



ASTRA

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IMPLEMENTATION GUIDE

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Headquarters and local implementation of G01–G09, actual providers, handovers, disrupted services, digital integrity and separate authority.

Source requirements and added implementation detail

The controlling ASTRA source is identified above by content fingerprint. Numbered source clauses and annexes retain their own authority. The retained operating material is restructured and expanded with implementation methods, additional profile controls, worked synthetic examples, decision diagrams and record contracts. Added implementation detail is not presented as an earlier institutional approval or as a change to the supplied core standard. Any additional binding criterion requires the applicable technical adoption process.

The displayed publication date identifies the edition; it is not a fabricated authoring, test, approval or operational date. Actual records retain genuine event times and controlled versions. No named outside organisation or standard is incorporated as a normative reference. AF internal instruments and separate legal or contractual duties remain applicable within their actual scope.

Acceptance boundary

A positive grant requires every applicable mandatory condition to PASS, every N/A to have independent justification, every in-scope nonconformity to be verified closed, and competent independent authority. HOLD, unknown state, missing evidence, a favourable average, a signature image or a completed form cannot substitute for those conditions.

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1 Reader, scope and first decisions

For: Ground-operation providers, station managers and specialist service reviewers.

Headquarters and local implementation of G01-G09, actual providers, handovers, disrupted services, digital integrity and separate authority.

Start with the actual requested conclusion and the current adopted profile. Identify which information is source evidence, what is only proposed, who performs the activity and which independent function may decide. A guide explains implementation; it does not add a hidden pass threshold or substitute for the full standard.

2 Implementation sequence

Scope Definition, Applicability and Evidence Reuse

All case tuples, activity-based applicability, local/remote interfaces and reliance on prior results. This procedure controls the meaning of the claim before planning time or issuing a certificate.

Map retained responsibility

Identify the legal entity, sites, external performers, design/acceptance authority and lifecycle duties. Outsourcing changes the performer but does not necessarily remove the applicant duty. Distinguish headquarters governance from local implementation and direct service performance from coordination.

Examine reused evidence

Verify the original issuer, source, method, configuration, conditions, date and accessible limitations. Identify precisely which characteristics or requirements remain unchanged. Preserve failures and restrictions. A common owner or identical document title does not establish site equivalence.

Carry scope through every record

Check the same tuple in the plan, observations, reports, findings, review, decision, certificate instruction and public record. When the scope changes, preserve the earlier request and assessment history. Do not silently remove a failed activity merely to present the remaining work as an unrestricted success.

Common error / hold: Unclear outcome class, missing configuration, unsupported exclusion or inaccessible essential reused evidence holds the dependent conclusion until an independently reviewable boundary exists.

Assessment Planning, Resources and Site Coverage

Planning by object, sites, methods, shifts, actual performers, conditions and consequence. Organisational AF 9100 time rules are not transplanted into laboratory witnesses or personnel examinations.

Plan local evidence

For initial and renewal operational-capability or CAB work, establish direct evidence at every included delivery location. Shared governance does not establish local capability. Use physical visits where necessary work cannot be established remotely. Apply eligible surveillance sampling only through a justified approved profile.

Calculate real evaluation resources

For non-organisational work, sum justified productive task hours and divide by eight. Count genuinely shared work once. Allocate travel, breaks, reporting, translation delay and independent review/panel work separately. Apply the complete AF 9100 model only for its organisational route and add necessary coverage.

Reconcile actual execution

Record actual participants, productive hours, observations, interruptions and deviations. Add work when essential coverage is missing, or hold/narrow the conclusion through an actual reviewed boundary. Report completed coverage rather than copying the original plan as though every planned action occurred.

Common error / hold: Missing site evidence, unjustified method grouping, unavailable specialist competence, unsafe access or inadequate time requires additional work, a supported restriction or deferral.

Remote and Hybrid Assessment Control

Live video, remote instruments, secure document rooms, telemetry, prerecorded material and controlled simulation. Suitability is determined per task, not for a whole organisation by default.

Check permission and confidentiality

Obtain lawful access, recording arrangements and any restrictions before the session. Determine whether the responsible participants and reviewers may see controlled information. Do not route protected data through an unapproved public or AI service.

Observe and retain provenance

Record the essential steps actually seen, source files, readings, conditions and any coaching. Connect observations to the same object and configuration throughout the task. Avoid unnecessary personal or tactical detail in the shared report; retain sufficient protected evidence for independent review.

Close and protect the records

Retain the session log, permissions, source evidence, interruptions, limitations and additional work. Confirm lawful storage and retention of recordings. Review method validity after changes to equipment, software, location or intended decision use.

Common error / hold: Missing identity, essential observation, lawful access, adequate fidelity or continuity leaves the dependent requirement not demonstrated and blocks a broader claim.

Technical Witnessing and Method-Family Coverage

Witnessing of manufacturing, testing, inspection, maintenance, services, education or statement activities within an approved profile and safe access boundary.

Confirm readiness and authority

Verify actual performer, task authorisation, method, article configuration, equipment, software and environmental conditions. Confirm safe access and the responsible stop authority. An assessor observes competence and does not take operational command of hazardous work.

Trace forward to release

Follow the observation into raw data, calculation, report review, technical disposition and actual authorised release. Check whether the conclusion matches the evaluated item and whether recipients received required restrictions. Separate process qualification, product acceptance and provider competence.

Hand over for independent review

Provide an attributable witness record with sources, actual observations, findings and precise conclusion. Identify any supplementary work still required. The witness recommendation is evaluation evidence, not the independent final conformity decision.

Common error / hold: An unobserved essential step, inappropriate method, invalid equipment or unsupported representative grouping requires additional demonstration or an explicitly restricted conclusion.

Technical Reporting, Amendments and Report Review

Laboratory, inspection, assessment, educational, operational and environmental reports, with the distinctions required by their actual result class.

Reconcile original evidence

Link observations, input identities, raw data, processing, corrections, measurement status and conditions to the same evaluated object. Keep customer-supplied descriptions, subcontracted results and expert opinions distinguishable from the issuer observations.

Perform competent technical review

The authorised reviewer checks the result against the applicable criteria, source evidence, method scope and permitted wording. Resolve contradictions or return the report for correction. Technical sign-off and an independent conformity decision remain separate where the route requires both.

Notify and retain usable history

Reach recipients who relied on an incorrect result, provide the corrected bounded conclusion and record acknowledgement where needed. Preserve originals, supersession and current status. An amended PDF must remain linked to raw evidence and any continuing restriction.

Common error / hold: An unsupported claim, unresolved essential evidence gap, invalid method or absent authorised signatory holds report release; an already issued unsupported conclusion triggers correction and recipient action.

Nonconformity, Containment and Corrective Action

All technical and administrative findings, with separate immediate protection, corrective action, independent status decisions and historical-output review.

Protect immediately

Responsible operations protect people and affected work upon a credible serious concern, preserve evidence and notify required parties. Holder critical notice is within 24 hours of awareness; operator action on a substantiated critical concern is within 24 hours. Earlier applicable duties remain. Grading debate must not delay protection.

Agree a dated action plan

Submit the plan within 30 calendar days of the original finding notification. Name owners, technical changes, protective measures, verification methods and effectiveness exposure. Set major closure at 60 days and minor closure at 90 days from the original notice, subject to earlier duties.

Close, reopen and learn

Record actual effectiveness evidence, closure authority and communications. Missed deadlines trigger the applicable status action, not automatic extension. Recurrence reopens cause and extent analysis. Preserve the original dates and earlier failed conclusions during reissue, reassignment and improvement.

Common error / hold: Uncontrolled critical concern, unverified effectiveness, missed required closure or open in-scope nonconformity blocks the relevant grant and triggers proportionate continuing-status protection.

Surveillance, Renewal and Scope Extension

Continuing capability and conformity status across the actual granted scope. Historical instance statements retain their object and period rather than an invented two-year technical validity.

Set the correct surveillance interval

Use no more than 12 months, reduced to six months for high-consequence, materially novel or significant competence/integrity exposure. An inseparable mixed scope follows the shortest triggered interval. Retain the decision/last-completed-surveillance trigger; a booking or new invoice does not reset it.

Complete surveillance and act on gaps

Record actual observations, time, findings and independent conclusions. Missing required completion triggers affected status action. Review systemic dependencies when a finding affects common resources. A document check alone is not completed technical surveillance.

Close the cycle record

Reconcile holder notices, exact registry state, public claims, pending appeals and ongoing duties. A pending appeal, payment, transfer or booked visit does not extend validity. Keep current and historical outcomes readable during issuer or system changes.

Common error / hold: Overdue required surveillance, unsupported material change, expired status or open renewal findings prevents continued or renewed claims within the affected scope.

Cyber Incidents, Evidence Recovery and Service Continuity

Defensive incident handling for engineering, production, assessment and public-status systems. No intrusive security testing is authorised by this procedure.

Contain within actual authority

Stop or restrict compromised access, data use or connected work using safe authorised arrangements. Coordinate with operational technical authorities so that a security response does not defeat an essential safety function. Apply urgent critical notices and status controls when their actual triggers are met.

Restore service separately from assurance

Record when the system becomes available, but do not declare assured return yet. Verify data identity, versions, units, time basis, permissions, evidence links and current/historical status. Missing original evidence stays unavailable rather than being reconstructed as an invented favourable record.

Verify learning and continued control

Repeat failed tests after correction and relevant regression after changes. Review occurrence and escape causes, supplier dependencies and recovery performance. Record residual limitations, owners and follow-up. Retain originals, incident chronology and actual decision history.

Common error / hold: Broken configuration/evidence links, unreconciled later events, compromised permissions or unresolved critical defects prevents assured return even when the service is online.

3 Detailed application boundaries

F07-G01 – Ground handling and turnaround

Station-specific passenger, baggage, accessibility, ramp, load-control, aircraft-movement and de-/anti-icing interfaces within declared contractual responsibilities. Include only tasks actually delivered and competently demonstrated.

Application-specific parameters: Provider/station; service tasks; aircraft/customer data; operating conditions; equipment compatibility; local variations; personnel authorisations; handover and hold points; abnormal-event reporting; contracted boundaries.

Representative witnessing: Follow a turnaround service trail from current aircraft/customer instructions through staff/equipment readiness, handovers, a recorded exception and actual service completion; do not direct live operations.

Change / requalification triggers: Station; aircraft/customer; service track; equipment; local instruction; staffing; operating environment; subcontractor; shared data system.

Result boundary: No loading, pushback or de-icing recipe, flight clearance or general airline operating authority is created.

F07-G02 – Cargo, mail and specialist logistics

Acceptance, custody, storage, preparation, transfer and release of declared cargo, mail and specialist shipments at named stations. Dangerous-goods and other restricted tasks require independently verified competence and permissions.

Application-specific parameters: Shipment classes; stations; task boundaries; custody parties; contents declarations; security interfaces; storage and temperature/time limits; equipment; segregation; permits; release recipients; excursion and recall rules.

Representative witnessing: Trace a consignment through multiple custody points and a separate excursion or rejected-acceptance case; examine the link between environmental readings, item identity and recipient notification.

Change / requalification triggers: Shipment class; station; packaging or route; storage limit; monitoring system; subcontractor; specialist permissions; customer instruction.

Result boundary: Capability recognition does not validate unknown contents, replace transport permissions or establish a shipment's technical eligibility solely from its paperwork.

F07-G03 – Fuel and energy services

Storage, source verification, quality control, transfer and delivery of named fuels or energy services at identified locations. Conventional fuel, electrical charging and hydrogen-related activities have distinct technical and permission boundaries.

Application-specific parameters: Fuel/energy identity; source and custody; storage/distribution architecture; sampling; compatibility; contamination controls; equipment; personnel; limits; supplied quantities; protective functions; emergency interfaces.

Representative witnessing: Follow a source-to-aircraft or asset delivery record with quality checks, equipment status, quantity reconciliation and handover; challenge an identity mismatch and an interrupted delivery using safe evidence.

Change / requalification triggers: Fuel or energy type; source; storage or transfer equipment; aircraft interface; sampling method; protective system; station; permission; attribute mechanism.

Result boundary: No fuel formulation, pressure, hazardous operating procedure or whole-flight zero-emission assertion is supplied by this profile.

F07-G04 – Ground equipment and technical facilities

Capability for operational support and maintenance of declared ground support equipment, boarding bridges, baggage systems, charging infrastructure, technical utilities and associated assets. Specify direct maintenance versus contracted coordination.

Application-specific parameters: Asset types and serials; supported aircraft/tasks; operating limits; maintenance data; inspection and protective functions; personnel; calibration; temporary repairs; digital configuration; release and restoration authority.

Representative witnessing: Observe a representative equipment inspection and trace a defect from detection through restriction, maintenance, protective-function verification and return; examine one temporary-condition record.

Change / requalification triggers: Asset family; aircraft interface; software or controls; maintenance method; temporary repair; protective device; infrastructure or energy change; support provider.

Result boundary: Equipment service capability is not unrestricted aircraft compatibility, statutory plant approval or proof that every connected device is conforming.

F07-G05 – Catering, cabin and sanitation services

Station-specific catering integrity, cleaning, cabin supplies, water/lavatory and sanitation services within declared tasks. Aircraft compatibility, hygienic handling and specialist local obligations remain explicit.

Application-specific parameters: Service and station; aircraft/customer requirements; product and chemical suitability; contamination barriers; time/temperature where applicable; storage; equipment; staff training; delivery trace; incident and withdrawal duties.

Representative witnessing: Trace one delivery from source/storage to aircraft handover and one rejected or disrupted service; examine segregation, product compatibility and recipient traceability without inventing clinical or food-safety limits.

Change / requalification triggers: Product or chemical; supplier; station; aircraft/customer instruction; equipment; storage/transport; time-temperature basis; subcontractor.

Result boundary: An ASTRA service result is not a substitute for applicable food, water or workplace permissions and does not authorise use of an incompatible aircraft chemical.

F07-G06 – FBO and business-aviation support

A fixed-base operator's named service package covering declared passenger/crew support, property care, parking and handling coordination, communications and underlying technical services. Directly performed and arranged activities remain separately identified.

Application-specific parameters: Location; direct services; arranged services; providers; customer interfaces; confidentiality; accessibility; permissions; equipment; emergency communications; disruption arrangements; service measures; actual handovers.

Representative witnessing: Follow a coordinated arrival/departure support case across actual external providers and a disrupted service; compare the marketed package to direct evidence and responsibility boundaries.

Change / requalification triggers: Package; location; supplier; aircraft/customer; direct-versus-coordinated role; data platform; operating hours; emergency support.

Result boundary: Coordination capability does not certify every underlying provider, give aircraft release powers or prove services at unassessed network locations.

F07-G07 – Flight and air-navigation support

Dedicated dispatch or flight-support, communications, navigation, surveillance and meteorological-support activities within named service boundaries. Each technical discipline requires its own method, competency and permission schedule.

Application-specific parameters: Service track; responsible originator/provider/user; geography; systems and configurations; data rights; coordinate/reference basis; accuracy and timeliness criteria; timestamps; fallback; permissions; operational decision owner.

Representative witnessing: Trace a source-to-user information trail and a stale or incorrect-data event, recording acquisition, receipt, processing, publication and use times with their declared conventions.

Change / requalification triggers: Discipline or geography; source data; reference system; software; performance criterion; operator mandate; fallback or communications dependency.

Result boundary: No public air-navigation authority, airline operating licence, flight clearance or guaranteed operational safety follows from a generic support-service outcome.

F07-G08 – Aviation digital and operational systems

Deployed aviation software and digital services affecting operations, information, coordination or technical evidence. The evaluated object is the defined service configuration and its responsibilities, not every integrated customer or third-party output.

Application-specific parameters: System/version; intended users and actions; source-of-record; interfaces; performance and integrity requirements; data rights; AI use; hosting/dependencies; access; update; fallback; recovery; termination and custody.

Representative witnessing: Trace a critical output through source, transformation, release and user reliance and execute safe prohibited/missing-data scenarios in the actual accepted environment; verify meaningful restoration.

Change / requalification triggers: Intended use; schema; source; algorithm/model; hosting; permissions; integration; interface; configuration; provider exit or migration.

Result boundary: A platform outcome is not certification of every generated output, every connected provider or the safety of all customer operations.

F07-G09 – Specialist aviation security services

Assessment of authorised specialist security-service provider capability, staff and equipment within declared aviation tasks. Detailed tactical methods and sensitive vulnerabilities remain in protected authorised systems.

Application-specific parameters: Legal provider; authorised activities; sites; scope of public/customer authority; staff competence and lawful suitability checks; equipment; protected data; service interfaces; performance criteria; oversight and incident handling.

Representative witnessing: Follow an authorised service and equipment-validity trail using appropriately protected evidence and a safe exception-management case; document inaccessible essential areas as holds or scope limits.

Change / requalification triggers: Legal mandate; task; site; equipment; protected method; key personnel; access arrangements; subcontractor; incident or revoked permission.

Result boundary: ASTRA does not transfer public security powers, authorise intrusive activity or supply tactical bypass, offensive or operational attack instructions.

Worked cases and challenge questions

Synthetic case – Scope Definition, Applicability and Evidence Reuse

A synthetic component has bench evidence but a new installation changes power and cooling. The unchanged material evidence is reused; installation compatibility remains open and requires new verification. The component result does not become an installed-system result.

Review challenge: identify the exact affected object, requirement, missing or adverse evidence, accountable action, independent decision and historical record. A fictional example is not a real applicant or evidence of a completed pilot.

Synthetic case – Remote and Hybrid Assessment Control

A fictional remote witness loses video during a concealed assembly check. A later photograph shows the finished assembly but cannot prove the hidden step. The required observation is repeated through a safe accepted method; it is not marked complete from the photograph.

Review challenge: identify the exact affected object, requirement, missing or adverse evidence, accountable action, independent decision and historical record. A fictional example is not a real applicant or evidence of a completed pilot.

Synthetic case – Technical Reporting, Amendments and Report Review

A fictional service report wrongly includes a station not visited. The issuer corrects the scope, evaluates reliance by recipients and retains the original and amendment. A new cover date does not turn the unvisited station into assessed capability.

Review challenge: identify the exact affected object, requirement, missing or adverse evidence, accountable action, independent decision and historical record. A fictional example is not a real applicant or evidence of a completed pilot.

4 Self-check before submission

Can the reviewer identify the exact object, current criteria, actual performer, representative evidence, adverse results, remaining uncertainty and real authority without inferring them from a title? Check local sites and dependent services separately. Keep blanks and unknowns visible and provide controlled continuations for long source material.

Decision and authority boundary

A positive grant, renewal or extension requires valid scope, every applicable criterion fulfilled, sufficient usable evidence, closure of every in-scope nonconformity, current competent independent decision authority and effective required permissions. No score, majority vote, membership status or future corrective promise replaces a missing gate. An operational technical release, a programme outcome and an administrative publication are separate actions.

E1 Explicit acceptance and evidence contract

Apply the following logic to the exact evaluated object and responsible function. A procedural checkpoint, product characteristic, competence decision and public credential are different objects. Their states shall not be collapsed into one score. Source: ASTRA 62.1–62.7 and Annex AL.

State	Sufficient basis	Required next action
PASS	Applicable; current approved predicate met by valid, purpose-specific evidence.	Retain the original evidence and bounded inference. Other mandatory gates still apply.
FAIL	Applicable; valid evidence demonstrates that the approved predicate is not met.	Contain affected use; retain the failure; assess cause, extent and required corrective verification.
HOLD	Applicability, criterion, method, evidence, uncertainty or authority is unresolved.	Resolve the missing basis. Do not manufacture a value, favourable default or product-defect conclusion.
N/A	Activity trigger and retained responsibility are absent; independent exclusion approval exists.	Retain the scope-specific reason and reassess when activity or responsibility changes.
UNSET	Only an uncompleted field in this PDF; not a conformity state.	No conclusion is recorded. Complete review before the field can support a decision.

For a compound source clause, create a child-condition ledger containing every separately testable condition, location, phase and operating mode. A sentence-level checkpoint is a navigation aid, not permission to merge unrelated predicates. Each child receives an ID, responsible owner, criterion, method, source evidence, uncertainty where relevant, current state and independent review. The parent cannot PASS while any mandatory child is FAIL, HOLD or UNSET.

An acceptable measurement interval and an acceptable authority chain are independent prerequisites. Use finite, unit-consistent, unrounded values; negative uncertainty, reversed limits, unknown version or wrong-object evidence produce HOLD. For inclusive [L,H] and accepted interval [a,b], PASS requires $a \geq L$ and $b \leq H$; FAIL requires $b < L$ or $a > H$; otherwise HOLD. Approved one-sided or exclusive boundaries retain their own declared predicate.

Positive-decision conjunction

Every applicable mandatory child is PASS AND each N/A is independently justified AND every in-scope nonconformity is verified closed AND scope, competence, independence and actual authority are valid AND required panel participation and voting rules are satisfied. No average, majority preference or payment supplies missing evidence.

E2 Source-to-implementation crosswalk

The references below use the supplied 248-page FIRST EDITION. Each row retains the original clause identifier and source page. The operating instructions in this document elaborate implementation; they do not replace the full source condition or its applicable annexes. A reference to a whole chapter requires selection of every triggered subclause, not only the examples printed here.

ASTRA ID / page	Source subject	Implementation use
1.3 / 10	Object and responsibility tuple	Requirement, objective evidence and local child predicates
1.5 / 11	Activity-based applicability	Requirement, objective evidence and local child predicates
7.1 / 17	Function-specific competence	Requirement, objective evidence and local child predicates
7.3 / 17	Essential steps and assessment security	Requirement, objective evidence and local child predicates

ASTRA ID / page	Source subject	Implementation use
7.4 / 17	Initial assessor population	Requirement, objective evidence and local child predicates
7.5 / 18	Maintenance and inactivity	Requirement, objective evidence and local child predicates
9.7 / 20	Technical reporting and amendments	Requirement, objective evidence and local child predicates
10.5 / 21	Remote access and live evidence	Requirement, objective evidence and local child predicates
10.6 / 22	Recovery, retention and closure	Requirement, objective evidence and local child predicates
11.3 / 22	Existing evidence and reuse	Requirement, objective evidence and local child predicates
12.1 / 23	Planning from scope and consequence	Requirement, objective evidence and local child predicates
12.2 / 23	Sites and stations	Requirement, objective evidence and local child predicates
12.3 / 23	Method-family witnessing	Requirement, objective evidence and local child predicates
12.4 / 24	Time and productive work	Requirement, objective evidence and local child predicates
13.3 / 25	Witness control	Requirement, objective evidence and local child predicates
13.5 / 25	Closing and report	Requirement, objective evidence and local child predicates
23.1 / 38	Provider, station and service definition	Requirement, objective evidence and local child predicates
23.2 / 38	G01 – Handling and turnaround	Requirement, objective evidence and local child predicates
23.3 / 39	G02 – Cargo, mail and specialist logistics	Requirement, objective evidence and local child predicates
23.4 / 39	G03 – Fuel and energy services	Requirement, objective evidence and local child predicates
23.5 / 39	G04 – Ground equipment and technical facilities	Requirement, objective evidence and local child predicates
23.6 / 39	G05 – Catering, cabin and sanitation	Requirement, objective evidence and local child predicates
23.7 / 39	G06 – FBO and business-aviation support	Requirement, objective evidence and local child predicates
23.8 / 39	G07 – Flight and air-navigation support	Requirement, objective evidence and local child predicates

ASTRA ID / page	Source subject	Implementation use
23.9 / 40	G08 – Digital and operational systems	Requirement, objective evidence and local child predicates
23.10 / 40	G09 – Specialist security services	Requirement, objective evidence and local child predicates
23.11 / 40	Local variation and continuing network control	Requirement, objective evidence and local child predicates
26.4 / 44	Remote, space and long-duration operation	Requirement, objective evidence and local child predicates
28.1 / 45	Mandatory scope content	Requirement, objective evidence and local child predicates
30.2 / 48	Controlled transition	Requirement, objective evidence and local child predicates
30.4 / 48	Scope withdrawal and learner/customer protection	Requirement, objective evidence and local child predicates
31.3 / 49	Actual adoption record	Requirement, objective evidence and local child predicates
43.1 / 65	Integrated energy boundary	Requirement, objective evidence and local child predicates
43.2 / 65	Batteries and electrical storage	Requirement, objective evidence and local child predicates
43.3 / 65	Hydrogen, fuels and chemical energy	Requirement, objective evidence and local child predicates
43.4 / 65	Propulsion and rotating equipment	Requirement, objective evidence and local child predicates
43.5 / 66	Ground support and emergency interfaces	Requirement, objective evidence and local child predicates
43.6 / 66	Qualification, change and release	Requirement, objective evidence and local child predicates
47.1 / 70	Safety-security dependency analysis	Requirement, objective evidence and local child predicates
47.2 / 70	Identity, access and privileged actions	Requirement, objective evidence and local child predicates
47.3 / 70	Supply-chain and dependency integrity	Requirement, objective evidence and local child predicates
47.4 / 71	Connected production and operational technology	Requirement, objective evidence and local child predicates
47.5 / 71	Update trust and cryptographic transition	Requirement, objective evidence and local child predicates
47.6 / 71	Incident recovery and assured return	Requirement, objective evidence and local child predicates

ASTRA ID / page	Source subject	Implementation use
50.1 / 74	Site-specific operating baseline	Requirement, objective evidence and local child predicates
50.2 / 74	Infrastructure condition and usable information	Requirement, objective evidence and local child predicates
50.3 / 74	Construction and operational change	Requirement, objective evidence and local child predicates
50.4 / 74	Coordinated emergency and continuity	Requirement, objective evidence and local child predicates
50.5 / 74	Passenger, accessibility and service interfaces	Requirement, objective evidence and local child predicates
50.6 / 75	Integrated but separate outcomes	Requirement, objective evidence and local child predicates
51.1 / 75	Headquarters and actual station delivery	Requirement, objective evidence and local child predicates
51.2 / 75	Turnaround and ground handling	Requirement, objective evidence and local child predicates
51.3 / 75	Cargo, energy and specialist support	Requirement, objective evidence and local child predicates
51.4 / 75	Flight and navigation-support data	Requirement, objective evidence and local child predicates
51.5 / 76	Digital platforms and protected security services	Requirement, objective evidence and local child predicates
51.6 / 76	Shared failure and service restoration	Requirement, objective evidence and local child predicates
54.1 / 78	Hazards, assumptions and essential controls	Requirement, objective evidence and local child predicates
54.2 / 78	Stop authority and escalation	Requirement, objective evidence and local child predicates
54.3 / 79	Emergency capability and exercises	Requirement, objective evidence and local child predicates
54.4 / 79	Occurrence, escape and affected population	Requirement, objective evidence and local child predicates
54.5 / 79	Learning and protected reporting	Requirement, objective evidence and local child predicates
56.4 / 81	Validation and prohibited cases	Requirement, objective evidence and local child predicates
56.5 / 81	Export, migration and meaningful recovery	Requirement, objective evidence and local child predicates
57.1 / 81	Role-specific competence and scope	Requirement, objective evidence and local child predicates

ASTRA ID / page	Source subject	Implementation use
57.3 / 82	Practical assessment and maintained practice	Requirement, objective evidence and local child predicates
58.2 / 82	Coverage and productive resources	Requirement, objective evidence and local child predicates
61.3 / 86	Dependent documents and compatibility	Explicit verification and acceptance predicate
62.1 / 88	Atomic requirement record	Explicit verification and acceptance predicate
62.3 / 88	Evidence validity before conformity	Explicit verification and acceptance predicate
62.4 / 88	Four requirement states	Explicit verification and acceptance predicate
62.5 / 89	No compensation or favourable default	Explicit verification and acceptance predicate
62.7 / 89	Decision replay and consistency	Explicit verification and acceptance predicate
63.1 / 90	Domain selection without geographic omission	Explicit verification and acceptance predicate
63.3 / 90	Environment, phase and mode matrix	Explicit verification and acceptance predicate
63.6 / 91	Interface and lifecycle closure	Explicit verification and acceptance predicate
64.4 / 92	Resource budgets and coupled margins	Explicit verification and acceptance predicate
64.5 / 92	Heritage and similarity	Explicit verification and acceptance predicate
65.6 / 95	Payload function and scientific or service output	Explicit verification and acceptance predicate
66.3 / 96	Delay and feasible intervention	Explicit verification and acceptance predicate
66.4 / 96	Data age and time uncertainty	Explicit verification and acceptance predicate
66.7 / 97	Outage, recovery and service evidence	Explicit verification and acceptance predicate
67.3 / 98	Receipt, execution and completion	Explicit verification and acceptance predicate
67.6 / 99	Anomaly response and safe restoration	Explicit verification and acceptance predicate
68.7 / 101	Status and long-term custody	Explicit verification and acceptance predicate
73.1 / 110	Population, mission and human tasks	Explicit verification and acceptance predicate
73.5 / 111	Human factors and effective authority	Explicit verification and acceptance predicate
74.4 / 112	Sample identity and custody	Explicit verification and acceptance predicate
74.6 / 113	Anomalies, unknown state and release of information	Explicit verification and acceptance predicate
74.7 / 113	Disposition and residual responsibility	Explicit verification and acceptance predicate
75.7 / 115	Handover, resource claims and closure	Explicit verification and acceptance predicate
77.1 / 118	Requirement-to-method completeness	Explicit verification and acceptance predicate
77.2 / 118	Campaign design and article pedigree	Explicit verification and acceptance predicate
77.5 / 118	Original data and invalid tests	Explicit verification and acceptance predicate

ASTRA ID / page	Source subject	Implementation use
77.8 / 119	Independent campaign closure	Explicit verification and acceptance predicate
78.4 / 120	Human authority and consequential decisions	Explicit verification and acceptance predicate
78.5 / 121	Security and trusted updates	Explicit verification and acceptance predicate
78.7 / 121	Recovery and semantic portability	Explicit verification and acceptance predicate
79.3 / 122	Loss of contact and uncertain physical state	Explicit verification and acceptance predicate
79.4 / 122	Affected populations and historical decisions	Explicit verification and acceptance predicate
79.5 / 122	Terminal evidence and responsible transfer	Explicit verification and acceptance predicate
80.1 / 124	One complete application schedule	Explicit verification and acceptance predicate
80.2 / 124	Domain and verification completeness	Explicit verification and acceptance predicate
80.3 / 124	Competent independent closure	Explicit verification and acceptance predicate
80.4 / 124	Bounded claim and publication	Explicit verification and acceptance predicate
80.5 / 124	Continuing conformity and change	Explicit verification and acceptance predicate

E3 Detailed operating extensions

AF-AST-PR-004 — Scope Definition, Applicability and Evidence Reuse

Implementation basis: 1.3 (p. 10); 1.5 (p. 11); 11.3 (p. 22); 62.1 (p. 88); 62.4 (p. 88); 63.1 (p. 90); 63.3 (p. 90); 63.6 (p. 91); 64.5 (p. 92); 80.1 (p. 124); 80.2 (p. 124)

X04.1 Resolve every applicable domain

Compare the mission concept with AK01-AK32 and the actual activity with F01-F08. Record each phase, mode, duration, interface and retained responsibility.

Completion / hold: Unknown applicability is HOLD; absent equipment or budget never establishes N/A.

X04.2 Establish a defensible similarity argument

Compare object identity, design, sources, environment, software, prior exposure and observability. Assign reused evidence to specific unchanged requirements only.

Completion / hold: Every material difference has accepted new evidence or an explicitly limited conclusion.

X04.3 Maintain separate outcome tuples

A combined case may share provenance and visits but keeps separate methods, criteria, sites, instances, reviewers and independent decisions.

Completion / hold: No shared dossier creates a blanket mission, tenant, supplier or fleet approval.

X04.4 Approve exclusion and re-open triggers

An independent technical reviewer checks the absent trigger and retained duty, names the supported excluded boundary and records conditions that would re-open it.

Completion / hold: Only independently justified exclusions receive N/A; an unexamined consequential interface remains HOLD.

Record contract: the actor records the input baseline, actual work, deviations, result and evidence link; the named receiving function acknowledges access and the permitted next action. A returned or incomplete handover retains the original event history. Use the associated FR modules and RG record links; no document or database field confers actual authority.

AF-AST-PR-005 – Personnel Qualification, Authorisation and Monitoring

Implementation basis: 7.1 (p. 17); 7.3 (p. 17); 7.4 (p. 17); 7.5 (p. 18); 57.1 (p. 81); 57.3 (p. 82); 62.5 (p. 89); 73.1 (p. 110); 73.5 (p. 111); 78.4 (p. 120); 80.3 (p. 124)

X05.1 Map competence to an actual task

Separate knowledge, specialist methods, practical evaluation, leadership, review, decision and appeal. Map mission-domain demands and evidence-access limits to each role.

Completion / hold: A general title or training course is not an authorisation for an unfamiliar task.

X05.2 Observe essential performance directly

Define task conditions, representative configuration, rubric, prohibited assistance and essential steps before the demonstration. Preserve failed attempts and material limits of simulation.

Completion / hold: Every essential step passes individually; component scores cannot compensate for essential failure.

X05.3 Test effective human authority

Confirm information, response time, skill and technical access needed for intervention or independent decisions, particularly with delayed mission data and AI support.

Completion / hold: A nominal human approval point fails when timely meaningful intervention is not feasible.

X05.4 Maintain event-time currency

Review actual practice, learning, witnessed work, changing methods, report quality and adverse feedback. Record suspension and supervised reactivation using genuine dates.

Completion / hold: Later authorisation cannot validate prior out-of-scope work; assess affected earlier outputs separately.

Record contract: the actor records the input baseline, actual work, deviations, result and evidence link; the named receiving function acknowledges access and the permitted next action. A returned or incomplete handover retains the original event history. Use the associated FR modules and RG record links; no document or database field confers actual authority.

AF-AST-PR-007 – Assessment Planning, Resources and Site Coverage

Implementation basis: 12.1 (p. 23); 12.2 (p. 23); 12.3 (p. 23); 12.4 (p. 24); 58.2 (p. 82); 63.3 (p. 90); 64.4 (p. 92); 77.1 (p. 118); 77.2 (p. 118); 80.2 (p. 124)

X07.1 Build a phase-by-mode coverage matrix

Identify every needed site, method family, operator role, configuration, normal/degraded scenario and remote limitation. Assign a required observation or justified alternative to each cell.

Completion / hold: No uncovered essential cell can be marked complete from another site's headquarters evidence.

X07.2 Allocate productive effort

Estimate necessary person-hours by actual task, shared-work contribution, specialism and concurrency. Separate travel, reporting, translation delay, review and panel effort.

Completion / hold: Shared administrative evidence can be counted once; distinct technical observations and independent work cannot be removed.

X07.3 Schedule dependencies and adverse work

Place prerequisites before dependent evaluation and reserve access to failed, changed, interrupted and difficult cases. A planned activity is distinct from actual execution.

Completion / hold: An infeasible schedule or unavailable specialist requires additional work or a bounded deferred scope.

X07.4 Close actual coverage

Reconcile planned and actual performer, duration, configuration, observation and evidence; document omissions, rework and resulting limitations.

Completion / hold: The independent reviewer accepts the actual coverage, not the original commercial duration or completion percentage.

Record contract: the actor records the input baseline, actual work, deviations, result and evidence link; the named receiving function acknowledges access and the permitted next action. A returned or incomplete handover retains the original event history. Use the associated FR modules and RG record links; no document or database field confers actual authority.

AF-AST-PR-008 – Remote and Hybrid Assessment Control

Implementation basis: 10.5 (p. 21); 13.3 (p. 25); 26.4 (p. 44); 63.3 (p. 90); 66.3 (p. 96); 66.4 (p. 96); 67.3 (p. 98); 74.4 (p. 112); 77.5 (p. 118); 78.7 (p. 121)

X08.1 Qualify remote observability

Specify the essential physical or practical steps, identity, camera/sensor coverage, spatial resolution, timing and what cannot be observed. Compare remote evidence with the intended decision.

Completion / hold: Unobservable essential characteristics remain HOLD unless valid supplementary evidence is accepted.

X08.2 Authenticate source and event time

Confirm live versus recorded content, actual performer, configuration, original timestamp, time scale, permissions and chain of custody.

Completion / hold: Recent receipt or an attractive recording does not prove current state or independent routine performance.

X08.3 Control interruption and substitution

Record loss of feed, sensor saturation, camera movement, substituted articles and coaching. Preserve partial observations and define the unobserved interval.

Completion / hold: No uninterrupted witness claim survives a material gap; repeat or supplement the required observation safely.

X08.4 Reconcile remote completion and custody

Separate instruction, receipt, execution, observed completion and receiving acceptance. Verify retrieval and protected record transfer after the session.

Completion / hold: Only the demonstrated bounded task is accepted; command acknowledgement alone is not physical completion.

Record contract: the actor records the input baseline, actual work, deviations, result and evidence link; the named receiving function acknowledges access and the permitted next action. A returned or incomplete handover retains the original event history. Use the associated FR modules and RG record links; no document or database field confers actual authority.

AF-AST-PR-012 – Technical Reporting, Amendments and Report Review

Implementation basis: 9.7 (p. 20); 13.5 (p. 25); 28.1 (p. 45); 62.3 (p. 88); 62.4 (p. 88); 65.6 (p. 95); 67.3 (p. 98); 74.6 (p. 113); 77.5 (p. 118); 77.8 (p. 119); 80.4 (p. 124)

X12.1 Reconcile output identity and basis

Confirm actual item, configuration, method, site, period, performer, conditions, raw evidence, corrections and authorised signatory.

Completion / hold: A report title or customer description cannot substitute for verified identity and scope.

X12.2 Separate observed result from interpretation

Label measured, model-derived, declared and unknown information; state uncertainty, detection/access limits and the justified population.

Completion / hold: Qualification, provider competence, scientific inference and operational permission are not interchangeable report conclusions.

X12.3 Control adverse and amended reports

Keep earlier issued versions, exact correction reason, affected characteristics, original failures and recipients who may have relied on them.

Completion / hold: A replacement favourable report cannot erase a valid adverse result or make a missing observation contemporaneous.

X12.4 Review publication against authority

Compare report, scope schedule, registry and public claim with the actual independent decision. Use the printed edition date only as publication identity.

Completion / hold: Every communicated result retains its actual event history and no unsupported broader scope.

Record contract: the actor records the input baseline, actual work, deviations, result and evidence link; the named receiving function acknowledges access and the permitted next action. A returned or incomplete handover retains the original event history. Use the associated FR modules and RG record links; no document or database field confers actual authority.

AF-AST-PR-020 – Cyber Incidents, Evidence Recovery and Service Continuity

Implementation basis: 10.6 (p. 22); 47.6 (p. 71); 56.4 (p. 81); 56.5 (p. 81); 66.7 (p. 97); 67.6 (p. 99); 78.5 (p. 121); 78.7 (p. 121); 79.3 (p. 122); 79.4 (p. 122)

X20.1 Contain the actual evidence dependency

Identify affected configuration, identities, source records, products, commands and decisions. Preserve raw evidence and isolate tests from live assets.

Completion / hold: Service availability alone does not establish trustworthy operation or exclude impact.

X20.2 Select a recoverable trusted baseline

Record recovery point, accepted schema/configuration, permissions, source links and missing or later events. Preserve the source for reconciliation.

Completion / hold: A backup job success is not acceptance of recoverable semantic evidence.

X20.3 Restore and reconcile meaning

Check record identity, source access, units, event time, versions, relationships, adverse states and independent decision instruments after restoration.

Completion / hold: Equal file counts or application startup cannot close missing relationships; dependent conclusions remain HOLD.

X20.4 Authorise return and remaining restrictions

Obtain technical return authority separately from registry/status decisions, inform affected recipients and retest original failure paths plus regression.

Completion / hold: No retrospective validation of outputs issued while essential integrity was unknown.

Record contract: the actor records the input baseline, actual work, deviations, result and evidence link; the named receiving function acknowledges access and the permitted next action. A returned or incomplete handover retains the original event history. Use the associated FR modules and RG record links; no document or database field confers actual authority.

AF-AST-PR-028 – Change, Transition, Transfer and Programme Closure

Implementation basis: 30.2 (p. 48); 30.4 (p. 48); 31.3 (p. 49); 56.5 (p. 81); 61.3 (p. 86); 62.7 (p. 89); 68.7 (p. 101); 74.7 (p. 113); 75.7 (p. 115); 78.7 (p. 121); 79.5 (p. 122); 80.5 (p. 124)

X28.1 Map the complete change population

Identify affected requirements, profiles, objects, configurations, sites, people, calculations, fields, interfaces and public claims.

Completion / hold: A cosmetic filename or edition-label change cannot hide a changed technical basis.

X28.2 Establish retained and additional evidence

Record what remains valid, what is invalidated, required new demonstration, compatible tools and actual competence. Keep mandatory protective duties active during transition.

Completion / hold: No automatic grandfathering, retrospectively applied requirement or unsupported transfer of scope.

X28.3 Accept custody and local implementation

Reconcile semantic records, permissions, actual receiving capability, remaining learners/customers, open cases, notices and independent decisions.

Completion / hold: Sending an archive or signing a commercial handover does not establish accepted technical custody.

X28.4 Close without abandoning terminal duties

Preserve unknown final states, original status gaps, hazardous inventories, unresolved remedies and actual receiving owners.

Completion / hold: Only demonstrably complete obligations are closed; remaining duties stay assigned after programme or provider cessation.

Record contract: the actor records the input baseline, actual work, deviations, result and evidence link; the named receiving function acknowledges access and the permitted next action. A returned or incomplete handover retains the original event history. Use the associated FR modules and RG record links; no document or database field confers actual authority.

E4 Application-specific parameter completion

These are required information groups from Annex AO, not pre-approved engineering limits. For every triggered group, populate actual values or observable attributes before evaluation, with unit, inclusivity, phase/mode, technical derivation, uncertainty/dependence, method version, owner, independent review, authentic approval and change trigger. An absent trigger requires an approved exclusion; an unsupported or missing essential value is HOLD.

P01 – Mission and scope

Legal owner, performer, family/module, object, domain, configuration, location, duration and modes.

Derivation and evidence: Scope tuple and mission concept; approved applicability matrix.

Completion test: No undefined essential object, duty, phase or exclusion.

P02 – Environment and exposure

Quantity, spatial/temporal boundary, distribution or bound, source/model, uncertainty and coupled effects.

Derivation and evidence: Mission environment baseline and qualified specialist rationale.

Completion test: Selected conditions bound each claimed use; unknown critical mechanisms remain HOLD.

P03 – Requirements and acceptance

Stable ID, owner, characteristic, units, bound inclusivity, predicate, observation and essential-step marker.

Derivation and evidence: Requirement baseline and Annex AL decision rule.

Completion test: Every condition is evaluable before observations are judged.

P04 – Geometry and reference systems

Frame origin/orientation, epoch, time scale, coordinate units, transformation and covariance.

Derivation and evidence: Validated transformation and independent known-answer checks.

Completion test: Correct frame and time are maintained through every interface.

P06 – Test article and fixtures

Article pedigree, differences from delivered object, mounting, boundary conditions, operating state and exposure history.

Derivation and evidence: Approved representativeness and cumulative-test analysis.

Completion test: No material difference or prior damage invalidates the intended inference.

P07 – Measurement and uncertainty

Measurand, instrument/range, corrections, sensitivity, covariance, coverage, time/space sampling and calibration.

Derivation and evidence: Complete measurement model; valid raw data.

Completion test: Uncertainty and detection capability are fit for the approved decision rule.

P08 — Structure, life and mechanisms

Loads, allowables, factors, life, geometry, material state, mechanisms, detectability and approved reserve.

Derivation and evidence: Qualified structural/life model and representative evidence.

Completion test: Each prospectively defined margin and essential mechanism predicate passes.

P11 — Communication and timing

Distance, frequency/wavelength, gain/loss, noise, rate, margin, latency, event time, age, clock error and outage.

Derivation and evidence: Validated end-to-end budget and adverse service tests.

Completion test: Required quality, delay and integrity conditions all pass.

P12 — Human and protective response

User/task, representative conditions, essential steps, feasible intervention, health-support interface and emergency resources.

Derivation and evidence: Specialist criteria and observed performance.

Completion test: Every essential protection is effective; no invented universal physiological limit.

P13 — Contamination and samples

Relevant substances/particles, pathway, limit, method/detection, custody, cleanliness, containment and receiving.

Derivation and evidence: Mission-specific technical/protection basis.

Completion test: Required integrity and scientific cleanliness are demonstrated for the actual sample/use.

P14 — Software, AI and models

Purpose/domain, source/build/weights/data, dependencies, target, errors, uncertainty, prohibited behaviour and change limits.

Derivation and evidence: Independent verification and model/use validation.

Completion test: Essential scenarios and target conditions pass; experimental outputs remain separate.

P15 — Security and command authority

Identities, roles, privileges, keys/trust, target, validity window, command sequence, integrity and interruption response.

Derivation and evidence: Written test authorisation and deployed workflow validation.

Completion test: No prohibited authority or unverified command state is accepted.

P17 — Logistics and environmental claims

Identity, amount, units, condition, losses, allocation, lifecycle boundary, factor provenance and exclusive attributes.

Derivation and evidence: Reconciled custody/quantity records and separate suitability/statement evaluation.

Completion test: Quantity and claim integrity pass independently of technical eligibility.

P18 — Decision, continuity and terminal duties

Closed findings, reviewer competence, independence, authority, status clocks, final-state criteria, custody and open obligations.

Derivation and evidence: Authenticated decisions and verified terminal/transfer evidence.

Completion test: Every mandatory gate is complete; incomplete or unknown terminal state remains explicit.

E5 All-space applicability and bounded responsibility

The following Annex AK tags are selected because the document can support these responsibilities. Applicability is decided for the actual case. Tags do not expand a family, create an operating permission or place a whole mission inside a supplier's limited scope. Resolve domain, phase, mode, environment and retained duty before accepting a claim.

Domain / source page	Coverage	Required boundary
AK01 / 187 Terrestrial engineering and supply	Design offices, manufacturing, material sources, procurement and integration.	Every delivered characteristic and essential supplier interface is traceable to accepted evidence.
AK02 / 187 Test facilities and technical providers	Environmental, structural, materials, calibration and inspection services, including mobile and remote work.	Actual method competence and valid result evidence are separately demonstrated.
AK03 / 187 Launch sites and spaceports	Site infrastructure, handling, ground services, emergency interfaces and actual permissions.	No site outcome is used as vehicle, launch or mission permission.
AK04 / 187 Launch and deployment interfaces	Vehicle/payload integration, handling, ascent environment, separation and commissioning.	Every required integration and protective condition is met before the actual commitment.
AK05 / 188 Reusable launch and return articles	Cumulative exposure, refurbishment, thermal protection, hidden damage and life decisions.	Reuse is based on actual history and accepted condition, never a reset life.
AK06 / 188 Low Earth orbit systems	Satellites, stations and services in the declared near-Earth operating environment.	Environment-specific qualification and end-of-life capability support the bounded mission.
AK07 / 188 Medium, geosynchronous and high Earth orbits	Navigation, communication, relay and other specified orbit-dependent services.	No lower-orbit or nominal-link evidence automatically covers a different environment.
AK08 / 188 Highly elliptical and transfer regions	Missions crossing materially different exposure, geometry and communication regimes.	Every phase and transition has a supported envelope and verification path.
AK09 / 189 Cislunar and libration-region systems	Lunar vicinity, relays, gateways, transportation interfaces and regional services.	The exact operating domain and service dependencies are technically complete.
AK10 / 189 Constellations and formation services	Distributed functions, inter-satellite links, fleet management and shared ground support.	Distributed performance and independent redundancy assumptions are validated.
AK11 / 189 Orbital traffic and tracking support	Tracking, conjunction information, data services and inter-operator coordination.	A metric is accepted only for its validated data/model scope; missing data are not zero risk.
AK12 / 189 Cooperative docking and servicing	Authorised inspection, connection, transfer, repair and service interventions.	All essential interface and completion states are independently supported.
AK13 / 190 On-orbit assembly and manufacture	Assembly, additive or other production, finishing and output verification in space.	Process execution is not substituted for evidence of required output properties.
AK14 / 190 Stations and inhabited orbital platforms	Habitation, payload integration, visiting vehicles, occupants and support.	Integrated human protection and resources are accepted independently of mission success.
AK15 / 190 Extravehicular and isolated crew work	Individual equipment, user/task, environment, support and rescue dependencies.	Essential individual and integrated protective tasks pass without averaging.

Domain / source page	Coverage	Required boundary
AK16 / 190 Lunar surface systems	Landers, rovers, infrastructure, observation and processing on the Moon.	Destination-specific evidence bounds the actual region, phase and operating mode.
AK17 / 191 Planetary landers and surface vehicles	Surface exploration, scientific instruments, mobility and handling.	Terrestrial analogy is justified; unknown critical surface conditions remain restricted.
AK18 / 191 Atmospheric and buoyant exploration	Planetary atmospheric vehicles, balloons, aircraft and relevant instruments.	All relevant environment-specific structural and functional predicates pass.
AK19 / 191 Small-body and comet operations	Observation, cooperative contact, sampling and resource demonstrations.	Uncertain body/interaction properties are not treated as established terrestrial conditions.
AK20 / 191 Subsurface and ocean-world exploration	Subsurface, liquid, ice and extreme-pressure exploration systems and their interfaces.	Specialist boundary and contamination evidence precedes dependent use.
AK21 / 192 Interplanetary cruise and deep-space missions	Spacecraft, relays, science operations and long-delay mission support.	Human and autonomous actions are feasible within actual timing and resource limits.
AK22 / 192 Solar and heliophysics missions	Solar observations and missions with relevant thermal, plasma and radiation extremes.	Protection and data-quality evidence cover the actual mission envelope, not a screening equation alone.
AK23 / 192 Outer-system and distant observatories	Low-flux, long-life, long-delay science and infrastructure applications.	Required lifetime and survival margins are met with credible continuity and data integrity.
AK24 / 192 Interstellar precursor and future distant systems	Bounded research and demonstrable capabilities for very long-range or novel concepts.	Research promise is not an operational grant; unsupported capability stays in development.
AK25 / 193 Human exploration and surface habitats	Crew transport interfaces, habitation, exploration support and emergency protection.	Every essential human protection and feasibility predicate is supported by specialists.
AK26 / 193 Planetary protection and sample return	Forward/backward contamination, scientific cleanliness, samples and receiving chain.	No dependent commitment precedes complete protection and receiving evidence.
AK27 / 193 Resource utilisation and remote processing	Resource characterisation, processing, quality, storage, use and residues.	Resource yield, product eligibility and permission remain distinct.
AK28 / 193 Space logistics and distributed supply	Warehousing, transfer, spares, custody, condition, receiving and service continuity.	Only physically or otherwise validly confirmed accepted usable inventory supports mission budgets.
AK29 / 194 Specialised energy infrastructure	Generation, storage, conversion, remote delivery and controlled high-hazard power interfaces.	Performance never substitutes for safety, source authority or terminal accountability.
AK30 / 194 Ground, communication and navigation services	Mission control, RF/optical links, timing, data processing, relays and PNT support.	Availability, correctness, authority and completion are separately demonstrated.
AK31 / 194 Digital and autonomous space systems	Software, programmable hardware, AI, models, twins and defensive security.	All essential behaviours and prohibited transitions are verified for the actual deployment.
AK32 / 194 Retirement and long-term stewardship	Disposal, passivation governance, loss-of-contact states, records and residual obligations.	Final-state claims are truthful and every unresolved duty has an accepted owner.

E6 Workflow and evidence relationships

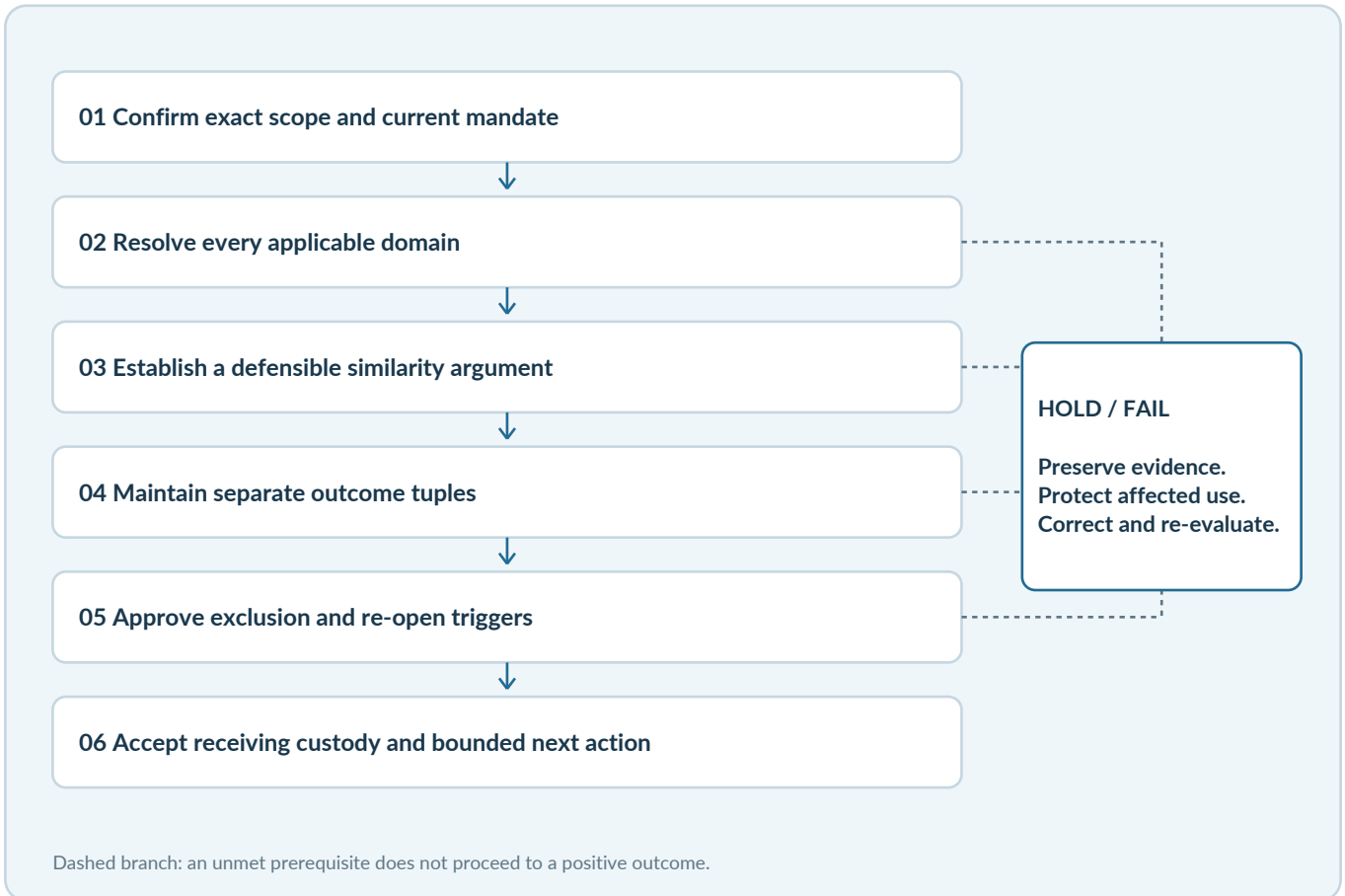
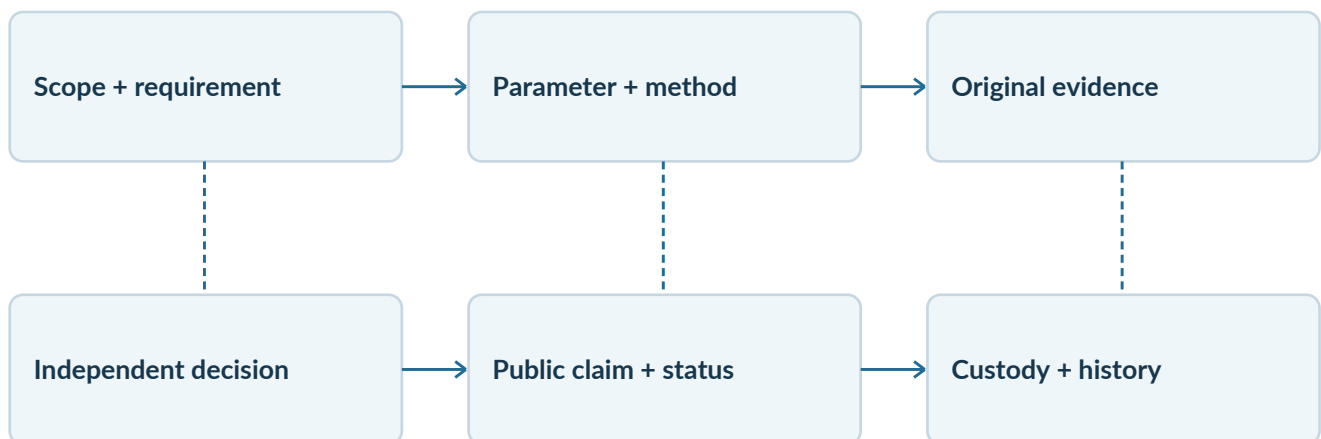


Figure — Implementation sequence for AF-AST-PR-004. Explanatory diagram; the source prerequisites and actual authority remain controlling.



Each relationship carries object identity, controlled version, actual event time and purpose-specific validity.

Figure — Scope-to-custody evidence relationships. A relationship is validated for its decision purpose, not merely because two identifiers exist.

E7 Calculations, assumptions and synthetic charts

The worked calculations below reproduce the supplied standard's Annex AM examples. Charted extensions are newly computed synthetic illustrations of those equations, not measured mission performance or new universal limits. A result is usable only when the actual inputs, model, units, uncertainty and approved application predicate are valid. A successful arithmetic check is not field validation.

AM.Q01 Measurement uncertainty and covariance

Source: ASTRA Annex AM, Q01, page 200. All numerical inputs in this example are synthetic.

$$u_c^2 = \sum (c_i^2 u_i^2) + 2\sum (i < j) (c_i c_j \text{cov}_{ij})$$

$$U = k u_c$$

Variables and units

u_i is a standard uncertainty; c_i is a sensitivity coefficient; cov_{ij} is covariance; k is the justified coverage factor. Variance terms carry squared output units.

Example inputs

Synthetic direct sum: $c_1=c_2=1$; $u_1=0.003$ mm; $u_2=0.004$ mm. First assume independence, then correlation $\rho=0.5$. Illustrative $k=2$.

Calculation and checks

1. Independent variance = $0.003^2 + 0.004^2 = 0.000025$ mm².
2. $u_c = 0.005$ mm; $U = 0.010$ mm for the stated k .
3. Correlated covariance = $0.5 \times 0.003 \times 0.004 = 0.000006$ mm².
4. Correlated variance = $0.000025 + 2 \times 0.000006 = 0.000037$ mm².
5. Correlated $u_c = 0.0060827625303$ mm; $U = 0.0121655250606$ mm.

Decision interpretation: The correlated model produces a larger uncertainty. No PASS/FAIL follows until an approved specification and decision rule are applied.

Validity limits: The linear propagation model requires a valid measurement function and adequate approximation. $k=2$ is not a universal guarantee of 95% coverage. Known bias requires correction or explicitly justified treatment; uncertainty does not conceal missing requirements.

ASTRA connections: 9.4–9.5; Annex G; 62; 77

Standard and expanded uncertainty

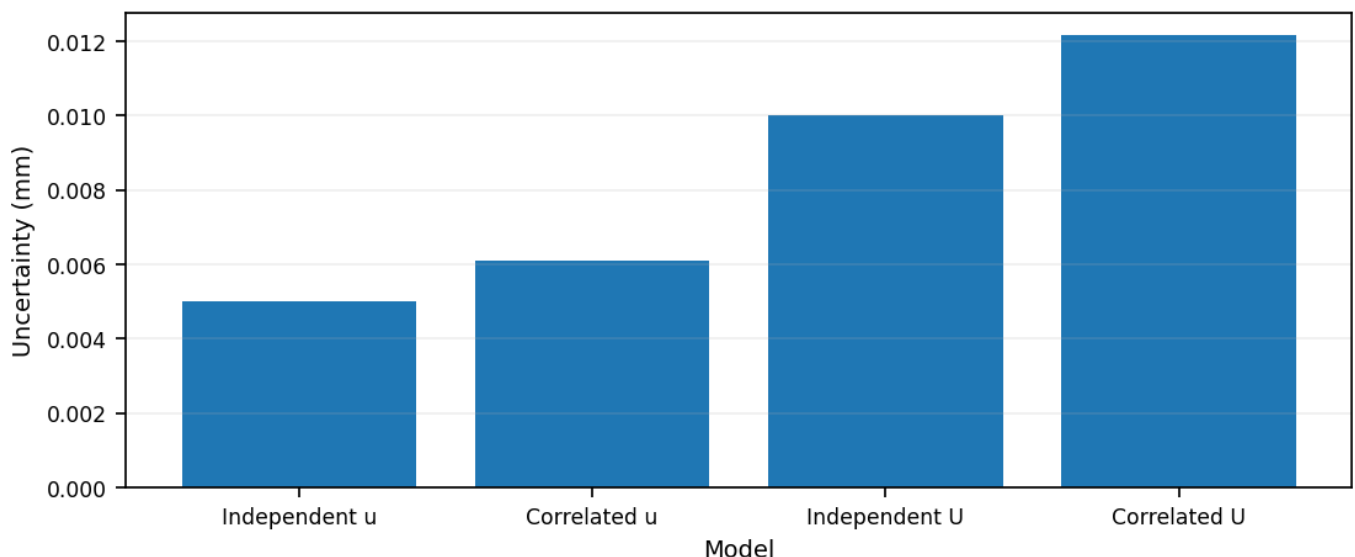


Figure Q01 — Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

Local replay record: retain the actual input manifest, source versions, calculation version, unit checks, independent recomputation, expected/observed boundary results, limitations and decision authority. Do not overwrite the teaching inputs as though they were operational data.

AM.Q02 Inclusive limits and four distinct measurement outcomes

Source: ASTRA Annex AM, Q02, page 201. All numerical inputs in this example are synthetic.

PASS: $y - U \geq L$ AND $y + U \leq H$

FAIL: $y + U < L$ OR $y - U > H$

Otherwise: HOLD; invalid evidence also results in HOLD

Variables and units

L and H are inclusive specification limits; y is a corrected result; U is a non-negative expanded uncertainty with stated coverage.

Example inputs

Synthetic specification [49.970, 50.030] mm; U=0.004 mm. Results y=50.024, 50.028, 50.036 and 50.026 mm.

Calculation and checks

1. $50.024 \pm 0.004 \rightarrow [50.020, 50.028]$ mm: PASS.
2. $50.028 \pm 0.004 \rightarrow [50.024, 50.032]$ mm: HOLD, interval overlaps the upper limit.
3. $50.036 \pm 0.004 \rightarrow [50.032, 50.040]$ mm: FAIL, interval entirely above the limit.
4. $50.026 \pm 0.004 \rightarrow [50.022, 50.030]$ mm: PASS; equality is inside the inclusive upper bound.

Decision interpretation: Neither the overlapping interval nor an invalid run is rounded into acceptance. N/A is an applicability decision, not a measurement outcome.

Validity limits: Use actual endpoints for asymmetric intervals. For an upper-only limit, PASS requires the upper endpoint at or below the limit and FAIL the lower endpoint above it. A coverage interval is not automatically a probability that this particular item conforms.

ASTRA connections: Annex G; 62.3–62.5; 77.6

Inclusive full-interval decisions

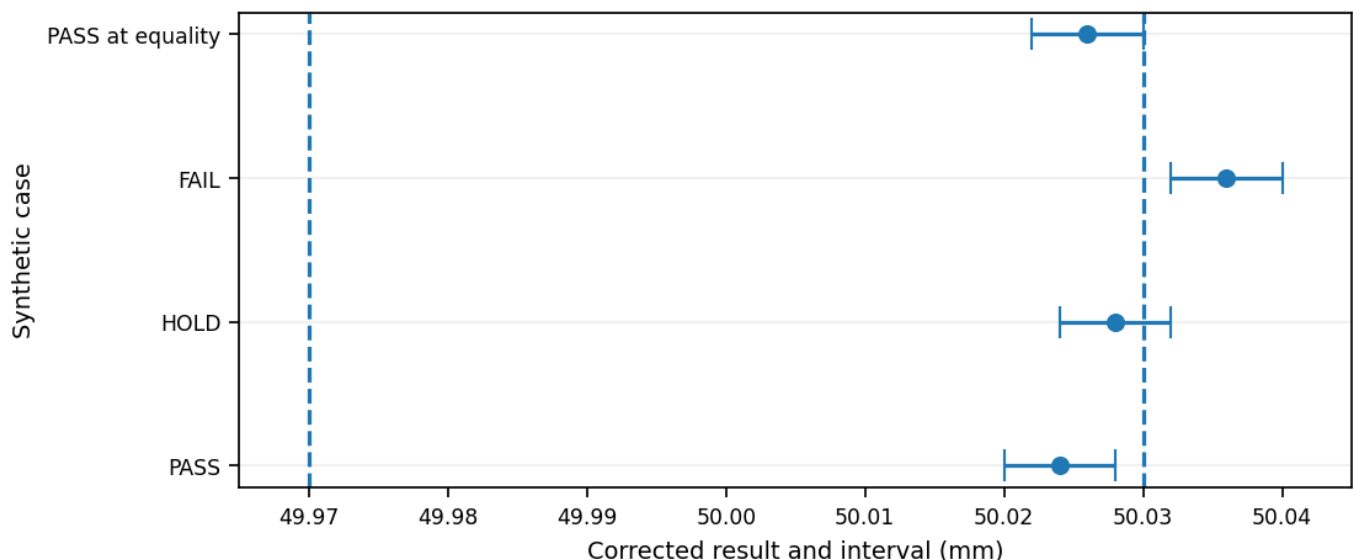


Figure Q02 — Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

Local replay record: retain the actual input manifest, source versions, calculation version, unit checks, independent recomputation, expected/observed boundary results, limitations and decision authority. Do not overwrite the teaching inputs as though they were operational data.

AM.Q03 Positive-decision conjunction and essential failure

Source: ASTRA Annex AM, Q03, page 202. All numerical inputs in this example are synthetic.

$G = S \wedge P \wedge E \wedge F \wedge C \wedge I \wedge A$

Requirement completion = completed applicable rows / all applicable rows

Variables and units

S=valid scope; P=all predicates passed; E=adequate valid evidence; F=all in-scope findings closed; C=competence; I=independence; A=actual authority.

Example inputs

A synthetic file has 200 applicable rows; 190 are complete. One remaining row concerns an essential protective control. Six other gate groups are true.

Calculation and checks

1. Completion = $190/200 = 0.95 = 95\%$.
2. The unverified essential row makes P false and E false for the requested conclusion.
3. $G = \text{true false false} \dots = \text{false}$.

Decision interpretation: No positive grant. The completion percentage is a planning measure only. A conditional development permission is a separate bounded action, not a conformity certificate.

Validity limits: No averaging, vote or commercial action can change a false mandatory gate. N/A requires independent approval of the absent trigger; it is not a way to remove unfinished work.

ASTRA connections: 15.2; Annex G.1; 62.5; 80

Completion is not the grant decision

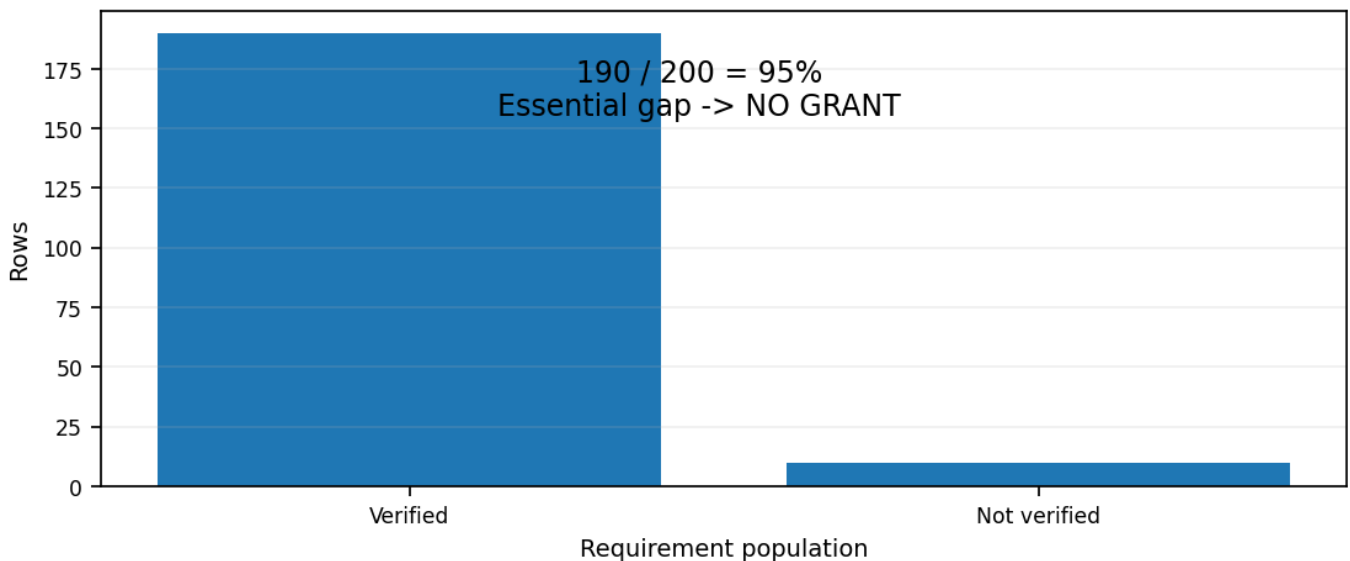


Figure Q03 – Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

Local replay record: retain the actual input manifest, source versions, calculation version, unit checks, independent recomputation, expected/observed boundary results, limitations and decision authority. Do not overwrite the teaching inputs as though they were operational data.

AM.Q04 Committee arithmetic and accreditation panels

Source: ASTRA Annex AM, Q04, page 203. All numerical inputs in this example are synthetic.

Substantive participation minimum = $\text{ceil}(2N/3)$

Affirmative minimum = $\text{ceil}(2V/3)$

Variables and units

N is the eligible committee population; V is the number of substantive yes/no votes. These equations concern the technical committee, not an applicant panel.

Example inputs

Synthetic committee: N=9, V=6, yes=4, no=2. Separate accreditation panel: three eligible members, two affirmative and one adverse.

Calculation and checks

1. Participation: $\text{ceil}(2 \times 9 / 3) = 6$; actual V=6 meets it.
2. Affirmative: $\text{ceil}(2 \times 6 / 3) = 4$; actual yes=4 meets it.
3. Accreditation panel: all three must participate; at least two support and all technical gates must pass.
4. Two participating panel members voting yes do not form a valid three-person panel.

Decision interpretation: The committee arithmetic passes for the stated case. The separate panel can decide positively only if technical gates and eligibility are all established.

Validity limits: Abstentions are not substantive committee yes/no votes. Rounding is upward. A mathematical majority never resolves missing technical evidence or an ineligible member.

ASTRA connections: 3.4; 4.3; 15.3; Annex B

Committee participation threshold

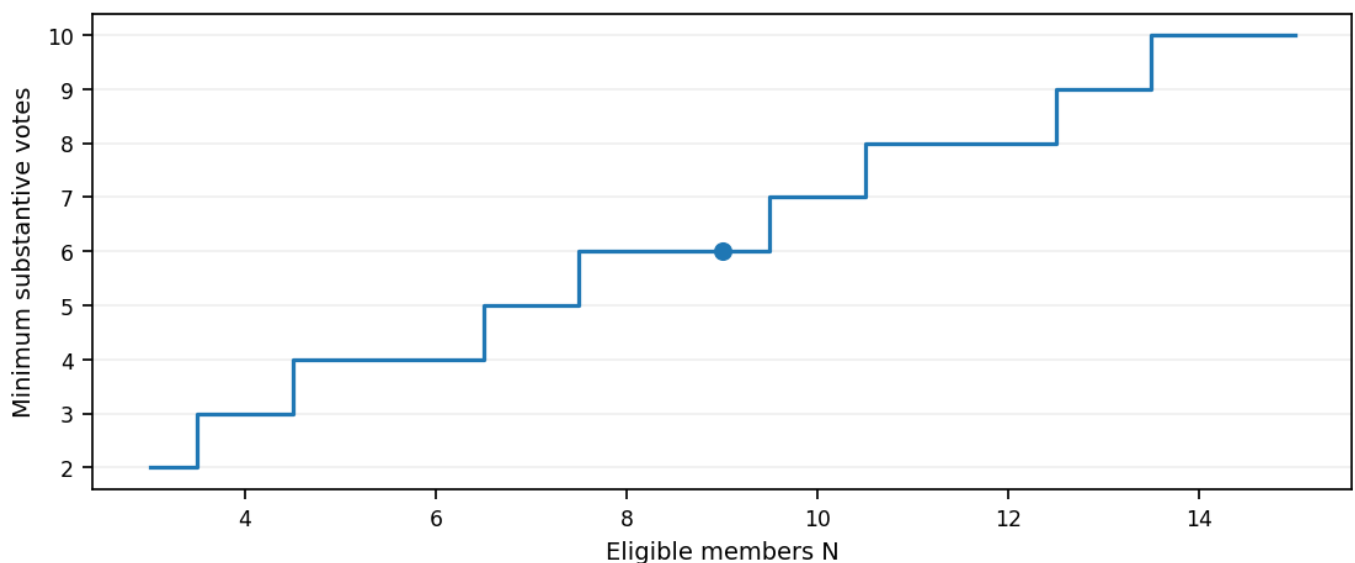


Figure Q04 – Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

Local replay record: retain the actual input manifest, source versions, calculation version, unit checks, independent recomputation, expected/observed boundary results, limitations and decision authority. Do not overwrite the teaching inputs as though they were operational data.

AM.Q05 Productive evaluation time without double counting

Source: ASTRA Annex AM, Q05, page 204. All numerical inputs in this example are synthetic.

$$T_{\text{eval}} = \sum h_i / 8 \text{ evaluator-days}$$

Total resource = evaluation + separate reporting/review/travel resources

Variables and units

h_i are distinct productive technical person-hours. Shared tasks are counted once unless distinct real work is documented.

Example inputs

Synthetic tasks: 12, 12, 12, 8 and 4 productive hours. Report 6 h; independent review 5 h; panel 3 person-hours.

Calculation and checks

1. Evaluation hours = $12+12+12+8+4 = 48$ h.
2. $T_{eval} = 48/8 = 6$ evaluator-days.
3. Separate report/review/panel time = $6+5+3 = 14$ person-hours.
4. Total stated technical resources = 62 person-hours before travel and other separately justified work.

Decision interpretation: Six evaluator-days describes only this synthetic activity breakdown. It is not a universal minimum or quotation.

Validity limits: Do not count a trainee as an independent productive assessor or two passive observers as two completed tasks. Calendar duration, person-hours and evaluator-days are distinct.

ASTRA connections: 12.4; Annex F.1; 58.2

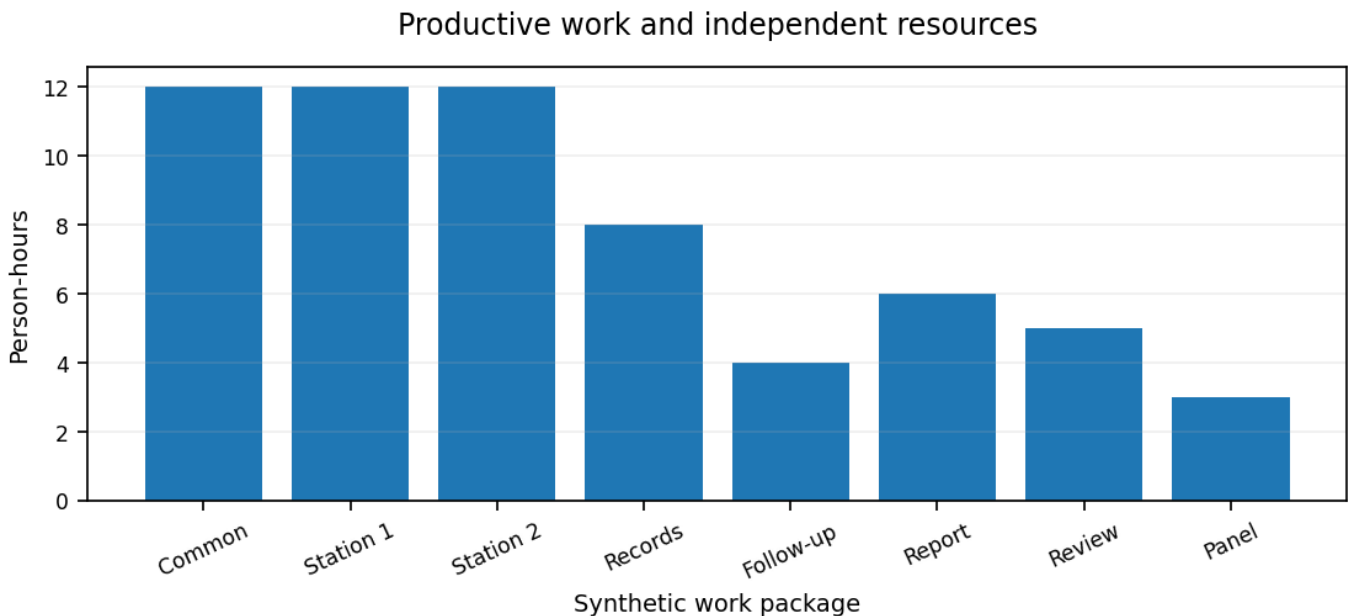


Figure Q05 — Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

Local replay record: retain the actual input manifest, source versions, calculation version, unit checks, independent recomputation, expected/observed boundary results, limitations and decision authority. Do not overwrite the teaching inputs as though they were operational data.

AM.Q06 Random detection sample size

Source: ASTRA Annex AM, Q06, page 205. All numerical inputs in this example are synthetic.

$$P(\text{at least one detection}) = 1 - (1-p)^n$$

$$n_{min} = \text{ceil}[\ln(1-C)/\ln(1-p)]$$

Variables and units

p is a fixed issue probability per independent representative observation; C is the selected target detection probability; n is a positive integer.

Example inputs

Synthetic $p=0.10$ and $C=0.95$.

Calculation and checks

1. $\ln(0.05)/\ln(0.90) = 28.433158...$; round upward to $n=29$.

2. $P(\text{detection at } n=29) = 1 - 0.9^{29} = 0.9528987130$.

3. At $n=28$, $P = 0.9476652367$, below the specified target.

Decision interpretation: 29 is the minimum integer sample for the stated independent model; the demonstration does not certify 95% conformity.

Validity limits: This calculation is invalid for unexamined dependence, changing p , biased selection or a judgemental sample represented as random. Detection is also conditional on an effective observation method.

ASTRA connections: 9.3; Annex F.5; 55.3

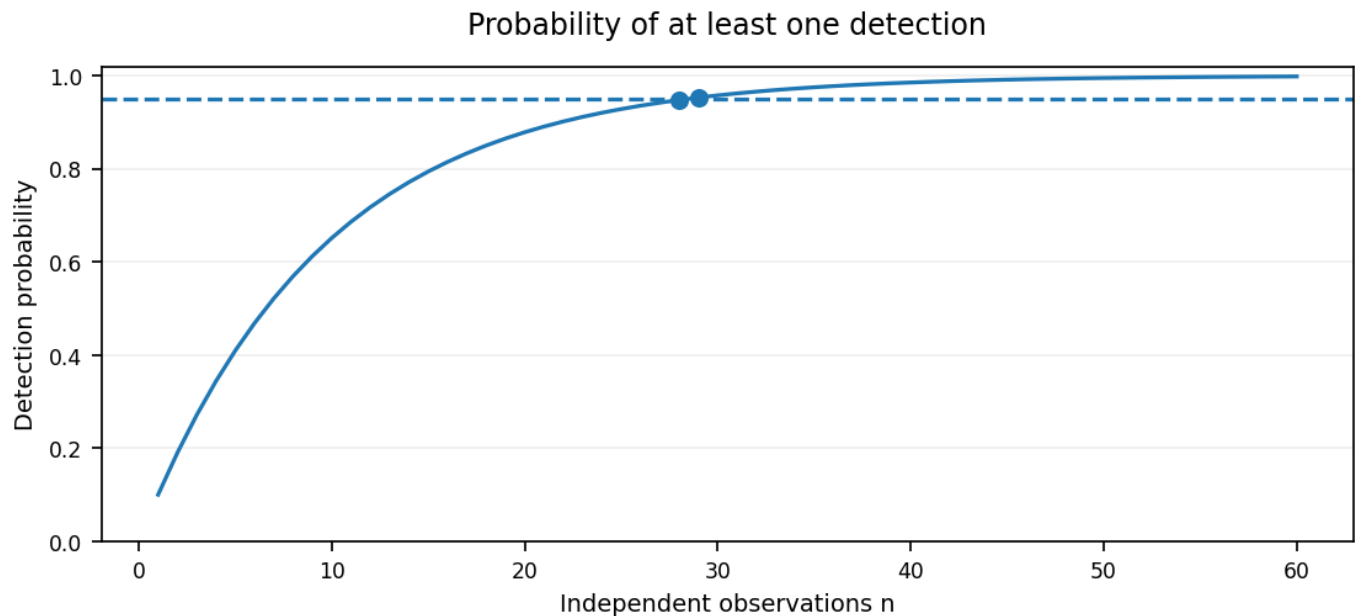


Figure Q06 – Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

Local replay record: retain the actual input manifest, source versions, calculation version, unit checks, independent recomputation, expected/observed boundary results, limitations and decision authority. Do not overwrite the teaching inputs as though they were operational data.

AM.Q09 Availability is not output correctness

Source: ASTRA Annex AM, Q09, page 208. All numerical inputs in this example are synthetic.

$$A_{\text{observed}} = T_{\text{available}} / T_{\text{window}}$$

$$\text{Correct-service fraction} = T_{\text{available_and_correct}} / T_{\text{window}}$$

Variables and units

All categories shall use the same declared window and explicit downtime and integrity definitions. Missing time is separately recorded.

Example inputs

Synthetic window=1,000 h; available=960 h; unavailable=40 h. Of the available time, 20 h produced unacceptable information.

Calculation and checks

1. Availability = $960 / 1,000 = 96\%$.

2. Available-and-correct time = $960 - 20 = 940$ h.

3. Correct-service fraction = $940 / 1,000 = 94\%$.

Decision interpretation: The 96% availability value does not prove correctness during every available hour. The two measures support different requirements.

Validity limits: The service boundary, outages, correctness test, unknown intervals and planned exclusions must be established in advance. A high uptime percentage cannot close an integrity failure.

ASTRA connections: 51.4; 55.1; 66.7; 78.7

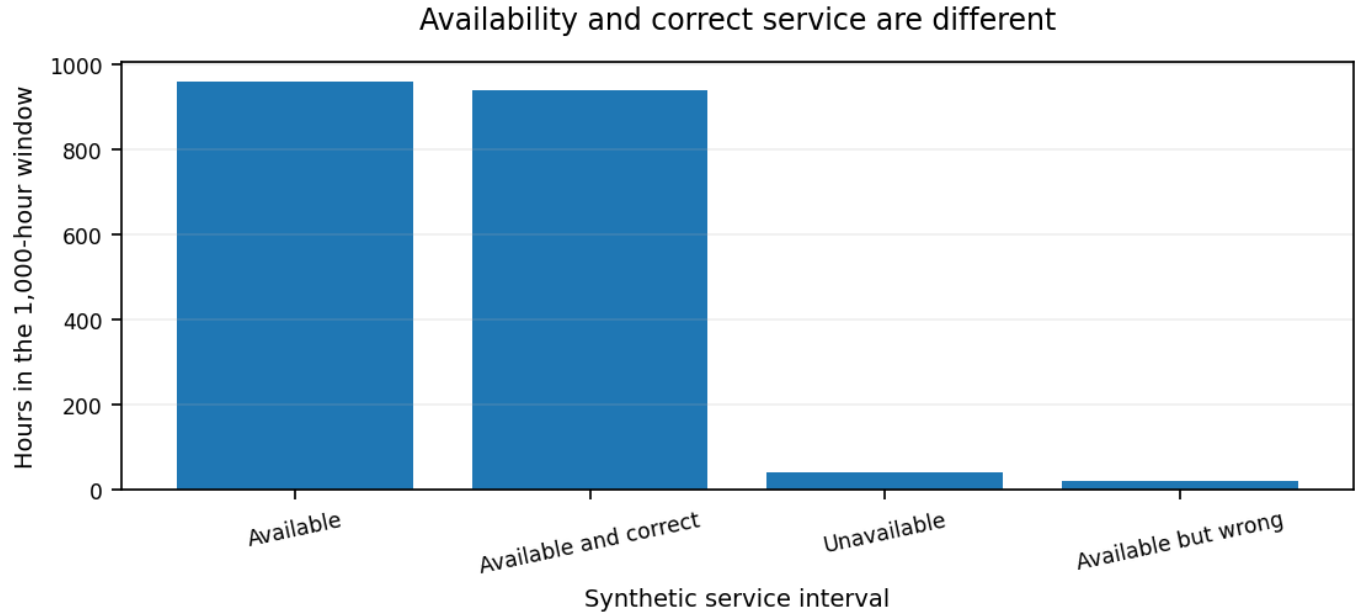


Figure Q09 – Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

Local replay record: retain the actual input manifest, source versions, calculation version, unit checks, independent recomputation, expected/observed boundary results, limitations and decision authority. Do not overwrite the teaching inputs as though they were operational data.

AM.Q15 Light-time and ground-intervention feasibility

Source: ASTRA Annex AM, Q15, page 214. All numerical inputs in this example are synthetic.

$$t_{\text{oneway}} = R/c$$

$$t_{\text{response}} = 2R/c + t_{\text{ground}} + t_{\text{actuation}}$$

Variables and units

R is a simplified constant path length in m; $c=299,792,458$ m/s. Processing, queueing, geometry change and other delays require additional terms where material.

Example inputs

Synthetic $R=2.25 \times 10^{11}$ m; ground processing=20 s; actuation=10 s; approved illustrative hazard-response window=1,200 s.

Calculation and checks

1. One-way light-time=750.519214196 s.
2. Round-trip propagation=1501.038428392 s.
3. Earliest modelled response=1531.038428392 s.
4. The response exceeds 1,200 s by 331.038428392 s.

Decision interpretation: The proposed ground intervention fails the example feasibility predicate and cannot be credited as the timely protective control.

Validity limits: The actual path and timing model must be used for a real mission. No communication architecture removes propagation delay; onboard protection still needs independent validation and authority.

ASTRA connections: 66.3; 67; 72.4; 73.8

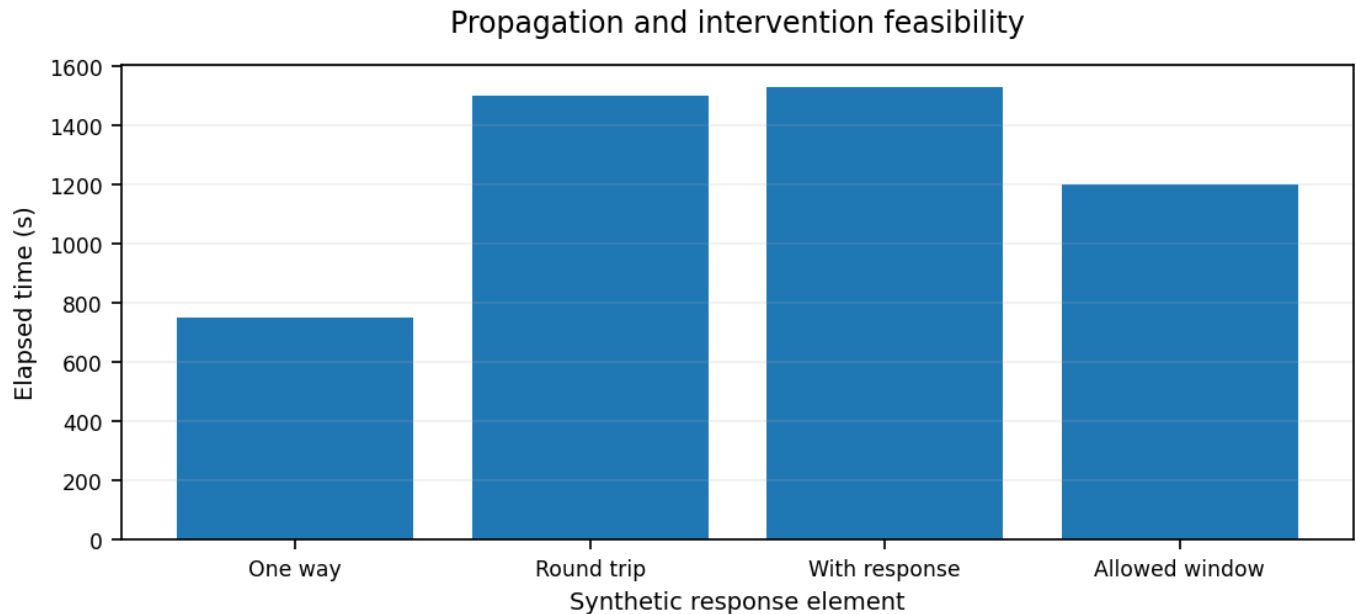


Figure Q15 — Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

Local replay record: retain the actual input manifest, source versions, calculation version, unit checks, independent recomputation, expected/observed boundary results, limitations and decision authority. Do not overwrite the teaching inputs as though they were operational data.

AM.Q16 Outage data storage with overhead

Source: ASTRA Annex AM, Q16, page 215. All numerical inputs in this example are synthetic.

$$B_{\text{required}} = R_{\text{data}} \times t_{\text{outage}} \times f_{\text{overhead}}$$

$$1 \text{ byte} = 8 \text{ bits}$$

Variables and units

Use a defined payload rate and explicit overhead, reserves and decimal/binary storage conventions. Avoid mixing Mbit/s and MB/s.

Example inputs

Synthetic 2.0×10^6 bit/s, 6 h outage, overhead factor=1.25; usable storage= 64×10^9 bit.

Calculation and checks

1. Outage duration= $6 \times 3,600 = 21,600$ s.
2. Required capacity= $2.0 \times 10^6 \times 21,600 \times 1.25 = 54 \times 10^9$ bit.
3. In decimal bytes this is 6.75×10^9 bytes = 6.75 GB.
4. Headroom= 10×10^9 bit; headroom/required=18.5185185%.

Decision interpretation: The example quantity fits in the stated usable capacity. Data priority, integrity and required extra reserve still need their own criteria.

Validity limits: Do not credit unvalidated compression, unavailable storage blocks or capacity already allocated elsewhere. Tests must include overflow, power interruption, duplicate delivery and recovery.

ASTRA connections: 66.3; 67.4; 78.7

Outage storage including the stated overhead

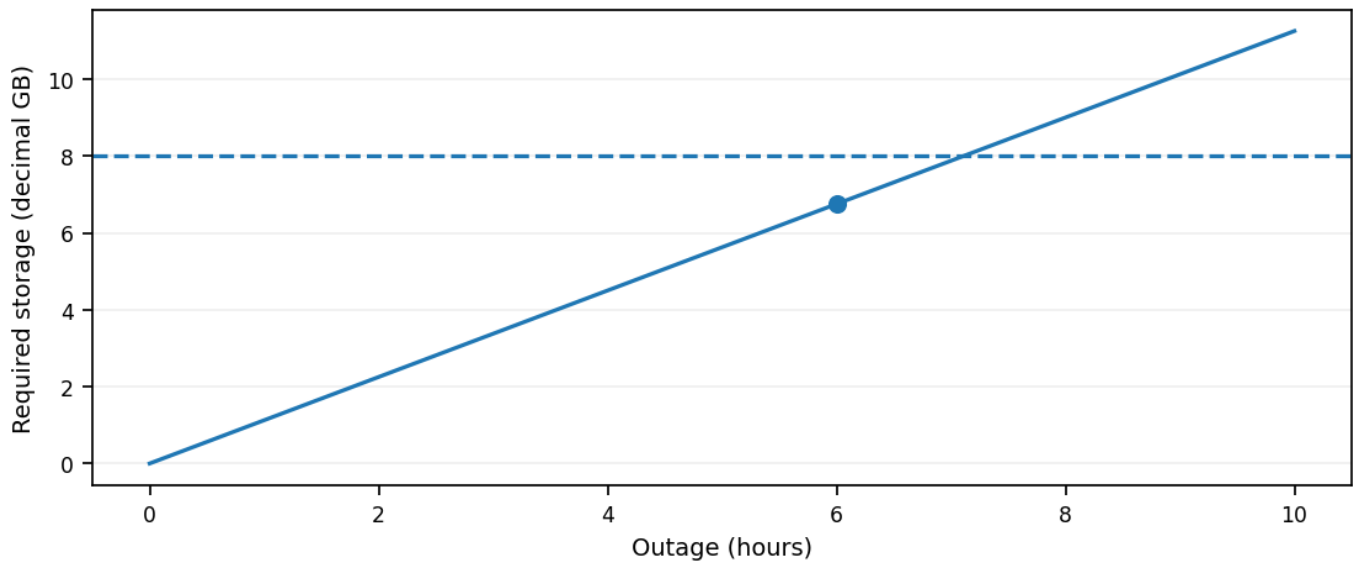


Figure Q16 – Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

Local replay record: retain the actual input manifest, source versions, calculation version, unit checks, independent recomputation, expected/observed boundary results, limitations and decision authority. Do not overwrite the teaching inputs as though they were operational data.

AM.Q17 Clock uncertainty and maximum data age

Source: ASTRA Annex AM, Q17, page 216. All numerical inputs in this example are synthetic.

$u_t = \sqrt{u_{\text{event}}^2 + u_{\text{sync}}^2}$ for justified independence

$U_t = k u_t$

Upper age endpoint = age_estimate + U_t

Variables and units

Time components refer to the same event and time basis. Correlation and systematic conversion errors require appropriate treatment.

Example inputs

Synthetic standard components 3 ms and 4 ms; illustrative $k=2$; maximum inclusive permitted data age=100 ms.

Calculation and checks

- $u_t = \sqrt{3^2 + 4^2} = 5$ ms; $U_t = 10$ ms.
- At age estimate 95 ms, interval=[85,105] ms: HOLD under the full-interval rule.
- At age estimate 80 ms, interval=[70,90] ms: PASS for this age criterion.

Decision interpretation: A recently received packet can still contain stale event data. The 95 ms estimate is not rounded down into acceptance.

Validity limits: This calculation does not account automatically for unrecorded queueing, an incorrect epoch or an unknown time scale. Such validity defects cause HOLD before the age predicate is evaluated.

ASTRA connections: 66.4; Annex G; 77.6

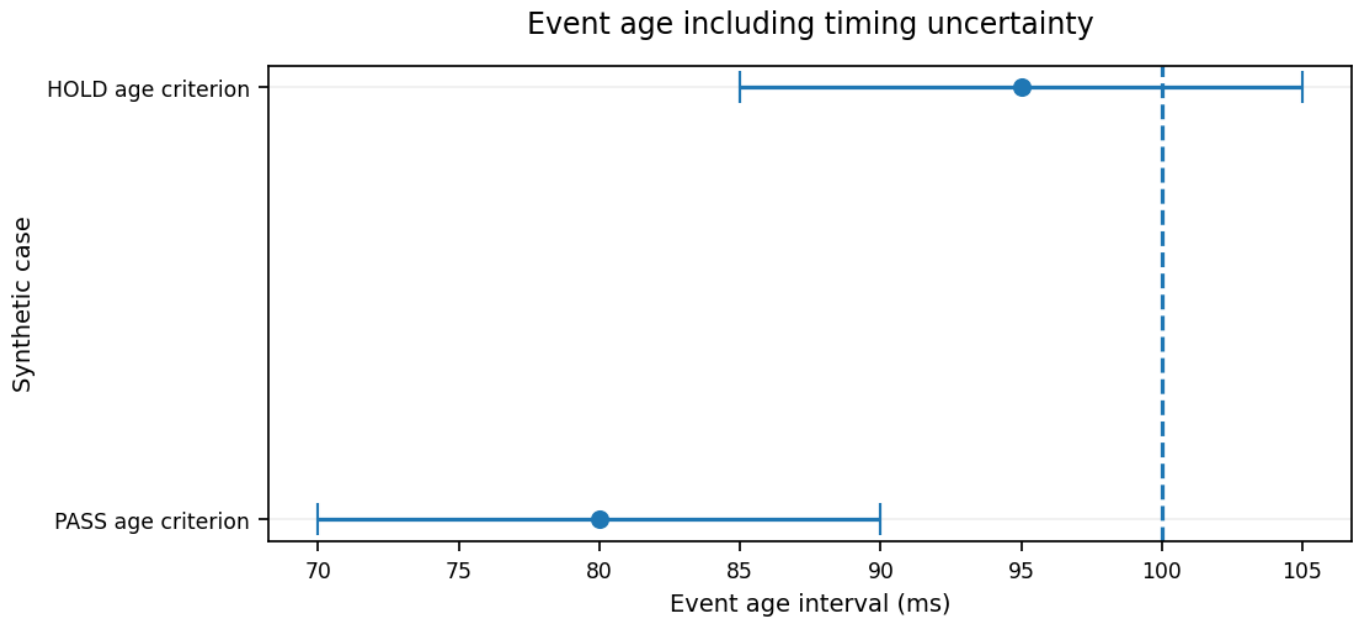


Figure Q17 – Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

Local replay record: retain the actual input manifest, source versions, calculation version, unit checks, independent recomputation, expected/observed boundary results, limitations and decision authority. Do not overwrite the teaching inputs as though they were operational data.

AM.Q23 Material genealogy, yield and retained work

Source: ASTRA Annex AM, Q23, page 222. All numerical inputs in this example are synthetic.

Input = good + reject + tests + losses + work_in_progress

First-pass yield = accepted_first_pass_output/input

Variables and units

All quantities shall use a consistent lot and period. Recovered material remains linked to its origin and is not counted twice as new production.

Example inputs

Synthetic input=500 units; good first-pass=410; reject=30; destructive tests=10; process losses=20; work in progress=30.

Calculation and checks

1. Reconciliation=410+30+10+20+30=500 units.
2. First-pass yield=410/500=82%.
3. If 20 rejected units are later recovered, the recovery does not increase original input or first-pass output.

Decision interpretation: The quantity balance closes. Technical identity, condition and acceptance evidence still determine whether the 410 outputs are eligible.

Validity limits: A closed balance does not prove authenticity, completeness or material quality. Mixing quantities with different units or unverified scrap/recovery transfers invalidates the reconciliation.

ASTRA connections: 18.4; 48.4; Annex AC; 75.4

Original input reconciliation

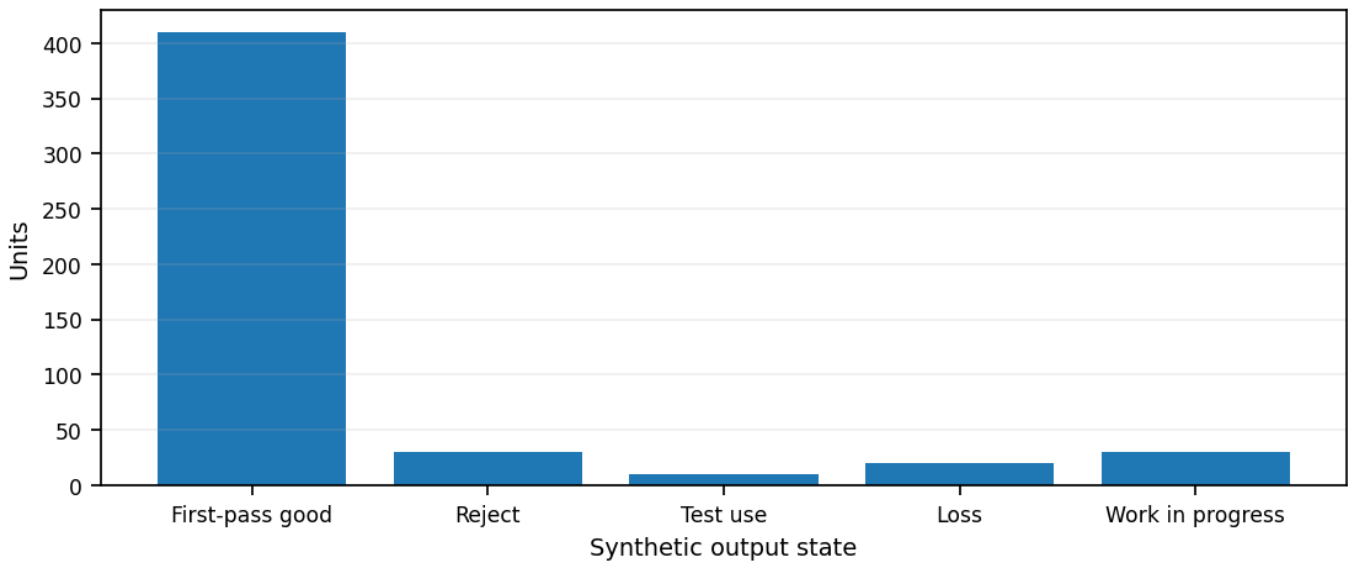


Figure Q23 – Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

Local replay record: retain the actual input manifest, source versions, calculation version, unit checks, independent recomputation, expected/observed boundary results, limitations and decision authority. Do not overwrite the teaching inputs as though they were operational data.

AM.Q25 Reliability architecture and common-cause sensitivity

Source: ASTRA Annex AM, Q25, page 224. All numerical inputs in this example are synthetic.

$R_{\text{series}} = R_1 R_2$ for independent required elements

$R_{\text{parallel}} = 1 - (1 - R_1)(1 - R_2)$ for independent full-capability alternatives

$R_{\text{with_common_event}} = (1 - q) R_{\text{parallel}}$

Variables and units

R_1 and R_2 refer to the same mission duration and domain. q is an illustrative independent probability of a common event defeating both alternatives. Perfect switching is assumed only for this example.

Example inputs

Synthetic $R_1=0.98$, $R_2=0.99$; illustrative common-event probability $q=0.01$.

Calculation and checks

1. Series result= $0.98 \times 0.99 = 0.9702$.
2. Ideal independent parallel result= $1 - (0.02 \times 0.01) = 0.9998$.
3. With the stated common event: $0.99 \times 0.9998 = 0.989802$.

Decision interpretation: The architecture and common-dependency assumptions materially change the result. Component figures alone cannot establish system reliability.

Validity limits: Unequal functions, imperfect switching, dormant failures, shared software, maintenance or external resources require a different model. The example probabilities are not actual mission data or prescribed targets.

ASTRA connections: 55.2; 68.1–68.2; 76.5

Architecture assumptions determine reliability

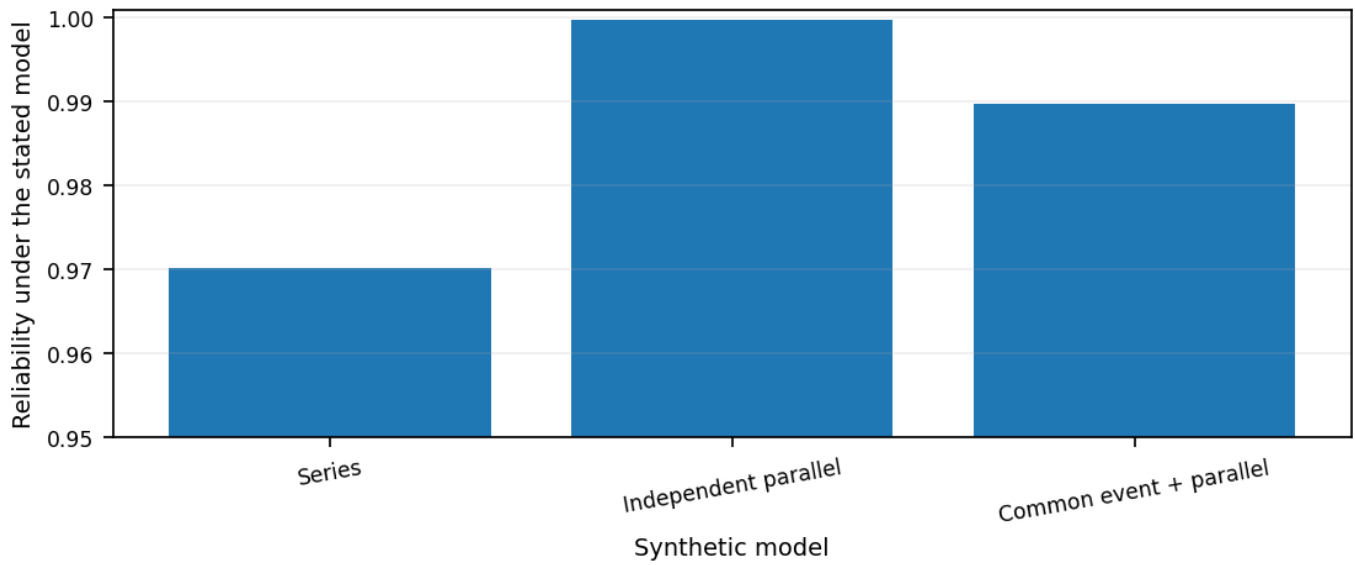


Figure Q25 — Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

Local replay record: retain the actual input manifest, source versions, calculation version, unit checks, independent recomputation, expected/observed boundary results, limitations and decision authority. Do not overwrite the teaching inputs as though they were operational data.

E8 Adverse cases and independent replay

Challenge	Expected handling	Evidence retained
PR-004: Resolve every applicable domain — required basis missing	Unknown applicability is HOLD; absent equipment or budget never establishes N/A.	Original input, unresolved value, affected requirement and scope; named action owner.
PR-004: Approve exclusion and re-open triggers — handover or review incomplete	Only independently justified exclusions receive N/A; an unexamined consequential interface remains HOLD.	Expected and observed state; independent replay; correction/retest; receiving acknowledgement.
PR-005: Map competence to an actual task — required basis missing	A general title or training course is not an authorisation for an unfamiliar task.	Original input, unresolved value, affected requirement and scope; named action owner.
PR-005: Maintain event-time currency — handover or review incomplete	Later authorisation cannot validate prior out-of-scope work; assess affected earlier outputs separately.	Expected and observed state; independent replay; correction/retest; receiving acknowledgement.
PR-007: Build a phase-by-mode coverage matrix — required basis missing	No uncovered essential cell can be marked complete from another site's headquarters evidence.	Original input, unresolved value, affected requirement and scope; named action owner.
PR-007: Close actual coverage — handover or review incomplete	The independent reviewer accepts the actual coverage, not the original commercial duration or completion percentage.	Expected and observed state; independent replay; correction/retest; receiving acknowledgement.
PR-008: Qualify remote observability — required basis missing	Unobservable essential characteristics remain HOLD unless valid supplementary evidence is accepted.	Original input, unresolved value, affected requirement and scope; named action owner.
PR-008: Reconcile remote completion and custody — handover or review incomplete	Only the demonstrated bounded task is accepted; command acknowledgement alone is not physical completion.	Expected and observed state; independent replay; correction/retest; receiving acknowledgement.
PR-012: Reconcile output identity and basis — required basis missing	A report title or customer description cannot substitute for verified identity and scope.	Original input, unresolved value, affected requirement and scope; named action owner.
PR-012: Review publication against authority — handover or review incomplete	Every communicated result retains its actual event history and no unsupported broader scope.	Expected and observed state; independent replay; correction/retest; receiving acknowledgement.
PR-020: Contain the actual evidence dependency — required basis missing	Service availability alone does not establish trustworthy operation or exclude impact.	Original input, unresolved value, affected requirement and scope; named action owner.

Challenge	Expected handling	Evidence retained
PR-020: Authorise return and remaining restrictions — handover or review incomplete	No retrospective validation of outputs issued while essential integrity was unknown.	Expected and observed state; independent replay; correction/retest; receiving acknowledgement.
PR-028: Map the complete change population — required basis missing	A cosmetic filename or edition-label change cannot hide a changed technical basis.	Original input, unresolved value, affected requirement and scope; named action owner.
PR-028: Close without abandoning terminal duties — handover or review incomplete	Only demonstrably complete obligations are closed; remaining duties stay assigned after programme or provider cessation.	Expected and observed state; independent replay; correction/retest; receiving acknowledgement.

Before local reliance, also select every relevant AP01–AP48 challenge in the core. Keep fictional tests isolated from live credentials, commands and recipients. For each test define the requirement, precondition, expected response, execution steps, actual observations, evidence, defect consequence, correction, retest and acceptance. This publication supplies test designs and examples, not completed local validation records.

Appendix A — Controlling source requirements

The following text is reproduced from the supplied ASTRA FIRST EDITION. The clause identifier and page refer to that 248-page source. These excerpts and their evidence fields must be read with all triggered normative annexes. Newly authored implementation steps elsewhere in this document do not amend the core standard.

1.3 — Object and responsibility tuple

Source: AF-AST-STD-001, page 10.

Each application shall identify the responsible legal entity, actual performer, object type, family and module, sites and remote functions, configuration or programme version, lifecycle role, applicable period, criticality, profile and exclusions. Products, services, processes, people, supplier scopes, educational programmes, assessment providers and environmental statements are separate objects. A combined dossier may share evidence but shall provide a separate conclusion and status history for each claimed object. Where a duty is outsourced, the record shall identify both the performer and the organisation retaining accountability.

Required evidence: Complete scope tuple; separate requested outcomes; actual-performer map.

1.5 — Activity-based applicability

Source: AF-AST-STD-001, page 11.

The applicant shall make a reasoned applicability decision for every common and family requirement. Non-applicability requires the actual activity and retained responsibility to be absent, without undermining a claimed outcome. Small size, another certificate, customer nomination or outsourcing alone does not justify exclusion. A provider that changes from distribution to repair, or from laboratory testing to product certification, shall reassess its scope before making the broader claim. Technical reviewers shall approve material exclusions and record the supporting evidence.

Required evidence: Approved applicability matrix; technical rationale; review triggers and version history.

7.1 — Function-specific competence

Source: AF-AST-STD-001, page 17.

The operator shall define separate competence requirements for application review, audit leadership, specialist evaluation, sampling, laboratory sign-off, independent review, decisions and appeals. Profiles shall state technical fields, methods, criticality, language, professional judgement, evidence interpretation and access permissions. A person may hold several roles only when separately qualified and case independence remains valid. No generic aerospace assessor designation shall imply mastery of all eight families.

Required evidence: Role profiles; technical authorisation matrix; case coverage check.

7.3 — Essential steps and assessment security

Source: AF-AST-STD-001, page 17.

Knowledge and practical criteria shall be fixed before candidate evaluation. Every predesignated essential safety, integrity and independence step shall be passed; component scores shall not be averaged to conceal failure. Equivalent reassessment shall follow evidenced remediation and preserve earlier attempts. Examination questions, scenarios, identity checks and scoring shall be secured and validated. An automated score or AI recommendation shall not be the sole authority for a practical competence decision.

Required evidence: Assessment blueprint; component/essential-step results; secured attempts; independent authorisation.

7.4 — Initial assessor population

Source: AF-AST-STD-001, page 17.

Where no established ASTRA assessor population exists, at least two independent competent professionals shall assess each candidate against the stated role and technical criteria. Their own competence and conflicts shall be documented. Comparable prior work may satisfy specified experience elements only after verification; programme knowledge, witnessed performance and independence shall not be waived. Honorary titles, reciprocal self-approval and attendance at an introductory meeting shall not create assessor authority.

Required evidence: Initial-panel qualifications; equivalence map; witnessed task; remaining scope restrictions.

7.5 – Maintenance and inactivity

Source: AF-AST-STD-001, page 18.

Maintain relevant development, current practice and observed performance at the intervals in Annex D. Review poor reports, inconsistent decisions, complaints, new technologies and changes in methods as well as activity counts. Failure to meet the applicable role minimum shall suspend independent role use until reviewed supervised reactivation. An individual shall notify limitations and request support rather than accept a task outside the authorised scope. Restoration does not erase earlier affected-work concerns.

Required evidence: Practice/development logs; witnessed reviews; suspension and reactivation; prior-work assessment.

9.7 – Technical reporting and amendments

Source: AF-AST-STD-001, page 20.

Reports shall identify issuer, client, actual item, scope, method/version, conditions, dates, results, units, uncertainty where needed, deviations, decision rule, conclusion, limitations and authorised signatory. Identify subcontracted results and opinions separately. A report shall not imply that untested characteristics or future production were examined. Amendments shall preserve the original, state the reason and affected conclusion, and reach recipients who relied on an incorrect result.

Required evidence: Attributable report; raw-data linkage; subcontracted-result identity; amendment and recipient log.

10.5 – Remote access and live evidence

Source: AF-AST-STD-001, page 21.

Before remote assessment, verify identity, connection security, permissions, camera or sensor adequacy, observation continuity and independent selection of evidence. Record interruptions, inaccessible areas and substitutions. Prerecorded material shall be identified and shall not be represented as live observation. Where physical or practical capability cannot be established remotely, arrange on-site or appropriately controlled witnessed work. Remote convenience shall not reduce scope coverage, time, competence or critical observation.

Required evidence: Remote suitability review; consent/access; live-session record; supplementary coverage.

10.6 – Recovery, retention and closure

Source: AF-AST-STD-001, page 22.

Maintain protected backups and test restoration of data, identity, configuration links and current status. Meeting recovery-time objectives does not establish restored evidence integrity. Retain assessment and decision evidence for at least seven years after the last relevant decision, or longer when justified by applicable obligations, service life or a hold; reconcile any legally required alternative handling without concealing the decision basis. Separate unnecessary personal copies and dispose of them under approved controls.

Required evidence: Restore/integrity tests; retention basis; legal holds; secure disposal and closure transfer.

11.3 – Existing evidence and reuse

Source: AF-AST-STD-001, page 22.

Review prior reports, approvals and certificates for authenticity, issuer competence, actual method, site, period, conditions and configuration. Identify precisely which requirement and decision use they support and what remains to be evaluated. Include adverse results and restrictions. Another outcome shall not be declared equivalent solely from a similar title or scope label. Evidence reuse may reduce repeated document requests but cannot remove necessary local implementation, witnessing or independent decision.

Required evidence: Reuse matrix; authenticity/scope checks; residual gaps; controlled access to original evidence.

12.1 – Planning from scope and consequence

Source: AF-AST-STD-001, page 23.

The plan shall begin with the requested object and requirement set, not a fixed commercial duration. Identify legal entities, technical methods, actual performers, sites, shifts, programme delivery modes, configurations, prior findings, changes and critical interfaces. Select representative routine and adverse work and assign specialists for every material domain. Define what evidence can support each conclusion and where sampling cannot establish the full claim.

Required evidence: Approved scope-led plan; coverage matrix; technical assignments; sample rationale.

12.2 – Sites and stations

Source: AF-AST-STD-001, page 23.

For initial and renewal operational-capability or CAB scopes, establish direct evidence at every included operating site, station or delivery location. Common governance evidence can be shared but local capability shall be demonstrated. Use physical visits where necessary work cannot be validly observed remotely. Surveillance sampling of genuinely homogeneous low-consequence activities requires an approved profile, justified eligibility, rotation and expansion triggers; no generic headquarters sample grants all stations. AF 9100 organisational cases retain the specific site rules of that standard.

Required evidence: Site-by-activity coverage; remote/on-site rationale; rotation and ineligible-site controls.

12.3 – Method-family witnessing

Source: AF-AST-STD-001, page 23.

Group methods only when common principles, equipment, competence, ranges and failure mechanisms justify representativeness. Witness each distinct method or capability family, including material extremes and high-consequence tasks. A single demonstration shall not cover unrelated techniques merely because one employee performs them. Include the whole relevant task from preparation and identity through data interpretation and reporting. Map any unobserved part to valid supplementary evidence or exclude it from the granted scope.

Required evidence: Witnessing plan; family grouping rationale; observed limits; supplementary evidence.

12.4 – Time and productive work

Source: AF-AST-STD-001, page 24.

Use an activity-based work breakdown for non-organisational assessments, with necessary preparation, observation, data review, sites, shifts and rework. One evaluator-day is eight productive evaluation hours. Travel, breaks, sales, report preparation, translation delay and independent review/decision are separate resources. Do not count a trainee as a fully productive assessor or double-count two observers performing the same task without distinct technical work. AF 9100 organisational time remains governed by its Annex AC. Annex F provides a planning method and examples, not universal technical durations.

Required evidence: Task/time matrix; separate resources; actual productive time; approved additions.

13.3 – Witness control

Source: AF-AST-STD-001, page 25.

Record the actual task, date, site, equipment, software, personnel, conditions, method version and acceptance basis. Observe essential steps directly where required and prevent coached performance from being misrepresented as routine independent work. Controlled simulation is acceptable only where the profile justifies its fidelity and restrictions. Live work shall not be made unsafe to create a demonstration. A missing essential observation requires supplementary evidence, reassessment or restricted scope, not a presumed pass.

Required evidence: Witness log; essential steps; simulation validity; unobserved-step disposition.

13.5 – Closing and report

Source: AF-AST-STD-001, page 25.

Communicate evidence-based findings, affected scope, immediate protection and the distinction between team recommendation and final decision. Acknowledge factual corrections without erasing valid adverse evidence. Issue the final evaluation report within 14 calendar days of evaluation closure; exceptional delay shall be explained without moving an already notified finding clock. The report shall state actual time, methods, samples, sites, witnesses, criteria, limitations, findings and recommendation.

Required evidence: Closing record; findings and original notification dates; final actual-coverage report.

23.1 – Provider, station and service definition

Source: AF-AST-STD-001, page 38.

The applicant shall identify headquarters, legal entities, stations, service tracks, actual tasks, equipment, contracted responsibilities and subcontractors. Each included station shall demonstrate local implementation, trained staff, usable instructions, equipment suitability and interface competence. Common manuals may be reused only with a verified local-variation record. An FBO or digital-platform package shall not conceal the organisations actually performing underlying services.

Required evidence: Provider/station register; task scope; local variations; actual-performer interfaces.

23.2 – G01 – Handling and turnaround

Source: AF-AST-STD-001, page 38.

For declared passenger, baggage, accessibility, ramp, load-control, aircraft-movement or de-/anti-icing interfaces, define responsibilities, competent roles, equipment compatibility, handovers, hold points and exception reporting. Verify representative work safely and include peak, disrupted and shift-change conditions. Technical operating limits shall come from current applicable data. This programme does not provide pushback, loading or de-icing recipes and does not confer aircrew operational authority.

Required evidence: Turnaround/service plan; training/authorisations; representative records; discrepancies and handovers.

23.3 – G02 – Cargo, mail and specialist logistics

Source: AF-AST-STD-001, page 39.

Control shipment acceptance, identification, security interfaces, custody, storage, build-up/breakdown, special handling, temperature/time constraints and release. Dangerous-goods tasks require verified role competence and actual permissions. Monitor custody and environmental excursions through subcontractors and transfers. A logistics certification shall not validate unknown contents or authorise a prohibited shipment. Corrective action shall identify affected consignments and downstream recipients.

Required evidence: Cargo scope; acceptance/custody; special handling; excursion/recipient trace.

23.4 – G03 – Fuel and energy services

Source: AF-AST-STD-001, page 39.

Define storage, source verification, quality control, transfer, delivery and aircraft/ground interface responsibilities for each declared fuel or energy service. Control contamination, identity, sampling, equipment, staff competence and abnormal conditions through approved technical procedures. Record supplied quantity, source and relevant batch or transaction links. Emerging fuels, electrical architectures or hydrogen-related services require separate capability and safety supplements; conventional fuel scope does not establish competence for them.

Required evidence: Service/product identity; traceable quality controls; equipment/personnel; separate novel-energy approval.

23.5 – G04 – Ground equipment and technical facilities

Source: AF-AST-STD-001, page 39.

Define the maintenance and operational support scope for ground equipment, charging, bridges, baggage systems, technical utilities and related assets. Demonstrate compatibility with supported aircraft and tasks, inspection, planned maintenance, protective functions, isolation governance and competent release. Temporary repairs and bypasses require bounded technical approval and restoration. Digital monitoring shall be validated for the failure mechanism and shall not replace mandatory physical checks without an approved basis.

Required evidence: Asset/task capability; compatibility; maintenance and protection checks; controlled temporary conditions.

23.6 – G05 – Catering, cabin and sanitation

Source: AF-AST-STD-001, page 39.

Control catering integrity, cleaning, water/lavatory services, cabin supplies and hygienic handling within the declared tasks. Establish appropriate contamination prevention, segregation, temperature/time control where relevant, chemical suitability, equipment condition and traceable delivery. Staff shall understand cross-contamination and aircraft compatibility. A general quality system shall not substitute for task-specific food, water or sanitation obligations and incident response.

Required evidence: Service boundaries; hygiene and compatibility controls; delivery trace; incident and corrective records.

23.7 – G06 – FBO and business-aviation support

Source: AF-AST-STD-001, page 39.

Describe the actual fixed-base service package, including passenger/crew support, parking and handling coordination, property care, communications and dependencies. Underlying G01–G05 activities shall be evaluated for their own scopes where claimed. A coordinator shall verify provider capability and handovers and shall not claim direct performance of services it only arranges. Confidentiality, accessible service, emergency communication and disruptions shall be addressed.

Required evidence: FBO package; direct/arranged distinction; qualified dependencies; handover and recovery.

23.8 – G07 – Flight and air-navigation support

Source: AF-AST-STD-001, page 39.

Dispatch/flight-support, communications, navigation, surveillance and meteorological services shall each have a dedicated competence and permissions profile. Define data origin, timeliness, integrity, operational authority, validation, change control, fallbacks and coordination. Verify exact service boundaries and prevent advice from being presented as a public air-navigation or airline operating approval. Necessary specialist technical criteria shall be completed before the relevant service is admitted.

Required evidence: Specialist profile; data/authority chain; actual permissions; fallback and coordination evidence.

23.9 – G08 – Digital and operational systems

Source: AF-AST-STD-001, page 40.

Define software/services, users, interfaces, configuration, performance, cybersecurity, data ownership, external platforms and operational dependencies. Validate actual delivery and safe fallback when data are wrong, late or absent, not only when the application is available. Control updates, AI-assisted decisions, access, recovery and service termination. A platform result shall not grant competence to all integrated service providers or certify every output generated by the software.

Required evidence: Digital service profile; outcome tests; security/recovery; provider and update boundaries.

23.10 – G09 – Specialist security services

Source: AF-AST-STD-001, page 40.

Evaluate provider identity, authorised activities, staff suitability where lawfully required, competence, training, controlled information, equipment suitability and operational interfaces. Evidence access shall be restricted to authorised reviewers with sufficient technical understanding. Do not publish sensitive tactical methods or transfer public security powers through an ASTRA credential. An inaccessible essential capability shall be excluded or held rather than accepted from an unsupported statement.

Required evidence: Authorised scope; role competence; protected performance evidence; exact claim limits.

23.11 – Local variation and continuing network control

Source: AF-AST-STD-001, page 40.

Station variations shall identify customer data, infrastructure, language, equipment, staffing, climate, operating hours and local obligations affecting service. Monitor incident, delay, damage, complaint and control-performance information with defined denominators. Systemic headquarters failures require review across dependent stations; a local failure requires justified extent analysis, not automatic concealment by deleting that station. Additions and material changes require demonstrated capability before claim extension.

Required evidence: Local-variation file; network indicators; systemic/local extent; new-station decision.

26.4 – Remote, space and long-duration operation

Source: AF-AST-STD-001, page 44.

For inaccessible, in-space or delayed-communication work, establish evidence acquisition, identity, configuration, time basis, telemetry validity, data loss, permitted remote actions and safe fallback. Explain what is directly observed, inferred or unknown. Independent review shall use appropriately authorised experts and retained records. No space suitability or completed end-of-life action shall be claimed from an unverified signal or terrestrial analogy alone. Mission-specific technical profiles remain prerequisites.

Required evidence: Remote assurance plan; telemetry provenance; inference limits; mission profile and decisions.

28.1 – Mandatory scope content

Source: AF-AST-STD-001, page 45.

Each outcome shall state holder and responsible issuer, unique identifier, exact class, family/module, criteria and version, evaluated object, site, technical activity, conditions/ranges, configuration or delivery version, period, decision/issue dates, status and restrictions. Identify ongoing expiry or instance boundary appropriately. The scope schedule forms part of the outcome and shall be available for verification without disclosing protected technical detail. Annex I supplies the minimum schema.

Required evidence: Decision-linked scope schedule; claim class; criteria/version; public/private split.

30.2 – Controlled transition

Source: AF-AST-STD-001, page 48.

For a new profile or substantive version, identify affected holders, evidence gaps, changed methods, competence, system updates, communications and effectivity. Set a technically justified transition that does not waive immediate safety duties. Preserve the basis of previous decisions and state when additional assessment is needed. Neither indefinite grandfathering nor automatic retrospective invalidation is presumed. A future requirement is not applied as though it had governed an earlier decision.

Required evidence: Transition plan; holder impact; competence/tool updates; actual effective versions.

30.4 – Scope withdrawal and learner/customer protection

Source: AF-AST-STD-001, page 48.

Before closing a profile or provider operation, identify active holders, open cases, pending appeals, unresolved findings, learners, records, status, contracts and financial duties. Notify affected parties and arrange lawful transfer or teach-out as relevant. A closure shall not erase adverse evidence or imply continued authority. Preserve access to historical decisions and correction channels. If urgent cessation is required, prioritise protection and accurate communication while completing residual obligations.

Required evidence: Closure plan; affected-party notices; transfer/teach-out; retained records and remedies.

31.3 – Actual adoption record

Source: AF-AST-STD-001, page 49.

Record the authenticated legal operator, technical approval, consultation completion, competent institutional adoption, signatories, effective date, applicable instruments and any necessary compatibility amendments. Keep edition date distinct from legal or operational effectivity. Uncompleted approval fields shall not be filled with assumed names or dates. Programme-wide adoption alone shall not activate every listed technical scope; each profile requires the independent readiness and scope decision in Annex P.

Required evidence: Authentic adoption; completed compatibility conditions; individual scope activation.

43.1 – Integrated energy boundary

Source: AF-AST-STD-001, page 65.

The organisation shall define the complete energy-system boundary and the interactions among mechanical, electrical, thermal, chemical and control functions. Requirements shall cover transport, storage, charging or fuelling, operation, maintenance and end of life as applicable. Common dependencies and abnormal states shall be considered. Separate component results shall not establish integrated protection where failure can propagate across interfaces. Every critical limit and protective function shall have an approved technical basis and a method of verification.

Required evidence: Energy architecture; lifecycle hazard analysis; requirement and protection map; integrated verification.

43.2 – Batteries and electrical storage

Source: AF-AST-STD-001, page 65.

Battery assurance shall retain cell and module provenance, configuration, manufacturing consistency, protective controls, thermal management and actual operating history. Qualification shall address relevant degradation and credible abnormal conditions under the approved application basis. State estimates and health-monitoring outputs shall identify their model

and uncertainty. Reuse or second-life use shall require a new suitability assessment without erasing prior history. An acceptable nominal capacity or successful functional check shall not establish complete safety or fitness for another duty cycle.

Required evidence: Storage-system baseline; provenance and life history; qualification; monitoring validation; reuse decision.

43.3 – Hydrogen, fuels and chemical energy

Source: AF-AST-STD-001, page 65.

The assurance case shall identify material compatibility, containment, supply quality, contamination, detection, protective isolation and emergency interfaces appropriate to the actual architecture. Supply-chain and ground-service responsibilities shall be explicit. Technical interchangeability shall be separately demonstrated from a sustainability or provenance claim. The organisation shall maintain current specialist procedures for hazardous work and verify the competence and permissions of actual performers. This standard does not prescribe fuel formulations, operating pressures or hazardous handling instructions.

Required evidence: Compatibility and containment basis; supply-quality evidence; competent authorised procedures; separate environmental claims.

43.4 – Propulsion and rotating equipment

Source: AF-AST-STD-001, page 65.

Propulsion and rotating machinery shall have controlled requirements for operating envelope, duty, life, materials, balance, lubrication, thermal behaviour and protection as relevant. Critical parts and process histories shall remain traceable. Changes to speed, load, controls, materials or installation shall be reviewed against qualification and life evidence. The organisation shall distinguish a development performance result from acceptance of a delivered configuration. This clause sets evidence and responsibility requirements rather than design parameters or performance optimisation instructions.

Required evidence: Duty and envelope basis; critical-part genealogy; qualification and acceptance; change and life-management records.

43.5 – Ground support and emergency interfaces

Source: AF-AST-STD-001, page 66.

Ground energy delivery, charging or fuelling equipment shall be compatible with the supported system and maintained in the verified configuration. Handover shall include relevant limitations, protective actions and incident information. The organisation shall evaluate common utilities, communication dependencies and restoration after interruption. Emergency arrangements shall be exercised safely with the actual responsible parties. Availability of energy or a connected interface alone shall not establish suitability for a particular aircraft, vehicle or space system.

Required evidence: Ground-system compatibility; service capability; protective-function checks; emergency and restoration evidence.

43.6 – Qualification, change and release

Source: AF-AST-STD-001, page 66.

The qualification dossier shall reconcile system requirements, component evidence, integrated behaviour, material histories, test limitations and support capability. Essential unresolved hazards or invalid evidence shall block the dependent positive decision. After a protective event, anomaly or material change, the organisation shall review affected articles and earlier conclusions. Resumption requires actual technical acceptance. An ASTRA status or a completed commercial delivery shall not substitute for the authorised release required for the specific energy system or operation.

Required evidence: Complete qualification dossier; independent review; anomaly impact; resumption and release authority.

47.1 – Safety-security dependency analysis

Source: AF-AST-STD-001, page 70.

The organisation shall identify assets, trust boundaries, suppliers, users and interfaces whose loss of integrity, availability, authenticity or confidentiality can affect assured outcomes. Threat and safety analyses shall be coordinated where protective measures can interfere with emergency or degraded operation. Engineering records, machine programmes, maintenance data and product updates shall be included, not only office systems. Assumptions about shared infrastructure and external services shall have named owners and demonstrable controls.

Required evidence: Asset and trust-boundary inventory; joint hazard/threat review; dependency ownership; approved protective controls.

47.2 – Identity, access and privileged actions

Source: AF-AST-STD-001, page 70.

Access shall follow verified identities, necessary privileges and actual roles. Human, machine and service identities shall be controlled throughout their lifecycle. Privileged release, maintenance and status actions shall have authentication and attribution appropriate to consequence. Emergency access shall be bounded, logged and reviewed. Shared credentials shall not obscure who performed an action. Changes in employment, supplier access or responsibilities shall promptly trigger the relevant permission review and removal.

Required evidence: Access and role matrix; identity lifecycle; privileged approvals; emergency logs; event-time authority checks.

47.3 – Supply-chain and dependency integrity

Source: AF-AST-STD-001, page 70.

The organisation shall maintain a relevant inventory of digital components and dependencies, their provenance, supported versions and channels for vulnerability information. Disposition shall consider actual exposure, exploitability, safety consequences and available protection. An inventory is not proof that every component is secure. Supplier changes, unsupported software and inaccessible update mechanisms shall trigger technical and continuity review. The organisation shall identify the actual party responsible for remediation and for informing affected users.

Required evidence: Dependency inventory; provenance; vulnerability assessment; support commitments; remediation and notification records.

47.4 – Connected production and operational technology

Source: AF-AST-STD-001, page 71.

Connected equipment shall protect authorised machine programmes, process parameters, monitoring data and essential functions. Segmentation, access, backup, monitoring and degraded operation shall be selected according to the actual process risk. Patches and security tools shall be assessed for compatibility with timing, safety and production qualification. When immediate change is inappropriate, a documented compensating-control decision shall have an owner, limits and review. Operational continuity shall not excuse unbounded unsupported risk acceptance.

Required evidence: Operational-technology architecture; authorised configuration; patch review; compensating controls; restoration tests.

47.5 – Update trust and cryptographic transition

Source: AF-AST-STD-001, page 71.

Updates shall verify origin, integrity, authority, compatibility and intended target configuration. The organisation shall control signing and other trust dependencies, key custody, expiry, revocation and migration. A future algorithm transition shall be planned according to product life and actual risk; this standard does not declare a particular algorithm universally suitable. Recovery and rollback shall not silently reintroduce an unacceptable vulnerability. Evidence-preservation needs shall be considered separately from live-system authentication.

Required evidence: Update trust model; key and certificate governance; interruption/rollback tests; migration and archival-validation plan.

47.6 – Incident recovery and assured return

Source: AF-AST-STD-001, page 71.

Incident handling shall preserve evidence, contain affected use, identify impacted products and decisions, notify responsible parties and control restoration. Returning a service to availability shall be separated from verifying its data and configuration integrity. Exercises shall test recovery objectives and the meaning of restored records. Missing original evidence shall remain a gap in the dependent conclusion. An incident closure shall include the actual technical return authority and follow-up actions, not only a completed support ticket.

Required evidence: Incident and affected-output record; integrity checks; recovery exercise; authorised return and continuing actions.

50.1 – Site-specific operating baseline

Source: AF-AST-STD-001, page 74.

The operator shall define the actual site, infrastructure, permissions, operating characteristics, users, relevant conditions and responsibilities. The baseline shall distinguish conventional aerodromes, heliports, vertiports, spaceport interfaces and shared civil/military use. Each materially different activity needs an appropriate technical supplement and competent evaluation before inclusion. Group governance may be shared, but each site's delivery capability shall be demonstrated.

The geographic presence of a tenant shall not place its entire operation inside the airport's ASTRA outcome.

Required evidence: Site and activity baseline; permissions; supplement applicability; operator/tenant boundary.

50.2 – Infrastructure condition and usable information

Source: AF-AST-STD-001, page 74.

Inspection and defect management shall connect actual airside, terminal, utility and technical-facility conditions to operational information, restrictions, repair and verified restoration. Relevant operating periods, adverse weather, peak loads and degraded states shall be considered. Current information shall reach the responsible users through controlled interfaces. A completed inspection checklist shall not prove that an observed defect was communicated, protected or corrected. Necessary site-specific technical thresholds belong to the approved operating basis.

Required evidence: Inspections; defect-to-restriction trace; actual notices; repair and restored-condition evidence.

50.3 – Construction and operational change

Source: AF-AST-STD-001, page 74.

Changes involving infrastructure, aircraft or vehicle interfaces, equipment, digital services, energy or operating patterns shall undergo integrated impact review before use. The review shall address temporary conditions, contractors, cumulative effects and interfaces with ongoing operations. Hidden work and protective functions shall be verified before concealment or handover where required. Commercial completion of construction shall be separated from technical acceptance and operational readiness of the receiving site.

Required evidence: Change and temporary-condition review; contractor interfaces; commissioning; receiving operational acceptance.

50.4 – Coordinated emergency and continuity

Source: AF-AST-STD-001, page 74.

The operator shall establish actual arrangements with relevant emergency and continuity providers, including communication, access, equipment, competence and availability. Safe exercises shall test coordinated performance and weaknesses, not only participation. Dependencies on utilities, digital services and specialist providers shall be examined. The ASTRA assessor shall evaluate the evidence of coordination without assuming command of public emergency functions. Unavailable essential response capacity shall remain a limitation in the affected scope.

Required evidence: Emergency/continuity responsibilities; availability; exercises; corrective closure; declared limitations.

50.5 – Passenger, accessibility and service interfaces

Source: AF-AST-STD-001, page 74.

The service system shall define passenger information, accessibility, baggage, public-area condition, sanitation and disruption-recovery duties within the operator's control. Measures shall use stated populations, time windows and exclusions without overriding safety priorities. Evidence shall include actual delivery under peak and disrupted conditions. Outsourced delivery shall retain the actual performer and the operator's coordination duties. A service rating shall not imply assessment of every independently operated airline or contractor.

Required evidence: Service and accessibility commitments; representative delivery records; contractor controls; incident and recovery evidence.

50.6 – Integrated but separate outcomes

Source: AF-AST-STD-001, page 75.

A combined assessment may share identity, governance, selected data and visits after relevance review. It shall retain separate technical profiles, local evidence, competence and independent outcomes for site capability, maintenance, handling and environmental statements. A common utility or data failure shall trigger review of every dependent scope. A favourable environmental result shall not compensate for an operational deficiency, and an airport inventory shall not be presented as the footprint of all flights using the site.

Required evidence: Cross-family evidence map; separate scope decisions; common-failure review; bounded public claims.

51.1 – Headquarters and actual station delivery

Source: AF-AST-STD-001, page 75.

The provider shall identify headquarters controls, legal entities, stations, service tracks, actual performers and local variations. Each included station shall demonstrate suitable people, instructions, equipment, customer interfaces and permissions. Common manuals shall be translated into verified local implementation. A network name, booking platform or coordination contract shall not establish direct capability at every location. New stations and materially different services shall receive the required assessment before expanded claims are used.

Required evidence: Provider/station/service matrix; local-variation records; actual capability; extension decisions.

51.2 – Turnaround and ground handling

Source: AF-AST-STD-001, page 75.

Declared handling tasks shall have current technical data, competent roles, equipment compatibility, handover rules, hold points and exception reporting. Evidence shall represent relevant peak, disrupted and shift-change conditions. The provider shall preserve discrepancies and actual task completion rather than infer completion from an aircraft's departure. The standard does not supply loading, pushback or de-icing recipes. These operations remain governed by their applicable authorised technical procedures and operational responsibilities.

Required evidence: Task and interface plan; personnel authority; actual representative records; exception and receiving acknowledgements.

51.3 – Cargo, energy and specialist support

Source: AF-AST-STD-001, page 75.

Cargo, mail, fuel, energy, catering, cabin and sanitation services shall maintain the controls appropriate to their actual task. Identity, custody, contamination, time or temperature, equipment condition and release interfaces shall remain traceable. Hazardous or specialist tasks require relevant competence and permissions. A general quality-system result shall not establish every service capability. Environmental excursions and source defects shall be connected to affected consignments, deliveries or aircraft and communicated to responsible recipients.

Required evidence: Exact service scope; custody and condition; specialist authority; affected-delivery and notification records.

51.4 – Flight and navigation-support data

Source: AF-AST-STD-001, page 75.

Specialist support shall define data origin, transformation, units, reference systems, timestamps, timeliness, integrity and the user's permitted reliance. Wrong, missing, late and superseded information shall be included in validation. The organisation shall distinguish advice, data provision and actual operational authority. Availability alone shall not demonstrate correctness. Necessary dedicated criteria and permissions shall exist before a communications, navigation, surveillance or meteorological-support claim is admitted to the active scope.

Required evidence: Specialist profile; source-to-user data trace; timing and error-handling validation; actual permissions.

51.5 – Digital platforms and protected security services

Source: AF-AST-STD-001, page 76.

Digital service providers shall identify deployed configurations, dependencies, users, data rights, security, fallback and termination arrangements. Integrated third parties retain separate responsibility for their outputs. Specialist security evaluation shall protect sensitive operational information while enabling sufficient authorised evidence review. Neither platform connectivity nor an ASTRA credential transfers public security powers. An unavailable essential capability shall be held or excluded, not accepted on a broad corporate declaration.

Required evidence: Platform/service boundary; dependency and access controls; validated fallback; protected specialist review; precise claims.

51.6 – Shared failure and service restoration

Source: AF-AST-STD-001, page 76.

Network monitoring shall use defined incident, delay, damage, complaint and control-performance populations. A headquarters or shared-platform failure shall be traced across dependent stations. Restoration shall verify data and configuration integrity, local readiness, provider interfaces and receiving acknowledgement. Deleting an affected station from a dashboard shall not erase the historical failure or its systemic implications. Service availability and ASTRA status shall remain separately controlled by the relevant technical and independent authorities.

Required evidence: Network indicators; common-cause extent; local restoration checks; truthful history; separate service and status decisions.

54.1 – Hazards, assumptions and essential controls

Source: AF-AST-STD-001, page 78.

Hazard analysis shall identify credible consequences, relevant exposure, uncertainty, common causes and human or organisational dependencies. The organisation shall select methods appropriate to the system and maintain the analysis as the configuration and context evolve. Essential protective controls shall be identifiable and verified. Multiplying ordinal severity and likelihood categories shall not be presented as a physical probability or used to hide an unassessed severe consequence.

Required evidence: Hazard log; analysis basis; essential-control map; uncertainty and independent technical challenge.

54.2 – Stop authority and escalation

Source: AF-AST-STD-001, page 78.

Responsible personnel shall be able to stop or restrict affected work when an essential protective condition is absent or credible serious concern arises. The organisation shall define who can authorise temporary protection, technical restart and independent status decisions. Those roles shall not be confused. Urgent action shall preserve evidence and comply with the existing notification clocks in Clause 14 and Annex H. Debate about finding classification shall not delay necessary protection.

Required evidence: Stop and duty mandates; actual concern/action times; protection; separate restart and status records.

54.3 – Emergency capability and exercises

Source: AF-AST-STD-001, page 79.

Emergency arrangements shall identify actual people, communication, equipment, access, external interfaces and limitations. Exercises shall be authorised, safe and representative of the capability being claimed. The organisation shall distinguish discussion-based review from demonstrated operational coordination. Findings shall have accountable correction and follow-up. A planned exercise or signed service agreement shall not count as completed evidence of capability where essential resources were not available or could not perform their assigned role.

Required evidence: Emergency plan; resource availability; exercise design and actual observations; verified corrective action.

54.4 – Occurrence, escape and affected population

Source: AF-AST-STD-001, page 79.

Investigation shall examine both why an event occurred and why existing controls failed to prevent or detect it. The organisation shall preserve original evidence, competing explanations and uncertainty. Population tracing shall include already delivered products, services, reports and decisions that share relevant causes. Replacing a person or issuing training shall not alone close a systemic weakness in work design, resources, interfaces or measurement. Later correction shall not be backdated to legitimise earlier unsupported work.

Required evidence: Occurrence/escape analysis; population and dependency trace; tested causes; historical impact and recipient action.

54.5 – Learning and protected reporting

Source: AF-AST-STD-001, page 79.

Reporting routes shall protect good-faith concerns and preserve fair response to allegations. The organisation shall evaluate weak signals, near misses, repeated local failures and suppressive incentives without equating allegation with established misconduct. Lessons shall be translated into verified changes in methods, interfaces, training or assurance criteria through the appropriate controlled process. A declining report count shall not be assumed to demonstrate improvement where reporting access or culture has deteriorated.

Required evidence: Protected intake; impartial investigation; reporting-quality review; implemented and verified lessons.

56.4 – Validation and prohibited cases

Source: AF-AST-STD-001, page 81.

Local validation shall cover normal, boundary, missing, invalid and prohibited inputs in the actual deployment. Tests shall include open findings, expired authority, wrong profiles, broken evidence links, suspended status, duplicate imports and interrupted changes. Expected outcomes shall be defined from the controlling requirements before execution. Synthetic fixtures shall be isolated from live claims. Correction shall be followed by repetition of the original failed test and relevant

regression, not merely an assurance that the code was changed.

Required evidence: Local validation baseline; expected/observed cases; defect and retest history; actual acceptance and limitations.

56.5 – Export, migration and meaningful recovery

Source: AF-AST-STD-001, page 81.

Transfer shall preserve readable evidence, identities, versions, field semantics, units, time zones, approvals, relationships and current and historical status. Reconciliation shall examine meaning as well as counts; equal file totals may conceal substitutions or missing links. Recovery shall distinguish availability from integrity and reconcile events after the selected recovery point. A sent archive is not accepted custody. The receiving function shall demonstrate usable access and acknowledge continuing duties before dependent cutover.

Required evidence: Export manifest; semantic reconciliation; preserved source; recovery integrity; receiving acceptance and custody.

57.1 – Role-specific competence and scope

Source: AF-AST-STD-001, page 81.

The operator shall map actual assessment tasks to verified discipline, method, language, consequence and judgement requirements. Audit leadership, technical evaluation, independent review, decisions and appeals shall remain separate authorisations. Learning attendance and numerical experience minima shall not replace observed ability. A person competent in one method or programme shall not be assigned unrestricted aerospace authority. The case plan shall identify necessary specialists and limits before accepting the work.

Required evidence: Task-to-role and person matrix; verified entry evidence; observed performance; bounded authorisation.

57.3 – Practical assessment and maintained practice

Source: AF-AST-STD-001, page 82.

Knowledge and practical criteria shall be defined before evaluation. Essential safety, integrity and independence steps shall be separately passed. Mentored work shall identify what the candidate actually performed and what remained supervised. Continuing development, recent practice, observed performance and review feedback shall maintain the authorisation. Unmet minima or loss of currency shall suspend independent role use until the required supervised reactivation. Later renewal shall not validate prior work performed outside authority.

Required evidence: Blueprint and attempts; mentored-work records; continuing practice; suspension/reactivation; historical impact review.

58.2 – Coverage and productive resources

Source: AF-AST-STD-001, page 82.

The plan shall provide competent coverage of necessary sites, methods, shifts, delivery modes, configurations and adverse cases. Resources shall follow actual work, not a commercial target. The eight-hour evaluator-day and separate reporting/review resources remain governed by Clause 12.4; AF 9100 organisational rules apply only to their route. A trainee or second passive observer shall not be counted as additional productive technical coverage. Necessary omitted observations shall require more work or a restricted conclusion.

Required evidence: Work breakdown; person/task coverage; site/method witnesses; actual productive time and changes.

61.3 – Dependent documents and compatibility

Source: AF-AST-STD-001, page 86.

The responsible custodian shall identify every affected profile, manual, procedure, checklist, form and register before use of this text. Existing 108-title architecture and F01–F08 codes shall remain stable. Newly added requirements shall be mapped to the actual dependent documents; a previous checklist shall not be assumed to cover them. Actual constitutional and legal obligations remain separately applicable.

Verification: Reconcile the dependency register against selected requirements and operating versions.

Acceptance / hold rule: Every required operating document is available, consistent and authorised for the intended use. Unresolved conflicts place dependent use on HOLD.

62.1 – Atomic requirement record

Source: AF-AST-STD-001, page 88.

Each assessed requirement shall have a stable identifier, one accountable owner, an applicability trigger, defined object and configuration, required behaviour or characteristic, observable conditions, verification method and acceptance predicate. Compound statements shall be separated into individually testable rows without deleting any condition. Terms such as adequate, suitable, promptly or representative shall be resolved through the explicit records in this clause before they support an acceptance decision.

Verification: Inspect each requirement row and its linked method, boundary and predicate.

Acceptance / hold rule: Every applicable row is evaluable without inventing an object, limit, observation or decision role. Unresolved essential terms result in HOLD.

62.3 – Evidence validity before conformity

Source: AF-AST-STD-001, page 88.

The evaluator shall first determine whether evidence belongs to the correct object, configuration, period, method and authorised performer and whether it is usable for the intended inference. Only valid relevant evidence shall enter a conformity predicate. Rejected, corrupted, missing, unobservable or wrong-version evidence shall remain identified. Evidence may be valid and show failure; an invalid test is not a valid pass or a valid proof of product failure.

Verification: Check provenance, configuration, method capability, original data and uncertainty separately from result classification.

Acceptance / hold rule: Validity is established before PASS or FAIL is assigned; otherwise use HOLD with an explicit invalidity or evidence-gap reason.

62.4 – Four requirement states

Source: AF-AST-STD-001, page 88.

A requirement state shall be PASS, FAIL, HOLD or N/A. PASS means the approved predicate is satisfied by valid evidence. FAIL means valid evidence demonstrates that the predicate is not satisfied. HOLD means applicability, method, evidence, uncertainty or authority is not sufficiently resolved. N/A means the trigger and retained responsibility are absent and independent approval of that exclusion is recorded. Missing equipment, budget, access or time shall not justify N/A.

Verification: Execute the truth table in Annex AL using actual scope and evidence.

Acceptance / hold rule: Exactly one current state is assigned with reason and traceable evidence. All earlier states are retained.

62.5 – No compensation or favourable default

Source: AF-AST-STD-001, page 89.

A positive conformity decision shall require PASS for every applicable mandatory requirement, closure of every in-scope nonconformity, valid independent competence and actual authority. N/A rows shall have approved reasons; HOLD and FAIL rows shall not contribute a favourable default. Weighted scores, averages, majority votes, programme membership or good results in another discipline shall not compensate for an unmet condition.

Verification: Reconcile the complete requirement population with the decision dossier; test missing and negative cases.

Acceptance / hold rule: The Boolean conjunction in Annex AL is true. Otherwise no positive grant, renewal or extension is permitted.

62.7 – Decision replay and consistency

Source: AF-AST-STD-001, page 89.

A decision shall be reproducible from the same frozen requirements, parameter values, original evidence, calculation version, uncertainty model and role assignments. Two competent reviewers reaching different results shall identify the differing input, predicate, assumption or expertise before closure. Interpretation records may clarify a term but shall not change limits after results are known. Equation inputs shall retain unrounded values.

Verification: Independently replay a selected boundary case and reconcile every difference.

Acceptance / hold rule: The replay produces the same supported state, or the case remains HOLD pending a controlled technical resolution.

63.1 – Domain selection without geographic omission

Source: AF-AST-STD-001, page 90.

The mission owner shall assess every domain in Annex AK and record applicable, not applicable or not yet determined. The scope shall include terrestrial preparation, launch and recovery interfaces as well as the in-space activity. Earth orbit,

cislunar and libration-region operations, solar and planetary missions, small bodies, ocean-world exploration and interstellar precursor concepts shall not be excluded solely because they differ from conventional satellite operations.

Verification: Compare the mission concept and responsibility map with all Annex AK domain rows.

Acceptance / hold rule: Every domain has a reasoned disposition. Any unassessed domain that can affect a required outcome remains HOLD.

63.3 – Environment, phase and mode matrix

Source: AF-AST-STD-001, page 90.

For each applicable domain, define mission phase, operating mode, intended duration, exposure, interfaces, repairability, accessible evidence and credible degraded states. Include dormant storage, transport, separation, commissioning, routine service, communication outage, servicing, retirement and loss-of-mission conditions when relevant. A qualification for one phase shall not automatically cover another phase with different loads, resources or observability.

Verification: Review the complete phase-by-mode matrix and its verification links.

Acceptance / hold rule: Every safety-, mission- or claim-relevant cell has accepted evidence or an explicit restriction; no essential unexamined cell is passed by analogy.

63.6 – Interface and lifecycle closure

Source: AF-AST-STD-001, page 91.

The scope shall include relevant upstream and downstream duties, including supplied design data, ground services, communications, receiving facilities, environmental custody and long-term records. Transfers shall identify the sender, receiver, evidence and acceptance. A contractor delivering one subsystem shall not be made responsible for unrelated mission duties, but an integrator shall not exclude duties it retains because they are performed by others.

Verification: Trace each interface to an accountable performer and retained owner.

Acceptance / hold rule: No essential responsibility, evidence handover or terminal obligation is orphaned.

64.4 – Resource budgets and coupled margins

Source: AF-AST-STD-001, page 92.

Mass, power, energy, thermal rejection, timing, data, attitude-control resources and consumables shall have explicit allocation and reserve ownership. Account for concurrent loads, common reserves, environmental degradation, ageing, unavailable recharge and terminal obligations. The same reserve shall not be credited to two simultaneous needs. Positive scalar totals shall not replace transient, local or coupled analysis.

Verification: Reconcile subsystem and system budgets by phase and condition; independently check Annex AM calculations used.

Acceptance / hold rule: Each required margin meets its prospectively approved value under all selected bounding conditions; no reserve is double allocated.

64.5 – Heritage and similarity

Source: AF-AST-STD-001, page 92.

A heritage argument shall compare actual design, materials, manufacturing source, mission exposure, software, interfaces and life history. Identify unchanged evidence, invalidated evidence and new demonstration. Successful service of a related design shall be accepted only for characteristics and mechanisms it actually supports. Lack of a recorded failure shall not prove performance of an unmonitored critical characteristic.

Verification: Review a difference matrix and trace each retained conclusion to applicable original evidence.

Acceptance / hold rule: Every material difference has a technical disposition and sufficient evidence before the new claim is accepted.

65.6 – Payload function and scientific or service output

Source: AF-AST-STD-001, page 95.

Payload requirements shall identify intended outputs, calibration, dynamic range, contamination sensitivity, pointing or timing needs, processing and delivered data quality. Instrument performance, system suitability and scientific interpretation are separate conclusions. Changes in compression, processing or calibration shall retain raw or reconstructable data and algorithm identity. Marketing resolution or accuracy figures shall state the tested conditions and limitations.

Verification: Reconstruct selected output products from identified inputs, calibration and processing.

Acceptance / hold rule: Output criteria are met for the stated domain; unsupported scientific or service claims are not inferred from a functioning instrument.

66.3 – Delay and feasible intervention

Source: AF-AST-STD-001, page 96.

The service shall distinguish one-way propagation, round-trip exchange, queueing, processing, retransmission, human response and actuation delays. A ground intervention shall count as a protective control only when information and action can arrive within the validated hazard-response window. Store-and-forward or disruption-tolerant operation shall define expiration, duplicate handling, priority and stale-command rejection.

Verification: Test worst-case delay and outage scenarios using the approved mission geometry and timing model.

Acceptance / hold rule: Required responses are feasible within the approved window; a nominal human review step does not pass if communication makes it ineffective.

66.4 – Data age and time uncertainty

Source: AF-AST-STD-001, page 96.

Every consequential data item shall retain event time, time scale, receipt time, sequence, quality flags and relevant uncertainty. Clock drift, conversion error, leap or reset handling and synchronisation loss shall be bounded. Maximum data age and timing uncertainty shall be defined before use. A recent packet receipt shall not make its old event data current.

Verification: Challenge stale, duplicated, reordered, wrong-time-scale and clock-reset data.

Acceptance / hold rule: Data outside approved age or uncertainty bounds are marked unusable for the affected decision and trigger the defined protective response.

66.7 – Outage, recovery and service evidence

Source: AF-AST-STD-001, page 97.

The operator shall reconcile lost data, delayed messages, incomplete transfers and state changes after an outage. Recovery shall restore meaning, configuration, authority and history as well as network availability. Report actual service measures with time windows, excluded outages and missing data. A service restoration shall not retrospectively validate dependent decisions made with unavailable or corrupted information.

Verification: Review outage timelines, replay/reconciliation logs and receiving acceptance.

Acceptance / hold rule: All necessary state and data integrity checks are complete before assured use resumes; remaining gaps are carried into the affected claims.

67.3 – Receipt, execution and completion

Source: AF-AST-STD-001, page 98.

The record shall distinguish command prepared, approved, transmitted, received, accepted, started, completed, failed and unknown. A transmission log or acknowledgement shall not be treated as verified physical completion. Completion criteria shall identify telemetry or other evidence, timing, confidence limits and independent checks needed for the actual action.

Verification: Trace a command through its full event and evidence history.

Acceptance / hold rule: Only evidence satisfying the approved completion predicate supports completed status; missing terminal evidence remains unknown or partial.

67.6 – Anomaly response and safe restoration

Source: AF-AST-STD-001, page 99.

The operations team shall classify anomalies, preserve raw evidence, control affected commands and follow authorised mission-specific protective procedures. Restoration shall establish current physical and digital state, cause disposition, remaining restrictions and separate technical return authority. A restarted computer or renewed communication link does not prove that the spacecraft or remote process is safe to resume.

Verification: Examine adverse rehearsals and actual restoration records where available.

Acceptance / hold rule: Required state, integrity and protection checks pass before resumed dependent action; unresolved essential uncertainty retains a restriction.

68.7 — Status and long-term custody

Source: AF-AST-STD-001, page 101.

Closure shall record whether an asset is operating, restricted, dormant, disposed, lost or unknown using verified evidence and defined meanings. Loss of communication shall not be labelled successful disposal. Assign remaining notices, monitoring and records to an actual custodian. A closed commercial contract does not close an unresolved technical or environmental obligation.

Verification: Trace final-state evidence and accepted transfer of residual duties.

Acceptance / hold rule: Terminal claims match observed or explicitly bounded inferred states, and every continuing duty has a receiving owner.

73.1 — Population, mission and human tasks

Source: AF-AST-STD-001, page 110.

Define intended occupants, roles, mission duration, environmental conditions, physical access, workload, communication and reasonable variation in users. Identify essential tasks and protective actions. Validation shall state participant representativeness, assistance, training and limitations; one expert demonstration shall not establish capability for all users.

Verification: Review the user/task matrix and representative normal and degraded validation.

Acceptance / hold rule: Each essential task is demonstrated under its approved conditions; unsupported populations and tasks are excluded from the claim.

73.5 — Human factors and effective authority

Source: AF-AST-STD-001, page 111.

Displays, alerts and procedures shall identify state, urgency, limitations and required actions without ambiguous mode or priority. Workload, fatigue, interruptions, language, delayed feedback and automation bias shall be evaluated. A manual override is an effective control only when a person has the information, time, training and physical or technical ability to use it.

Verification: Observe representative task and intervention performance, including misleading and degraded information.

Acceptance / hold rule: Every essential response passes independently; aggregate usability scores do not offset a failed protective task.

74.4 — Sample identity and custody

Source: AF-AST-STD-001, page 112.

Each sample shall retain origin description, collection event, container, seal or interface identity, mass or quantity where known, conditions, contamination history, transfers, subdivisions and authorised access. Unknown provenance shall remain unknown. Splitting or pooling shall preserve parent-child links and shall not create duplicate inventories.

Verification: Reconcile original collection, custody, receiving and subdivision records.

Acceptance / hold rule: The sample and its history are unambiguous and usable for the claimed purpose; missing essential links block the dependent sample conclusion.

74.6 — Anomalies, unknown state and release of information

Source: AF-AST-STD-001, page 113.

Loss of containment indication, unverified seal condition, missing samples or unexplained contamination shall trigger preservation, restriction and qualified review. Do not equate absent alarms with demonstrated integrity. Technical data and scientific interpretations shall retain limitations; public statements shall not imply a sample is harmless or pristine solely because its custody form is complete.

Verification: Examine anomaly decisions, actual observations and bounded reporting.

Acceptance / hold rule: Only supported technical conclusions are released; uncertainty and unresolved protection duties remain visible.

74.7 — Disposition and residual responsibility

Source: AF-AST-STD-001, page 113.

Final disposition shall identify sample, container, residue, facility, record and long-term custody obligations. Transfer shall include receiving acceptance and usable evidence. Mission completion shall not terminate a continuing protection or

scientific-record duty. The custodian shall preserve genuine access conditions and correction channels after organisational closure.

Verification: Trace final-state evidence and accepted residual duties.

Acceptance / hold rule: No required custody or protection obligation is abandoned and no unverified disposal is claimed complete.

75.7 – Handover, resource claims and closure

Source: AF-AST-STD-001, page 115.

The final claim shall state actual production, quality, quantity, conditions, uncertainty, exclusions and accepted receiving responsibility. Demonstration of a resource process creates no ownership, extraction right or operating permission. Waste, residues, hazardous inventories and long-term custody shall have accepted disposition.

Verification: Reconcile reported outputs, accepted products, rights/permissions and final-state evidence.

Acceptance / hold rule: The claim is bounded to measured and accepted achievement; undeveloped scale-up and unknown disposition remain separate.

77.1 – Requirement-to-method completeness

Source: AF-AST-STD-001, page 118.

The verification matrix shall include every applicable requirement, object/configuration, method, test or analysis purpose, criterion, uncertainty, evidence and authorised conclusion. Inspection, analysis, demonstration and testing shall be selected for the actual failure mechanism. Annex T domains guide coverage but are not ready-made methods. A complete test list shall not replace requirement-level closure.

Verification: Reconcile the requirement population, test matrix and actual evidence using stable identifiers.

Acceptance / hold rule: Every applicable requirement has a valid completed evidence path; any essential uncovered row remains HOLD.

77.2 – Campaign design and article pedigree

Source: AF-AST-STD-001, page 118.

Define qualification articles, flight or service articles, specimens, representative differences, prior exposure, fixtures, operating modes and cumulative test sequence. Identify which conclusions may be transferred between articles and why. Failed tests, repairs and substitutions shall remain in the same historical chain.

Verification: Review specimen-to-product and test-to-configuration equivalence records.

Acceptance / hold rule: All material differences and accumulated effects are evaluated before evidence reuse; unrepresentative essential evidence is not accepted.

77.5 – Original data and invalid tests

Source: AF-AST-STD-001, page 118.

Retain actual setup, input and response histories, environmental conditions, interruptions, alarms, raw files, corrections, uncertainty and validity classification. An invalid run shall state what evidence remains usable and which requirement is not demonstrated. A repaired or changed article shall not silently replace the originally failed configuration.

Verification: Reconstruct a selected run from raw data and contemporaneous records.

Acceptance / hold rule: The run is independently interpretable and no failed, invalid or missing evidence is concealed.

77.8 – Independent campaign closure

Source: AF-AST-STD-001, page 119.

The final dossier shall reconcile configuration, criteria, valid results, adverse evidence, untested characteristics, uncertainty, concessions and open duties. Qualification, article acceptance, laboratory competence and ASTRA conformity shall retain separate decisions. A technical concession shall not be relabelled as fulfilment of the original criterion.

Verification: Perform independent requirement-by-requirement closure with actual decision authority.

Acceptance / hold rule: Every applicable gate for the exact claimed object passes; counts, percentages or programme completion dates alone cannot release the object.

78.4 – Human authority and consequential decisions

Source: AF-AST-STD-001, page 120.

Human oversight shall be validated against available information, response time, competence, workload and control access. Automated decision support may organise evidence but shall not independently issue an ASTRA grant, renewal, suspension or restoration. Generated observations and citations shall not be presented as authentic source events.

Verification: Challenge automation bias, false-source and delayed-intervention scenarios.

Acceptance / hold rule: Actual authorised people can perform every required role and source evidence remains verifiable; nominal oversight alone is insufficient.

78.5 – Security and trusted updates

Source: AF-AST-STD-001, page 121.

Protect source, build, machine instructions, operational data, identities and updates according to the actual threat and safety model. Update acceptance shall verify origin, integrity, authority, target, compatibility and interruption behaviour. Reversion to an earlier load shall not reintroduce an unacceptable defect without explicit technical disposition. Security testing requires written safe authorisation.

Verification: Review trust dependencies and execute isolated permitted and prohibited update tests.

Acceptance / hold rule: All required integrity and protective gates pass; a valid signature alone does not establish functional safety or compatibility.

78.7 – Recovery and semantic portability

Source: AF-AST-STD-001, page 121.

Export and recovery shall preserve identities, scope, configuration, evidence states, decisions, history, units, time basis, permissions and relationships. Equal file counts do not establish equal meaning. Reconcile events after the recovery point and obtain receiving acceptance before cutover. Service availability and evidence-integrity acceptance are separate.

Verification: Execute missing-link, wrong-version, interrupted-write, expired-authority and restore tests.

Acceptance / hold rule: All essential records and relationships are usable and correct; unresolved evidence loss keeps dependent decisions on HOLD.

79.3 – Loss of contact and uncertain physical state

Source: AF-AST-STD-001, page 122.

The operator shall define the distinction between missing data, confirmed failure, safe dormant state, lost asset and completed disposition. Preserve last valid observations, their age and uncertainty. The absence of an alarm or signal shall not establish safe state. An inference shall identify its model and limits and shall not be presented as direct observation.

Verification: Review the state-classification record against raw evidence and observability limits.

Acceptance / hold rule: Only a supported state is assigned; uncertain essential conditions retain UNKNOWN in operational records and HOLD in dependent acceptance.

79.4 – Affected populations and historical decisions

Source: AF-AST-STD-001, page 122.

An event shall be traced to affected configurations, fleet members, materials, methods, software, personnel, reports and prior decisions. Determine both occurrence and escape causes and test competing explanations. Changing a supplier, restarting a service or training one person shall not by itself close a shared systemic cause.

Verification: Inspect end-to-end dependency and look-back analysis with actual notifications.

Acceptance / hold rule: All materially dependent outputs are addressed; no valid adverse history is erased by later correction.

79.5 – Terminal evidence and responsible transfer

Source: AF-AST-STD-001, page 122.

Terminal-state claims shall specify the exact intended condition, permitted inference, observation method, resources and residual duties. Transfer shall preserve custody and receiving acceptance of records, hazardous inventory, notices, monitoring and unresolved remedies. A file sent or contract ended is not accepted closure.

Verification: Reconcile final-state evidence, inventory and recipient acknowledgement.

Acceptance / hold rule: Every required terminal criterion is demonstrated or openly limited, and every remaining duty has an actual receiving owner.

80.1 – One complete application schedule

Source: AF-AST-STD-001, page 124.

The schedule shall join the object tuple, F01–F08 selection, Annex AK domains, phase/mode matrix, required methods, parameter records, competence, evidence, independent decisions and continuing controls. All triggers in Annex AO shall be resolved. Shared records may be reused after relevance review, but shall not merge distinct objects, outcome classes or actual authority.

Verification: Reconcile the full schedule with Clauses 1, 4, 62 and 63 and Annex C.

Acceptance / hold rule: No essential scope, parameter, responsibility or evidence field remains undefined before a positive decision.

80.2 – Domain and verification completeness

Source: AF-AST-STD-001, page 124.

Map every applicable domain and requirement to valid verification and to an accountable conclusion. Treat domain counts, test counts and completed checklist percentages as planning measures only. Annex T is not exhaustive of all future methods; a newly discovered material mechanism shall create a controlled additional requirement and evidence task before the affected claim proceeds.

Verification: Perform forward and reverse traceability and inspect omitted-domain reasons.

Acceptance / hold rule: Every applicable condition passes or has a justified approved N/A; no HOLD or FAIL is hidden by a coverage percentage.

80.3 – Competent independent closure

Source: AF-AST-STD-001, page 124.

The independent reviewer shall have verified technical coverage, lawful evidence access and no prohibited case relationship. Technical dissent shall be resolved by evidence, corrected scope or further work. Where a three-person panel is required, all three eligible members shall participate and the established vote rule shall apply only after the technical gates are satisfied.

Verification: Check competence, conflict, access, panel and reasoned decision records.

Acceptance / hold rule: Both the technical conjunction and applicable authority/panel rules pass; a vote cannot cure absent evidence.

80.4 – Bounded claim and publication

Source: AF-AST-STD-001, page 124.

The outcome shall identify legal holder, issuer, object, configuration, family/module, domain, site or remote responsibility, criteria, limitations, actual dates and ongoing or instance basis. Public wording shall not imply unrestricted coverage of all space, universal safety, statutory permission or external recognition without evidence. The approved cover and edition label do not change those boundaries.

Verification: Compare the actual decision with credential, registry and all proposed public representations.

Acceptance / hold rule: Published scope and status exactly match the authorised decision and preserve every material restriction.

80.5 – Continuing conformity and change

Source: AF-AST-STD-001, page 124.

Maintain surveillance, technical validity, people, resources, configuration, monitoring and actual state history under the controlling clocks. Mission, environment, population or technology changes shall trigger impact review before expanded reliance. Restoration shall preserve expiry unless a full renewal has occurred and shall not validate the suspended interval.

Verification: Audit actual completion, change and status records rather than scheduled dates alone.

Acceptance / hold rule: The current claim remains fully supported; overdue or invalidated conditions trigger the applicable restriction, suspension or withdrawal.

Appendix B — Local adoption, validation and receiving acceptance

Gate	Required evidence	Outcome when incomplete
Authority and identity	Actual operator, scoped mandate, permissible result class, named owner, independent decision and remedy functions.	No live scope release.
Requirement population	All applicable clauses and annexes mapped to child conditions, with reasons and independent approval for exclusions.	HOLD the affected conclusion.
Parameters and methods	Prospective values/attributes; technical basis; valid methods; representativeness; calibration, uncertainty and approved predicates.	No dependent acceptance.
People and evidence	Current demonstrated competence; conflict clearance; original usable source evidence; actual configuration and event times.	Reassign or obtain sufficient evidence.
Local tools and tests	Actual deployment tested with positive, boundary, missing, invalid and prohibited inputs; original failed cases retested.	No consequential reliance on unaccepted tools.
Independent closure	Every mandatory requirement PASS, approved N/A, all in-scope nonconformities verified closed, panel rules where required.	No grant, renewal or extension.
Claims and continuity	Decision-linked scope/status; source history; genuine custody, receiving access, retention, urgent notices and terminal duties.	Restrict publication or transfer until resolved.

Record authentic approval and activation in AF-AST-FR-001 and AF-AST-SC-004 or an equivalent controlled record. The edition label is not an effective date for a particular case. Preserve historical decisions under their actual controlling basis; a newer document does not retroactively create missing competence or evidence. Source: Clauses 4, 31, 61, 62 and 80; Annexes P and AR.

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