Dweve
Weaving Intelligence

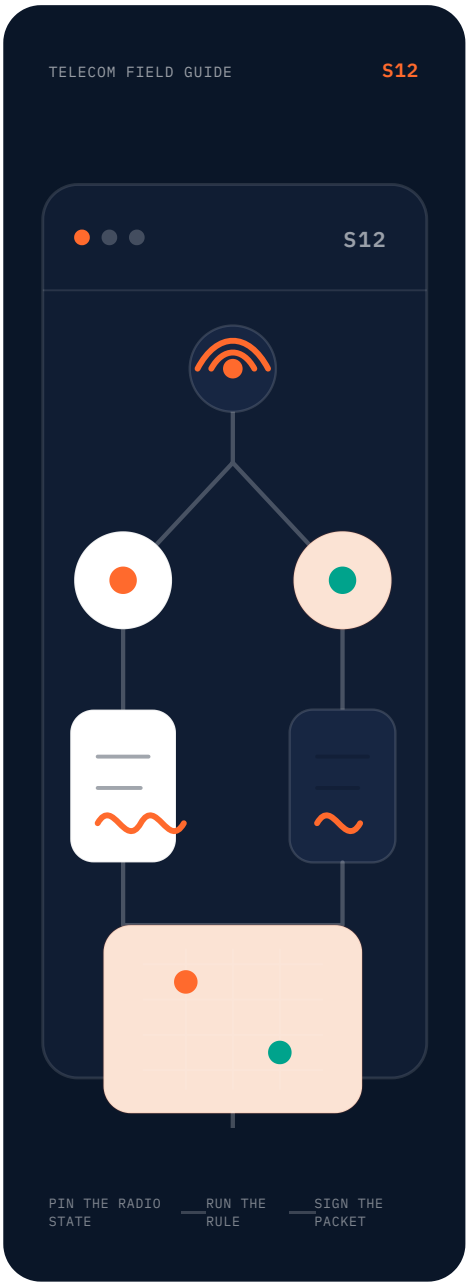
ENGLISH SOURCE EDITION · JULY 2026

TELECOM FIELD GUIDE · S12

The telecom decision field guide

One radio handover, followed from RSRP, RSRQ, and SINR measurements to the 3GPP rule, NOC signature, customer answer, and roaming replay.

HANDOVER · DETERMINISTIC ROUTING · NOC AUTHORITY · ROAMING REPLAY



Not a generic AI catalogue. One radio handover with its measurements, neighbour set, rule, licence, operator, target cell, and packet kept together.

S12

CONTENTS

The network decision, from measurement to packet

This field guide stays with handover H-23. The radio measurements, active 3GPP profile, spectrum lane, score, NOC action, target event, and later customer or regulator question remain connected.

PRIMARY READERS	READING DEPTH	DECISION THIS SUPPORTS
telecom decision field guide domain, operations and assurance teams	Sector specialist	A telecom-specific working book for RAN, core, OSS, BSS, NOC, security, regulatory, roaming, billing, and assurance teams.

HOW TO USE IT

Replace the illustrative measurements, subscriber reference, cells, licence, and operator with one network-owned event. Keep the record shape, but do not treat this book as a 3GPP specification, a regulator filing, or a service guarantee.

SOURCE DISCIPLINE

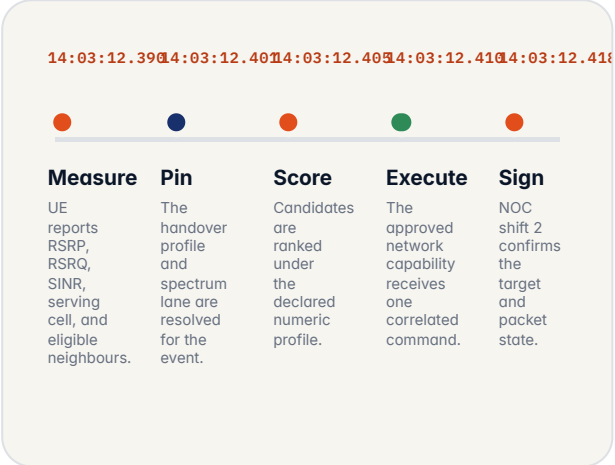
Dweve-specific facts are taken directly from the English website text audited 2026-07-20; web-navigation wording is humanised for print. Evaluation guidance is editorial, and scenarios and derived visuals are illustrative. Unsupported synthesis is replaced by canonical copy or omitted.

THE CONTROL-ROOM QUESTION

A handover is a live decision with a later audience

The subscriber sees a changed cell or a dropped session. The NOC, regulator, billing team, and customer desk need the measurement window, active rule, network state, and human authority that explain it.

At 14:03:12.418 UTC, handset H-23 leaves cell NL-RN-17 during a busy-hour train corridor. The operational question is not simply whether the target cell was stronger. It is which measurements were admitted, which neighbour candidates were eligible, which 3GPP profile and spectrum licence applied, what the deterministic score produced, whether automation was inside its safe band, and who signed the final network state.



The radio event is fast. The evidence contract must be faster than the later reconstruction.

The packet must cross teams without changing meaning

RAN sees radio conditions. Core sees session continuity. OSS sees topology and alarms. BSS sees service and SLA effects. Roaming and interconnect teams see clearing records. A customer asks for a plain reason. These views can refer to one event without becoming one undifferentiated log.

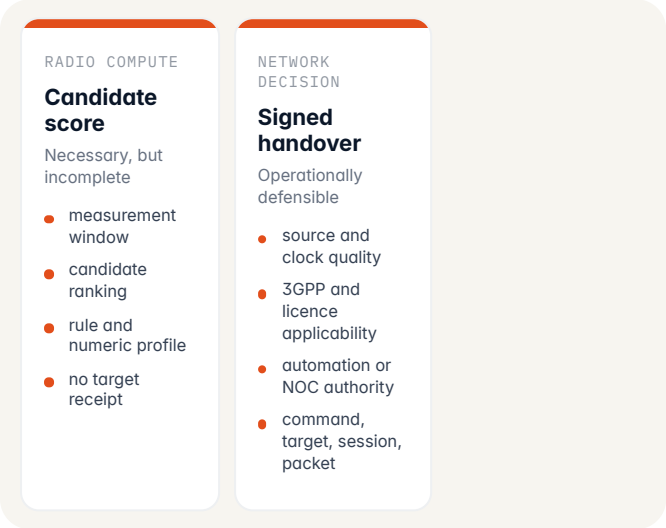
TELECOM TEST

If the NOC must query today’s neighbour table to explain yesterday’s handover, the network has telemetry but not a replayable decision record.

THE DIFFERENCE BETWEEN SELECTION AND ACTION

A radio score is not the network decision

Handover logic can be deterministic and still require a boundary for licence, topology, capability, NOC authority, and actual target state.



The score belongs inside the handover record, not in place of it.

For H-23, “moved to NL-RN-21” is only the visible outcome. The later answer needs the serving and target cells, RSRP of -92 dBm, RSRQ of -11 dB, SINR of 18 dB, the measurement timestamp and units, the eligible neighbour set, profile 38.331-24.4, spectrum licence NL-3.5G-2026-02, score, command correlation, NOC operator S. Visser, and observed target event. The values are illustrative; the shape is the control.

Keep four questions separate

- What did the network measure, and how fresh and trustworthy was the sample?
- Which 3GPP, routing, spectrum, service, or SLA rule applied?
- What did the deterministic layer recommend or invoke?
- Who owned the command, customer effect, rollback, or explanation?

NO FALSE CERTAINTY

A bit-identical score does not prove the radio sample was truthful, the neighbour topology was current, or the target cell accepted the command.

01

HANDOVER H-23

Pin the radio state before the rule runs

The case is intentionally specific. Radio units, time alignment, candidate cells, spectrum, and network capability are different evidence classes with different owners.

The handover has a measurement boundary, a computation boundary, and an actuation boundary.

MEASUREMENTS, CLOCKS, AND PSEUDONYMOUS CONTEXT

H-23 has one radio identity

The first network control is knowing which event, time window, serving cell, target candidates, and service context the operator is explaining.

H-23 is a pseudonymous handover reference in this edition. A live implementation should correlate the UE measurement report, RAN event, core session, NOC action, and later customer or roaming record without copying subscriber identity into every operational packet.

Freeze what the algorithm saw

A current cell map is not the map at 14:03:12. The record needs sample identity, clock source, collection latency, unit conversion, freshness, missing fields, correction state, and the relation to the serving and candidate cells. Clock drift is a network input defect, not an afterthought in the report.

- event and pseudonymous session identity, serving cell, target candidates, and decision time
- RSRP, RSRQ, SINR, units, measurement source, and freshness
- network time source, clock offset, radio and core correlation
- link to the original RRC, core, telemetry, and NOC records
- minimum subscriber and service class context required for the selected rule

`handover.identity` BOUND

Event

H-23 · serving NL-RN-17 to candidate set

`measurement.window` PINNED

Window

14:03:12.390–14:03:12.401 UTC

`radio.sample` COMMITTED

Sample

RSRP -92 dBm · RSRQ -11 dB · SINR 18 dB

`topology.snapshot` DECLARED

Topology

Neighbour map and capability at decision time

`target.correlation` RECONCILED

Effect

RRC/core command and target-cell receipt

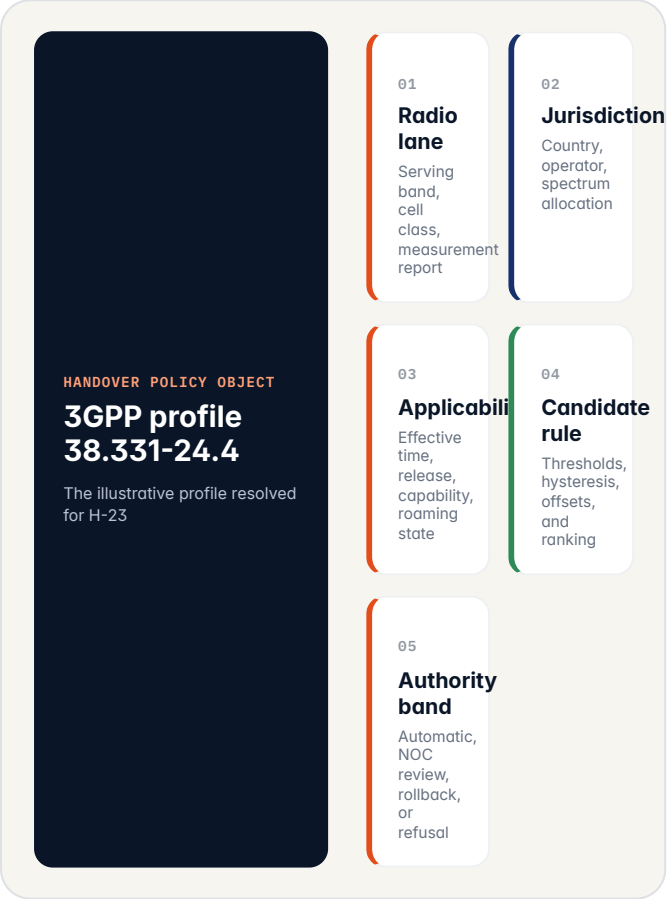
PRIVACY BOUNDARY

A network trace needs enough context to explain service state. It does not need to become a subscriber dossier.

3GPP PROFILE, SPECTRUM, AND SERVICE APPLICABILITY

The rule has a radio lane and a legal lane

A handover policy is not just a filename. Replay needs the exact version, radio profile, spectrum allocation, network capability, and service or roaming applicability.



Radio rule, spectrum licence, service promise, and authority band are related but not interchangeable.

Spindle can retain source atoms for 3GPP profiles, routing policy, spectrum allocations, and SLA definitions. Charter can represent operating policy and change authority. The network owner still decides which release, licence, topology, and capability are admitted to this handover lane.

The historical lane must survive change

When profile 38.331-24.5 or a new auction allocation becomes active, it may govern future traffic. It must not overwrite the evidence needed to explain H-23. A replay should resolve the historical lane directly, including a withdrawn or superseded neighbour.

NETWORK-OWNED QUESTION

Can the RAN or regulatory owner point from H-23 to the exact profile, spectrum version, effective state, and approved authority band?

INTEGER PATH, ORACLE, AND TARGET EFFECT

Determinism lives inside a measured latency budget

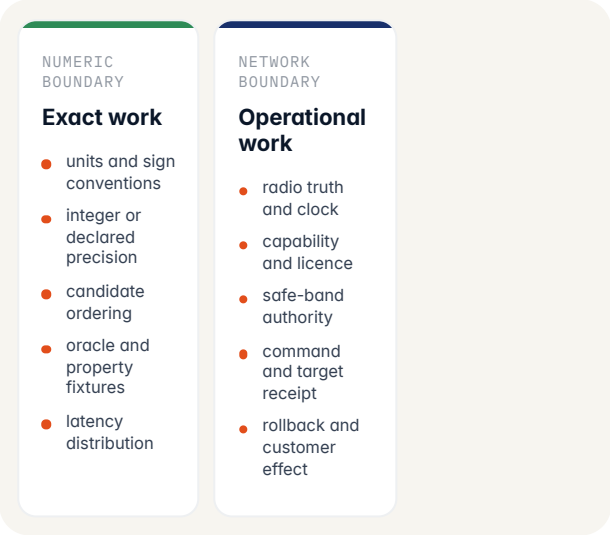
The handover path may use integer arithmetic and a high-precision oracle. That is useful only when the network records the input domain, runtime, tolerance, and actual command outcome.

The website describes handover scoring on integer arithmetic, a pinned 3GPP rule, bit-identical replay, MPFR 256-bit reference checking, property tests, and a CPU-native path. Those are engineering claims to verify under the selected network scope, not substitutes for a live RAN acceptance corpus.

Illustrative handover witness

```
rsrp.serving = -92 dBm
rsrq.serving = -11 dB
sinr.serving = 18 dB
candidates = [NL-RN-21, NL-RN-24]
profile = 3gpp://38.331-24.4
licence = spectrum://NL-3.5G-2026-02
score = deterministic_integer_path(measurements, offsets,
hysteresis)
selected = NL-RN-21
comparison = oracle_256_bit(score)
method = declared units + clock + runtime + tolerance
```

The values are illustrative. The operator owns units, threshold, tolerance, and safe-band acceptance.



A deterministic engine can be precise while the network around it remains uncertain.

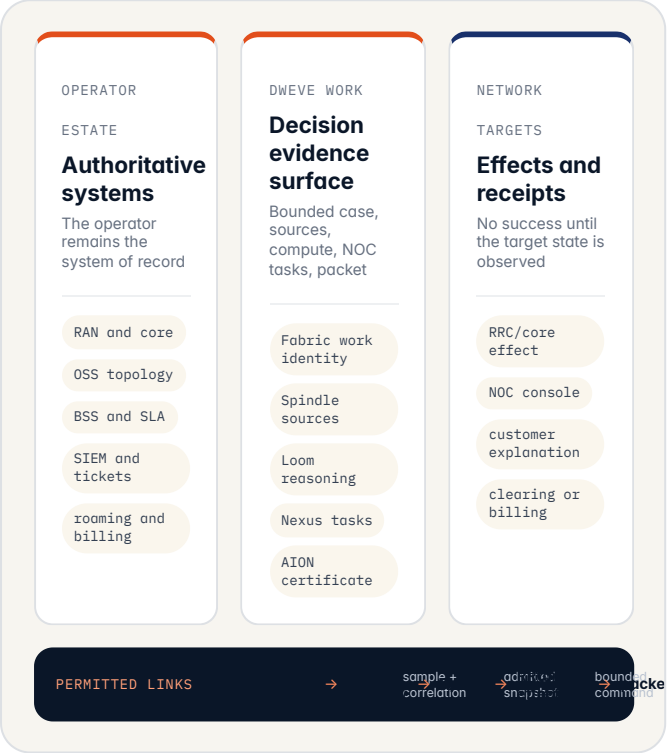
REFUSAL CONDITION

If measurements are stale, clocks disagree, the licence is unavailable, candidates are not authorised, or the target receipt is unknown, the path must degrade, hold, or escalate.

NO SHADOW NETWORK ESTATE

OSS and BSS stay authoritative

The decision layer wraps existing OSS, BSS, SIEM, RAN, core, clearing, and billing systems. It does not become a second source of network truth.



The integration is a set of explicit trust and ownership boundaries, not a parallel OSS.

A first proof should sit beside one handover or QoS workflow. The operator chooses APIs, event streams, identity, clocks, archives, and command surfaces. The proof records which payloads remain references, how mTLS and network segmentation work, how a retry avoids duplicate actuation, and how a target timeout becomes an explicit unknown state.

Keep the command path boring

- one stable correlation across UE, RAN, core, NOC, packet, and customer service
- idempotency and command replay protection
- receipt that distinguishes accepted, applied, rejected, and unknown
- reconciliation between radio outcome, session continuity, SLA, and billing state

INTEGRATION ACCEPTANCE

A packet is incomplete when it says the decision layer sent a command. It is complete when the operator can say what the network target did.

QOS, INTERCONNECT, AND CLEARING

A roaming record has more than one clock

The home network, visited network, mediation layer, clearing house, and bill can each describe the same session differently. The packet must preserve their relations instead of flattening them.

For a roaming data session, the visited network owns one set of usage and radio facts, the home operator owns customer and service context, mediation transforms records, and the clearing process reconciles commercial state. A QoS complaint may begin with a subscriber and end with a BEREC or billing question.

The shared packet links records without pretending that home and visited systems have one authority.

Questions the clearing path must answer

- Which session, subscriber reference, home and visited operator, and service class are being reconciled?
- Which measurement, tariff, SLA, roaming, and regulatory versions were active?
- Did mediation transform or drop a field, and can the original record be retrieved?
- What happens when the home bill, visited usage, and clearing record disagree?
- Which owner can correct the bill or file the required dispute?

COMMERCIAL BOUNDARY

Deterministic replay can show how a charge or SLA result was derived. It does not make an unsettled clearing record settled.

AUTOMATION, OVERRIDE, AND CUSTOMER CONSEQUENCE

The NOC operator is a real authority boundary

A safe band may automate a handover. The record still needs to show when automation acted, when a human intervened, and who owned the service effect.

The NOC gate must have meaningful choices, not only a green button beside a finished score.

What the operator must be able to inspect

- the measurements and topology that materially affected the candidate selection
- the profile, licence, service, and excluded or conflicting source state
- the numeric path, runtime, tolerance, and latency budget
- the target capability, rollback path, and customer or SLA effect
- the consequences of accepting, changing, holding, or refusing

The action needs timestamp, identity, shift, role, authority, reason, command correlation, and relation to the recommendation. “NOC reviewed” is not enough. Distinguish automated, accepted, changed, rolled back, escalated, and refused.

02

SIGNED NETWORK WITNESS

Make the packet travel across the trust boundary

The witness is smaller than the operator estate and stronger than a screenshot. It binds measurements, rule, computation, authority, target state, and later verification.

HANDOVER H-23 · WITNESS	From radio sample to regulator or customer packet		
01	MEASUREMENT SNAPSHOT **what the network saw**	RAN / telemetry	committed
02	PROFILE + LICENCE **which lane governed**	RAN / regulatory	effective
03	SCORE WITNESS **how candidates were ranked**	method owner	verified
04	NOC ACTION **who accepted or changed it**	network operations	signed
05	TARGET RECEIPT **what the network did**	RAN / core	observed
06	CERTIFICATE + VERIFIER **the packet remained intact**	independent reviewer	checkable

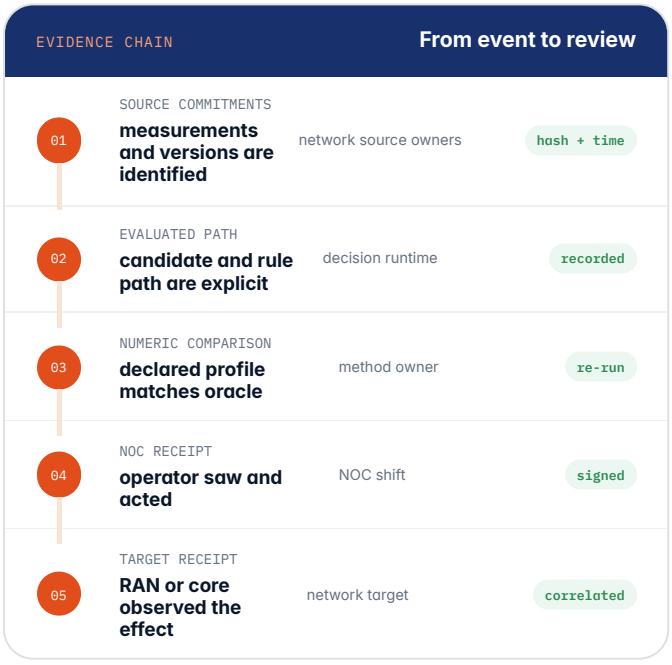
Each link answers a different question. No single signature makes the radio measurement true.

CERTIFICATE, CHAIN, AND INDEPENDENT REPLAY

AION checks the packet at the edge of trust

A network operator, customer desk, or regulator may need to verify a selected decision outside the service that produced it.

AION's portable decision-certificate concept can give H-23 a proof surface that travels with the selected packet. It can commit to admitted measurements, profile and licence, evaluated clauses, selected target, NOC receipt, and verifier material. It does not certify radio truth, spectrum compliance, service quality, or a regulator's conclusion. It makes the declared decision material checkable under the supported format.



The independent check separates the packet from the service that assembled it.

What the certificate does not do

- It does not make a forged or stale measurement trustworthy.
- It does not prove the network chose the best cell for every subscriber.
- It does not replace RAN validation, security controls, NOC runbooks, or regulatory reporting.
- It does not prove a customer understood a QoS explanation merely because the message was delivered.

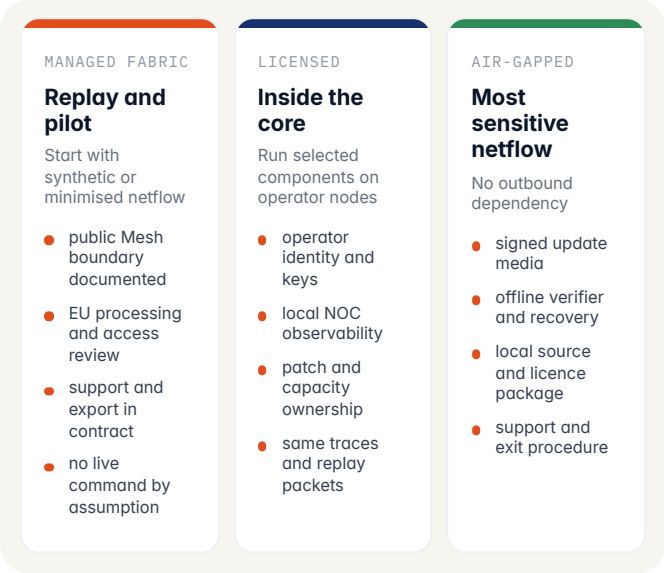
INDEPENDENT REVIEWER QUESTION

Can the reviewer check H-23 with the retained packet and verifier, without giving the verifier permission to issue network commands?

MANAGED, LICENSED, OR AIR-GAPPED

The trust boundary is a network control

Three operating models can share semantic contracts and packet shape while carrying different egress, key, support, update, and recovery responsibilities.



A posture is a hypothesis until the operator observes the actual dependency and recovery path.

The telecom website description describes managed Fabric on the public Mesh, licensed operation on the core network, and air-gapped operation for the most sensitive netflow. The proof should preserve one typed integration contract while measuring actual clock, mTLS, topology, update, telemetry, key, capacity, support, and restore conditions in each posture.

Posture-specific evidence

- Managed: processing boundary, access, subprocessor, retention, incident path, export, and continuity.
- Licensed: node ownership, local keys, updates, NOC integration, capacity, backup, and patch responsibility.
- Air-gapped: signed media, offline dependencies, local time, verifier distribution, recovery, and no-egress test.

NO RE-PLATFORMING CLAIM

If the same handover is promised across postures, prove that the semantic packet, authority band, and failure behaviour remain intact. Do not assume identical operational risk.

THE ACCEPTANCE CORPUS

Run the proof against real network edges

A convincing telecom proof includes ordinary handovers, measurement defects, regulatory transitions, commercial disagreement, and cases that should refuse to act.

CORPUS SLICE	INCLUDE	EXPECTED OBSERVATION
Normal handover	fresh sample, eligible target, safe automation band	target effect and packet close
Rule transition	3GPP profile or spectrum allocation change	historical lane remains resolvable
Measurement defect	stale RSRQ, clock skew, missing SINR, poisoned telemetry	hold or refusal names the defect
Topology change	neighbour removed or target capability unavailable	candidate set and refusal are explicit
NOC intervention	operator override, rollback, or manual target	authority and rationale are visible
Commercial path	roaming, clearing, QoS, SLA, or bill dispute	network and billing state reconcile
Resilience	OSS outage, target timeout, restore, offline replay	unknown state and recovery repeat
Abuse	command replay, privilege misuse, cross-subscriber access	denied, correlated, and investigated

The corpus is part of the network decision. A green lab handover alone is not acceptance.

Measure what a later reviewer can check

- measurement and clock quality at the original decision time
- candidate ordering, exact score, oracle comparison, and end-to-end latency
- licence, profile, capability, automation, NOC override, and reason alignment
- command, target, session, clearing, billing, and customer reconciliation
- packet completeness, integrity check, retrieval time, and offline verification
- segmentation, access denial, incident record, restore outcome, and export

Do not lead with an average handover success number detached from radio conditions. Record raw events, expected packet links, failed assertions, degraded service states, and reviewer conclusions. A network operator needs evidence a successor can inspect.

GO, NARROW, HOLD, OR STOP

The operator decides whether to proceed

A proof ends with a recorded telecom decision, not with the last successful replay.

RAN, core, NOC, security, regulatory, roaming, billing, privacy, engineering, procurement, and customer-service owners may each own a different production condition. They decide the selected network workflow, population, consequence boundary, profiles and licences, automation band, human gates, integrations, retention, support, recovery, and exit state.

TELECOM PRODUCTION RECORD	Handover H-23 proof decision	
WORKFLOW	**Radio handover from serving to target cell**	BOUNDED
NETWORK	**Named RAN, core, band, cell, and service cohort**	SCOPED
EVIDENCE	**Measurements + profile + licence + score + target**	LINKED
AUTHORITY	**Automation band + NOC override + rollback**	REVIEWED
OPERATION	**Latency, monitoring, incident, restore, support**	OWNED
COMMERCIAL	**QoS, roaming, clearing, bill, complaint**	DATED
DECISION	**Go / narrow / hold / stop**	SIGNED

The signed record should remain understandable after the shift, rollout team, and original network reviewers have moved on.

The smallest credible next step

Run H-23 and a deliberately chosen boundary set beside the operator's existing RAN and core estate. Make the RAN owner, NOC operator, security owner, regulatory owner, billing owner, and archive owner review the same packet. If they cannot answer their different questions without reconstruction, narrow the proof until they can.

PRIMARY ACCEPTANCE CRITERION

The operator can identify the exact measurements, clock, topology, profile, licence, calculation, authority, target effect, service or commercial outcome, and replay result for every selected event.

That is a credible beginning. It is not permission to generalise one handover proof to every network, subscriber, roaming partner, cell, radio release, or regulatory duty.

FIND A SUBJECT

Subject index

Page references point to the substantive explanation, worked example, control, boundary, or decision record, not merely to a passing label.

SUBJECT INDEX CONTINUED

Subject index · P–W

Terms are grouped alphabetically. Consecutive page references are collapsed into ranges.

CLOSING RECORD

Start with the handover you most dread explaining

Choose one network workflow, name its authority, and make the answer retrievable before the regulator, customer, or billing dispute asks for it.

Write the event identity, measurement and clock boundary, cell and topology state, 3GPP and spectrum versions, numeric witness, model or rule manifest, automation band, NOC authority, target receipt, session and commercial effects, packet, verifier, deployment posture, recovery, retention, export, and stop conditions.

Then choose the difficult test: a clock transition, stale measurement, changed neighbour, licence boundary, unavailable target, command timeout, NOC override, roaming mismatch, QoS complaint, billing dispute, or air-gapped restore. A field guide is useful when it makes the hard network state concrete enough to run.

EVENT

One bounded handover, QoS, routing, or roaming decision

Do not begin with the entire network

SOURCE

Measurements, clocks, topology, rule, licence, and target

Each has an effective state

AUTHORITY

Automation band, NOC, regulatory, billing, and customer owners

Roles stay distinct

EVIDENCE

Score, command, target, session, commercial, and packet

Observed state matters

DECISION

Go, narrow, hold, or stop

Signed with rollback and review triggers

THE TELECOM STANDARD

A routing score can be reproduced. A defensible network decision also shows the measurement, clock, topology, rule, authority, actual target effect, service consequence, and packet that existed when the operator acted.