



AF 9100:2026

Aerospace Quality Management System

CHECKLIST

Systems Engineering and Mission Assurance — Checklist

AF-CL-9100-002

FIRST EDITION

30 September 2026 | English master text

Publication identity and application

Control	Publication value
Title	Systems Engineering and Mission Assurance — Checklist
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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.

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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 Checklist use and state definitions

Evaluate the whole source condition, including every joined sub-condition. Where different parts have different evidence, add separate continuation rows linked to the original identifier. Do not compress a compound requirement into a favorable summary.

Field state	Meaning
PASS	Conforming: valid evidence meets the approved applicable condition.
FAIL	Nonconforming: valid evidence demonstrates failure of the applicable requirement.
HOLD	Not yet demonstrated: applicability, criteria, evidence, validity, interpretation or authority remains unresolved.
N/A	Not applicable only with an approved absence-of-activity-and-responsibility rationale. Missing resources or access are not exclusions.

States in this companion map to the source’s requirement-status dictionary; operational record status and evidence validity remain separate. No prefilled state is supplied. A metric counts progress only and cannot override a mandatory failure.

Assessment / case / object / profile / evaluated version

Assessor / actual dates / route / sites / configuration / selected scope

Approved applicability and exclusions / continuation record location

2 Complete source-condition evaluation

11.1 — Mission and concept definition

11.1(a) | Source p. 28

The organization shall establish a mission or service concept identifying users, objectives, success criteria, operational scenarios, environments, external interfaces and constraints. Normal, degraded, emergency, maintenance and retirement states shall be considered. Assumptions about external services or operator behavior shall be explicit.

Mission concept; scenario catalogue; boundary assumptions; success and safe-state criteria.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT

Gap / required action / continuation record:

11.1(b) | Source p. 28

The concept shall define the boundary between mission success and safe behavior when mission success is no longer achievable. A system shall not be permitted to continue an unsafe action merely to preserve a mission objective. Changes to the concept shall trigger reassessment of derived requirements and evidence.

Mission concept; scenario catalogue; boundary assumptions; success and safe-state criteria.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT

Gap / required action / continuation record:

11.2 — Requirements decomposition and interface control

11.2(a) | Source p. 28

System requirements shall be allocated to subsystems, functions, operators and external services with traceable rationale. Interfaces shall specify physical, electrical, data, timing, environmental, human and procedural characteristics as applicable.

Requirement allocation; interface-control documents; integration assumptions; cross-interface verification.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT

Gap / required action / continuation record:

11.2(b) | Source p. 28

The organization shall assess emergent behavior and incompatible assumptions between separately acceptable subsystems. Interface changes shall be jointly reviewed by the affected authorities. Verification of each component independently shall not be assumed to verify the integrated system.

Requirement allocation; interface-control documents; integration assumptions; cross-interface verification.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT

Gap / required action / continuation record:

11.3 — Assurance planning and lifecycle gates

11.3(a) | Source p. 28

Programs shall define lifecycle gates with entry criteria, required evidence, accountable decision makers, independent review, open-issue rules and exit criteria. Annex C provides minimum decision content. Gate names may be adapted to the organization, but the required decisions shall remain identifiable.

Gate plan; review packages; decision records; conditions and verified closure.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT

Gap / required action / continuation record:

11.3(b) | Source p. 28

Gate decisions shall distinguish unconditional progression, bounded conditional progression and hold. Conditions shall have owners, deadlines and limits on work permitted before closure. A schedule milestone shall not be recorded as a passed technical gate when required evidence is missing.

Gate plan; review packages; decision records; conditions and verified closure.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT

Gap / required action / continuation record:

11.4 — Reliability, availability and maintainability

11.4(a) | Source p. 28

RAM requirements shall be derived from operational needs, exposure, consequence, support concept and applicable obligations. The organization shall state the population, mission duration, failure definition, repair boundary, confidence and statistical assumptions associated with every numerical claim.

RAM plan; models and assumptions; test plan; field exposure; repair-time and downtime definitions.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT

Gap / required action / continuation record:

11.4(b) | Source p. 28

Analysis shall address failure mechanisms, dependencies, common causes, wear-out, maintenance-induced failure, dormant failures and environmental stress as relevant. Predicted reliability shall be distinguished from demonstrated performance. Qualification tests shall not be interpreted as proving rare-event safety rates without a defensible statistical and engineering basis.

RAM plan; models and assumptions; test plan; field exposure; repair-time and downtime definitions.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT

Gap / required action / continuation record:

11.4(c) | Source p. 28

Maintainability shall consider access, diagnosis, repair errors, tools, spares, human factors and verification after intervention. Availability claims shall identify whether logistics and administrative downtime are included. Annex F provides worked methods and limits.

RAM plan; models and assumptions; test plan; field exposure; repair-time and downtime definitions.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT

Gap / required action / continuation record:

11.5 — Hazard analysis and assurance case

11.5(a) | Source p. 28

The organization shall maintain a structured safety and mission-assurance argument proportionate to criticality. Claims shall be bounded by configuration and operational domain and supported by traceable evidence. The argument shall expose uncertainty, counter-evidence and unresolved limitations.

Assurance case; hazard log; analysis rationale; evidence index; limitations and independent challenge.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT

Gap / required action / continuation record:

11.5(b) | Source p. 28

Hazard analysis shall be maintained as the design and operating context evolve. Failure-mode analysis, fault trees, scenario analysis and other methods shall be selected for the problem rather than used as paperwork substitutes. Shared resources, common software, environmental exposure and organizational dependencies shall be assessed.

Assurance case; hazard log; analysis rationale; evidence index; limitations and independent challenge.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT

Gap / required action / continuation record:

11.6 — Verification strategy and model credibility

11.6(a) | Source p. 28

The organization shall select inspection, analysis, demonstration and testing methods capable of establishing each requirement. The selected method shall address representativeness, observability, uncertainty, test-article differences and required confidence.

Verification matrix; method-selection rationale; model-credibility dossier; approved extrapolations.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT

Gap / required action / continuation record:

11.6(b) | Source p. 28

For models and simulations, credibility shall be established for the stated decision use. Verification of implementation, validation against relevant observations, input quality, sensitivity and uncertainty shall be addressed. Extrapolation beyond the demonstrated domain shall be identified and approved with compensating evidence.

Verification matrix; method-selection rationale; model-credibility dossier; approved extrapolations.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT
Gap / required action / continuation record: 		

11.7 — Technical budgets and margin management

11.7(a) | Source p. 29

The organization shall manage relevant budgets such as mass, power, thermal capacity, memory, latency, structural loads and resource consumption. Each budget shall have a baseline, allocation, margin definition, uncertainty treatment, owner and review trigger.

Budget register; margin definitions; allocation history; uncertainty and change assessments.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT
Gap / required action / continuation record: 		

11.7(b) | Source p. 29

Margins shall be defined consistently so that reserve is not counted twice across subsystem and system levels. Changes that consume allocated margin shall be evaluated for cumulative effects and compatibility with qualification evidence. A positive arithmetic margin shall not substitute for a valid physical model.

Budget register; margin definitions; allocation history; uncertainty and change assessments.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT
Gap / required action / continuation record: 		

11.8 — Integrated readiness and handover

11.8(a) | Source p. 29

Before operational handover, the organization shall reconcile the released configuration, validated operational procedures, support capability, training, maintenance data, open issues and contingency arrangements. The receiving organization shall acknowledge responsibilities and limitations.

Integrated readiness review; handover dossier; receiving acknowledgement; long-life support arrangements.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT
Gap / required action / continuation record: 		

11.8(b) | Source p. 29

The handover shall include information required for continued assurance and not merely delivery acceptance. Long-duration missions shall plan how evidence, expertise, spares and secure updates remain available after original project personnel or suppliers are no longer present.

Integrated readiness review; handover dossier; receiving acknowledgement; long-life support arrangements.

STATE	EVIDENCE / APPROVED N/A BASIS	REVIEWER / ACTUAL EVENT

Gap / required action / continuation record:

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4 Compound-condition continuation and final reconciliation

Duplicate these controlled continuation fields as needed. Each additional predicate retains its parent source identifier, object, criterion, evidence, actual result, gap and independent approval. The number of printed fields is not a limit on the required evidence.

Parent requirement / compound condition / applicable object

Separate criterion and approved technical basis

Method, actual configuration and original evidence

Result, uncertainty/rubric and PASS/FAIL/HOLD/N/A reason

Failed/held condition, owner, original due event and action

Approved exclusion and independent review reference

Final requirement population and unresolved conditions

Independent reviewer / decision authority / genuine approval reference

Initial grant, renewal and extension require closure of all in-scope nonconformities and the source's complete decision conditions. A separate authorized technical concession does not make a failed original criterion conforming. Preserve independent review, actual authority and precise scope.