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Purpose and application

Carbon, Environment and Climate Assurance for 6 retained scope subjects. This book specifies evaluable implementation controls, scope boundaries and the complete application-specific parameter and evidence architecture. Actual engineering values, local permissions and release decisions must be separately established.

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 Family boundary, outcome and retained subjects

Carbon, Environment and Climate Assurance for 6 retained scope subjects. This book specifies evaluable implementation controls, scope boundaries and the complete application-specific parameter and evidence architecture. Actual engineering values, local permissions and release decisions must be separately established.

This book retains each original subject code and its R01–R06 implementation controls. R07–R12 are new elaborations aligned with the latest core. They become binding only through the applicable technical adoption process. None supplies a universal engineering value or a real scope activation.

Retained subject	Exact title	Result boundary
F08-C01	Inventory and data	A verified airport or supplier inventory is not the footprint of every flight, tenant or customer and does not establish a reduction without comparable historical evidence.
F08-C02	Reduction and transition	Plan validation neither guarantees future reductions nor proves present reduction. A lower intensity can coexist with higher total emissions and must be reported accurately.
F08-C03	Energy and circular resources	A recovery percentage is not proof that a critical part is fit for service, that all waste was recycled or that internal recirculation represents new recovered material.
F08-C04	Local environmental performance	An inventory or general sustainability label cannot establish compliance with every local environmental duty or guarantee absence of effects at unmeasured receptors.
F08-C05	Climate resilience	Neither a scenario report nor capability recognition guarantees that a facility will withstand every climate event or replaces engineering design and statutory approval.
F08-C06	Low-carbon energy and supply claims	An attribute purchase does not necessarily mean physical delivery, verified operational reduction, fuel compatibility or zero emissions for an entire flight or service.

2 Requirement and decision architecture

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.

3 Prospective parameter schedule

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.

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.

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.

P16 – Reliability and availability

Population, exposure, failure definition, observation, dependencies, confidence model, downtime and maintenance exclusions.

Derivation and evidence: Prospective statistical design plus engineering mechanism evidence.

Completion test: The actual demonstrated bound meets the approved claim; zero failures is not zero risk.

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.

4 Detailed subject profiles

F08-C01 – Inventory and data

Organisational environmental capability and independently evaluated historical inventories for defined entities, sites, categories, periods and intended users. Separate inventory verification from capability recognition and verifier accreditation.

Application-specific parameters: Entity/site boundary; reporting period; categories; functional unit; activity sources; factors and versions; gases/CO₂-equivalent basis; allocation; estimates; gaps; uncertainty; materiality; assurance form; statement version.

Profile boundary	Detail
Technical emphasis	inventory boundary, category data and factors
Failure / evidence risks	a correct total can conceal an omitted mandatory category or a factor from the wrong boundary
Representative witnessing	Trace significant inventory rows from statement to source activity/factor and forward through calculation, correction and independent conclusion; include an omitted or mismatched-factor case.
Change and requalification triggers	Entity/site boundary; period; factor source; calculation model; allocation; category; source system; assurance form; structural change.
Outcome limitation	A verified airport or supplier inventory is not the footprint of every flight, tenant or customer and does not establish a reduction without comparable historical evidence.

F08-C01-R01 – Retained subject control

Agree the engagement, responsible statement, boundary, period, intended users and assurance form before substantive evaluation; identify excluded sites and value-chain categories explicitly.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C01-R02 – Retained subject control

Trace material activity quantities to actual meters, transactions or reviewed estimation models with consistent units, timestamps and source identity.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C01-R03 – Retained subject control

Review emission or conversion factors for geography, year, material/energy type, lifecycle boundary and version rather than copy a convenient unrelated value.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C01-R04 — Retained subject control

Reconcile aggregation, allocation, unit conversions, gross categories and shared sources, retaining original errors and corrections in a versioned inventory.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C01-R05 — Retained subject control

Evaluate data quality, uncertainty and missing categories separately; a numerical uncertainty allowance does not compensate for an omitted material lifecycle stage.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C01-R06 — Retained subject control

Use competent independent review to determine a bounded conclusion under the agreed materiality and assurance basis; do not equate verified inventory with achieved reduction or zero emissions.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C01-R07 — Mission and environment transfer

For inventory and data, define the qualified or evaluated envelope for inventory boundary, category data and factors. Compare the intended mission, material, site, configuration and phase/mode with the actual evidence. Identify material differences and allocate new demonstration before relying on heritage or terrestrial qualification.

Verification: Inspect the difference matrix, environmental inputs, owner approvals and requirement-to-method links.

Acceptance / hold: PASS only when every influential difference is either bounded by valid retained evidence or closed by accepted additional demonstration. Missing essential transfer evidence is HOLD.

Basis: New implementation detail aligned with ASTRA 62.1–62.2; 63.2–63.6; 64.1–64.6

F08-C01-R08 — Essential properties and observability

Identify the failure and evidence risks specific to this subject: a correct total can conceal an omitted mandatory category or a factor from the wrong boundary. State which critical properties are directly observed, measured, inferred using a validated model or unknown. Allocate separate child predicates for each hidden property and each essential protective function.

Verification: Review detection capability, raw observations, model validity and limitations against each claimed property.

Acceptance / hold: A valid observation supports only its demonstrated property and domain. An unobservable essential condition is HOLD, not a favourable default or a proven product defect.

Basis: New implementation detail aligned with ASTRA 62.3–62.5; 77.1–77.6

F08-C01-R09 — Configuration and data identity

Bind inventory boundary, category data and factors to actual configuration, controlled technical data, source/lot or record identity, equipment and software state, authorised performer and actual event time. Preserve failed runs, changed objects and prior evidence through any digital transfer.

Verification: Replay one result from original records and verify event-time authority, method version and the evaluated-to-delivered relationship.

Acceptance / hold: PASS requires reproducible identity and valid links for the actual claim. Wrong configuration, stale state, inaccessible evidence or an unverified substituted record is HOLD.

Basis: New implementation detail aligned with ASTRA 33.3–33.4; 56.1–56.5; 62.7; 78.7

F08-C01-R10 – Subject-specific adverse demonstration

Challenge the following mechanism through a safe authorised test, independent record review or controlled simulation appropriate to this subject: reconcile material quantities, provenance, units, factor suitability and declared exclusions. Define the expected outcome before execution, retain original failures and repeat the failed case after correction.

Verification: Compare prospective expectations, actual observations, conditions, evidence, defect disposition and relevant regression.

Acceptance / hold: Every essential adverse scenario must have valid accepted evidence. A scripted teaching example is not actual qualification; unavailable required observation remains HOLD.

Basis: New implementation detail aligned with ASTRA 62.6–62.7; 77.5–77.8; Annex AP

F08-C01-R11 – Receiving interface and bounded output

Deliver the bounded output to inventory owner and independent statement reviewer. Reconcile identity, configuration, conditions, unresolved limitations, technical eligibility, remaining duties and readable evidence. Identify the actual performer and the organisation retaining acceptance responsibility.

Verification: Check the sending manifest, actual recipient access, acknowledgement, restrictions and remaining action owners.

Acceptance / hold: Transfer is complete only after the necessary receiving acceptance is authentic. Sending a file, reconciling quantity or generating a certificate does not establish technical eligibility.

Basis: New implementation detail aligned with ASTRA 32.5; 48.4–48.6; 63.6; 80.4

F08-C01-R12 – Independent release and continuing validity

Evaluate F08-C01 independently within its declared object and outcome class. Reconcile the original R01–R06 controls with R07–R11, applicable source requirements, prospective parameters, findings and actual authority. Monitor the subject-specific changes stated in this profile and reopen affected conclusions when the evidence changes.

Verification: Independently replay the final predicate and inspect scope, exclusions, competence, conflict clearance, findings closure and event history.

Acceptance / hold: No positive grant, renewal or extension while any applicable mandatory child is FAIL, HOLD or UNSET. N/A requires independent scope justification; technical concessions remain separate from conformity.

Basis: New implementation detail aligned with ASTRA 15.1–15.5; 16.1–16.6; 62.4–62.7; 80.1–80.6

Qualification dossier and receiving closure

The profile owner assembles the actual scope, local child-condition ledger, approved parameters, method validation, source and output genealogy, representative observations, adverse-case results, competency and independence checks, finding closure, technical release and bounded public claim. The independent reviewer checks original evidence and challenges unsupported inheritance. Keep the accepted dossier version and actual decision time accessible to the receiving custodian.

Worked failure path — synthetic: reconcile material quantities, provenance, units, factor suitability and declared exclusions The reviewer records the affected F08-C01 child condition, contains the dependent use, retains earlier evidence and requests the missing or corrected demonstration. A later favourable run does not erase the first result. Final closure requires evidence addressing the original mechanism and receiving acceptance by inventory owner and independent statement reviewer.

F08-C02 – Reduction and transition

Historical reduction statements and prospective transition-plan validation for named boundaries and intended users. Keep measured achievement, forecast, removal, avoided emissions and compensation separately labelled and evaluated.

Application-specific parameters: Baseline/current periods; boundaries; recalculation rules; structural change; absolute/intensity metrics; functional output; attribution; transition milestones; resources; dependencies; uncertainty; monitoring; statement purpose.

Profile boundary	Detail
Technical emphasis	historical reduction and prospective transition
Failure / evidence risks	a favourable future scenario can be misrepresented as an achieved reduction
Representative witnessing	Compare a historical statement to its controlled baseline and current sources, then separately trace a prospective milestone to its assumptions and resources; identify a misleading achieved-versus-planned claim.
Change and requalification triggers	Boundary; base year; factor or method; production mix; corporate structure; milestone; resources; external technology or energy dependency.
Outcome limitation	Plan validation neither guarantees future reductions nor proves present reduction. A lower intensity can coexist with higher total emissions and must be reported accurately.

F08-C02-R01 — Retained subject control

Determine whether the engagement concerns achieved historical change or the plausibility of a future plan; assign the corresponding verification or validation conclusion.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C02-R02 — Retained subject control

Establish comparable baseline and current activity, methods, factors and boundaries, recording structural changes, output mix and all justified recalculations.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C02-R03 — Retained subject control

Separate absolute reductions from intensity changes and disclose operational reductions, removals, compensation and avoided-emission scenarios without misleading net aggregation.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C02-R04 — Retained subject control

For prospective plans, challenge technical feasibility, milestones, finance, resource availability, external dependencies and uncertainty instead of assuming future delivery.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C02-R05 — Retained subject control

Evaluate implementation and monitoring records against actual commitments, preserve missed milestones and review material changes to the baseline or transition pathway.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C02-R06 — Retained subject control

Independently review corrected historical claims or prospective assumptions and limit wording to the evidence; validation must not be publicised as achieved net-zero performance.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C02-R07 — Mission and environment transfer

For reduction and transition, define the qualified or evaluated envelope for historical reduction and prospective transition. Compare the intended mission, material, site, configuration and phase/mode with the actual evidence. Identify material differences and allocate new demonstration before relying on heritage or terrestrial qualification.

Verification: Inspect the difference matrix, environmental inputs, owner approvals and requirement-to-method links.

Acceptance / hold: PASS only when every influential difference is either bounded by valid retained evidence or closed by accepted additional demonstration. Missing essential transfer evidence is HOLD.

Basis: New implementation detail aligned with ASTRA 62.1–62.2; 63.2–63.6; 64.1–64.6

F08-C02-R08 — Essential properties and observability

Identify the failure and evidence risks specific to this subject: a favourable future scenario can be misrepresented as an achieved reduction. State which critical properties are directly observed, measured, inferred using a validated model or unknown. Allocate separate child predicates for each hidden property and each essential protective function.

Verification: Review detection capability, raw observations, model validity and limitations against each claimed property.

Acceptance / hold: A valid observation supports only its demonstrated property and domain. An unobservable essential condition is HOLD, not a favourable default or a proven product defect.

Basis: New implementation detail aligned with ASTRA 62.3–62.5; 77.1–77.6

F08-C02-R09 — Configuration and data identity

Bind historical reduction and prospective transition to actual configuration, controlled technical data, source/lot or record identity, equipment and software state, authorised performer and actual event time. Preserve failed runs, changed objects and prior evidence through any digital transfer.

Verification: Replay one result from original records and verify event-time authority, method version and the evaluated-to-delivered relationship.

Acceptance / hold: PASS requires reproducible identity and valid links for the actual claim. Wrong configuration, stale state, inaccessible evidence or an unverified substituted record is HOLD.

Basis: New implementation detail aligned with ASTRA 33.3–33.4; 56.1–56.5; 62.7; 78.7

F08-C02-R10 — Subject-specific adverse demonstration

Challenge the following mechanism through a safe authorised test, independent record review or controlled simulation appropriate to this subject: separate actual baseline/current data from forecasts, output-mix changes and attribution assumptions. Define the expected outcome before execution, retain original failures and repeat the failed case after correction.

Verification: Compare prospective expectations, actual observations, conditions, evidence, defect disposition and relevant regression.

Acceptance / hold: Every essential adverse scenario must have valid accepted evidence. A scripted teaching example is not actual qualification; unavailable required observation remains HOLD.

Basis: New implementation detail aligned with ASTRA 62.6–62.7; 77.5–77.8; Annex AP

F08-C02-R11 — Receiving interface and bounded output

Deliver the bounded output to statement owner and independent historical/prospective reviewer. Reconcile identity, configuration, conditions, unresolved limitations, technical eligibility, remaining duties and readable evidence. Identify the actual performer and the organisation retaining acceptance responsibility.

Verification: Check the sending manifest, actual recipient access, acknowledgement, restrictions and remaining action owners.

Acceptance / hold: Transfer is complete only after the necessary receiving acceptance is authentic. Sending a file, reconciling quantity or generating a certificate does not establish technical eligibility.

Basis: New implementation detail aligned with ASTRA 32.5; 48.4–48.6; 63.6; 80.4

F08-C02-R12 — Independent release and continuing validity

Evaluate F08-C02 independently within its declared object and outcome class. Reconcile the original R01–R06 controls with R07–R11, applicable source requirements, prospective parameters, findings and actual authority. Monitor the subject-specific changes stated in this profile and reopen affected conclusions when the evidence changes.

Verification: Independently replay the final predicate and inspect scope, exclusions, competence, conflict clearance, findings closure and event history.

Acceptance / hold: No positive grant, renewal or extension while any applicable mandatory child is FAIL, HOLD or UNSET. N/A requires independent scope justification; technical concessions remain separate from conformity.

Basis: New implementation detail aligned with ASTRA 15.1–15.5; 16.1–16.6; 62.4–62.7; 80.1–80.6

Qualification dossier and receiving closure

The profile owner assembles the actual scope, local child-condition ledger, approved parameters, method validation, source and output genealogy, representative observations, adverse-case results, competency and independence checks, finding closure, technical release and bounded public claim. The independent reviewer checks original evidence and challenges unsupported inheritance. Keep the accepted dossier version and actual decision time accessible to the receiving custodian.

Worked failure path — synthetic: separate actual baseline/current data from forecasts, output-mix changes and attribution assumptions. The reviewer records the affected F08-C02 child condition, contains the dependent use, retains earlier evidence and requests the missing or corrected demonstration. A later favourable run does not erase the first result. Final closure requires evidence addressing the original mechanism and receiving acceptance by statement owner and independent historical/prospective reviewer.

F08-C03 — Energy and circular resources

Energy, water, waste, material efficiency, repair, reuse, remanufacture and recovery capability or statements for a defined system. Environmental performance and technical eligibility of recovered aerospace inputs remain distinct.

Application-specific parameters: Flows and boundaries; opening/closing stocks; inputs/outputs; losses; reused/recovered quantities; functional denominator; metering; allocation; waste destination; item genealogy; life status; uncertainty; claim mechanism.

Profile boundary	Detail
Technical emphasis	energy/resource flows and circularity
Failure / evidence risks	repeated internal recirculation can inflate recovered-output totals
Representative witnessing	Trace a material flow and one reused item from receipt through processing, losses, output and receiving destination; compare mass reconciliation with separate technical suitability evidence.
Change and requalification triggers	Flow boundary; denominator; process; reuse route; material mix; metering; recovery contractor; destination; technical duty or life evidence.

Profile boundary	Detail
Outcome limitation	A recovery percentage is not proof that a critical part is fit for service, that all waste was recycled or that internal recirculation represents new recovered material.

F08-C03-R01 — Retained subject control

Define the material or energy flow boundary, reporting period, units, input/output categories and denominator before calculating a rate or improvement.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C03-R02 — Retained subject control

Reconcile purchases, transfers, consumption, recovered outputs, inventories and losses to original records without counting the same internal circulation repeatedly.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C03-R03 — Retained subject control

Distinguish repair, reuse, remanufacture, recycling and disposal; establish what was actually performed and what is only planned or sent to a contractor.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C03-R04 — Retained subject control

Preserve item identity, life and condition evidence and required qualification when recovered material or parts return to critical use; environmental benefit cannot waive technical eligibility.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C03-R05 — Retained subject control

Review measurement quality, contractor evidence, allocation and missing streams, including harmful displacement of effects to another boundary.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C03-R06 — Retained subject control

Independently evaluate the exact capability or quantitative statement and maintain accurate destination, custody and change records after transfer or provider closure.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C03-R07 — Mission and environment transfer

For energy and circular resources, define the qualified or evaluated envelope for energy/resource flows and circularity. Compare the intended mission, material, site, configuration and phase/mode with the actual evidence. Identify material differences and allocate new demonstration before relying on heritage or terrestrial qualification.

Verification: Inspect the difference matrix, environmental inputs, owner approvals and requirement-to-method links.

Acceptance / hold: PASS only when every influential difference is either bounded by valid retained evidence or closed by accepted additional demonstration. Missing essential transfer evidence is HOLD.

Basis: New implementation detail aligned with ASTRA 62.1–62.2; 63.2–63.6; 64.1–64.6

F08-C03-R08 — Essential properties and observability

Identify the failure and evidence risks specific to this subject: repeated internal recirculation can inflate recovered-output totals. State which critical properties are directly observed, measured, inferred using a validated model or unknown. Allocate separate child predicates for each hidden property and each essential protective function.

Verification: Review detection capability, raw observations, model validity and limitations against each claimed property.

Acceptance / hold: A valid observation supports only its demonstrated property and domain. An unobservable essential condition is HOLD, not a favourable default or a proven product defect.

Basis: New implementation detail aligned with ASTRA 62.3–62.5; 77.1–77.6

F08-C03-R09 — Configuration and data identity

Bind energy/resource flows and circularity to actual configuration, controlled technical data, source/lot or record identity, equipment and software state, authorised performer and actual event time. Preserve failed runs, changed objects and prior evidence through any digital transfer.

Verification: Replay one result from original records and verify event-time authority, method version and the evaluated-to-delivered relationship.

Acceptance / hold: PASS requires reproducible identity and valid links for the actual claim. Wrong configuration, stale state, inaccessible evidence or an unverified substituted record is HOLD.

Basis: New implementation detail aligned with ASTRA 33.3–33.4; 56.1–56.5; 62.7; 78.7

F08-C03-R10 — Subject-specific adverse demonstration

Challenge the following mechanism through a safe authorised test, independent record review or controlled simulation appropriate to this subject: reconcile unique material flows, denominators, losses and separate technical reuse eligibility. Define the expected outcome before execution, retain original failures and repeat the failed case after correction.

Verification: Compare prospective expectations, actual observations, conditions, evidence, defect disposition and relevant regression.

Acceptance / hold: Every essential adverse scenario must have valid accepted evidence. A scripted teaching example is not actual qualification; unavailable required observation remains HOLD.

Basis: New implementation detail aligned with ASTRA 62.6–62.7; 77.5–77.8; Annex AP

F08-C03-R11 — Receiving interface and bounded output

Deliver the bounded output to resource custodian and independent claim reviewer. Reconcile identity, configuration, conditions, unresolved limitations, technical eligibility, remaining duties and readable evidence. Identify the actual performer and the organisation retaining acceptance responsibility.

Verification: Check the sending manifest, actual recipient access, acknowledgement, restrictions and remaining action owners.

Acceptance / hold: Transfer is complete only after the necessary receiving acceptance is authentic. Sending a file, reconciling quantity or generating a certificate does not establish technical eligibility.

Basis: New implementation detail aligned with ASTRA 32.5; 48.4–48.6; 63.6; 80.4

F08-C03-R12 — Independent release and continuing validity

Evaluate F08-C03 independently within its declared object and outcome class. Reconcile the original R01–R06 controls with R07–R11, applicable source requirements, prospective parameters, findings and actual authority. Monitor the subject-specific changes stated in this profile and reopen affected conclusions when the evidence changes.

Verification: Independently replay the final predicate and inspect scope, exclusions, competence, conflict clearance, findings closure and event history.

Acceptance / hold: No positive grant, renewal or extension while any applicable mandatory child is FAIL, HOLD or UNSET. N/A requires independent scope justification; technical concessions remain separate from conformity.

Basis: New implementation detail aligned with ASTRA 15.1–15.5; 16.1–16.6; 62.4–62.7; 80.1–80.6

Qualification dossier and receiving closure

The profile owner assembles the actual scope, local child-condition ledger, approved parameters, method validation, source and output genealogy, representative observations, adverse-case results, competency and independence checks, finding closure, technical release and bounded public claim. The independent reviewer checks original evidence and challenges unsupported inheritance. Keep the accepted dossier version and actual decision time accessible to the receiving custodian.

Worked failure path — synthetic: reconcile unique material flows, denominators, losses and separate technical reuse eligibility The reviewer records the affected F08-C03 child condition, contains the dependent use, retains earlier evidence and requests the missing or corrected demonstration. A later favourable run does not erase the first result. Final closure requires evidence addressing the original mechanism and receiving acceptance by resource custodian and independent claim reviewer.

F08-C04 — Local environmental performance

Local air quality, noise, discharge, spills, biodiversity and other site-specific environmental performance within a declared responsibility. Use separate competent methods and actual obligations for each measured effect.

Application-specific parameters: Site/receptors; activity and sources; baseline; period/season; sampling locations; operating conditions; method and detection limits; attribution; uncertainty; thresholds; permits; incident response; affected parties.

Profile boundary	Detail
Technical emphasis	local environmental performance and receptors
Failure / evidence risks	a single quiet-period measurement can conceal peak or seasonal exposure
Representative witnessing	Trace one local measurement to sampling location, operating conditions, method, source attribution and report, alongside a spill/noise or other relevant adverse event and corrective follow-up.
Change and requalification triggers	Site or receptor; source activity; season; method; instrument; threshold or permit; construction; operating pattern; material environmental incident.
Outcome limitation	An inventory or general sustainability label cannot establish compliance with every local environmental duty or guarantee absence of effects at unmeasured receptors.

F08-C04-R01 — Retained subject control

Define the actual environmental question, relevant receptors, sites, source responsibility and applicable permissions before selecting data or claiming improvement.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C04-R02 — Retained subject control

Establish a representative baseline and sampling plan covering relevant seasonal, operating and location variation rather than selecting only favourable periods.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C04-R03 — Retained subject control

Demonstrate measurement and analytical competence, instrument suitability, detection limits, calibration and method uncertainty for the claimed property.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C04-R04 — Retained subject control

Evaluate source attribution, background influences, estimates and missing observations; distinguish absence of a detected effect from proof of absence below the method capability.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C04-R05 — Retained subject control

Preserve operational controls and incident response regardless of favourable average metrics, and examine whether improvement in one area displaced harm elsewhere.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C04-R06 — Retained subject control

Independently review the exact site/period conclusion, permit boundaries, affected-party communications and changes requiring renewed sampling or assessment.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C04-R07 — Mission and environment transfer

For local environmental performance, define the qualified or evaluated envelope for local environmental performance and receptors. Compare the intended mission, material, site, configuration and phase/mode with the actual evidence. Identify material differences and allocate new demonstration before relying on heritage or terrestrial qualification.

Verification: Inspect the difference matrix, environmental inputs, owner approvals and requirement-to-method links.

Acceptance / hold: PASS only when every influential difference is either bounded by valid retained evidence or closed by accepted additional demonstration. Missing essential transfer evidence is HOLD.

Basis: New implementation detail aligned with ASTRA 62.1–62.2; 63.2–63.6; 64.1–64.6

F08-C04-R08 — Essential properties and observability

Identify the failure and evidence risks specific to this subject: a single quiet-period measurement can conceal peak or seasonal exposure. State which critical properties are directly observed, measured, inferred using a validated model or unknown. Allocate separate child predicates for each hidden property and each essential protective function.

Verification: Review detection capability, raw observations, model validity and limitations against each claimed property.

Acceptance / hold: A valid observation supports only its demonstrated property and domain. An unobservable essential condition is HOLD, not a favourable default or a proven product defect.

Basis: New implementation detail aligned with ASTRA 62.3–62.5; 77.1–77.6

F08-C04-R09 — Configuration and data identity

Bind local environmental performance and receptors to actual configuration, controlled technical data, source/lot or record identity, equipment and software state, authorised performer and actual event time. Preserve failed runs, changed objects and prior evidence through any digital transfer.

Verification: Replay one result from original records and verify event-time authority, method version and the evaluated-to-delivered relationship.

Acceptance / hold: PASS requires reproducible identity and valid links for the actual claim. Wrong configuration, stale state, inaccessible evidence or an unverified substituted record is HOLD.

Basis: New implementation detail aligned with ASTRA 33.3–33.4; 56.1–56.5; 62.7; 78.7

F08-C04-R10 — Subject-specific adverse demonstration

Challenge the following mechanism through a safe authorised test, independent record review or controlled simulation appropriate to this subject: review relevant location, operating period, source attribution, methods and uncertainty. Define the expected outcome before execution, retain original failures and repeat the failed case after correction.

Verification: Compare prospective expectations, actual observations, conditions, evidence, defect disposition and relevant regression.

Acceptance / hold: Every essential adverse scenario must have valid accepted evidence. A scripted teaching example is not actual qualification; unavailable required observation remains HOLD.

Basis: New implementation detail aligned with ASTRA 62.6–62.7; 77.5–77.8; Annex AP

F08-C04-R11 — Receiving interface and bounded output

Deliver the bounded output to local environmental owner and independent technical reviewer. Reconcile identity, configuration, conditions, unresolved limitations, technical eligibility, remaining duties and readable evidence. Identify the actual performer and the organisation retaining acceptance responsibility.

Verification: Check the sending manifest, actual recipient access, acknowledgement, restrictions and remaining action owners.

Acceptance / hold: Transfer is complete only after the necessary receiving acceptance is authentic. Sending a file, reconciling quantity or generating a certificate does not establish technical eligibility.

Basis: New implementation detail aligned with ASTRA 32.5; 48.4–48.6; 63.6; 80.4

F08-C04-R12 — Independent release and continuing validity

Evaluate F08-C04 independently within its declared object and outcome class. Reconcile the original R01–R06 controls with R07–R11, applicable source requirements, prospective parameters, findings and actual authority. Monitor the subject-specific changes stated in this profile and reopen affected conclusions when the evidence changes.

Verification: Independently replay the final predicate and inspect scope, exclusions, competence, conflict clearance, findings closure and event history.

Acceptance / hold: No positive grant, renewal or extension while any applicable mandatory child is FAIL, HOLD or UNSET. N/A requires independent scope justification; technical concessions remain separate from conformity.

Basis: New implementation detail aligned with ASTRA 15.1–15.5; 16.1–16.6; 62.4–62.7; 80.1–80.6

Qualification dossier and receiving closure

The profile owner assembles the actual scope, local child-condition ledger, approved parameters, method validation, source and output genealogy, representative observations, adverse-case results, competency and independence checks, finding closure, technical release and bounded public claim. The independent reviewer checks original evidence and challenges unsupported inheritance. Keep the accepted dossier version and actual decision time accessible to the receiving custodian.

Worked failure path — synthetic: review relevant location, operating period, source attribution, methods and uncertainty The reviewer records the affected F08-C04 child condition, contains the dependent use, retains earlier evidence and requests the missing or corrected demonstration. A later favourable run does not erase the first result. Final closure requires evidence addressing the original mechanism and receiving acceptance by local environmental owner and independent technical reviewer.

F08-C05 — Climate resilience

Capability and bounded assessments addressing physical climate risks for defined assets, services and dependencies over stated horizons. Scenario analysis supports adaptation decisions but is not proof of survival under all future conditions.

Application-specific parameters: Assets; service functions; time horizon; climate scenarios and sources; exposure; vulnerabilities; consequence; dependencies; uncertainty; adaptation options; resources; protective criteria; exercise and monitoring.

Profile boundary	Detail
Technical emphasis	climate scenario, dependencies and adaptation
Failure / evidence risks	a scenario model can be mistaken for guaranteed resilience under every future condition
Representative witnessing	Trace a material asset vulnerability through scenario assumptions, adaptation decision, implementation evidence, exercised continuity and residual restrictions; challenge an untested external-service assumption.
Change and requalification triggers	Asset or service life; scenario evidence; exposure; design; protective measure; utility/supplier dependency; severe event; new vulnerability.
Outcome limitation	Neither a scenario report nor capability recognition guarantees that a facility will withstand every climate event or replaces engineering design and statutory approval.

F08-C05-R01 — Retained subject control

Identify relevant heat, flood, storm, wildfire, water-stress or other physical exposures and the asset/service life over which decisions will rely on the assessment.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C05-R02 — Retained subject control

Explain scenario selection, source version, resolution, uncertainty and limitations; do not present one scenario as a guaranteed forecast.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C05-R03 — Retained subject control

Map vulnerabilities and common dependencies across utilities, transport, suppliers, people, data and emergency services, including effects outside the immediate site.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C05-R04 — Retained subject control

Evaluate adaptation options against actual protective objectives, feasibility, resources, technical safety and the risk of transferring harm or dependence.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C05-R05 — Retained subject control

Verify implemented protective measures and exercise continuity through safe representative conditions, retaining shortcomings and actual response capability.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C05-R06 — Retained subject control

Maintain review triggers for changed infrastructure, new evidence, failed controls and service dependency changes; report the assessment and capability limits accurately.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C05-R07 — Mission and environment transfer

For climate resilience, define the qualified or evaluated envelope for climate scenario, dependencies and adaptation. Compare the intended mission, material, site, configuration and phase/mode with the actual evidence. Identify material differences and allocate new demonstration before relying on heritage or terrestrial qualification.

Verification: Inspect the difference matrix, environmental inputs, owner approvals and requirement-to-method links.

Acceptance / hold: PASS only when every influential difference is either bounded by valid retained evidence or closed by accepted additional demonstration. Missing essential transfer evidence is HOLD.

Basis: New implementation detail aligned with ASTRA 62.1–62.2; 63.2–63.6; 64.1–64.6

F08-C05-R08 — Essential properties and observability

Identify the failure and evidence risks specific to this subject: a scenario model can be mistaken for guaranteed resilience under every future condition. State which critical properties are directly observed, measured, inferred using a validated model or unknown. Allocate separate child predicates for each hidden property and each essential protective function.

Verification: Review detection capability, raw observations, model validity and limitations against each claimed property.

Acceptance / hold: A valid observation supports only its demonstrated property and domain. An unobservable essential condition is HOLD, not a favourable default or a proven product defect.

Basis: New implementation detail aligned with ASTRA 62.3–62.5; 77.1–77.6

F08-C05-R09 — Configuration and data identity

Bind climate scenario, dependencies and adaptation to actual configuration, controlled technical data, source/lot or record identity, equipment and software state, authorised performer and actual event time. Preserve failed runs, changed objects and prior evidence through any digital transfer.

Verification: Replay one result from original records and verify event-time authority, method version and the evaluated-to-delivered relationship.

Acceptance / hold: PASS requires reproducible identity and valid links for the actual claim. Wrong configuration, stale state, inaccessible evidence or an unverified substituted record is HOLD.

Basis: New implementation detail aligned with ASTRA 33.3–33.4; 56.1–56.5; 62.7; 78.7

F08-C05-R10 — Subject-specific adverse demonstration

Challenge the following mechanism through a safe authorised test, independent record review or controlled simulation appropriate to this subject: trace selected scenarios to vulnerabilities, resources, protective evidence and stated limitations. Define the expected outcome before execution, retain original failures and repeat the failed case after correction.

Verification: Compare prospective expectations, actual observations, conditions, evidence, defect disposition and relevant regression.

Acceptance / hold: Every essential adverse scenario must have valid accepted evidence. A scripted teaching example is not actual qualification; unavailable required observation remains HOLD.

Basis: New implementation detail aligned with ASTRA 62.6–62.7; 77.5–77.8; Annex AP

F08-C05-R11 — Receiving interface and bounded output

Deliver the bounded output to asset resilience owner and independent adaptation reviewer. Reconcile identity, configuration, conditions, unresolved limitations, technical eligibility, remaining duties and readable evidence. Identify the actual performer and the organisation retaining acceptance responsibility.

Verification: Check the sending manifest, actual recipient access, acknowledgement, restrictions and remaining action owners.

Acceptance / hold: Transfer is complete only after the necessary receiving acceptance is authentic. Sending a file, reconciling quantity or generating a certificate does not establish technical eligibility.

Basis: New implementation detail aligned with ASTRA 32.5; 48.4–48.6; 63.6; 80.4

F08-C05-R12 — Independent release and continuing validity

Evaluate F08-C05 independently within its declared object and outcome class. Reconcile the original R01–R06 controls with R07–R11, applicable source requirements, prospective parameters, findings and actual authority. Monitor the subject-specific changes stated in this profile and reopen affected conclusions when the evidence changes.

Verification: Independently replay the final predicate and inspect scope, exclusions, competence, conflict clearance, findings closure and event history.

Acceptance / hold: No positive grant, renewal or extension while any applicable mandatory child is FAIL, HOLD or UNSET. N/A requires independent scope justification; technical concessions remain separate from conformity.

Basis: New implementation detail aligned with ASTRA 15.1–15.5; 16.1–16.6; 62.4–62.7; 80.1–80.6

Qualification dossier and receiving closure

The profile owner assembles the actual scope, local child-condition ledger, approved parameters, method validation, source and output genealogy, representative observations, adverse-case results, competency and independence checks, finding closure, technical release and bounded public claim. The independent reviewer checks original evidence and challenges unsupported inheritance. Keep the accepted dossier version and actual decision time accessible to the receiving custodian.

Worked failure path — synthetic: trace selected scenarios to vulnerabilities, resources, protective evidence and stated limitations. The reviewer records the affected F08-C05 child condition, contains the dependent use, retains earlier evidence and requests the missing or corrected demonstration. A later favourable run does not erase the first result. Final closure requires evidence addressing the original mechanism and

receiving acceptance by asset resilience owner and independent adaptation reviewer.

F08-C06 – Low-carbon energy and supply claims

Provenance and allocation claims concerning fuels, energy or separated contractual environmental attributes. The profile identifies the claim mechanism and distinguishes physical delivery, book-and-claim style allocation and actual environmental outcomes.

Application-specific parameters: Material/energy/attribute identity; source; eligibility rules; custody model; quantity and units; conversion/allocation; ownership; transfers; beneficiary; reporting period; cancellation/retirement; exclusivity; evidence and claim text.

Profile boundary	Detail
Technical emphasis	low-carbon energy and exclusive supply claims
Failure / evidence risks	one eligible quantity can be allocated to more than one exclusive claim
Representative witnessing	Trace an eligible quantity from source through ownership and allocation to a final beneficiary and cancellation record; challenge a duplicate exclusive claim and a mismatch between physical and contractual supply.
Change and requalification triggers	Supply source; eligibility mechanism; custody chain; beneficiary; period; conversion/allocation; cancellation platform; quantity correction; technical fuel/energy interface.
Outcome limitation	An attribute purchase does not necessarily mean physical delivery, verified operational reduction, fuel compatibility or zero emissions for an entire flight or service.

F08-C06-R01 – Retained subject control

Define the exact claim and whether it follows physically delivered supply or a separated contractual attribute; state eligibility, boundary and intended beneficiary before evaluation.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C06-R02 – Retained subject control

Trace source, transfers, conversion and allocation to actual records and identify the responsible party at each custody or ownership change.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C06-R03 – Retained subject control

Reconcile eligible quantities and loss/conversion assumptions without exceeding available supply or allocating the same exclusive attribute to more than one claimant.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C06-R04 — Retained subject control

Verify cancellation, retirement or equivalent final allocation where the mechanism requires it, retaining identities, dates and evidence rather than accepting an invoice alone.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C06-R05 — Retained subject control

Distinguish attribute ownership and environmental accounting from technical compatibility of a fuel, energy source or aircraft service; use separate engineering evidence for interchangeability.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C06-R06 — Retained subject control

Independently review the claim mechanism, limitations, later corrections and recipient communications. Public statements must not imply whole-service zero emissions from a bounded purchase.

Verification: Trace each independently testable condition to its actual criterion, method, evidence, responsible performer and independent reviewer.

Acceptance / hold: Every mandatory child predicate is satisfied by valid evidence. Unresolved applicability or evidence is HOLD; demonstrated unmet criteria are FAIL.

Basis: Retained operating subject control; latest core 24; 62 and Annex AL.

F08-C06-R07 — Mission and environment transfer

For low-carbon energy and supply claims, define the qualified or evaluated envelope for low-carbon energy and exclusive supply claims. Compare the intended mission, material, site, configuration and phase/mode with the actual evidence. Identify material differences and allocate new demonstration before relying on heritage or terrestrial qualification.

Verification: Inspect the difference matrix, environmental inputs, owner approvals and requirement-to-method links.

Acceptance / hold: PASS only when every influential difference is either bounded by valid retained evidence or closed by accepted additional demonstration. Missing essential transfer evidence is HOLD.

Basis: New implementation detail aligned with ASTRA 62.1–62.2; 63.2–63.6; 64.1–64.6

F08-C06-R08 — Essential properties and observability

Identify the failure and evidence risks specific to this subject: one eligible quantity can be allocated to more than one exclusive claim. State which critical properties are directly observed, measured, inferred using a validated model or unknown. Allocate separate child predicates for each hidden property and each essential protective function.

Verification: Review detection capability, raw observations, model validity and limitations against each claimed property.

Acceptance / hold: A valid observation supports only its demonstrated property and domain. An unobservable essential condition is HOLD, not a favourable default or a proven product defect.

Basis: New implementation detail aligned with ASTRA 62.3–62.5; 77.1–77.6

F08-C06-R09 — Configuration and data identity

Bind low-carbon energy and exclusive supply claims to actual configuration, controlled technical data, source/lot or record identity, equipment and software state, authorised performer and actual event time. Preserve failed runs, changed objects and prior evidence through any digital transfer.

Verification: Replay one result from original records and verify event-time authority, method version and the evaluated-to-delivered relationship.

Acceptance / hold: PASS requires reproducible identity and valid links for the actual claim. Wrong configuration, stale state, inaccessible evidence or an unverified substituted record is HOLD.

Basis: New implementation detail aligned with ASTRA 33.3–33.4; 56.1–56.5; 62.7; 78.7

F08-C06-R10 — Subject-specific adverse demonstration

Challenge the following mechanism through a safe authorised test, independent record review or controlled simulation appropriate to this subject: reconcile ownership, transfers, eligibility, cancellation and physical-versus-contractual boundaries. Define the expected outcome before execution, retain original failures and repeat the failed case after correction.

Verification: Compare prospective expectations, actual observations, conditions, evidence, defect disposition and relevant regression.

Acceptance / hold: Every essential adverse scenario must have valid accepted evidence. A scripted teaching example is not actual qualification; unavailable required observation remains HOLD.

Basis: New implementation detail aligned with ASTRA 62.6–62.7; 77.5–77.8; Annex AP

F08-C06-R11 — Receiving interface and bounded output

Deliver the bounded output to attribute ledger custodian and independent statement authority. Reconcile identity, configuration, conditions, unresolved limitations, technical eligibility, remaining duties and readable evidence. Identify the actual performer and the organisation retaining acceptance responsibility.

Verification: Check the sending manifest, actual recipient access, acknowledgement, restrictions and remaining action owners.

Acceptance / hold: Transfer is complete only after the necessary receiving acceptance is authentic. Sending a file, reconciling quantity or generating a certificate does not establish technical eligibility.

Basis: New implementation detail aligned with ASTRA 32.5; 48.4–48.6; 63.6; 80.4

F08-C06-R12 — Independent release and continuing validity

Evaluate F08-C06 independently within its declared object and outcome class. Reconcile the original R01–R06 controls with R07–R11, applicable source requirements, prospective parameters, findings and actual authority. Monitor the subject-specific changes stated in this profile and reopen affected conclusions when the evidence changes.

Verification: Independently replay the final predicate and inspect scope, exclusions, competence, conflict clearance, findings closure and event history.

Acceptance / hold: No positive grant, renewal or extension while any applicable mandatory child is FAIL, HOLD or UNSET. N/A requires independent scope justification; technical concessions remain separate from conformity.

Basis: New implementation detail aligned with ASTRA 15.1–15.5; 16.1–16.6; 62.4–62.7; 80.1–80.6

Qualification dossier and receiving closure

The profile owner assembles the actual scope, local child-condition ledger, approved parameters, method validation, source and output genealogy, representative observations, adverse-case results, competency and independence checks, finding closure, technical release and bounded public claim. The independent reviewer checks original evidence and challenges unsupported inheritance. Keep the accepted dossier version and actual decision time accessible to the receiving custodian.

Worked failure path — synthetic: reconcile ownership, transfers, eligibility, cancellation and physical-versus-contractual boundaries. The reviewer records the affected F08-C06 child condition, contains the dependent use, retains earlier evidence and requests the missing or corrected demonstration. A later favourable run does not erase the first result. Final closure requires evidence addressing the original mechanism and receiving acceptance by attribute ledger custodian and independent statement authority.

5 Domain-specific integration dossiers

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.

AK01 — Terrestrial engineering and supply

Design offices, manufacturing, material sources, procurement and integration.

Mandatory profile content: Actual site, source, configuration, delegated responsibilities and released technical data.

Source acceptance boundary: Every delivered characteristic and essential supplier interface is traceable to accepted evidence.

Source connection: 32, 33, 41, 48, 62–65

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

AK03 – Launch sites and spaceports

Site infrastructure, handling, ground services, emergency interfaces and actual permissions.

Mandatory profile content: Named site/operator, vehicle and payload classes, utilities, restrictions and receiving parties.

Source acceptance boundary: No site outcome is used as vehicle, launch or mission permission.

Source connection: 21, 36, 50, 70

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

AK06 – Low Earth orbit systems

Satellites, stations and services in the declared near-Earth operating environment.

Mandatory profile content: Actual orbit and duration, drag/atmosphere, atomic oxygen where material, radiation and terminal duties.

Source acceptance boundary: Environment-specific qualification and end-of-life capability support the bounded mission.

Source connection: 35, 37, 64–68

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.

Dossier step	Evidence and decision control
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

AK07 – Medium, geosynchronous and high Earth orbits

Navigation, communication, relay and other specified orbit-dependent services.

Mandatory profile content: Actual geometry, radiation/charging, links, clocks, service bounds and disposal assumptions.

Source acceptance boundary: No lower-orbit or nominal-link evidence automatically covers a different environment.

Source connection: 35, 64–68

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

AK13 – On-orbit assembly and manufacture

Assembly, additive or other production, finishing and output verification in space.

Mandatory profile content: Inputs, essential variables, environment, sensor/model validity and product acceptance.

Source acceptance boundary: Process execution is not substituted for evidence of required output properties.

Source connection: 18, 37, 41, 69, 75

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.

Dossier step	Evidence and decision control
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

AK16 – Lunar surface systems

Landers, rovers, infrastructure, observation and processing on the Moon.

Mandatory profile content: Dust, local terrain, illumination, temperature, gravity, radiation and communication assumptions.

Source acceptance boundary: Destination-specific evidence bounds the actual region, phase and operating mode.

Source connection: 38, 64, 71, 73–75

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

AK17 – Planetary landers and surface vehicles

Surface exploration, scientific instruments, mobility and handling.

Mandatory profile content: Environment/region, terrain, access, autonomy, supportability and contamination control.

Source acceptance boundary: Terrestrial analogy is justified; unknown critical surface conditions remain restricted.

Source connection: 38, 65, 71, 74

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

AK19 – Small-body and comet operations

Observation, cooperative contact, sampling and resource demonstrations.

Mandatory profile content: Body uncertainty, surface interaction, contamination, autonomy and sample custody.

Source acceptance boundary: Uncertain body/interaction properties are not treated as established terrestrial conditions.

Source connection: 35, 38, 64, 69, 71, 74

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

AK20 – Subsurface and ocean-world exploration

Subsurface, liquid, ice and extreme-pressure exploration systems and their interfaces.

Mandatory profile content: Pressure/chemistry, thermal state, containment, access, communication and protection duties.

Source acceptance boundary: Specialist boundary and contamination evidence precedes dependent use.

Source connection: 38, 64, 71, 74

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

AK21 – Interplanetary cruise and deep-space missions

Spacecraft, relays, science operations and long-delay mission support.

Mandatory profile content: Duration, communications, resources, remote autonomy, radiation and repairability.

Source acceptance boundary: Human and autonomous actions are feasible within actual timing and resource limits.

Source connection: 35, 64–67, 72

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.

Dossier step	Evidence and decision control
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

AK22 – Solar and heliophysics missions

Solar observations and missions with relevant thermal, plasma and radiation extremes.

Mandatory profile content: Time-varying flux, geometry, surface degradation, charged environment and instrument calibration.

Source acceptance boundary: Protection and data-quality evidence cover the actual mission envelope, not a screening equation alone.

Source connection: 35, 64, 65, 72

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

AK23 – Outer-system and distant observatories

Low-flux, long-life, long-delay science and infrastructure applications.

Mandatory profile content: End-of-life power, thermal survival, data return, ageing and long-term support.

Source acceptance boundary: Required lifetime and survival margins are met with credible continuity and data integrity.

Source connection: 35, 55, 65, 66, 72

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

AK26 – Planetary protection and sample return

Forward/backward contamination, scientific cleanliness, samples and receiving chain.

Mandatory profile content: Destination, pathway, applicable protection duties, containment, custody and receiving readiness.

Source acceptance boundary: No dependent commitment precedes complete protection and receiving evidence.

Source connection: 35, 38, 69–74

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

AK27 – Resource utilisation and remote processing

Resource characterisation, processing, quality, storage, use and residues.

Mandatory profile content: Input variability, environmental qualification, quantity/quality, rights and disposition.

Source acceptance boundary: Resource yield, product eligibility and permission remain distinct.

Source connection: 18, 37, 38, 53, 75

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

AK28 – Space logistics and distributed supply

Warehousing, transfer, spares, custody, condition, receiving and service continuity.

Mandatory profile content: Actual items, life, environment, compatible interfaces and arrival/acceptance states.

Source acceptance boundary: Only physically or otherwise validly confirmed accepted usable inventory supports mission budgets.

Source connection: 48, 49, 69, 75

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

AK29 – Specialised energy infrastructure

Generation, storage, conversion, remote delivery and controlled high-hazard power interfaces.

Mandatory profile content: Architecture, margins, protection, specialist permissions, heat rejection and terminal inventory.

Source acceptance boundary: Performance never substitutes for safety, source authority or terminal accountability.

Source connection: 43, 53, 65, 76

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

AK32 – Retirement and long-term stewardship

Disposal, passivation governance, loss-of-contact states, records and residual obligations.

Mandatory profile content: Terminal criteria, actual evidence, unknowns, remaining inventories, notifications and custody.

Source acceptance boundary: Final-state claims are truthful and every unresolved duty has an accepted owner.

Source connection: 30, 36, 37, 53–55, 68, 79

Dossier step	Evidence and decision control
Define the exact application	Record the responsible entity and actual performer; claimed object; location/domain; intended phase and mode; configuration; duration; upstream and receiving interfaces.
Resolve environmental transfer	Compare the selected domain with the environment represented by prior qualification. Identify retained evidence, invalidated evidence, unobserved mechanisms and required new demonstration.
Challenge the claim	Use an adverse case in which the domain is correct but the configuration, event time, remote observability or receiving authority is wrong. The dependent predicate shall not PASS from a correct domain label alone.

Dossier step	Evidence and decision control
Close and maintain	Record accepted requirements and restrictions. Preserve unknown operational states separately from requirement HOLD. A later mission or provider change reopens affected assumptions before expanded reliance.

6 Qualification and evidence handovers

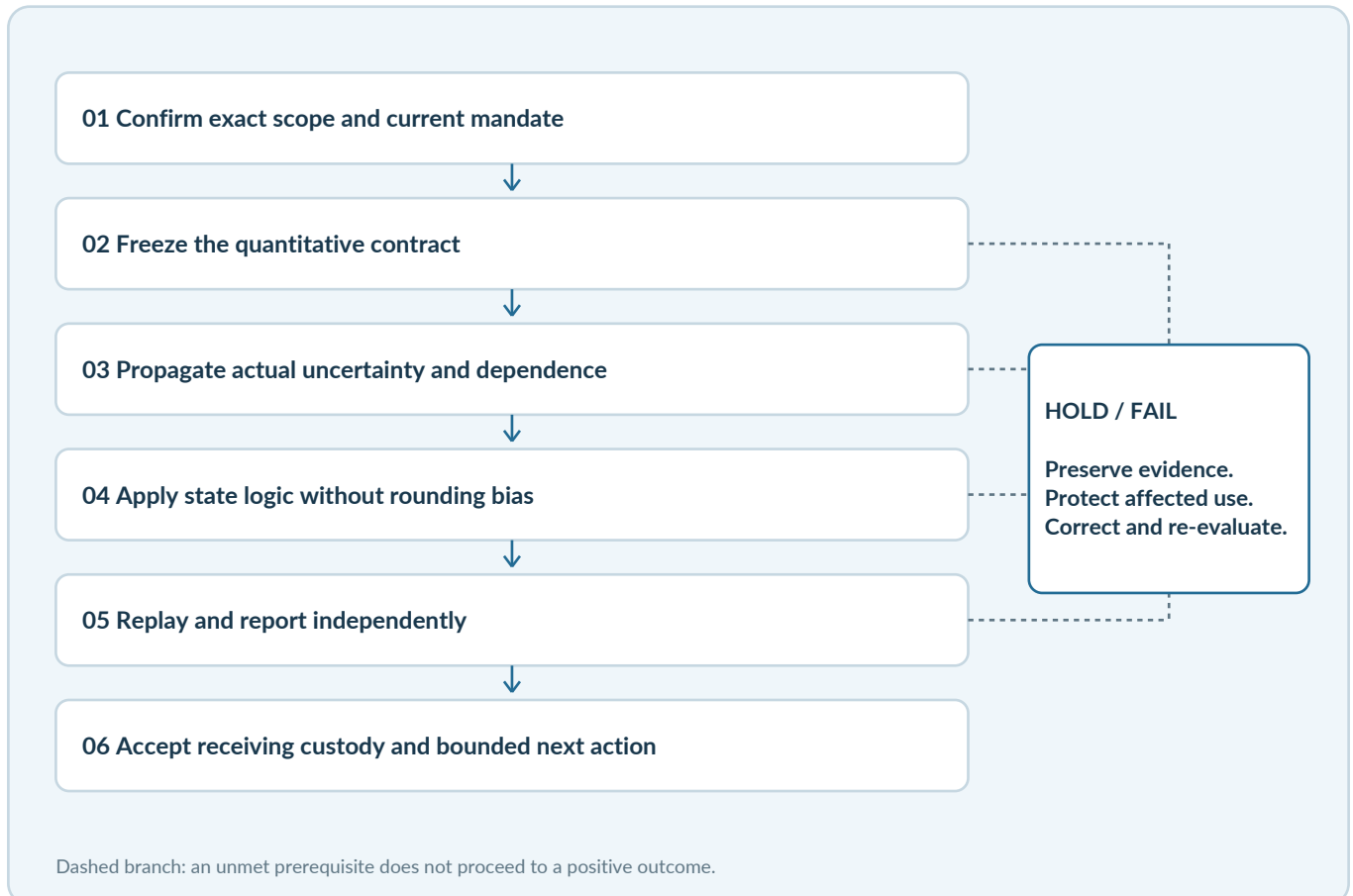
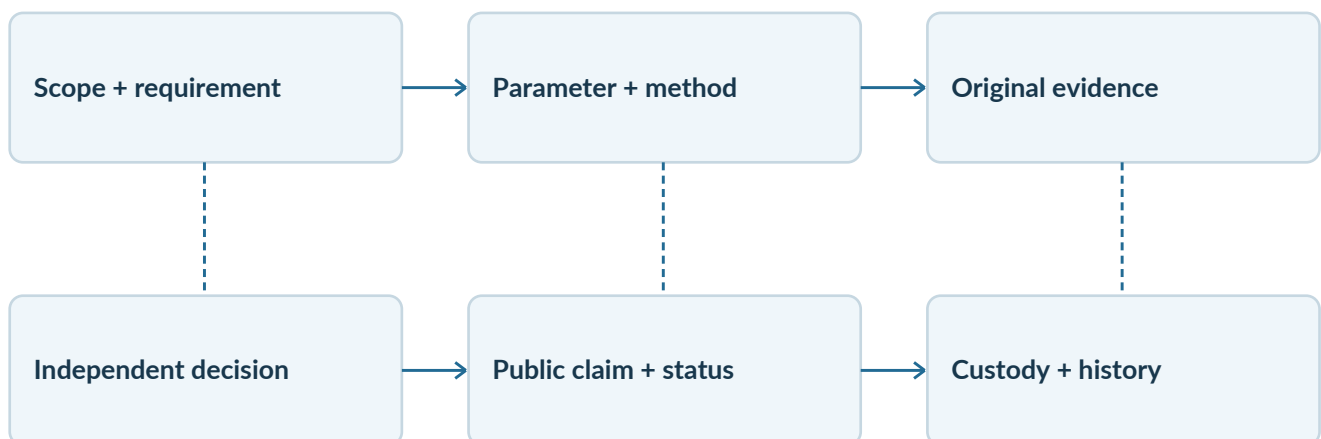


Figure — Implementation sequence for AF-AST-PR-010. Explanatory diagram; the source prerequisites and actual authority remain controlling.



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.

7 Worked calculations and technical 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

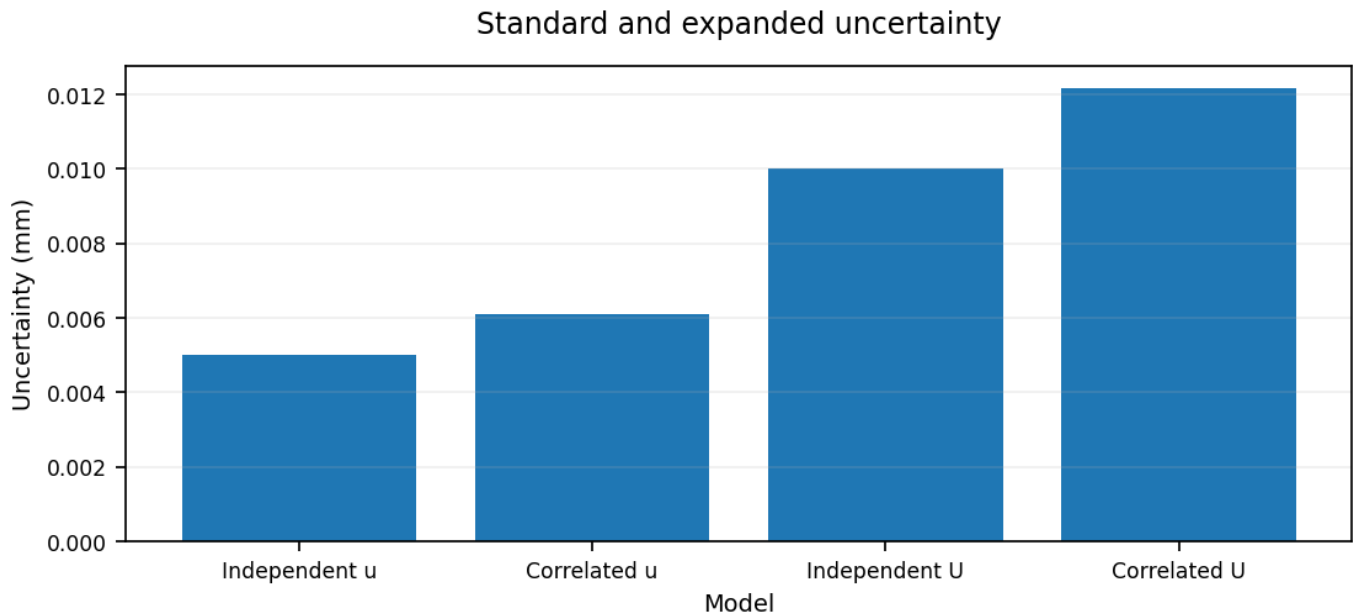


Figure Q01 — Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

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.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

- $\ln(0.05)/\ln(0.90) = 28.433158...$; round upward to $n=29$.
- $P(\text{detection at } n=29) = 1 - 0.9^{29} = 0.9528987130$.
- 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

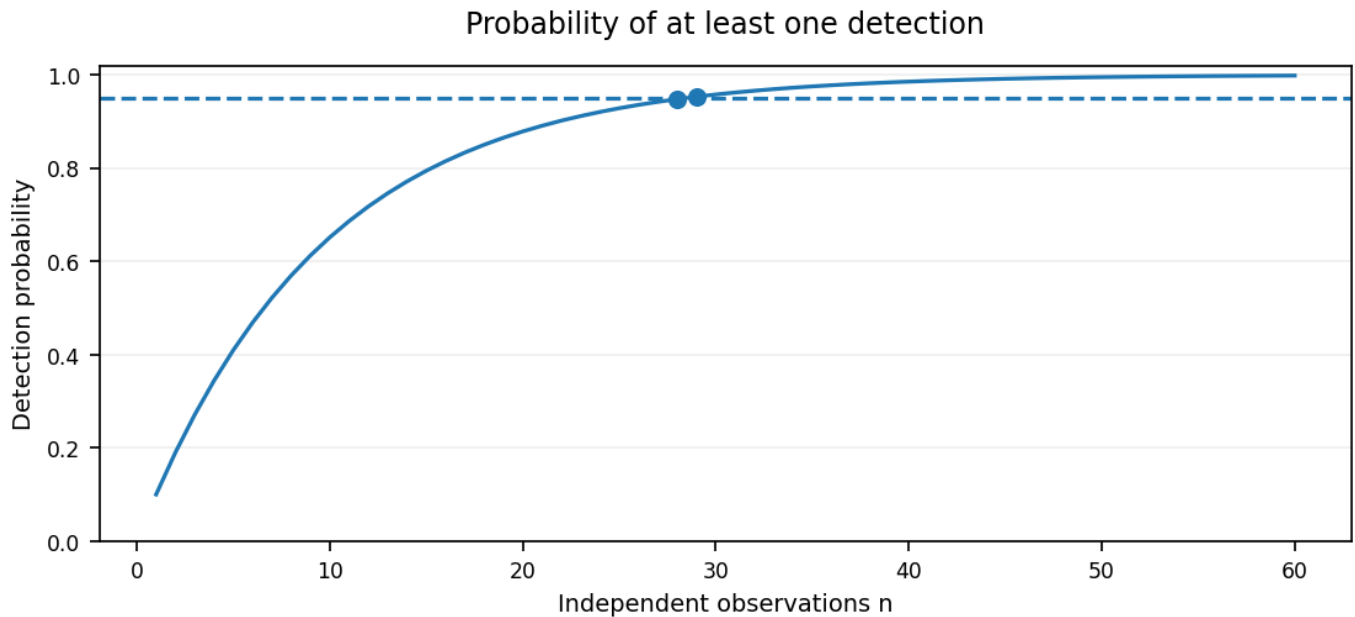


Figure Q06 – Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

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

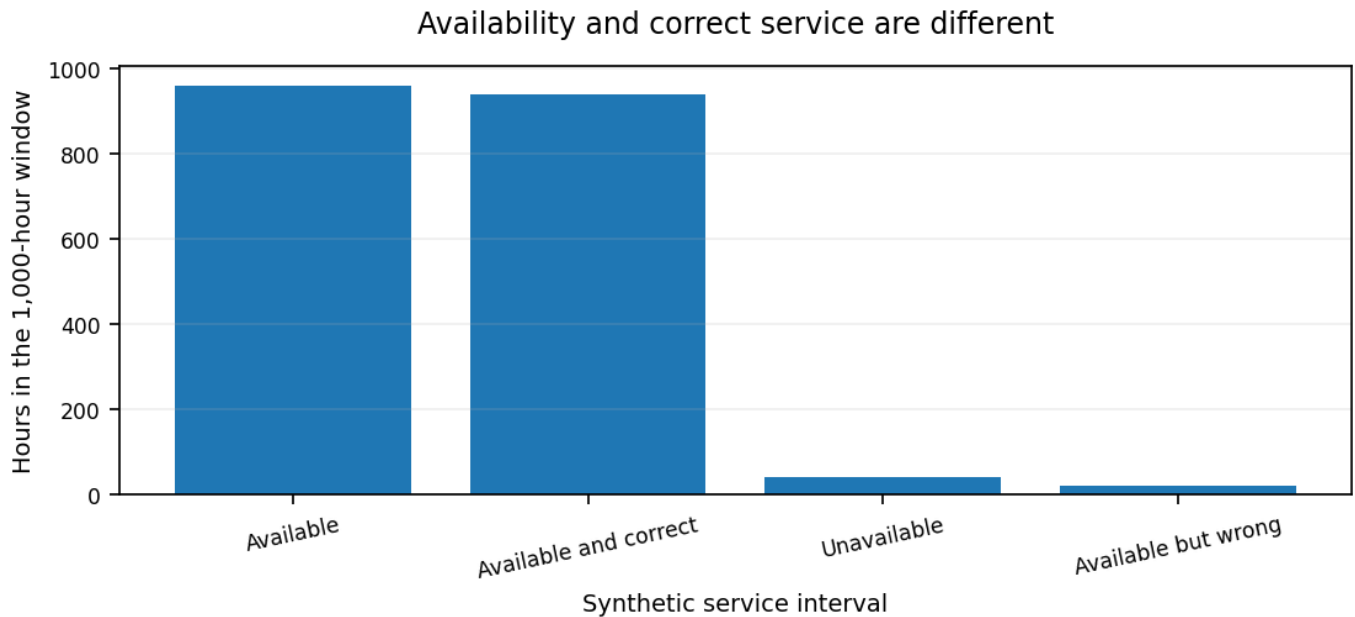


Figure Q09 – Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

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.Q22 Process consumables, recovery and unusable inventory

Source: ASTRA Annex AM, Q22, page 221. All numerical inputs in this example are synthetic.

Gross demand = number_of_units × unit_rate × duration

Usable feed need = gross demand × (1-recovery_fraction)

Stock requirement = feed need + unusable allowance + reserved amount

Variables and units

This is a non-physiological process-resource example. Recovery is credited only when quantity, quality and availability are demonstrated for the same duty.

Example inputs

Synthetic four identical process units; 2 kg/day/unit for 10 days; validated illustrative recovery=60%; unusable allowance=5 kg; reserve=8 kg; stock=50 kg.

Calculation and checks

1. Gross demand=4×2×10=80 kg.
2. Fresh usable feed need=80×(1-0.60)=32 kg.
3. Stock requirement=32+5+8=45 kg.
4. Headroom=50-45=5 kg.

Decision interpretation: The example quantity requirement is met. It supplies no crew-consumption rate or health criterion.

Validity limits: Availability, recovery timing, quality, contamination, storage losses and common-resource failure are separate checks. A calculated recycling benefit cannot substitute for demonstrated usable output.

ASTRA connections: 64.4; 73.3; 75.4–75.5

Usable consumables and retained reserves

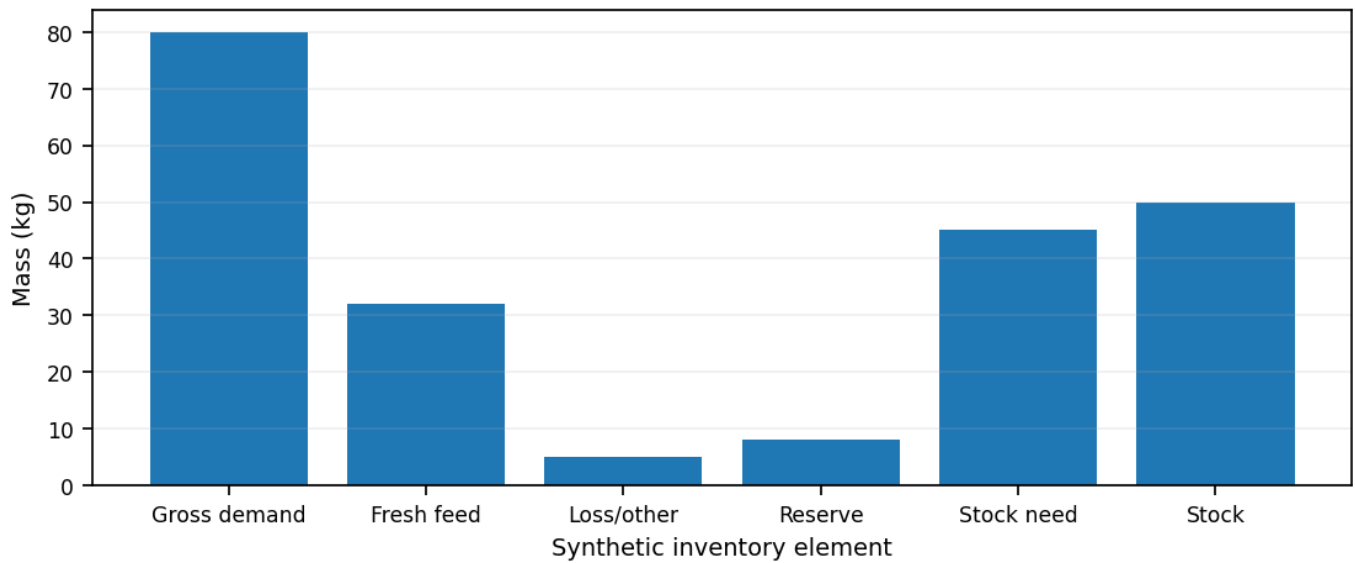


Figure Q22 – Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

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

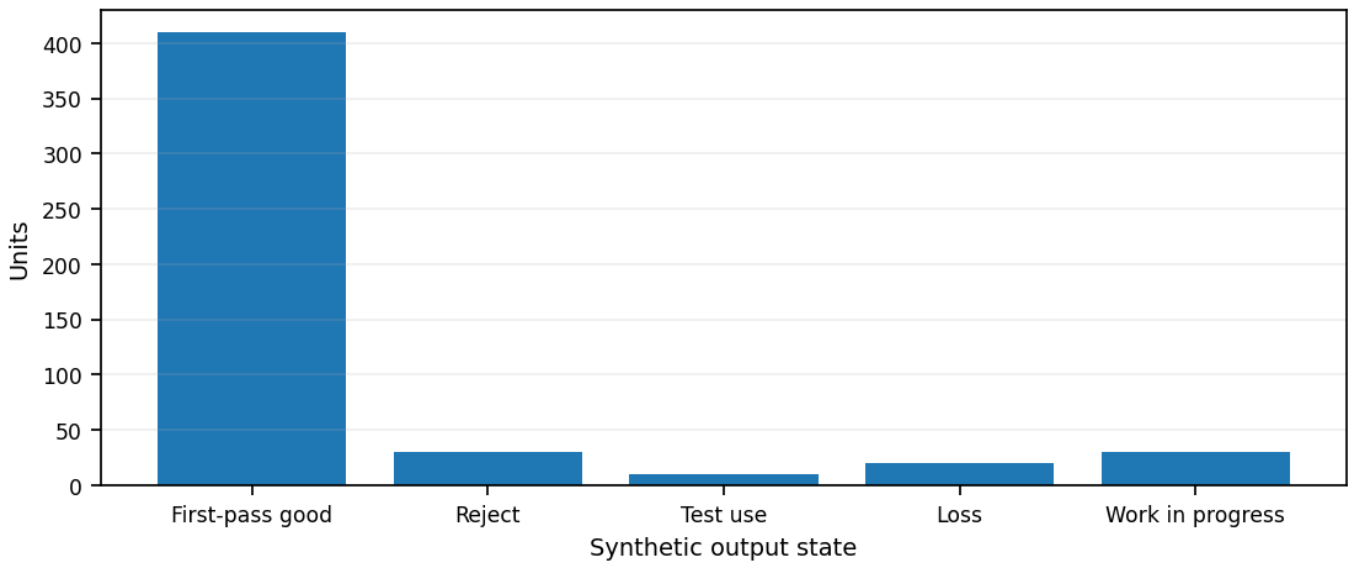


Figure Q23 – Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

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.Q24 Environmental inventory and uncertainty

Source: ASTRA Annex AM, Q24, page 223. All numerical inputs in this example are synthetic.

$$E = \sum(A_i \times EF_i)$$

$$u(E) = \sqrt{\sum u_i^2} \text{ only for independent components}$$

Variables and units

A_i are activities and EF_i compatible factors for the same declared boundary. All factors below are deliberately fictional and shall not be used for actual emissions.

Example inputs

Synthetic 200,000 kWh×0.25 kg CO₂e/kWh; 10,000 L×2.50 kg CO₂e/L; 20,000 tonne-km×0.10 kg CO₂e/tonne-km.
Relative standard uncertainties=5%, 10%, 20%.

Calculation and checks

1. Category totals=50,000; 25,000; 2,000 kg CO₂e. Total=77,000 kg CO₂e.
2. For 10,000 defined service events, intensity=7.7 kg CO₂e/event.
3. Standard components=2,500; 2,500; 400 kg CO₂e.
4. $u(E)=\sqrt{(2,500^2+2,500^2+400^2)}=3,558.089375$ kg CO₂e.

Decision interpretation: The arithmetic is correct for this limited synthetic boundary. No real environmental achievement or full lifecycle footprint is asserted.

Validity limits: Covariance is required where sources are dependent. Quantified uncertainty does not absorb omitted lifecycle stages, unsuitable factors, double allocation or missing mandatory categories.

ASTRA connections: 24; 53; Annex L

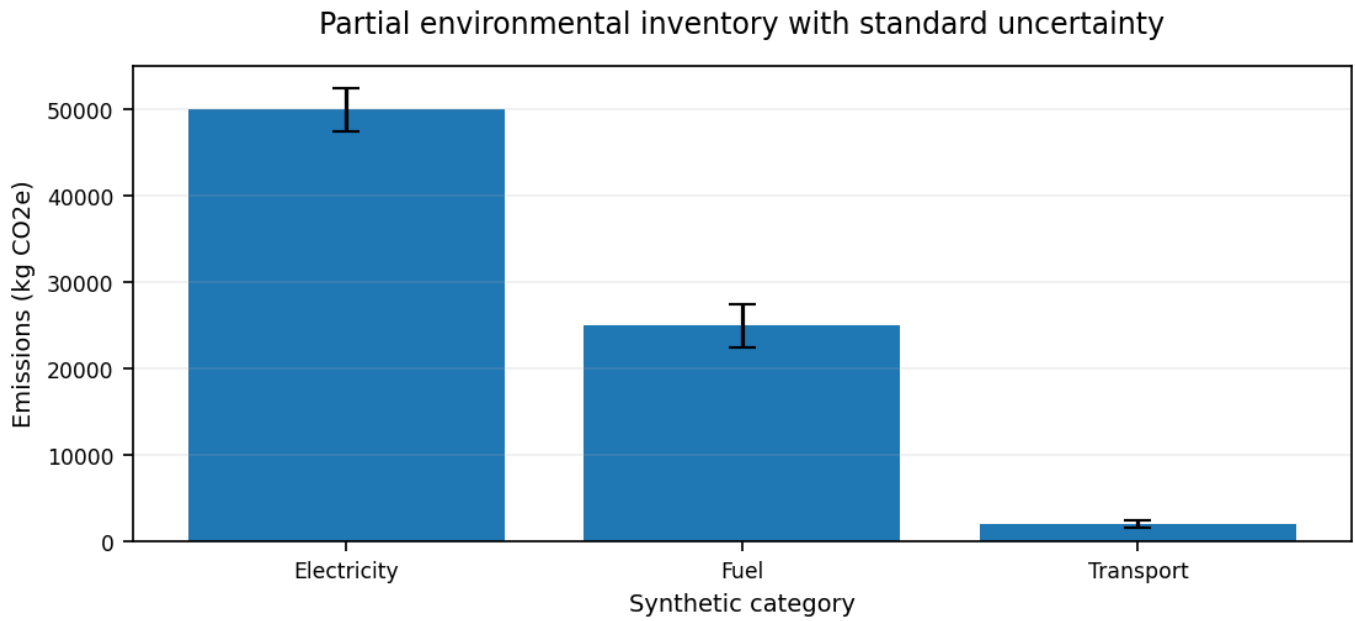


Figure Q24 — Synthetic visualisation. The axes and stated scenario define the quantity; no graph is an accreditation score, approved operating envelope or evidence of a real mission.

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.

8 Assessment and adverse-case programme

Challenge	Expected handling	Evidence retained
PR-010: Freeze the quantitative contract — required basis missing	Invalid or missing essential inputs remain HOLD; the assessor does not supply an undocumented limit.	Original input, unresolved value, affected requirement and scope; named action owner.
PR-010: Replay and report independently — handover or review incomplete	Unresolved replay disagreement blocks the dependent acceptance even where the nominal arithmetic appears plausible.	Expected and observed state; independent replay; correction/retest; receiving acknowledgement.
PR-011: Design a purposeful validity programme — required basis missing	Participation alone is not satisfactory performance or demonstrated detection capability.	Original input, unresolved value, affected requirement and scope; named action owner.
PR-011: Close causes and historical extent — handover or review incomplete	New satisfactory performance restores only a bounded current capability after independent acceptance; old evidence is not rewritten.	Expected and observed state; independent replay; correction/retest; receiving acknowledgement.
PR-019: Classify purpose and necessary data — required basis missing	Collecting more sensitive material than needed is not a substitute for better technical evidence.	Original input, unresolved value, affected requirement and scope; named action owner.
PR-019: Preserve custody and authorised disposal — handover or review incomplete	Disposal cannot conceal a required historical decision basis or erase unresolved access and correction duties.	Expected and observed state; independent replay; correction/retest; receiving acknowledgement.
PR-027: Freeze the statement and assurance objective — required basis missing	A future plan or partial inventory cannot be relabelled as an achieved complete reduction.	Original input, unresolved value, affected requirement and scope; named action owner.
PR-027: Review and communicate the bounded conclusion — handover or review incomplete	Do not issue an unqualified favourable conclusion solely to meet a reporting deadline.	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.

9 Source requirement 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
8.2 / 18	Equipment identity and fitness	Requirement, objective evidence and local child predicates

ASTRA ID / page	Source subject	Implementation use
8.3 / 18	Traceability and calibration	Requirement, objective evidence and local child predicates
9.2 / 19	Verification and validation	Requirement, objective evidence and local child predicates
9.4 / 20	Measurement model and uncertainty	Requirement, objective evidence and local child predicates
9.5 / 20	Decision rules and boundary results	Requirement, objective evidence and local child predicates
9.6 / 20	Continuing validity and comparisons	Requirement, objective evidence and local child predicates
10.2 / 21	Confidentiality, personal data and controlled technology	Requirement, objective evidence and local child predicates
10.6 / 22	Recovery, retention and closure	Requirement, objective evidence and local child predicates
19.3 / 32	Method performance and detection	Requirement, objective evidence and local child predicates
19.10 / 33	Comparisons and validity programme	Requirement, objective evidence and local child predicates
24.1 / 40	Engagement and statement boundary	Requirement, objective evidence and local child predicates
24.2 / 40	C01 – Inventory and data	Requirement, objective evidence and local child predicates
24.3 / 41	C02 – Reduction and transition	Requirement, objective evidence and local child predicates
24.4 / 41	C03 – Energy and circular resources	Requirement, objective evidence and local child predicates
24.5 / 41	C04 – Local environment	Requirement, objective evidence and local child predicates
24.6 / 41	C05 – Climate resilience	Requirement, objective evidence and local child predicates
24.7 / 41	C06 – Low-carbon energy and supply claims	Requirement, objective evidence and local child predicates
24.8 / 41	Materiality and assurance planning	Requirement, objective evidence and local child predicates
24.9 / 42	Verification execution and independent conclusion	Requirement, objective evidence and local child predicates
24.10 / 42	Overlap, claims and continuing change	Requirement, objective evidence and local child predicates
25.6 / 43	Proficiency and reference-material activities	Requirement, objective evidence and local child predicates

ASTRA ID / page	Source subject	Implementation use
33.1 / 51	Requirement quality and allocation	Requirement, objective evidence and local child predicates
33.2 / 51	Multidisciplinary interfaces	Requirement, objective evidence and local child predicates
33.3 / 52	Configuration states and genealogy	Requirement, objective evidence and local child predicates
33.4 / 52	Change impact and independence	Requirement, objective evidence and local child predicates
33.5 / 52	Engineering budgets and margins	Requirement, objective evidence and local child predicates
33.6 / 52	Verification closure and model limitations	Requirement, objective evidence and local child predicates
39.1 / 60	Intended users and representative conditions	Requirement, objective evidence and local child predicates
39.2 / 60	Workload, information and error recovery	Requirement, objective evidence and local child predicates
39.3 / 60	Life-support and habitation responsibilities	Requirement, objective evidence and local child predicates
39.4 / 60	Emergency response and safe-return assumptions	Requirement, objective evidence and local child predicates
39.5 / 60	Maintenance and worker protection	Requirement, objective evidence and local child predicates
39.6 / 60	Human authority in automated systems	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
45.1 / 67	Intended use and prohibited use	Requirement, objective evidence and local child predicates
45.2 / 68	Data provenance and evaluation independence	Requirement, objective evidence and local child predicates

ASTRA ID / page	Source subject	Implementation use
45.3 / 68	Performance and uncertainty	Requirement, objective evidence and local child predicates
45.4 / 68	Human oversight and safe fallback	Requirement, objective evidence and local child predicates
45.5 / 68	Release, drift and bounded adaptation	Requirement, objective evidence and local child predicates
45.6 / 68	Assurance decisions remain attributable	Requirement, objective evidence and local child predicates
46.1 / 69	Decision purpose and model authority	Requirement, objective evidence and local child predicates
46.2 / 69	Verification, validation and uncertainty	Requirement, objective evidence and local child predicates
46.3 / 69	Twin synchronisation and stale state	Requirement, objective evidence and local child predicates
46.4 / 69	Replacement or reduction of physical work	Requirement, objective evidence and local child predicates
46.5 / 69	Model-based maintenance and remaining life	Requirement, objective evidence and local child predicates
46.6 / 70	Reproducibility and independent access	Requirement, objective evidence and local child predicates
48.1 / 71	Critical suppliers and actual performers	Requirement, objective evidence and local child predicates
48.2 / 71	Flow-down and acknowledgement	Requirement, objective evidence and local child predicates
48.3 / 72	Provenance and counterfeit prevention	Requirement, objective evidence and local child predicates
48.4 / 72	Split, merge, logistics and storage	Requirement, objective evidence and local child predicates
48.5 / 72	Diminishing sources and replacement evidence	Requirement, objective evidence and local child predicates
48.6 / 72	Performance, transfer and exit	Requirement, objective evidence and local child predicates
53.1 / 77	Declared lifecycle and material effects	Requirement, objective evidence and local child predicates
53.2 / 77	Inventory and comparable reduction	Requirement, objective evidence and local child predicates
53.3 / 77	Energy attributes and circular resources	Requirement, objective evidence and local child predicates
53.4 / 78	Local effects and climate adaptation	Requirement, objective evidence and local child predicates

ASTRA ID / page	Source subject	Implementation use
53.5 / 78	Statements and independent conclusions	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
62.1 / 88	Atomic requirement record	Explicit verification and acceptance predicate
62.2 / 88	Mandatory parameter completion	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
62.6 / 89	Exceptions, tailoring and unresolved conflict	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
63.2 / 90	Object and activity rather than a universal label	Explicit verification and acceptance predicate
63.3 / 90	Environment, phase and mode matrix	Explicit verification and acceptance predicate
63.4 / 90	No automatic new programme family	Explicit verification and acceptance predicate
63.5 / 91	Unknown and future environments	Explicit verification and acceptance predicate
63.6 / 91	Interface and lifecycle closure	Explicit verification and acceptance predicate
64.2 / 92	Geometry, reference frames and event time	Explicit verification and acceptance predicate
64.5 / 92	Heritage and similarity	Explicit verification and acceptance predicate
67.1 / 98	Configuration and operational baseline	Explicit verification and acceptance predicate
68.1 / 100	Fleet membership and common dependencies	Explicit verification and acceptance predicate
68.2 / 100	Distributed function and degradation	Explicit verification and acceptance predicate
68.3 / 100	Tracking and conjunction-information quality	Explicit verification and acceptance predicate
68.4 / 100	Coordination and consent	Explicit verification and acceptance predicate
68.5 / 101	Debris prevention and released items	Explicit verification and acceptance predicate

ASTRA ID / page	Source subject	Implementation use
68.6 / 101	Mission extension and terminal resources	Explicit verification and acceptance predicate
68.7 / 101	Status and long-term custody	Explicit verification and acceptance predicate
71.1 / 106	Destination-specific conditions	Explicit verification and acceptance predicate
71.2 / 106	Surface mobility and interaction	Explicit verification and acceptance predicate
71.3 / 106	Atmospheric and buoyant exploration	Explicit verification and acceptance predicate
71.4 / 106	Subsurface and ocean-world interfaces	Explicit verification and acceptance predicate
71.5 / 107	Long darkness and resource interruption	Explicit verification and acceptance predicate
71.6 / 107	Construction and surface infrastructure	Explicit verification and acceptance predicate
71.7 / 107	Autonomy and limited intervention	Explicit verification and acceptance predicate
71.8 / 107	Completion, samples and remaining duties	Explicit verification and acceptance predicate
73.7 / 111	Medical capability and health-data boundaries	Explicit verification and acceptance predicate
74.1 / 112	Mission-specific protection classification	Explicit verification and acceptance predicate
74.2 / 112	Contamination pathways and control allocation	Explicit verification and acceptance predicate
74.3 / 112	Scientific cleanliness and background	Explicit verification and acceptance predicate
74.4 / 112	Sample identity and custody	Explicit verification and acceptance predicate
74.5 / 113	Return-chain containment and receiving readiness	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
75.1 / 114	Process purpose and environment	Explicit verification and acceptance predicate
75.2 / 114	Inputs, feedstock and source variability	Explicit verification and acceptance predicate
75.3 / 114	Essential variables and remote monitoring	Explicit verification and acceptance predicate
75.4 / 114	Yield, mass balance and circularity	Explicit verification and acceptance predicate
75.5 / 115	Logistics, storage and compatibility	Explicit verification and acceptance predicate
75.6 / 115	Maintenance, spares and distributed production	Explicit verification and acceptance predicate
75.7 / 115	Handover, resource claims and closure	Explicit verification and acceptance predicate
76.1 / 116	System boundary and conversion chain	Explicit verification and acceptance predicate
76.2 / 116	Beamed and remote energy services	Explicit verification and acceptance predicate
76.3 / 116	Cryogenic, chemical and pressure interfaces	Explicit verification and acceptance predicate
76.4 / 116	Nuclear and radiation-source governance	Explicit verification and acceptance predicate
76.5 / 117	Infrastructure availability and failure propagation	Explicit verification and acceptance predicate

ASTRA ID / page	Source subject	Implementation use
76.6 / 117	Degradation, environmental claims and retirement	Explicit verification and acceptance predicate
77.2 / 118	Campaign design and article pedigree	Explicit verification and acceptance predicate
77.3 / 118	Measurement and uncertainty readiness	Explicit verification and acceptance predicate
77.5 / 118	Original data and invalid tests	Explicit verification and acceptance predicate
77.6 / 119	Numerical and attribute acceptance	Explicit verification and acceptance predicate
77.7 / 119	Retest and corrective verification	Explicit verification and acceptance predicate
78.3 / 120	Evaluation data and model credibility	Explicit verification and acceptance predicate
78.7 / 121	Recovery and semantic portability	Explicit verification and acceptance predicate
79.1 / 122	Protect people and essential assets before mission success	Explicit verification and acceptance predicate
79.2 / 122	Emergency feasibility and resources	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
79.6 / 123	Learning and sustained accountability	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
80.6 / 125	Completion boundary	Explicit verification and acceptance predicate

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.

8.2 — Equipment identity and fitness

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

Equipment, software-controlled instruments, fixtures, tools and reference artefacts shall be uniquely identified and suitable for the required range, resolution, accuracy, uncertainty and duty. Verify acceptance before first use, after repair or configuration change, and when validity is questioned. Records shall include version, location, maintenance, checks, restrictions and status. Calendar calibration alone shall not establish fitness for every method or specimen. Out-of-service equipment shall be prevented from supporting an authorised result.

Required evidence: Equipment register; acceptance and checks; method suitability; restricted-use controls.

8.3 — Traceability and calibration

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

Measurement results shall have a technically appropriate documented connection to accepted reference quantities or justified reference bases, with uncertainty contributions and competent calibration evidence. Verify the actual service range and result, not only the provider's logo. Where direct reference traceability is not technically possible, document the alternative reference, method validation and limitations. Do not claim metrological traceability from an unverified manufacturer declaration or a broken chain of comparisons.

Required evidence: Calibration chain; certificates/results; uncertainty contributions; justified alternative basis.

9.2 — Verification and validation

Source: AF-AST-STD-001, page 19.

Verify established methods in the actual implementation. Validate new, non-standard or materially modified methods for the intended use, addressing relevant bias, precision, selectivity, sensitivity, range, robustness and uncertainty. Establish acceptance criteria before validation data are assessed. Retain failed trials and restrictions. Method transfer between sites, instruments, software or personnel requires evidence that material performance remains valid; a shared procedure number does not demonstrate successful transfer.

Required evidence: Validation/verification plan; raw results; acceptance analysis; transfer and limitation records.

9.4 — Measurement model and uncertainty

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

Evaluate uncertainty appropriate to the reported result and decision. Identify measurand, significant corrections, input distributions, sensitivity coefficients, dependence, sample preparation and environmental effects. The calculation shall distinguish standard and expanded uncertainty, coverage factor, units and coverage interpretation. Known material bias shall be corrected or explicitly handled through an approved model, not hidden in a convenient uncertainty allowance. A result shall not inherit an uncertainty copied from an unrelated calibration capability.

Required evidence: Uncertainty budget; corrections; covariance; units; coverage and applicability justification.

9.5 — Decision rules and boundary results

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

Agree the decision rule before evaluation and record its treatment of false acceptance, false rejection, uncertainty and criticality. Annex G sets the full-interval rule and alternative-rule controls. Conformity demonstrated, nonconformity demonstrated and indeterminate are separate outcomes under that rule. Indeterminate work remains held from acceptance pending valid disposition. Repeating observations until one passes, rounding a borderline value into compliance or changing the specification after seeing the result is not a valid resolution.

Required evidence: Pre-agreed rule; unrounded inputs; outcome; hold and authorised disposition.

9.6 – Continuing validity and comparisons

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

Maintain a planned programme of internal controls and independent or interlaboratory comparison appropriate to each significant technical field. Participation alone is not satisfactory performance. Investigate adverse results, assign causes and assess prior reports. Where a suitable comparison is unavailable or impracticable, approve a technically justified alternative with evidence of challenge and limitations; lack of participation opportunity shall not be described as external proof of competence. Review coverage as methods and volumes change.

Required evidence: Validity-monitoring plan; comparison results; justified alternatives; adverse-result actions.

10.2 – Confidentiality, personal data and controlled technology

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

Collect only information needed for the authorised purpose and apply suitable access, transfer, retention and disposal controls. Agree legally sufficient confidential review of proprietary or restricted evidence. Public registry fields shall be separated from protected technical and personal records. A security or secrecy restriction shall not lead to a favourable conclusion based on inaccessible essential evidence. Use authorised reviewers, a bounded scope or refusal when adequate lawful review cannot be achieved.

Required evidence: Data classification; permissions; secure review; retained evidence and public-field separation.

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.

19.3 – Method performance and detection

Source: AF-AST-STD-001, page 32.

Demonstrate method suitability for relevant defect mechanisms or measurands, specimen preparation, surfaces, geometry, matrix effects, interference, access and environmental conditions. For qualitative inspection, evaluate false-positive and false-negative behaviour where material. Detection capability shall be tied to technique, task, equipment and person. A successful reference check on an easy artefact shall not prove the ability to detect every relevant defect in an installed structure.

Required evidence: Method validation; challenge specimens; detection limitations; authorised interpretation.

19.10 – Comparisons and validity programme

Source: AF-AST-STD-001, page 33.

For each significant technical field, define risk-based reference checks, blind or duplicate work, comparison participation and other validity controls. Before granting a new scope, examine available satisfactory comparison evidence or an independently accepted alternative that directly challenges the claimed ability. No arbitrary score shall compensate for unresolved poor performance. Record investigation, affected historical work and successful corrective verification. Programme enrolment alone shall not be counted as a satisfactory result.

Required evidence: Validity coverage map; comparison/alternative results; investigations; restored capability.

24.1 – Engagement and statement boundary

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

Identify the responsible entity, assets/sites, reporting period, intended users, statement, methodology, criteria and required form of assurance. Separate capability evaluation from statement verification and prospective validation. Approve the boundary, exclusions, materiality approach, data access and reporting conditions before evaluation. An airport operator's inventory is not automatically the inventory of every aircraft, tenant or service provider connected to it.

Required evidence: Engagement record; exact statement; boundary and period; agreed assurance objective.

24.2 – C01 – Inventory and data

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

Identify direct emissions, purchased-energy emissions and relevant value-chain categories with consistent CO₂-equivalent treatment where applicable. Retain activity data, factors, units, versions, allocation, estimates, gaps and uncertainty. Explain excluded categories and shared sources. Trace material figures to actual meters, transactions or justified estimation models. A factor supplied for another geography, fuel, year or lifecycle boundary shall not be adopted without a suitability review.

Required evidence: Inventory model; activity/factor evidence; category and boundary rationale; data-quality assessment.

24.3 – C02 – Reduction and transition

Source: AF-AST-STD-001, page 41.

Verify historical reductions against a controlled comparable baseline and disclose structural changes, method changes, output mix and recalculation. Separate absolute and intensity changes and distinguish operational reduction from removal, compensation and avoided emissions. A future transition plan shall state assumptions, milestones, finance/resource dependencies, uncertainties and monitoring. Validation of that plan is not verification of achieved reduction and shall not be labelled as a net-zero achievement.

Required evidence: Baseline/recalculation; comparable actual results; transition assumptions; separate conclusion types.

24.4 – C03 – Energy and circular resources

Source: AF-AST-STD-001, page 41.

Define energy, water, waste, hazardous-material, repair, reuse and recovery indicators with boundaries, denominators and measurement methods. Track material flows and avoid counting internal recirculation repeatedly as new recovered output. Evaluate environmental improvements alongside product eligibility, life history, safety and contamination. A recycled-content or recovery percentage does not establish fitness of a critical part for reuse. Statements shall identify technical and environmental limitations separately.

Required evidence: Resource flow; measurement basis; repair/reuse eligibility; bounded environmental statements.

24.5 – C04 – Local environment

Source: AF-AST-STD-001, page 41.

Evaluate local air, noise, discharges, spills and biodiversity interfaces using appropriate location, baseline, sampling and approved methods. Address seasonal/operational variability, receptors, source attribution and uncertainty where relevant. A reduction in one metric shall not conceal an increased material effect elsewhere. Operational controls and incident response shall remain active irrespective of a favourable inventory. Specialist permissions and technical criteria shall be established for each claimed local-environment conclusion.

Required evidence: Local methods; sampling and receptors; baseline/uncertainty; operational controls and incidents.

24.6 – C05 – Climate resilience

Source: AF-AST-STD-001, page 41.

Assess relevant heat, flood, storm, wildfire, water-stress or other physical-risk scenarios across asset life and service dependencies. Explain scenario choice, time horizon, vulnerabilities, uncertainty and adaptation decisions. Exercise continuity and verify critical protective measures against the stated basis. A scenario study is not proof that an asset will survive every future climate condition. Update assumptions after material evidence or infrastructure change.

Required evidence: Scenario/vulnerability assessment; adaptation decisions; exercises; limits and review triggers.

24.7 – C06 – Low-carbon energy and supply claims

Source: AF-AST-STD-001, page 41.

Trace fuel or energy provenance, chain of custody, transfers, conversion, allocation and contractual attributes. Distinguish physically delivered material from a separated contractual attribute. Check ownership, eligibility, retirement or cancellation where relevant and prevent duplicate allocation of an exclusive claim. A purchased credit or fuel invoice alone does not prove that the complete service is zero-emission. Publish the actual mechanism and limits of the claim.

Required evidence: Custody/attribute ledger; eligibility and allocation; exclusive-claim checks; transparent statement.

24.8 – Materiality and assurance planning

Source: AF-AST-STD-001, page 41.

Set quantitative and qualitative materiality for the intended users, statement and consequences before substantive work. Plan evidence accordingly and consider aggregation, bias, omissions and fraud indicators. There is no universal five-percent materiality or assurance percentage in this standard. Materiality does not authorise knowingly false reporting, omitted mandatory categories or ignoring a significant qualitative issue. Reasonable and limited assurance engagements shall have separately defined work and appropriately worded conclusions.

Required evidence: Materiality rationale; assurance level; strategic and evidence plan; aggregated/qualitative issues.

24.9 – Verification execution and independent conclusion

Source: AF-AST-STD-001, page 42.

Evaluate data controls and substantive evidence, challenge estimates, reconcile interfaces and sample material categories. Preserve identified misstatements and corrections with the original statement. The independent reviewer shall confirm sufficiency for the agreed assurance form. If residual misstatement or missing evidence prevents a supportable conclusion, require correction, qualify the conclusion within permitted rules, or decline it; do not issue an unqualified favourable statement to meet a reporting deadline.

Required evidence: Verification trail; misstatement register; revised statement; independent conclusion and limitations.

24.10 – Overlap, claims and continuing change

Source: AF-AST-STD-001, page 42.

Overlapping direct and value-chain inventories of different entities are not automatically erroneous, but portfolio aggregation and exclusive reduction claims shall avoid inappropriate double counting. Report gross quantities, reductions, removals and compensation separately. Later evidence invalidating a historical statement requires correction and recipient communication; an instance statement does not require an invented continuing validity period. Capability status follows its separate surveillance and change controls.

Required evidence: Overlap/aggregation analysis; separate totals; claim approval; historical correction and capability status.

25.6 – Proficiency and reference-material activities

Source: AF-AST-STD-001, page 43.

A body organising proficiency exercises or producing reference material requires a separately released technical profile. That profile shall cover competence, planning, assigned values or property characterisation, homogeneity/stability, uncertainty, participant/sample confidentiality, statistical methods, reporting and validity. These functions shall not be inferred from ordinary laboratory accreditation. Until the specialised profile and witnesses are complete, the catalogue shall show the requested activity as development, not granted scope.

Required evidence: Dedicated profile; characterisation/statistical basis; valid specialised witnessing; bounded status.

33.1 – Requirement quality and allocation

Source: AF-AST-STD-001, page 51.

Requirements shall be identifiable, verifiable, internally consistent and assigned to an accountable implementation and acceptance function. The organisation shall record the technical basis, intended use, units, tolerances where relevant, environment and consequence of failure. Derived requirements shall retain their relationship to parent needs and constraints. Ambiguous terms such as future-ready or aerospace-grade shall be translated into evaluable conditions before they are used for acceptance. Requirements that are not yet technically defined shall remain open and shall prevent the dependent positive conclusion.

Required evidence: Requirement baseline; allocation and rationale; verification method; unresolved-definition register.

33.2 – Multidisciplinary interfaces

Source: AF-AST-STD-001, page 51.

Interface definitions shall address relevant mechanical, structural, electrical, thermal, fluid, data, timing, human and organisational characteristics. They shall identify the provider and receiver, valid configurations, ownership, assumptions,

error handling and change-notification duties. Integration reviews shall examine incompatible assumptions between individually acceptable subsystems. Units, coordinate frames, reference times and version conventions shall be explicit. Interface acceptance shall include abnormal inputs and loss of a supporting service where material to the intended use.

Required evidence: Interface-control baseline; owner acknowledgements; compatibility review; integrated verification and anomalies.

33.3 – Configuration states and genealogy

Source: AF-AST-STD-001, page 52.

The configuration system shall distinguish intended, designed, built, tested, delivered, installed and currently operated states. Each technical result shall identify the state actually evaluated, including relevant software, parameters, materials and modifications. Serial, batch, assembly and parent-child relationships shall survive splitting, replacement and repair. Configuration identity shall not be inferred from a commercial product name alone. Where a legacy baseline is incomplete, the organisation shall establish the uncertainty and necessary verification before extending the assurance claim.

Required evidence: Configuration register; as-built and as-operated records; genealogy; test-to-configuration links; legacy gap review.

33.4 – Change impact and independence

Source: AF-AST-STD-001, page 52.

A proposed change shall identify affected requirements, interfaces, hazards, qualification evidence, manufacturing controls, maintenance data, training and public claims. The review shall state which prior evidence remains valid and why, what becomes invalid and what new demonstration is required. The design or technical authority shall approve the technical disposition, while the independent conformity function separately determines any effect on ASTRA status. A document version, new software version or relocated process shall not automatically inherit its predecessor's evidence.

Required evidence: Before-and-after baseline; impact map; retained-evidence argument; new tests; separate technical and status decisions.

33.5 – Engineering budgets and margins

Source: AF-AST-STD-001, page 52.

Relevant mass, power, energy, thermal, structural, timing, memory, communication and consumable budgets shall have a baseline, owner, allocation, uncertainty treatment and review trigger. Margin definitions shall be consistent across subsystem and system levels so that the same reserve is not counted more than once. Cumulative changes and degraded conditions shall be reviewed. A positive arithmetic balance shall not establish physical adequacy where the underlying model, environmental assumption or failure scenario is unsupported.

Required evidence: Budget register; allocation and margin definitions; uncertainty; cumulative-change review; approved technical basis.

33.6 – Verification closure and model limitations

Source: AF-AST-STD-001, page 52.

The verification matrix shall link each requirement to an approved method, representative configuration, evidence and acceptance decision. Unverified interfaces and waived observations shall remain visible. A model shall be credible for the particular decision and conditions in which it is used; a visual match or successful numerical execution is insufficient. Extrapolation beyond validated conditions requires explicit justification and independent review. Verification closure shall not be declared by counting completed tests when a required function or failure condition remains unexamined.

Required evidence: Verification matrix; coverage and configuration review; model limitations; requirement-specific closure.

39.1 – Intended users and representative conditions

Source: AF-AST-STD-001, page 60.

The organisation shall define the relevant users, tasks, environment, expected duration, physical access, communication and operational constraints. Human-system requirements shall consider capabilities, limitations and reasonably foreseeable behaviour. Validation shall use representative users and conditions where practicable and state the limitations of substitutes or simulation. A single expert operator or ideal-condition demonstration shall not establish usability for all intended users or emergency conditions.

Required evidence: User/task analysis; representative population and scenario rationale; validation results and limitations.

39.2 – Workload, information and error recovery

Source: AF-AST-STD-001, page 60.

Interfaces and procedures shall provide understandable status, priorities, warnings and recovery information appropriate to the task. The organisation shall evaluate workload, fatigue, interruption, handover, language and the ability to recover from foreseeable errors. A warning shall not be the sole mitigation where an essential design or protective control is required. Nominal response time shall be distinguished from the time demonstrated by actual users under representative workload and degraded-information conditions.

Required evidence: Interface requirements; workload and interruption studies; observed recovery; design and protective-control decisions.

39.3 – Life-support and habitation responsibilities

Source: AF-AST-STD-001, page 60.

Where life-support or habitation systems are within scope, responsibilities shall cover the integrated environment, consumables, monitoring, maintenance, degradation and emergency interfaces. The technical basis shall identify the expected occupancy and mission duration and the consequences of loss of a supporting function. The organisation shall obtain competent specialist review appropriate to consequence and actual legal obligations. User acceptance of risk shall not replace required technical controls, independent review or operational permission.

Required evidence: Life-support responsibility matrix; occupancy/duration basis; integrated verification; independent specialist review.

39.4 – Emergency response and safe-return assumptions

Source: AF-AST-STD-001, page 60.

The organisation shall identify emergency scenarios and the interfaces on which rescue, safe return, evacuation or continued protection depend. Agreements shall be supported by evidence of actual availability and compatible communication, equipment and competence. Exercises shall be safe and representative of the response being claimed. A signed cooperation document or an optimistic recovery time shall not establish effective emergency capability where a critical resource or external service remains unavailable.

Required evidence: Scenario and dependency analysis; resource availability; exercised interfaces; corrective follow-up and limitations.

39.5 – Maintenance and worker protection

Source: AF-AST-STD-001, page 60.

Work design shall address hazards affecting people and conformity, including access, lifting, hazardous energy, exposure, fatigue and restoration after intervention. Contractors and temporary personnel shall receive relevant task controls and supervision. The organisation shall preserve stop-work and escalation rights without retaliation. This standard does not replace a complete workplace safety framework; it requires the actual obligations and competent protective arrangements to be integrated with the claimed aerospace activity.

Required evidence: Work-risk interfaces; task authorisation; contractor controls; interruption and safe-restoration records.

39.6 – Human authority in automated systems

Source: AF-AST-STD-001, page 60.

Automation shall have explicit authority limits and an identified accountable organisation. Human oversight shall be evaluated for actual information, time, skill and ability to intervene, not simply the presence of a person in a process diagram. Training shall cover limitations, misleading outputs and degraded modes. Material changes in automation, tasks or user populations shall trigger reassessment. A favourable aggregate task-completion rate shall not compensate for a failed essential protective response.

Required evidence: Authority allocation; intervention validation; representative training and assessment; change review; essential-step results.

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.

45.1 – Intended use and prohibited use

Source: AF-AST-STD-001, page 67.

Each AI use shall have an accountable owner, intended purpose, operational domain, affected decisions, permitted authority and prohibited applications. The organisation shall examine foreseeable harms, security exposure, human limitations and whether a simpler, more verifiable method can meet the need. Development and experimental uses shall be separated from released operational use. A vendor's capability claim or a benchmark result shall not establish the suitability of the deployed system for a high-consequence application.

Required evidence: AI use-case register; alternatives and consequence review; domain and authority limits; release boundary.

45.2 – Data provenance and evaluation independence

Source: AF-AST-STD-001, page 68.

Datasets shall retain collection sources, rights, versions, labelling methods, relevant populations, operating conditions and known limitations. Training, tuning and evaluation partitions shall prevent leakage or unjustified overlap. The organisation shall preserve difficult, rare and adverse conditions needed for the intended use. Synthetic data shall be identified and its representativeness justified. A large dataset or overall accuracy score shall not establish coverage of a materially different population, environment or critical failure scenario.

Required evidence: Dataset manifest; partition and labelling controls; scenario coverage; synthetic-data limitations; independent evaluation design.

45.3 – Performance and uncertainty

Source: AF-AST-STD-001, page 68.

Acceptance criteria shall be fixed before evaluation and define relevant errors, denominators, exposure, uncertainty and essential protective conditions. Results shall be examined by meaningful operating condition or subgroup rather than only in aggregate. False acceptance, missed detection, unavailable output and indeterminate behaviour shall be distinguishable. A model confidence score is not automatically a calibrated probability of correctness or a probability of safe operation. Material evidence gaps shall prevent the dependent positive conclusion.

Required evidence: Prospective performance criteria; stratified results; uncertainty and calibration review where relevant; essential-failure record.

45.4 – Human oversight and safe fallback

Source: AF-AST-STD-001, page 68.

The organisation shall demonstrate that responsible people have sufficient information, time, competence and technical ability to intervene. Fallback shall be feasible in the actual operating environment and shall not rely on a failed common resource without justification. Invalid, missing, adversarial or out-of-domain inputs shall be considered under the approved threat and hazard model. A nominal manual-override button or requirement to review every result shall not count as an effective control without representative evidence.

Required evidence: Oversight task analysis; intervention and fallback tests; abnormal-input response; validated operating restrictions.

45.5 – Release, drift and bounded adaptation

Source: AF-AST-STD-001, page 68.

Model weights, preprocessing, dependencies, thresholds, sensor configuration and deployment conditions shall form an identifiable released baseline. Monitoring shall define relevant drift, changed exposure, failure indicators and accountable response. Adaptation outside the approved envelope requires renewed impact review and verification before reliance. The organisation shall retain earlier versions and explain the validity of previous conclusions after a change. An autonomous improvement claim shall not remove the need to demonstrate continued fulfilment of essential requirements.

Required evidence: Model release card; drift and response plan; adaptation boundary; change approvals; retained historical baselines.

45.6 – Assurance decisions remain attributable

Source: AF-AST-STD-001, page 68.

AI may support search, document review, classification and anomaly detection within validated limitations. It shall not independently grant, renew, suspend or restore an ASTRA outcome. The authorised decision maker shall have access to

verifiable source evidence, understand material limitations and record the reasoned decision. Generated transcripts, images or observations shall not be presented as authentic events. Independent reviewers shall challenge automation bias and the risk of several tools repeating the same unsupported source.

Required evidence: Approved decision-support use; source verification; human review and decision; generated-content identification; independence checks.

46.1 – Decision purpose and model authority

Source: AF-AST-STD-001, page 69.

Every relied-upon model shall identify its owner, decision purpose, physical or operational target, version, inputs, outputs and authorised use boundary. The organisation shall distinguish an illustrative model, an engineering prediction, a synchronised digital twin and an acceptance model. Visual realism or a common data format shall not establish technical credibility. A model validated for one output or range shall not automatically support a different decision, configuration or environment.

Required evidence: Model identity and purpose; authority and use limits; target/configuration association; versioned assumptions.

46.2 – Verification, validation and uncertainty

Source: AF-AST-STD-001, page 69.

The organisation shall verify the implementation and validate the model against relevant observations for the claimed use. It shall evaluate input quality, numerical effects, calibration, sensitivity, dependence and uncertainty as appropriate. Calibration and validation evidence shall be distinguishable. Material discrepancy shall be investigated rather than concealed through repeated tuning to the same evidence. The final conclusion shall state the limits of the demonstrated domain and the consequences of relying on extrapolation.

Required evidence: Verification and validation plan; independent comparison data; sensitivity and uncertainty; discrepancy and extrapolation review.

46.3 – Twin synchronisation and stale state

Source: AF-AST-STD-001, page 69.

A digital twin shall maintain a traceable association with the actual asset and identify the source and age of updates. The system shall detect relevant missing, stale, inconsistent or wrong-configuration information. Maintenance and replacement shall update both physical and model records without erasing prior states. The organisation shall define what decisions remain permissible when synchronisation is lost. A visually current dashboard shall not be treated as proof that the underlying configuration is current.

Required evidence: Asset-twin identity; update and timestamp controls; stale-state response; configuration reconciliation.

46.4 – Replacement or reduction of physical work

Source: AF-AST-STD-001, page 69.

Where modelling replaces or reduces physical testing, inspection or practical observation, the organisation shall provide a prospective equivalence argument. It shall address failure mechanisms, validated domain, uncertainty, independent review and the material properties or behaviours that remain unobserved. The actual technical and legal obligations shall be checked before removal of a required activity. Cost, speed or model convenience alone shall not justify a reduction in necessary evidence.

Required evidence: Test-replacement rationale; validated equivalence; residual physical evidence; approval and restrictions.

46.5 – Model-based maintenance and remaining life

Source: AF-AST-STD-001, page 69.

A predictive or remaining-life output shall identify the asset history, degradation mechanism, observable inputs, model assumptions and uncertainty. The organisation shall validate the output for the intended maintenance decision and retain mandatory inspection or life-limit obligations. Absence of an alert shall not establish integrity where the model cannot detect the relevant mechanism. A new duty, repair, missing history or changed sensor shall trigger reassessment before the model supports an extended use decision.

Required evidence: Asset-history linkage; degradation and model validity; uncertainty; interval/life decision; changed-duty review.

46.6 – Reproducibility and independent access

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

The evidence dossier shall retain sufficient model definition, input data, parameter settings, tool version and execution records to reconstruct the conclusion. Proprietary restrictions shall be managed through authorised access without accepting an inaccessible essential model by reputation. Independent review shall address the engineering relevance as well as computational correctness. Export and migration shall preserve units, field meaning, relationships and known limitations. A successful file transfer shall not establish successful model transfer.

Required evidence: Reproducible execution package; lawful independent access; engineering review; semantic migration checks.

48.1 – Critical suppliers and actual performers

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

The organisation shall identify suppliers and sub-tier performers according to the technical consequence of their outputs. The scope shall record what each party actually performs, where it operates, its competent personnel, process or method capability and necessary evidence access. A trading or coordinating organisation shall not claim direct performance of outsourced work. Shared ownership, customer nomination or another certificate shall not remove the commissioning organisation's retained acceptance and oversight responsibilities.

Required evidence: Supplier/performance map; criticality; exact capability checks; retained-responsibility and access records.

48.2 – Flow-down and acknowledgement

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

Purchasing and subcontract terms shall transmit relevant specifications, configuration, quality and safety conditions, changes, inspection, evidence, notification and retention duties to the actual level of performance. The organisation shall verify acknowledgement and implementation, not only that standard terms were attached to a purchase order. Conflicting instructions shall be resolved before dependent work. Onward delegation and substitution shall be controlled, with technical acceptance distinct from commercial approval.

Required evidence: Requirement flow-down matrix; sub-tier acknowledgement; actual implementation checks; controlled substitution.

48.3 – Provenance and counterfeit prevention

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

Inputs shall retain verifiable source, lot or serial identity, condition, life status and relevant conformity evidence. Suspect, altered or counterfeit items shall be segregated and traced through potentially affected outputs. Investigation shall preserve originals and avoid treating suspicion as a final misconduct finding before sufficient review. A visually convincing certificate, searchable identifier or supplier logo shall not establish authenticity. Source changes and exceptional procurement shall receive risk-based technical review.

Required evidence: Provenance and receipt records; authenticity checks; suspect-item containment; affected-output and investigation history.

48.4 – Split, merge, logistics and storage

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

Material and part identity shall survive split lots, repackaging, kitting, pooling, return and transport. Quantities, units, ownership or custody and relevant environmental conditions shall reconcile. A quantity balance does not by itself prove correct identity or suitability. Shelf life, out-time, damage and transport excursions shall remain attached to the actual items. Customer-selected or supplied material shall be clearly identified, with limitations on the organisation's independent source claims.

Required evidence: Movement and genealogy record; quantity reconciliation; storage/transport conditions; excursion and eligibility decisions.

48.5 – Diminishing sources and replacement evidence

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

The organisation shall plan for unavailable suppliers, obsolete parts, unsupported software and loss of technical knowledge. Replacement shall examine function, interfaces, materials, process differences, qualification and life evidence. A physically interchangeable part shall not automatically be technically equivalent. The review shall define retained evidence and additional demonstration before release. Support contracts and access arrangements shall be assessed for

actual continuity, including the possibility of provider cessation or inaccessible digital tools.

Required evidence: Obsolescence register; substitution/equivalence argument; additional qualification; support and access plan.

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.

53.1 – Declared lifecycle and material effects

Source: AF-AST-STD-001, page 77.

The organisation shall define the product, asset, service or institutional boundary, functional unit, period and environmental responsibilities. It shall identify material upstream, operational and end-of-life effects relevant to that boundary. Data gaps, allocation, estimates and exclusions shall be transparent. A partial operational inventory shall not be presented as a full lifecycle footprint. Technical safety and quality requirements shall remain active during environmental improvement; an unassessed risk shall not be traded for a favourable metric.

Required evidence: Lifecycle boundary; materiality and category rationale; technical/environmental interface review; disclosed gaps.

53.2 – Inventory and comparable reduction

Source: AF-AST-STD-001, page 77.

Quantification shall retain actual activity data, suitable factors, units, versions, source quality, corrections and relevant uncertainty. Comparisons shall use a coherent baseline and address structural, methodological and output-mix changes. Absolute and intensity changes shall be reported separately where material. Gross emissions, direct reductions, removals, compensation and avoided emissions shall not be merged into an unexplained net result. Numerical examples in this standard are synthetic and are not real-world factors.

Required evidence: Inventory model; data and factor provenance; baseline/recalculation; separated quantities; uncertainty and claim review.

53.3 – Energy attributes and circular resources

Source: AF-AST-STD-001, page 77.

The organisation shall distinguish physical material or energy delivery from contractual attributes and identify ownership, eligibility, allocation and cancellation where applicable. Exclusive claims shall not be allocated twice. Material recovery, reuse, repair and circularity measures shall have defined flows and denominators. Internal recirculation shall not be counted repeatedly as new recovered output. Reused safety-critical inputs shall retain identity, life history and technical suitability independently of an environmental benefit.

Required evidence: Custody/attribute ledger; quantity and exclusive-claim checks; material-flow model; technical reuse eligibility.

53.4 – Local effects and climate adaptation

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

Local air, noise, water, spills, biodiversity and climate-resilience conclusions shall use relevant locations, periods, scenarios, receptors, methods and uncertainty. Seasonal and operating variation shall be considered. The organisation shall distinguish a scenario assessment from proof of performance under every future condition. Adaptation decisions shall identify resources, protective measures, dependencies and verification. Changes in infrastructure or material evidence shall trigger review rather than reliance on a permanently unchanged resilience label.

Required evidence: Local-environment methods; scenario and vulnerability basis; adaptation actions; protective verification; review triggers.

53.5 – Statements and independent conclusions

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

Capability recognition, historical verification, prospective validation and verifier accreditation shall remain distinct. Each engagement shall define the statement, criteria, intended users, assurance form, materiality and reporting boundary before substantive work. Errors, omissions, bias and residual uncertainty shall be evaluated independently. A favourable transition-plan review is not an achieved reduction. Later evidence invalidating a historical statement shall lead to appropriate correction and recipient communication without rewriting the original decision history.

Required evidence: Engagement terms; statement versions; misstatement and limitation record; independent conclusion; correction and notices.

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.

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.

62.2 – Mandatory parameter completion

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

An application-dependent value shall be entered in a controlled parameter schedule before the relevant test or evaluation. Each entry shall state symbol, meaning, unit, inclusive or exclusive bounds, uncertainty treatment, operating modes, technical derivation, source evidence, approver and change trigger. A declared value is not adequate merely because the applicant selected it. The independent reviewer shall challenge whether it bounds the claimed environment and consequence.

Verification: Recalculate derivations and check mission, interface and obligation coverage.

Acceptance / hold rule: The complete parameter set is approved prospectively. A blank, TBD, unsupported factor or undefined threshold blocks the dependent release.

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.

62.6 – Exceptions, tailoring and unresolved conflict

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

An exception shall identify the affected requirement, technical basis, permissible authority, scope, consequence and independent review. It shall not waive a mandatory ASTRA gate or an applicable binding obligation. Tailoring shall define how a requirement is met in the actual application, not silently remove it. If two applicable requirements cannot both be satisfied, the responsible authorities shall resolve the conflict before dependent work; an assessor shall not choose the easier rule.

Verification: Review each exclusion, alternative method and concession against controlling requirements.

Acceptance / hold rule: No unapproved exception or unresolved conflict affects a positive conclusion; any known departure remains visible in its separate technical disposition.

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.

63.2 – Object and activity rather than a universal label

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

The claimed object shall be identified as a system, subsystem, component, material, process, service, facility, software artefact, person, educational programme, assessment provider or statement. Record what is designed, built, tested, operated, maintained or retired, by whom and where. A phrase such as all space, space-qualified or complete mission assurance shall not replace the exact boundaries and limitations of the evaluated object.

Verification: Compare application, technical schedule, evidence and proposed public wording.

Acceptance / hold rule: The object and activities agree throughout the dossier; unsupported sector-wide or geographically unlimited claims are prohibited.

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.

63.4 – No automatic new programme family

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

Space-domain tags organise technical applicability within F01–F08. They shall not be counted as additional accreditation families, new public privileges or independently active programmes. The technical owner shall map each space activity to the existing object route and applicable clauses, then define a dedicated profile where the actual method, environment or competence differs. A portfolio listing is not scope activation.

Verification: Check domain tags against family, module, object and activation records.

Acceptance / hold rule: Every granted space scope has a valid family connection and independently complete profile; no authority is inferred from the catalogue.

63.5 – Unknown and future environments

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

For a novel environment or technology, the technical owner shall document known conditions, uncertain mechanisms, missing measurements, model limitations and the evidence needed to resolve them. Restricted research may continue only inside its approved protective boundary. An operational or conformity claim shall not be issued until the essential criteria and evidence are complete. Existing equations shall not be extrapolated beyond their validity without a tested justification.

Verification: Examine novelty analysis, experiment authority and unresolved-condition register.

Acceptance / hold rule: Unknown essential behaviour is not recorded as safe or conforming. Development status and permitted work are explicit.

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.

64.2 – Geometry, reference frames and event time

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

Trajectory- and geometry-dependent information shall identify frame origin, orientation, epoch, time scale, units, state covariance and transformation version. An exchanged position or orientation shall not be accepted without enough metadata to transform it consistently. Surface-relative, body-fixed, inertial and local engineering coordinates shall remain distinct. Event time, receipt time and ground processing time shall not be merged.

Verification: Recompute selected transformations and challenge wrong-frame and stale-epoch inputs.

Acceptance / hold rule: Transformations meet the approved error and time bounds; incompatible or ambiguous metadata produces HOLD.

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.

67.1 – Configuration and operational baseline

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

The ground baseline shall identify deployed hardware, software, databases, operational procedures, configuration dictionaries, simulation models, keys, operators and external services. The controlled baseline shall be linked to each

supported flight configuration. A simulator or training installation shall be segregated from live commanding.

Verification: Reconcile installed versions and target mappings with approved release records.

Acceptance / hold rule: Every live mission interface uses an accepted compatible baseline; training or stale configuration cannot be selected as a live authority.

68.1 – Fleet membership and common dependencies

Source: AF-AST-STD-001, page 100.

Maintain the identity, configuration, ownership, status and responsible control function for each fleet member. Identify shared software, ground infrastructure, suppliers, communication paths, operational procedures and resource constraints. A result for one satellite shall not be copied to an entire constellation without a demonstrated similarity and coverage argument.

Verification: Reconcile fleet and configuration records with actual membership and service commitments.

Acceptance / hold rule: All included assets and common-cause dependencies are identified; unsupported members remain outside the granted scope.

68.2 – Distributed function and degradation

Source: AF-AST-STD-001, page 100.

Define the collective service, required contribution of each element, acceptable degradation, reconfiguration authority and conditions for withdrawal. Verification shall address loss, stale state, conflicting leadership, corrupted shared data and simultaneous failure of common services. A large number of assets shall not be interpreted as independent redundancy without evidence.

Verification: Test representative distributed-service and common-cause scenarios.

Acceptance / hold rule: The specified service and protective behaviour meet approved predicates; aggregate uptime does not conceal an essential degraded-state failure.

68.3 – Tracking and conjunction-information quality

Source: AF-AST-STD-001, page 100.

Tracking and conjunction-support data shall retain source, age, frame, epoch, covariance, hard-body assumptions where used, quality indicators and domain of validity. The responsible function shall assess data sufficiency before relying on a probability or miss-distance result. Screening volume, alert threshold and operational decision thresholds shall remain distinct and prospectively defined.

Verification: Review data lineage, uncertainty and method validity; challenge stale and inconsistent source cases.

Acceptance / hold rule: The data and model support the intended decision. Unsupported collision-probability estimates remain HOLD, not reassuring zero values.

68.4 – Coordination and consent

Source: AF-AST-STD-001, page 100.

Coordination procedures shall identify counterparties, contact reliability, authority, message meaning, acknowledgement and conflicting assumptions. Receipt of a coordination message shall not be treated as consent to an operation or proof that the other party will act. Any change to a shared interface shall preserve actual responsibility and required permissions.

Verification: Inspect communication records and representative failed-contact or contradictory-message exercises.

Acceptance / hold rule: Each required acknowledgement and authority is established; unresolved coordination essential to the claim blocks that claim.

68.5 – Debris prevention and released items

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

The lifecycle plan shall identify intentional and potential released objects, retained energy, fragmentation risks, degradation and terminal-state responsibilities. The organisation shall define a lawful technical basis for prevention and end-of-life measures and verify their implementation for the actual configuration. A nominal mission plan shall not establish successful debris prevention or disposition.

Verification: Review released-item inventory, risk analysis, protective evidence and closure records.

Acceptance / hold rule: Every triggered prevention and terminal condition has accepted evidence; no unknown disposition is reported as completed.

68.6 – Mission extension and terminal resources

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

Before extending service, reassess remaining energy, support, communications, attitude capability, life, uncertainty, monitoring and resources required for terminal duties. The extension shall not consume a reserve already committed to a required protective or end-of-life function without authorised technical resolution. The decision shall preserve original life history.

Verification: Reconcile updated budgets, remaining-life evidence and terminal feasibility.

Acceptance / hold rule: Required continued-service and terminal predicates both pass; a commercially useful asset is not automatically eligible for extension.

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.

71.1 – Destination-specific conditions

Source: AF-AST-STD-001, page 106.

Define the actual body or environment, region, season or illumination assumptions, terrain, atmosphere, pressure, temperature, radiation, dust, electrostatic effects, gravity and access limitations. The profile shall separate measured conditions from inferred and unknown conditions. A terrestrial, lunar or planetary analogy shall not establish a universal environment specification.

Verification: Examine destination/region assumptions, uncertainty and required evidence.

Acceptance / hold rule: All essential environmental inputs are bounded for the declared mission; missing critical environmental knowledge retains a development or restricted status.

71.2 – Surface mobility and interaction

Source: AF-AST-STD-001, page 106.

Mobility assurance shall define load, terrain interaction, traction or anchoring, stability, dust effects, sensing, energy, thermal behaviour and recoverability relevant to the actual vehicle. Representative tests shall identify differences in gravity, soil or surface material, pressure and scale. A laboratory traverse shall not be equated with full mission access or survivability.

Verification: Review integrated mobility and resource tests and the justified analogue-transfer argument.

Acceptance / hold rule: Required mobility and protective-state predicates pass for the approved envelope; unsupported terrain classes remain excluded.

71.3 – Atmospheric and buoyant exploration

Source: AF-AST-STD-001, page 106.

Atmospheric vehicles shall have defined environmental profiles, materials, structural, buoyancy or flight functions, energy, communication and terminal responsibilities. Pressure, composition, corrosion, turbulence and inaccessible maintenance shall be considered when triggered. Airworthiness or site results from a different planetary or terrestrial context shall not be inherited without technical justification.

Verification: Review environment-specific material, structural and functional qualification and data validity.

Acceptance / hold rule: Every essential environmental and functional condition is supported for the stated domain; unvalidated atmosphere assumptions block broader claims.

71.4 – Subsurface and ocean-world interfaces

Source: AF-AST-STD-001, page 106.

Subsurface or liquid-environment exploration shall identify pressure, thermal, chemical, access, communication, containment and biological/scientific contamination concerns. Verify boundary integrity, sensor observability, retrieval assumptions and evidence custody without providing hazardous access procedures. A surface-system qualification shall not establish suitability for submerged or subsurface duty.

Verification: Review pressure-boundary and environmental evidence through authorised specialist assessment.

Acceptance / hold rule: All triggered boundary, protection and observation predicates pass; uncertain containment or retrieval capability remains explicitly restricted.

71.5 – Long darkness and resource interruption

Source: AF-AST-STD-001, page 107.

Mission planning shall identify darkness, unavailable recharge, thermal survival, communications gaps and delayed resupply. Energy and consumable reserves shall include degradation, uncertainty, interruptions and terminal duties. Restart after dormancy shall verify state and protection, not only a successful boot.

Verification: Recalculate resource and survival budgets and review representative dormant/restart tests.

Acceptance / hold rule: All required survival and recovery conditions meet approved criteria without double-counted reserves; missing state evidence keeps restart dependent actions held.

71.6 – Construction and surface infrastructure

Source: AF-AST-STD-001, page 107.

Habitats, pads, utilities, handling systems, civil works and resource facilities shall have a defined design and environment basis, material provenance, site assumptions, inspection strategy and acceptance authority. Hidden work and critical interfaces shall be verified before concealment. Demonstrating a manufacturing technique shall not establish readiness of an integrated surface installation.

Verification: Trace design and material records through construction, commissioning and receiving acceptance.

Acceptance / hold rule: Every essential structural, utility, environmental and operational interface has valid completion evidence before use.

71.7 – Autonomy and limited intervention

Source: AF-AST-STD-001, page 107.

Autonomous surface work shall define sensing coverage, permitted domain, adaptation limits, command authority, safe cessation and human intervention feasibility. Validation shall include occlusion, unfamiliar conditions, delayed information, partial execution and loss of a shared resource. Human oversight shall not be credited when delay or observability prevents meaningful intervention.

Verification: Challenge the approved autonomous envelope and required protective transitions.

Acceptance / hold rule: All essential scenarios pass; out-of-domain behaviour is limited or stopped under the approved protective design.

71.8 – Completion, samples and remaining duties

Source: AF-AST-STD-001, page 107.

The mission dossier shall distinguish science acquisition, engineering demonstration, collected sample custody, completed construction, final asset state and environmental closure. Unreachable assets shall retain a stated confidence basis and unknowns. Responsibilities for contamination, residues, hazardous inventories and interpreting long-term records shall survive mission and supplier closure.

Verification: Review final-state evidence, sample manifests and accepted residual-duty assignments.

Acceptance / hold rule: Each conclusion is limited to its demonstrated object and evidence; no lost contact or incomplete transfer is relabelled as complete closure.

73.7 – Medical capability and health-data boundaries

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

The mission shall identify the qualified health functions, equipment and support access required for its actual population and duration. Engineering assurance shall verify availability, integration, power, maintenance, communication and privacy without inventing treatment protocols or clinical certification. Health information shall be restricted to authorised purposes and handled separately from public conformity records.

Verification: Check actual health-support arrangements, equipment integration and protected data access.

Acceptance / hold rule: Required support functions are demonstrably available and usable within the mission limits; undocumented specialist capacity is not credited.

74.1 – Mission-specific protection classification

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

The responsible function shall identify destinations, return paths, scientific objectives, exposed materials, biological payloads and applicable protection duties. Forward contamination, backward contamination and scientific interference shall be assessed separately. The selected obligations and technical criteria shall be documented before mission or facility design decisions that depend on them.

Verification: Review destination, pathway and consequence analysis with qualified independent specialists.

Acceptance / hold rule: Every triggered protection duty has an explicit owner, criterion and verification path; an undefined classification remains HOLD.

74.2 – Contamination pathways and control allocation

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

Map contamination sources, transport pathways, contact interfaces, releases and receiving environments across manufacture, test, integration, operation, collection, return and disposition. Allocate controls to actual performers and preserve interface assumptions. A cleaning or containment declaration shall not establish effectiveness without method-specific evidence for the relevant material and pathway.

Verification: Inspect the pathway map and validated evidence for each relied-upon control.

Acceptance / hold rule: All essential pathways are controlled to the approved technical basis; inaccessible required evidence prevents a favourable conclusion.

74.3 – Scientific cleanliness and background

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

Define species, particulates, molecular residues or other backgrounds capable of affecting the specific measurement. Reference samples, witness materials, blanks, calibration and contamination history shall have traceable identity and handling. A broad cleanliness classification shall not establish suitability for an instrument with a different detection limit or scientific objective.

Verification: Review measurement-specific contamination budgets and actual verification results.

Acceptance / hold rule: Required cleanliness and background predicates pass within method uncertainty; uncharacterised contamination remains a limitation on the affected output.

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.

74.5 – Return-chain containment and receiving readiness

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

Where containment or restricted receiving applies, verify compatible transport, return vehicle, retrieval, custody, receiving facility, authorised personnel and contingency arrangements. The profile shall define the evidence needed to establish boundary integrity and safe transfer without specifying hazardous treatment methods. A ready spacecraft does not establish readiness of an absent receiving facility.

Verification: Review the complete return-to-receiving chain and authorised representative integrity demonstrations.

Acceptance / hold rule: Every essential interface and receiving capability is accepted before dependent return commitments; otherwise the chain remains incomplete.

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.

75.1 – Process purpose and environment

Source: AF-AST-STD-001, page 114.

Define intended output, material properties, environment, equipment, software, tooling, personnel or autonomous role, inspection access and downstream use. Distinguish research yield, qualified process capability and product acceptance. A terrestrial qualification shall not automatically transfer to a different gravity, vacuum, thermal, contamination or radiation environment.

Verification: Review environment differences and the process-to-property qualification argument.

Acceptance / hold rule: All essential output properties and influential conditions have an approved evidence path; unsupported transfer remains HOLD.

75.2 – Inputs, feedstock and source variability

Source: AF-AST-STD-001, page 114.

Retain origin, composition or material type, condition, contamination, storage, reuse, mixing and representative property evidence for feedstock. Local or recovered resources shall have a characterised variability and sampling basis. A claimed resource abundance shall not establish usable quantity or technical eligibility. Source substitution shall be assessed before use.

Verification: Trace input lots and samples to process runs and accepted property evidence.

Acceptance / hold rule: Input identity and suitability meet approved criteria; uncertain composition or life history is not replaced by a nominal source label.

75.3 – Essential variables and remote monitoring

Source: AF-AST-STD-001, page 114.

The qualified envelope shall identify influential variables, combinations, tolerances, monitoring performance and reaction rules. Retain actual variable histories, interruptions and sensor gaps by output identity. Remote telemetry shall support acceptance only for properties and mechanisms demonstrated to be observable or validly inferred. A successful process

command does not prove the intended material transformation occurred.

Verification: Review representative qualification, sensor/model validation and raw production history.

Acceptance / hold rule: All required variables and output characteristics are supported; an unobservable essential property requires additional evidence or a restricted outcome.

75.4 – Yield, mass balance and circularity

Source: AF-AST-STD-001, page 114.

Material accounting shall separate input, good output, reject, sample consumption, process loss, recovered material, work in progress and unknown difference. Internal recirculation shall not be counted repeatedly as new resource production. Mass closure and yield are different measures; neither proves safety or material performance. Units and measurement uncertainty shall be explicit.

Verification: Independently reconcile the material ledger and separately review quality acceptance.

Acceptance / hold rule: Balances meet the approved uncertainty-based criterion and all claimed good output is technically accepted; unexplained losses or duplicate recovery remain open.

75.5 – Logistics, storage and compatibility

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

Logistics shall preserve item identity, custody, configuration, life, condition and applicable environmental exposure through packaging, handling, transport, transfer and storage. Receiving systems shall confirm mechanical, fluid, electrical, data and contamination compatibility where relevant. Planned delivery shall not be counted as physically received usable inventory.

Verification: Inspect the complete shipment and receiving chain, including excursions and damage.

Acceptance / hold rule: Only accepted usable inventory enters mission budgets; unknown or restricted items are segregated in both physical and digital records.

75.6 – Maintenance, spares and distributed production

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

On-demand or remote production of replacement parts shall satisfy the same applicable design, material, process and acceptance requirements as other sources. Digital files, authorised build configuration, inspection capability and life history shall be controlled. A successfully printed shape shall not establish structural, electrical or environmental suitability. Missing original supply does not waive qualification.

Verification: Review replacement authorisation, production genealogy and configuration-specific verification.

Acceptance / hold rule: Every essential replacement predicate passes before use; unsupported functional or life equivalence is prohibited.

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.

76.1 – System boundary and conversion chain

Source: AF-AST-STD-001, page 116.

Define energy source, conversion, storage, distribution, loads, interfaces, heat rejection and terminal duties. Identify normal and degraded states, common dependencies, exposure and maintenance accessibility. Component efficiency or nameplate power shall not be represented as available end-to-end service capability.

Verification: Trace energy and thermal balances across the actual architecture and conditions.

Acceptance / hold rule: Every essential stage and interface meets approved functional and protective requirements.

76.2 – Beamed and remote energy services

Source: AF-AST-STD-001, page 116.

A remote energy-service profile shall identify transmitter, receiver, conversion, alignment, intervening environment, control authority and protection of unintended recipients. The assurance case shall address wrong-target, lost-tracking, interrupted-service and emergency shutdown conditions through authorised safe demonstrations. A received-power measurement alone shall not close protection or permission requirements.

Verification: Review written scope, compatible interfaces, performance evidence and safe protective tests.

Acceptance / hold rule: Delivery and all triggered protective predicates pass; no hazardous or unauthorised operation is justified by a positive efficiency value.

76.3 – Cryogenic, chemical and pressure interfaces

Source: AF-AST-STD-001, page 116.

Specialised energy storage and transfer shall define relevant material compatibility, containment, thermal behaviour, quality, monitoring, protective isolation and emergency interfaces. Actual pressure, composition, exposure and handling limits shall be approved by competent specialists for the specific system. This publication shall not be used as an operating procedure.

Verification: Review authorised technical basis, qualification, inspection and integration evidence.

Acceptance / hold rule: Every essential containment and protection condition is supported; missing hazardous-work authority blocks the activity.

76.4 – Nuclear and radiation-source governance

Source: AF-AST-STD-001, page 116.

Where a mission uses a nuclear or other controlled radiation source, the organisation shall identify the actual competent authorities, permissions, safety case, transport, launch/operation interfaces, security, emergency responsibilities and end-of-life duties. Independent specialist access shall be sufficient for the bounded evaluation. ASTRA shall not grant source-handling, reactor-design or public-safety permission.

Verification: Verify the existence, scope and authenticity of required specialist approvals and integration evidence.

Acceptance / hold rule: All relevant permissions and assurance interfaces are complete; a generic aerospace credential cannot substitute for them.

76.5 – Infrastructure availability and failure propagation

Source: AF-AST-STD-001, page 117.

Utilities, storage, conversion and networks shall be evaluated for common failures, load prioritisation, restoration, fire or containment interfaces and dependence on external support. Protection of people and essential assets shall be distinguished from mission-service continuity. A shared resource cannot be credited as independent backup to itself.

Verification: Review dependency analysis and safe tests of loss, isolation and restoration.

Acceptance / hold rule: Every essential protective path remains effective under the approved failure set; unsupported independence is not credited.

76.6 – Degradation, environmental claims and retirement

Source: AF-AST-STD-001, page 117.

Capacity, conversion and loss models shall reflect ageing and relevant exposure. Environmental claims shall use a separately defined lifecycle boundary and shall not imply technical interchangeability or complete safety. Retirement shall preserve hazardous inventory, terminal protection, custody and monitoring duties.

Verification: Reconcile actual condition, model validity, separate environmental statements and final disposition.

Acceptance / hold rule: Technical life and terminal conditions are met independently of environmental metrics; unknown inventories remain open obligations.

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.

77.3 – Measurement and uncertainty readiness

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

Before execution, verify instrument identity, calibration, range, bandwidth, synchronisation, environment, software, raw-data retention and uncertainty suitability. Sensor placement and spatial coverage shall represent the characteristic being accepted. Protect the article and personnel through separately specified stop conditions.

Verification: Inspect the full measurement chain and execute relevant readiness checks.

Acceptance / hold rule: All required channels are valid for the intended inference; a missing, saturated or misconfigured critical channel prevents that acceptance.

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.

77.6 – Numerical and attribute acceptance

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

Quantitative decisions shall use the prospectively selected predicate and uncertainty rule. Attribute decisions shall name observable states and essential steps rather than unstructured judgement. Equality at an inclusive limit is handled as specified; empty acceptance regions, invalid units and non-finite values produce HOLD. Rounding shall not change an outcome.

Verification: Replay boundary, negative and missing-input cases using Annex AL and Annex AM.

Acceptance / hold rule: The correct state follows deterministically from valid unrounded inputs and the approved predicate.

77.7 – Retest and corrective verification

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

Retest shall follow an approved rationale, defined scope and representative configuration. It shall preserve the original failure and address causal, exposure and selection effects. Repeated trials until a pass occurs are not an acceptance strategy. Corrective verification shall include the original failure mode and relevant regression, not merely a new favourable measurement.

Verification: Review the retest authorisation, all attempts and failure-to-correction trace.

Acceptance / hold rule: The original deficiency and affected requirements are demonstrably resolved; otherwise the claim remains failed or held.

78.3 – Evaluation data and model credibility

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

Evaluation shall retain data provenance, rights, labelling, representative populations, partitions, leakage checks, synthetic contribution and adverse cases. Model verification, calibration and independent validation shall be distinguished. A high aggregate score, large dataset or visual twin is not evidence of every rare or safety-critical condition.

Verification: Inspect data partitions and independently reproduce selected performance and model-validation results.

Acceptance / hold rule: Prospective scenario-specific criteria are met with disclosed uncertainty and limitations; unsupported extrapolation remains HOLD.

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.

79.1 – Protect people and essential assets before mission success

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

The assurance case shall separate mission-success conditions from required protection when the mission objective cannot be achieved. Define credible severe consequences, essential controls, detection, escalation and authorised stop or restriction. Commercial benefit and a favourable aggregate risk score shall not override a missing essential protective condition.

Verification: Review hazard-to-control-to-verification traceability for failed-mission scenarios.

Acceptance / hold rule: Every required protective function has accepted evidence independently of mission performance metrics.

79.2 – Emergency feasibility and resources

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

Protective and recovery plans shall identify actual people, communication, access, equipment, energy, consumables, time and external assistance. An assumed response shall be credited only within demonstrated capability and mission constraints. A rescue agreement, proposed future service or unallocated reserve shall not be counted as assured availability.

Verification: Reconcile scenario timing, resource budgets and exercised interfaces.

Acceptance / hold rule: All required protective pathways are feasible within their approved response and survival bounds.

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.

79.6 – Learning and sustained accountability

Source: AF-AST-STD-001, page 123.

Lessons shall be translated into controlled requirements, methods, training, resources or interfaces and verified under representative conditions. Protect good-faith reporting and distinguish allegation from substantiated misconduct. Long-term archives shall retain technical meaning, access conditions and correction responsibility after staff, tools or institutions change.

Verification: Review corrective effectiveness and test retrieval by a receiving competent reviewer.

Acceptance / hold rule: The affected controls demonstrably improve and the mission record remains interpretable; publication of a lesson alone is not closure.

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.

80.6 – Completion boundary

Source: AF-AST-STD-001, page 125.

The final document is a requirement and evidence framework. Each actual mission and technical profile shall complete its numerical limits, specialist procedures, permissions and validation. Newly authored provisions shall follow the real adoption process before binding live use. No statement in this publication guarantees that every undiscovered physical phenomenon or future technology has already been validated.

Verification: Review the final release dossier and the truthful distinction between prepared text and real implementation.

Acceptance / hold rule: Only the exact demonstrated and authorised scope is released; incomplete domains remain available for controlled development, not presumed conformity.

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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