



# ASTRA

## AEROSPACE STANDARD

PROCEDURE

### Change, Transition, Transfer and Programme Closure

AF-AST-PR-028

FIRST EDITION

30 September 2026 | English master text

Aviation / Space / Defense / Future systems

# Publication identity and use

| Control                      | Publication information                                                                                                                                                            |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Code and title               | AF-AST-PR-028 — Change, Transition, Transfer and Programme Closure                                                                                                                 |
| Edition and publication date | FIRST EDITION   30 September 2026   English master text                                                                                                                            |
| Accountable function         | Assurance Programme Manager                                                                                                                                                        |
| Controlling technical basis  | AF-AST-STD-001 / AF ASTRA-100:2026; supplied 248-page FIRST EDITION, Clauses 0–80 and Annexes A–AR.                                                                                |
| Source fingerprint           | fe0f775b3f57e43c7ad6b3d4ab17ac0ff872d3ce8c88fcd9ae9a0116b23209b1                                                                                                                   |
| Portfolio                    | 108 retained document codes; F01–F08; 68 retained technical subjects. All-space and verification domains are applicability tags, not additional families.                          |
| Publication and operation    | Prepared publication. Actual technical approval, consultation, institutional adoption, operational effectivity and individual scope activation require separate authentic records. |

## Purpose and application

Prospective transition, receiving capability, record and duty transfer, learner/customer protection and preservation of real historical decision bases.

## 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 Scope, trigger and responsibility

Prospective transition, receiving capability, record and duty transfer, learner/customer protection and preservation of real historical decision bases.

Trigger: A programme/profile version, transfer, provider cessation, scope withdrawal or closure affects controlled work.

Accountable process owner: Assurance Programme Manager. Actual named appointments and deputies are recorded separately. The process owner coordinates execution; technical review, independent conformity decisions and operational permissions retain their separate mandates.

| Input                                                                   | Output / destination                                                                               |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Actual request or triggering event, scope and current technical basis   | A traceable process record linked to its case/object and the required form modules.                |
| Competence, conflict, authority and access evidence                     | Approved assignment and lawful access before affected work begins.                                 |
| Original observations, technical results, limitations and prior history | Reasoned accept/hold/escalation decision; preserved adverse evidence and recipient communications. |
| Controlling clocks and genuine event timestamps                         | Actual due/completion records in SC-003 and the relevant register; no administrative reset.        |

# 2 Operating sequence

## PR-028 – Change, Transition, Transfer and Programme Closure

Trigger: A programme/profile version, transfer, provider cessation, scope withdrawal or closure affects controlled work.

### 1. Identify the actual change and boundary

The programme manager states old/new versions, reasons, entities, profiles, locations, methods, configurations and affected stakeholders. Distinguish document version from technical transfer, operating-authority change and complete closure.

### 2. Analyse compatibility and authority

Review the applicable Constitution, common scheme rules, AF 9100 and adopted ASTRA requirements. A changed marketing label cannot amend a higher instrument or confer new powers. Identify separately required technical, institutional, legal and operating approvals.

### 3. Map gaps and retained evidence

For each affected requirement, determine what remains valid, what becomes invalid and what new methods, observations, competence or tools are needed. Preserve the earlier evidence and decision basis. Neither indefinite grandfathering nor automatic retrospective invalidation is assumed.

### 4. Set prospective implementation conditions

Specify actual effective versions, owners, permitted work, prohibited claims, notices, required additional assessment and verification. Do not waive immediate safety duties. Conditions on development progression do not authorise a conformity certificate with unmet mandatory criteria.

### 5. Verify the receiving capability

On transfer, compare sending/receiving equipment, methods, people, environment, software, data and permissions. Require representative new evidence for material differences. A sent archive, purchased machine or signed commercial handover is not technical receiving acceptance.

## 6. Protect open parties and obligations

Identify holders, pending applications, appeals, findings, learners, recipients, contracts and financial duties. Arrange clear communications and lawful transfer or teach-out. Retain current restrictions and expire/withdraw unsupported claims accurately during transition.

## 7. Preserve usable records and history

Transfer readable decisions, source evidence, dictionaries, configuration links, event dates, permissions and original-versus-corrected states. Reconcile meaning as well as counts. Obtain receiving custody and retention acknowledgement, including preservation holds and correction channels.

## 8. Record completion and residual duties

The actual authorised function decides transition, transfer or closure for an exact scope and date. Keep unresolved notifications, warranties, remedies and custody duties assigned. Closing a project or changing an issuer must not erase failure history or imply continuous authority that never existed.

Hold / escalation: Unresolved essential compatibility, missing receiving capability, abandoned learner/customer duties or an incomplete evidence transfer prevents a supported closure or new-scope release.

Record handover: AF-AST-FR-001, AF-AST-FR-012, AF-AST-FR-015, AF-AST-FR-016, AF-AST-FR-018, AF-AST-FR-028.

# 3 Completion, holds and handover

Unresolved essential compatibility, missing receiving capability, abandoned learner/customer duties or an incomplete evidence transfer prevents a supported closure or new-scope release.

## 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.

| Required record | Capture responsibility                              |
|-----------------|-----------------------------------------------------|
| AF-AST-FR-001   | Programme adoption and scope activation             |
| AF-AST-FR-012   | Finding, containment and corrective action          |
| AF-AST-FR-015   | Surveillance, change and renewal                    |
| AF-AST-FR-016   | Suspension, restriction, restoration and withdrawal |
| AF-AST-FR-018   | Operator agreement and authorisation schedule       |
| AF-AST-FR-028   | Programme change, transition and closure            |

The performer hands the actual record to the designated owner or reviewer. The receiving function verifies scope, version, usable evidence, open conditions, original dates and the action it may take. Sending an email, completing a form or setting a database flag is not acceptance of that handover.

# 4 Timing and escalation

| Control / source | Trigger and interval | Required response |
|------------------|----------------------|-------------------|
|------------------|----------------------|-------------------|

Use actual awareness, notification, completion, decision, issue and expiry timestamps with a declared time zone. Days are calendar days unless explicitly stated otherwise. Month intervals end on the corresponding date, or month-end where that date does not exist. Earlier applicable duties prevail. Source: Annex H.

## 5 Worked application and failure response

Synthetic example: A fictional provider closes with two open appeals and a suspended method. The receiving custodian accepts records and duties, but the suspended scope is not made active by the transfer. Independent review determines any future capability and authority.

Before closure, challenge a missing essential input, an expired or conflicted role, wrong configuration, contradictory evidence and an incomplete receiving handover where applicable. Record expected and actual behaviour. A completed synthetic exercise tests reasoning or workflow only; it cannot replace required technical witnessing.

## 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                                         |
|-----------------|--------------------------------------|------------------------------------------------------------|
| 16.6 / 28       | Transfer and cessation               | Requirement, objective evidence and local child predicates |
| 30.1 / 47       | Existing instruments and terminology | Requirement, objective evidence and local child predicates |
| 30.2 / 48       | Controlled transition                | Requirement, objective evidence and local child predicates |
| 30.3 / 48       | Reliance and cooperation agreements  | Requirement, objective evidence and local child predicates |

| ASTRA ID / page | Source subject                                   | Implementation use                                         |
|-----------------|--------------------------------------------------|------------------------------------------------------------|
| 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 |
| 31.4 / 49       | Implementation and verification                  | Requirement, objective evidence and local child predicates |
| 48.6 / 72       | Performance, transfer and exit                   | Requirement, objective evidence and local child predicates |
| 56.5 / 81       | Export, migration and meaningful recovery        | Requirement, objective evidence and local child predicates |
| 60.5 / 85       | Controlled launch, surveillance and evolution    | Requirement, objective evidence and local child predicates |
| 61.3 / 86       | Dependent documents and compatibility            | Explicit verification and acceptance predicate             |
| 62.7 / 89       | Decision replay and consistency                  | Explicit verification and acceptance predicate             |
| 68.7 / 101      | Status and long-term custody                     | 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             |
| 78.7 / 121      | Recovery and semantic portability                | Explicit verification and acceptance predicate             |
| 79.5 / 122      | Terminal evidence and responsible transfer       | Explicit verification and acceptance predicate             |
| 80.5 / 124      | Continuing conformity and change                 | Explicit verification and acceptance predicate             |

## E3 Detailed operating extensions

### 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.

## **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.

## **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.         |

| Domain / source page                                         | Coverage                                                                                  | Required boundary                                                                                       |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| 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.                            |
| 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.              |

| Domain / source page                                     | Coverage                                                                                      | Required boundary                                                                                  |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| 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

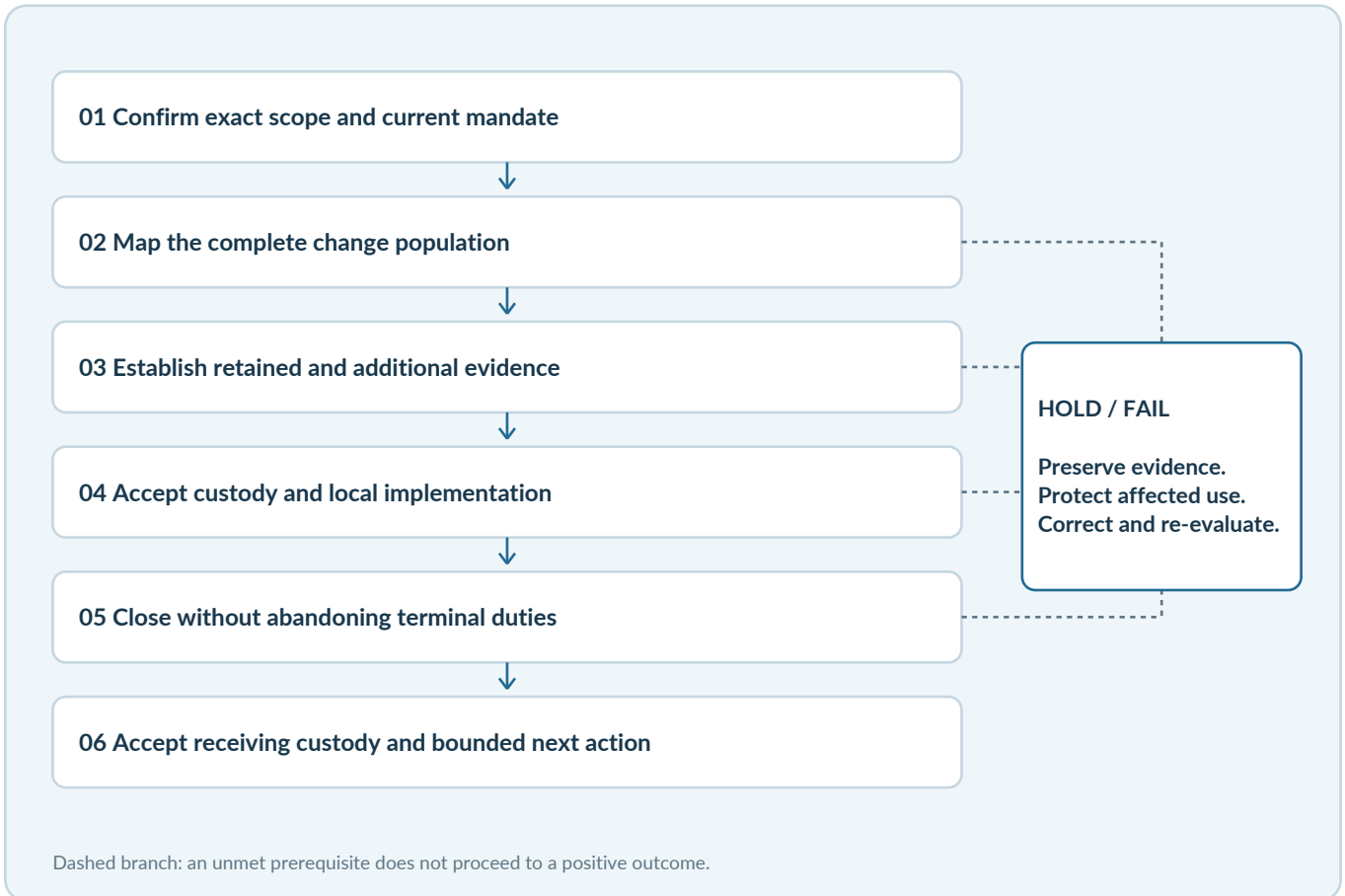
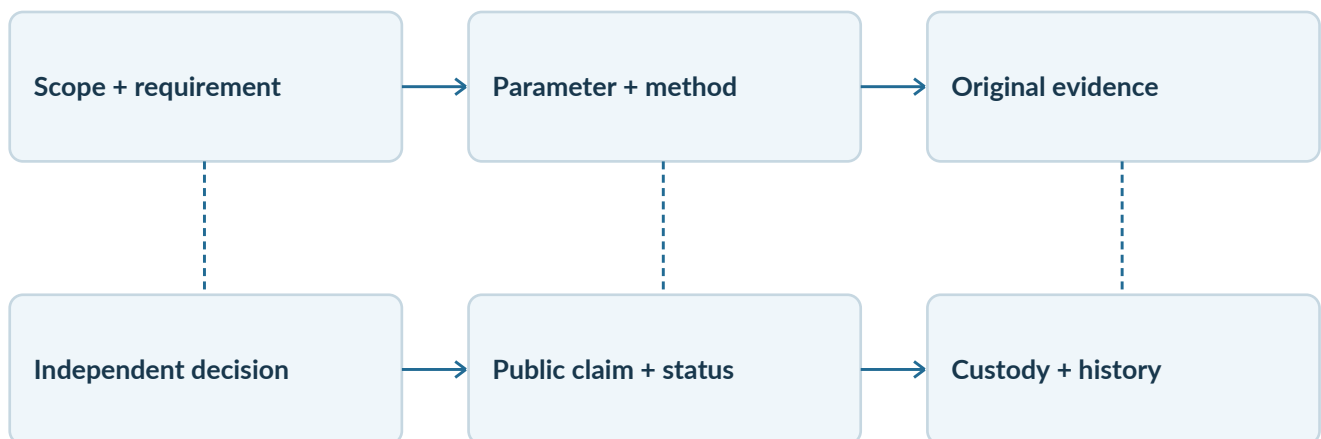


Figure — Implementation sequence for AF-AST-PR-028. Explanatory diagram; the source prerequisites and actual authority remain controlling.



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.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

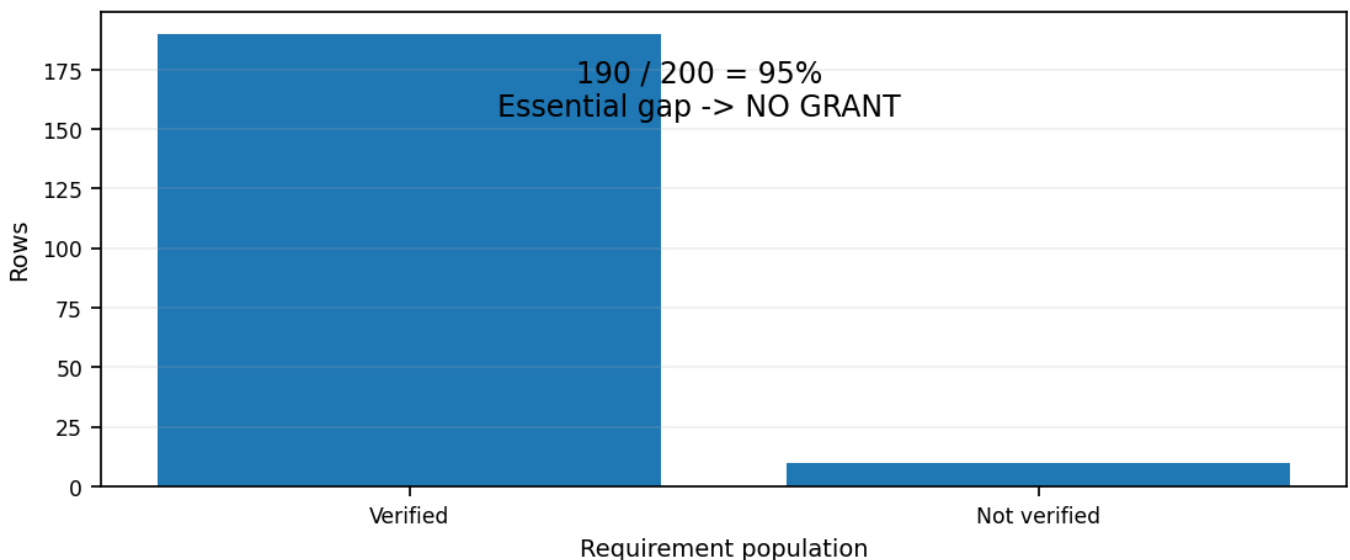


Figure Q03 – Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

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.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

### Availability and correct service are different

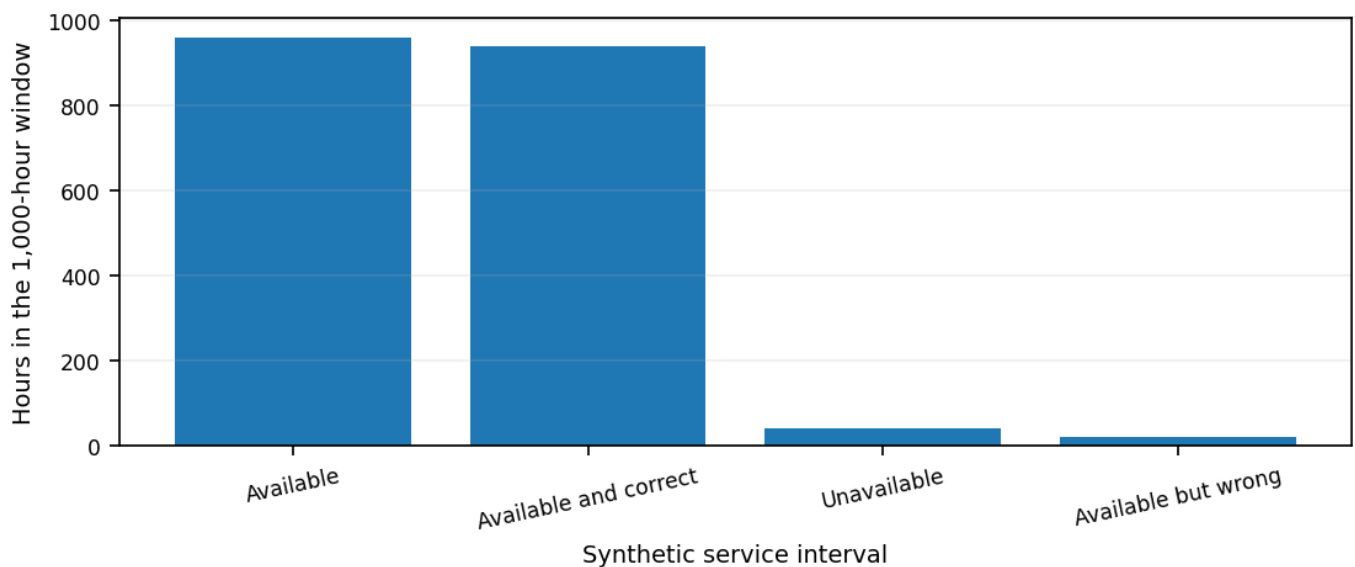


Figure Q09 — Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

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.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 byte = 8 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  $2.0 \times 10^6$  bit/s, 6 h outage, overhead factor=1.25; usable storage= $64 \times 10^9$  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  $6.75 \times 10^9$  bytes = 6.75 GB.
4. Headroom= $10 \times 10^9$  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

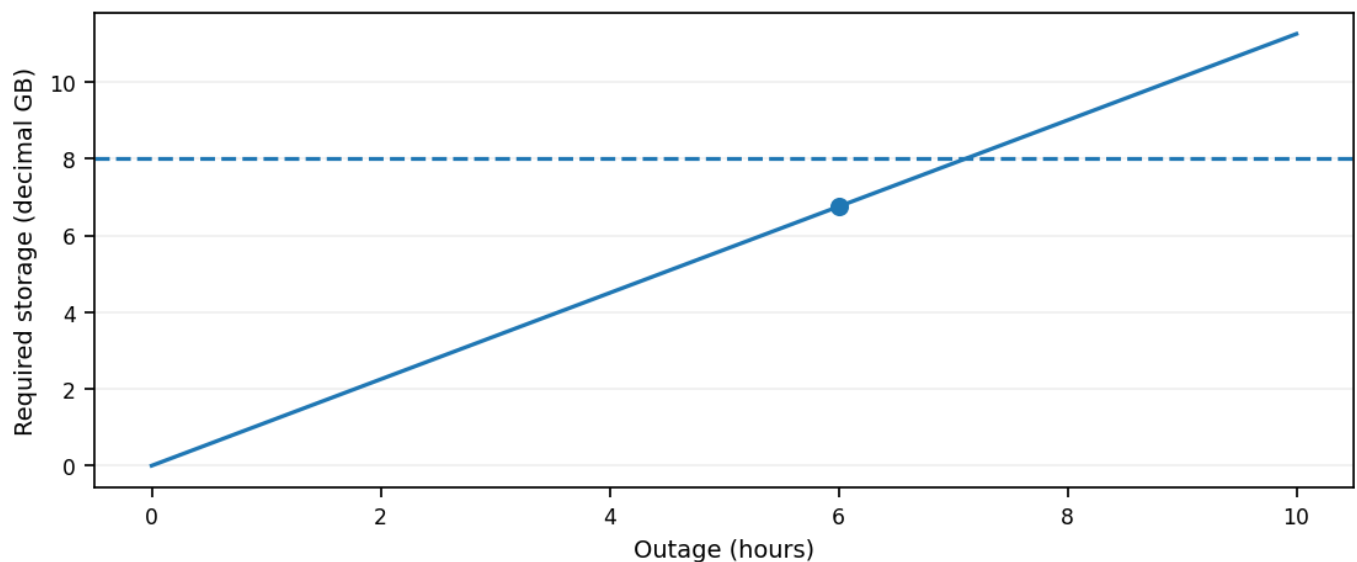


Figure Q16 – Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

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

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

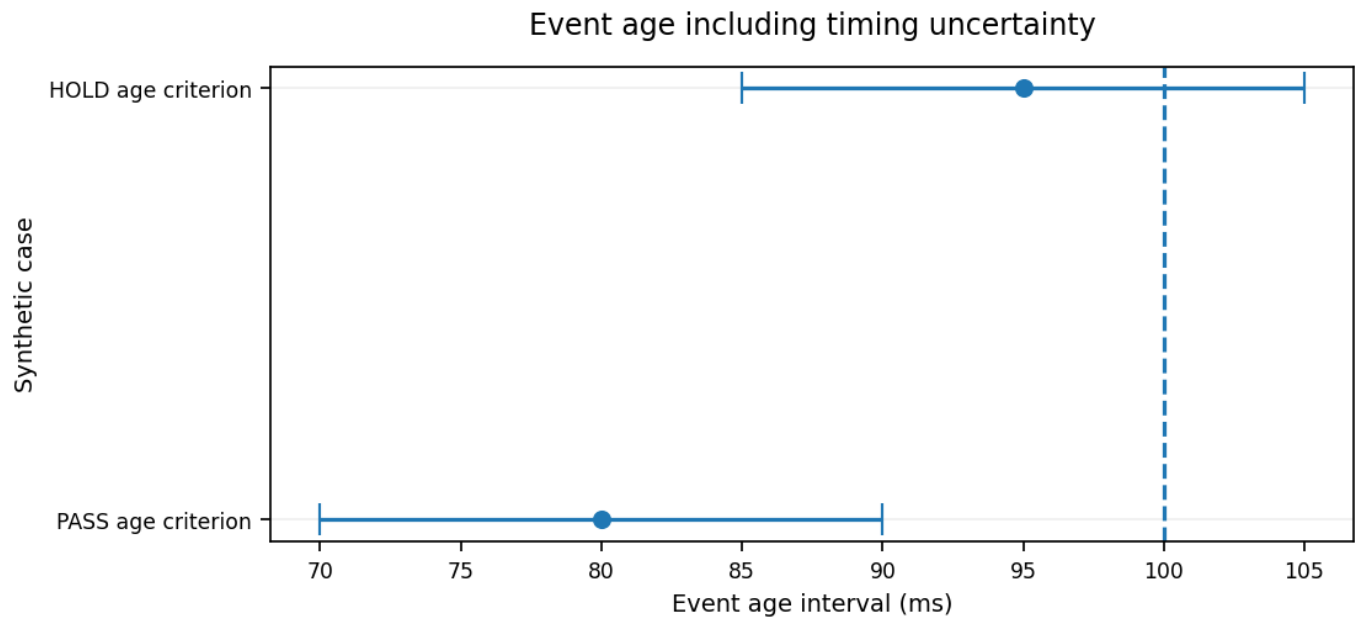


Figure Q17 – Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

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

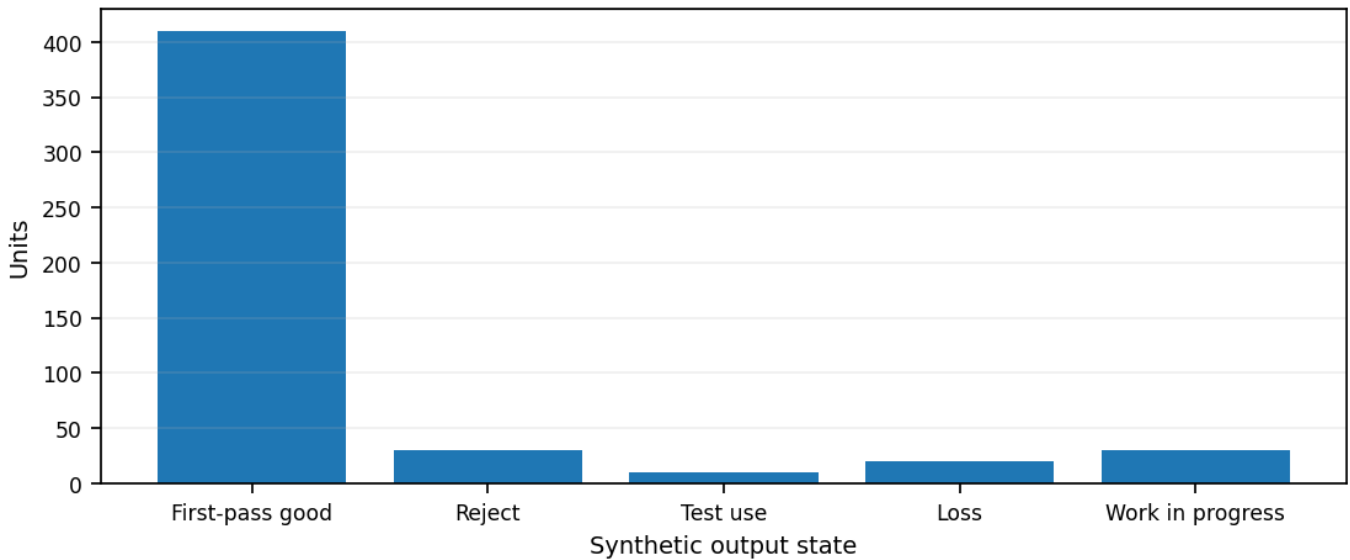


Figure Q23 — Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

**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.

## E8 Adverse cases and independent replay

| Challenge                                                                        | Expected handling                                                                                                        | Evidence retained                                                                              |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| 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.

## 16.6 – Transfer and cessation

Source: AF-AST-STD-001, page 28.

A receiving operator shall verify authenticity, scope, criteria, decision history, findings, surveillance, authority and technical evidence before accepting a transfer, and perform additional evaluation where necessary. Suspended or unsupported status cannot be made valid by changing issuer. Operator cessation shall preserve records, pending remedies, current status, holder communication and lawful access. Transfer of files does not itself transfer accreditation, AF operating authority or a wider technical scope.

Required evidence: Transfer review; additional work; continuity agreement; accurate issuer/status history.

## 30.1 – Existing instruments and terminology

Source: AF-AST-STD-001, page 47.

The eight-family architecture and ASTRA identity do not amend existing AF instruments by implication. Record compatibility of every proposed outcome with AF-CON-001, AF-SR-001 and any applicable AF technical standard. Present educational and operational recognition remains available under compatible profiles; a wider accreditation designation requires the explicit higher-instrument decisions identified in Annex N. Do not change AF 9100 or historical certificates merely to align a marketing label.

Required evidence: Compatibility decision; authorised terminology; separate amendment work where needed.

## 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.

## 30.3 – Reliance and cooperation agreements

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

Any agreement to rely on another party's results shall identify parties, exact activities, acceptance conditions, competent evaluation, monitoring, territorial limits, confidentiality and withdrawal. Verify authenticity and fit for each actual use. Do not infer acceptance from an MoU title, shared event, commercial partnership or similar standard number. The party making an acceptance decision retains responsibility for that decision. Mutual familiarity is not independent competence evidence.

Required evidence: Executed bounded agreement; evidence checks; monitoring; truthful acceptance statements.

## 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.

### 31.4 – Implementation and verification

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

Implement in the following order: settle authority and permissible outcomes; release core operating controls; validate forms, tools and registry states; establish qualified teams and independent decision functions; complete technical profiles and checklists; conduct representative controlled pilots; close findings; and authorise exact live scopes. Annex Q assigns documentation work packages without imposing an invented calendar promise. Maintain an open-action register and verify that every active dependency is actually available.

Required evidence: Implementation programme; verified dependencies; pilot/closure; exact live-scope notice.

### 48.6 – Performance, transfer and exit

Source: AF-AST-STD-001, page 72.

Supplier monitoring shall include adverse results, changes, delivery and technical performance using defined populations and denominators. A systemic failure shall trigger review of dependent sources and products, not merely reassignment to a new supplier. Transfers shall verify receiving capability and preserve open findings, technical restrictions and historical records. Exit shall identify remaining warranties, notifications, record custody and unresolved obligations. Changing a supplier or issuer shall not make unsupported evidence valid.

Required evidence: Supplier performance review; systemic extent; transfer acceptance; open-duty and custody records.

### 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.

### 60.5 – Controlled launch, surveillance and evolution

Source: AF-AST-STD-001, page 85.

Launch shall identify exact active profiles, authorised operators, competent resources, terms, public claims and operational effectivity. Scope availability shall follow real release decisions. Continuing review shall monitor technical validity, independence, changes, outcomes, access and resources rather than certificate volume alone. The programme shall maintain usable historical records, controlled version and responsible closure. A later expansion shall preserve earlier code meanings and undergo its own compatibility, technical and activation review.

Required evidence: Actual activation; public availability; surveillance and independent review; version /transition and closure records.

### 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.

## 62.7 – 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.

## 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.

## 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.

## 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.

## 79.5 – 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.

## **80.5 – 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.

PDF recording limits: text fields may scroll beyond their visible area. A printed or flattened copy shall include controlled continuations whenever the full response is not visible. A typed name is not a certificate-based authenticated signature. An actual signed instrument or authenticated workflow shall establish approval. Record custody and privacy are implemented by the receiving organisation, not by this PDF alone.