristics shall be controlled at points where their conformity can be established. A later inspection shall not be presumed to detect every earlier process failure.

8.5.1(c) Evidence shall show completion of required operations and acceptance activities. Utilities, consumables, tools and software affecting output shall be controlled. Error prevention, FOD prevention and identification of work awaiting verification shall be integrated into the process.

Required evidence: Controlled route or work package; process records; in-process verification; quantity reconciliation; FOD and utility controls.

8.5.1.1 Equipment, tooling and production software

SOURCE p. 24 | Normative when applicable

8.5.1.1(a) Equipment, tooling, fixtures and software used to create, control, inspect or measure outputs shall be verified or validated before release for use. The assessment shall include the actual application, configuration, interfaces, failure behavior and ability to maintain required characteristics.

8.5.1.1(b) Maintenance, storage, preservation and periodic condition checks shall be defined. Tool repairs, software updates, relocation and changes to compensation parameters shall trigger an impact-based revalidation decision. Access to editable machine programs shall be restricted and changes traceable.

Required evidence: Tool and software qualification; controlled programs; maintenance; storage checks; revalidation records.

8.5.1.2 Special-process validation and control

SOURCE p. 24 | Normative when applicable

8.5.1.2(a) Special processes shall have approved methods, qualified personnel, suitable equipment, validated parameter windows and defined acceptance and monitoring criteria. Qualification shall demonstrate that relevant output characteristics can be achieved reproducibly under the proposed operating conditions.

8.5.1.2(b) The organization shall define conditions for maintaining approval, monitoring essential variables, retaining records and requalification. Changes to material, geometry, equipment, software, consumables or location shall be evaluated. Final visual inspection alone shall not replace control of hidden or irreversible characteristics.

Required evidence: Special-process qualification dossier; approved parameter ranges; operator qualifications; run records; requalification decisions.

8.5.1.3 Production-process and first article verification

SOURCE p. 24 | Normative when applicable

8.5.1.3(a) The organization shall verify that the planned production route, documentation, equipment and tooling can produce an item meeting requirements. Verification shall use a representative item or other justified approach and account for every applicable characteristic, including material, process, software and interface requirements.

8.5.1.3(b) Repeat verification shall be considered after design, process, source, tooling or location changes, significant interruption or evidence that previous results no longer represent production. Partial verification shall identify and justify the unaffected portion. Approval of first article evidence shall not authorize later process drift.

Required evidence: First article record; characteristic accountability; material/process evidence; differences and repeat-verification rationale.

8.5.2 Identification, status and traceability

SOURCE p. 24 | Normative when applicable

8.5.2(a) Outputs shall be identified sufficiently to establish their configuration and acceptance status throughout the lifecycle. Where traceability is required, identity shall link material origin, lots, serials, processing, personnel, inspection, software versions and disposition as relevant to consequence and obligations.

8.5.2(b) Traceability shall survive splitting, combining, packaging changes, repairs and movement between systems. Acceptance stamps, passwords and electronic signatures shall be controlled. The organization shall periodically demonstrate that a suspect source or process event can be traced to the affected population and that an item can be traced back to its evidence.

Required evidence: Identity scheme; genealogy records; status controls; signature register; forward and reverse trace exercises.

8.5.3 Customer and external-provider property

SOURCE p. 25 | Normative when applicable

8.5.3(a) Property under the organization's control shall be identified, protected and used only as authorized. This includes physical items, tooling, intellectual property, technical data, software, personal information and access credentials.

8.5.3(b) Loss, damage, unsuitable condition or unauthorized use shall be reported to the owner through the agreed channel and recorded. The organization shall preserve evidence and assess product or service impact rather than treating the issue solely as an administrative property loss.

Required evidence: Property register; receipt checks; access controls; condition and incident records.

8.5.4 Preservation, packaging and transport

SOURCE p. 25 | Normative when applicable

8.5.4(a) The organization shall preserve conformity during handling, storage, packaging and transport. Controls shall address cleanliness, FOD, humidity, temperature, corrosion, ESD, shock, shelf life, material compatibility, hazardous conditions and stock rotation as applicable.

8.5.4(b) Packaging methods shall be qualified for the actual route and exposure where risk warrants. Excursions or damaged packaging shall trigger a product assessment. Expired, life-limited or environmentally exposed material shall not be returned to normal stock without an authorized disposition based on technical evidence.

Required evidence: Preservation specifications; packaging qualification; environmental history; shelf-life controls; excursion dispositions.

8.5.5 Post-delivery support and field feedback

SOURCE p. 25 | Normative when applicable

8.5.5(a) The organization shall define support responsibilities for installation, operation, training, maintenance, repair, warranty, spare parts, software updates and obsolescence within the agreed lifecycle. Technical information shall be controlled and updated when experience changes safe or effective use.

8.5.5(b) Field performance and failures shall be collected and analyzed with exposure and configuration context. A detected problem shall trigger investigation, communication and appropriate containment of the affected population. Off-site work shall meet the same applicable controls as equivalent work at the main facility.

Required evidence: Support plan; service information; field reliability data; notifications; off-site work controls.

8.5.6 Production and service changes

SOURCE p. 25 | Normative when applicable

8.5.6(a) Production and service changes shall be reviewed and authorized by competent persons with defined authority. The review shall consider changes to output characteristics, process capability, hidden features, qualification, measurement, configuration and contractual approvals.

8.5.6(b) Emergency changes shall have temporary limits, additional checks and an expiry or conversion decision. The organization shall retain the baseline, change rationale, approval and verification of the changed output. A change implemented to restore delivery shall not bypass required design approval.

Required evidence: Process-change record; technical impact; approvals; temporary controls; changed-output verification.

D.1 Requirement-record integrity

SOURCE p. 55 | Normative when applicable

D.1(a) Every controlled product or service requirement shall have an identifier, statement, source, owner, revision, rationale, applicability, verification method and acceptance criteria. Derived and safety-related requirements shall include their parent link and approving authority.

D.1(b) The organization shall maintain traceability through allocation, implementation, verification, anomaly resolution and release. Traceability completeness shall be evaluated for meaning and validity, not only the presence of hyperlinks. Broken or circular links shall be investigated.

D.2 Identifiers, versioning and time

SOURCE p. 55 | Normative when applicable

D.2(a) Identifiers shall remain unique within the defined repository and resolvable after migration. Revision and status shall be distinct; an approved obsolete version shall not appear current. Time records shall identify the relevant time basis and sequence sufficient to reconstruct events.

D.2(b) Units, coordinate systems, reference frames and data encodings shall be explicit where misinterpretation could affect conformity. Imported supplier data shall be checked for mapping errors, truncated precision and semantic differences. Automated exchange shall retain validation results.

D.3 Evidence provenance and tamper indication

SOURCE p. 55 | Normative when applicable

D.3(a) An evidence record shall identify the source system or person, acquisition method, processing, transformations and approvals. Cryptographic hashes or signatures may support integrity but shall not be treated as proof that the original observation was correct.

D.3(b) Corrections shall preserve the prior evidence and explain why it changed. Access and modification logs shall be protected in accordance with consequence and obligations. Migration shall verify relationships as well as files; a readable PDF without its underlying configuration links may be insufficient. The filled chain demonstrates structure only. It deliberately does not supply a universal stopping-time value, load or speed; those values require a valid system-specific safety basis.

K.1 Planning and trigger assessment

SOURCE p. 71 | Normative when applicable

K.1(a) The organization shall define when a full or partial first article verification is required, based on new product, new process, design change, source transfer, tooling change, interruption or evidence that prior verification is no longer representative.

K.1(b) The verification plan shall identify the production-representative item, route, design baseline, material, tooling, software and all applicable characteristics. A partial verification shall list the changed portion and justify the continuing validity of the remainder.

K.2 Characteristic completion rules

SOURCE p. 71 | Normative when applicable

K.2(a) Each applicable drawing, model, specification and interface characteristic shall be accounted for. Results shall be numeric where the criterion is numeric, or use a defined attribute evaluation with traceable evidence. "Pass" without the required actual result shall not be accepted for a variable characteristic requiring retained

measurement.

K.2(b) The organization shall verify that material and special-process evidence relate to the actual first article. Unverified characteristics shall remain open. A sample selected for excellent appearance shall not replace a representative production article.

K.3 Production-readiness conclusion

SOURCE p. 71 | Normative when applicable

K.3(a) The readiness conclusion shall consider process stability, tooling, inspection capability, operator competence, supplier readiness and closure of nonconformities, not only one conforming item. Where data are insufficient for capability inference, the limitation and compensating verification shall be recorded.

K.3(b) First article acceptance shall not remove continuing process controls, surveillance or the obligation to reassess after change. The organization shall define any enhanced monitoring for initial production and objective criteria for returning to normal control.

Source tables — complete field and decision payloads

Table D-1 — Required lifecycle data entities

Source p. 55 | Required structure when applicable

Entity	Minimum fields	Required relationships
Requirement	ID; revision; statement; source; rationale; criticality; owner; acceptance criterion; status.	Parent need; allocated item/function; verification case; applicable obligation.
Configuration item	ID; type; revision; physical/software identity; owner; baseline; approved use.	Requirements; BOM; interfaces; change history; as-built or deployed instances.
Material or component lot	Source; manufacturer; lot/batch; quantity; condition; certificate; received date.	Incoming verification; process route; consumed serials; split/merge history.
Verification case	ID; method; requirement; configuration; procedure; environment; uncertainty; acceptance rule.	Test article; equipment; raw data; result; anomaly and disposition.
Process execution	Route revision; operation; performer; date/time; equipment; parameters; material; result.	Lot/serial; qualified procedure; inspection; nonconformity; next authorized step.
Change	ID; reason; baseline before/after; impact; approvals; effectivity; verification.	Affected requirements/items; delivered population; suppliers; support information.
Hazard or risk	ID; scenario; consequence; likelihood basis; exposure; controls; owner; residual decision.	Requirements; mitigations; verification evidence; operational limitations.
Release	ID; configuration; scope; acceptance evidence; concessions; restrictions; authorized identity; date.	Requirements baseline; product serial/lot; delivery dossier; service-life status.
Digital artifact	Artifact ID; version; source/build; dependencies; hash; signature; provenance; access class.	Requirements; verification; release; deployment instances; vulnerabilities.
Retirement	Asset identity; condition; hazardous inventory; reuse restrictions; disposition; verifier.	Life history; disposal evidence; retained records; remaining obligations.

Table D-2 — Filled illustrative trace chain

Source p. 55, 56 | Illustrative or explanatory source table

Record	Example value	Connection
Need	NEED-GSC-01: controlled motion during payload handling.	Allocated to SYS-GSC-R12.
Requirement	SYS-GSC-R12 rev B: stop response within a program-defined limit under stated load and speed.	Hazard H-GSC-02; verification V-GSC-12.
Configuration	Controller CTRL-07 rev C; firmware 2.4.1; cart serial GSC-004.	Build manifest BM-241; interface ICD-09 rev D.

Record	Example value	Connection
Verification	V-GSC-12 rev 3; test article GSC-004; report TR-012.	Raw records RAW-012; calibrated timer TM-08; approved decision rule DR-03.
Disposition	Anomaly AN-04 closed after independent retest.	NCR-026; verified corrective action CA-026.
Release	REL-GSC-004 rev 1; approved operating- domain restriction attached.	Release authority RA-02; receiving acknowledgement ACK-004.

Table K-1 — Required first article record sections

Source p. 71 | Required structure when applicable

Section	Minimum required content
Product accountability	Part/service identity; revision; serial/lot; assembly hierarchy; production order; first article reason and full/partial status.
Production route	Actual site, line, equipment, tools, machine programs, work instructions and applicable revisions.
Material and process evidence	Material identity and certificates; authenticity checks; special-process qualifications; external-source approvals.
Characteristic accountability	Unique characteristic ID; design location; requirement; units; criticality; method; actual result; uncertainty/decision rule where relevant.
Functional and software evidence	Functional requirements; software/firmware configuration; build identity; test procedure and actual results.
Nonconformities	NCR links; technical disposition; repair/rework evidence; required customer or design- authority approval.
Review and release	Completeness check; independent review where required; authorized conclusion; remaining restrictions and records index.

Table K-2 — Filled synthetic characteristic-accountability extract

Source p. 71 | Illustrative or explanatory source table

ID / characteristic	Illustrative requirement	Evidence / actual result	Disposition
K-01 / external dimension	50.000 ± 0.030 mm.	50.0040 mm; U=0.00445 mm, k=2; agreed full-interval rule.	Conformity demonstrated under the example rule.
K-02 / hole pitch	80.000 ± 0.050 mm.	80.0120 mm; U=0.0060 mm, k=2; calibrated coordinate method.	Conformity demonstrated under the example rule.
K-03 / material identity	Material specification MAT-17 rev B.	Lot ML-021; certificate MC-021; identity check IV-021.	Identity and lot linkage verified; no strength claim inferred from appearance.
K-04 / bonded process	Qualified route BOND-04 rev C.	Run BR-116; qualified operator OP-18; process record within approved window.	Process evidence complete.
K-05 / firmware identity	Firmware 2.4.1; build manifest BM-241.	Read-back identity and hash match signed release manifest.	Configuration verified; functional evidence also required.

ID / characteristic	Illustrative requirement	Evidence / actual result	Disposition
K-06 / functional interface	Controlled interface test IF-09 rev D.	Report TR-009 records all required checks and one resolved anomaly AN-04.	Accepted only after independent retest and NCR closure.