

TAKWA SEBAI - ENGLISH FIELD EDITION

5G MMWAVE LAYER ADDITION

A controlled MOP template for existing Ericsson NR 700 and NR 2600 networks

FIELD PROMISE

Move from design intent to a locked-cell pilot, evidence-based acceptance and a reversible rollout - without inventing node-specific Ericsson commands.

NR 700 coverage foundation confirm live band	NR 2600 capacity layer protect baseline	FR2 / mmWave localized capacity stage and prove
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Planning roles are indicative. The live band, architecture and operator design remain the authority.

A practical field guide for RAN design, rollout, optimization, NOC, transport and acceptance teams.

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By Takwa Sebai - Telecom technical manager, RAN validation and RCA

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Start here

This guide turns a complex FR2 layer addition into a controlled sequence. It is designed to be useful before the exact Ericsson configuration package is available, while making the stop conditions explicit.

What you can take away in 10 minutes

- A seven-gate flow from scope freeze to monitored closure.
- A site-specific input sheet that exposes missing design data before the change window.
- A command-neutral installation and activation sequence for a locked-cell pilot.
- Acceptance checks for alarms, synchronization, transport, RF, mobility, throughput and voice continuity.
- Rollback triggers, containment order and evidence registers ready to adapt.

The one-page rollout map

Stage	Question to answer	Proof before moving on
1. Freeze	What exactly is being added, where and under which architecture?	Approved scope, spectrum, HLD/LLD and live inventory
2. Make safe	Can the site support the radio, power, fibre, timing and exposure conditions?	Permits, calculations, tests and approved BOM
3. Build locked	Can the new objects and hardware be introduced without radiating?	Clean install, baseline diff, zero unresolved blocking alarm
4. Pilot	Does one approved sector work end to end?	UE capability, FR2 use, transport, RF, mobility and service evidence
5. Decide	Is the gain proven without regression on existing layers?	Signed acceptance or immediate rollback decision
6. Expand	Can scope widen without invalidating the pilot evidence?	Explicit authorization, staged batches and observation
7. Close	Is the final state supportable and reproducible?	As-built pack, monitoring record and owned residual risks
STOP AT THE FIRST MISSING PROOF A green import result or an unlocked cell is not acceptance. Missing live inventory, compatibility, spectrum, safety, rollback or test evidence is a stop condition.		

How to use and control this template

PUBLIC TEMPLATE - NOT AN EXECUTION AUTHORIZATION

This document is an educational and planning aid. It becomes executable only after the operator and vendor authorities provide the exact site inputs, current Ericsson CPI, approved configuration and rollback packages, permits and signed change authorization.

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Adaptation record

Operator / programme	Complete before controlled use
Site / node / sectors	Complete before controlled use
Live Ericsson release	Confirm from node inventory and current CPI
Architecture	SA / NSA / NR-CA / NR-DC - freeze the approved option
Existing layers	Confirm exact bands, frequencies, bandwidths and TDD/FDD configuration
Target FR2 layer	Confirm licensed band, channel, bandwidth, TDD pattern and emission limits
Controlled revision	Assign document ID, revision, owner and repository location
Change window	Record approved start, stop, observation and rollback decision times

Mandatory approval record

Authority	Name / role	Ticket or signature	Status
RAN design and vendor technical authority			Required
Change management and NOC			Required
Field safety, EMF and regulatory			Required
Transport and synchronization			Required
Core / IMS when affected			Conditional
Acceptance / performance owner			Required

No approval by silence. Approval must identify the exact scope and revision.

Field-guide map

Section	Use it to
1. Purpose and governing principles	Set the boundaries and preserve the existing service.
2. Engineering decision record	Freeze FR2, architecture, spectrum, hardware and aggregation choices.
3. Site-specific data sheet	Expose every value that cannot remain generic.
4. Roles, risks and prerequisites	Build the evidence gate before field or configuration work.
5. Controlled procedure	Move from baseline to locked creation, one-cell pilot and staged expansion.
6. Acceptance and rollback	Make pass, stop and recovery decisions objectively.
7. Monitoring and handover	Prove the result beyond the first successful speed test.
Appendices	Record commands, evidence, deviations and sign-offs without changing the method.

Evidence chain

CONFIGURED what may be used	ACTIVE what applies now	SCHEDULED what was allocated	DELIVERED what users received
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Do not collapse these states into one conclusion. A configured FR2 carrier does not prove active addition, scheduled resources or delivered service.

COMMAND-NEUTRAL BY DESIGN

Managed-object names, feature keys and execution commands are intentionally omitted. They must come from the approved package for the exact Ericsson node, RAN release, hardware and management environment.

Purpose, scope and governing principles

Purpose

This MOP controls the addition of an Ericsson mmWave NR layer to a live network that already carries NR at approximately 700 MHz and 2600 MHz. It covers design confirmation, site readiness, Ericsson RAN integration, transport and synchronization readiness, controlled activation, service validation, performance observation and rollback.

In scope

- One pilot site, or a precisely identified set of sectors, followed by a gated site or cluster rollout.
- New FR2 radio and supporting RAN Compute, power, optical, mounting, grounding, surge-protection and synchronization work.
- Creation of the mmWave carrier and NR cell, initially locked, using an approved Ericsson configuration delta.
- Relations, mobility, traffic steering and an approved NR carrier-aggregation or dual-connectivity strategy.
- SA and NSA decision controls, including LTE-anchor checks for NSA and 5GC/IMS checks for SA.
- Acceptance with compatible test UEs or CPE, radio measurements, data service and voice continuity where voice is in scope.

Out of scope unless separately approved

- Unrelated software upgrades, core migrations, spectrum refarming or retuning of the existing NR 700 / NR 2600 layers.
- Unapproved feature activation, automated cluster-wide unlock, mass neighbour changes or load-balancing changes outside the named footprint.
- Any Huawei or Nokia managed-object names, thresholds or scripts found in the local corpus.
- Commercial launch, public coverage claims or customer communication before formal acceptance.

Governing principles

Principle	Application
Fail closed	If a mandatory value, approval, script, capability or measurement is missing, stop before impact.
No invented commands	Only the approved Ericsson delta and rollback scripts for the exact node release may be executed.
Single-cell first	Create locked, validate, unlock one cell or sector, observe, then widen the scope.

Principle	Application
Existing service protected	NR 700 and NR 2600 remain the reference service. Any regression beyond the approved threshold triggers containment or rollback.
Evidence at every gate	Timestamped alarms, configuration snapshots, counters, traces and test results form the execution record.
No band inference	The labels NR 700 and NR 2600 are not sufficient to prove n28 and n7. Confirm the live band, frequency and duplex configuration.

Technical basis and engineering decision record

Band references

The following values are standards references, not a site design. The actual operator allocation and national licence remain authoritative.

Layer label	Standards example	Operating range	Duplex	Execution rule
NR 700	n28	UL 703-748 MHz; DL 758-803 MHz	FDD	Confirm live band and channel from the Ericsson node.
NR 2600	n7	UL 2500-2570 MHz; DL 2620-2690 MHz	FDD	Confirm live band and channel from the Ericsson node.
26 GHz mmWave	n258	UL/DL 24,250-27,500 MHz	TDD	Use only if allowed by the operator licence and national coordination.

Source: ETSI TS 138 104 V19.4.0 (3GPP TS 38.104 Release 19), Tables 5.2-1 and 5.2-2.

n258 channel and synchronization-block reference

Item	3GPP reference value	Site-specific decision
Carrier raster at 60 kHz	NR-ARFCN 2,016,667 to 2,070,832, step 1	Complete from approved frequency plan
Carrier raster at 120 kHz	NR-ARFCN 2,016,667 to 2,070,831, step 2	Complete from approved frequency plan
Channel bandwidth at 60 kHz SCS	50, 100 or 200 MHz	Complete from licence, design and Ericsson support
Channel bandwidth at 120 kHz SCS	50, 100, 200 or 400 MHz	Complete from licence, design and Ericsson support
SSB option	120 kHz Case D or 240 kHz Case E; n258 GSCN ranges apply	Complete from radio design and Ericsson CPI

Source: ETSI TS 138 104 V19.4.0, Tables 5.3.5-2, 5.4.2.3-2 and 5.4.3.3-2. Do not derive an operating channel from these ranges without the licensed frequency plan.

Architecture selection

Option	When it applies	Required controls	Decision
SA with NR-CA	The 5GC is active and the supported UE/network combination aggregates FR1 and FR2 carriers.	RAN software and licence, band-combination support, serving-cell strategy, UL control, 5GC and IMS readiness.	Select / reject with design reference
SA with NR-DC	FR1 acts as master cell group and FR2 as secondary cell group where Ericsson and UE support the combination.	Xn/F1/E1 as applicable, SCG configuration, split bearer, mobility and failure handling, test UE capability.	Select / reject with design reference
SA direct FR2 cell	The UE can camp and receive service directly on FR2 in the intended footprint.	Initial access, SSB/beam plan, coverage, registration, PDU session and voice fallback or VoNR behavior.	Select / reject with design reference
NSA / EN-DC	An LTE anchor and EPC-based NSA architecture are present.	Identify LTE master node and anchor bands. Existing NR 700 / NR 2600 cannot replace the LTE anchor in EN-DC.	Select / reject with design reference
Architecture hard gate No cell creation may start until the approved High-Level Design and Low-Level Design identify the architecture, serving and secondary roles, allowed band combinations, user-plane path, mobility model, voice treatment and fallback behavior.			

Ericsson hardware path

Ericsson public material identifies AIR 5322 as an mmWave antenna-integrated radio and documents deployments with RAN Processor / Baseband 6651, 6655, 6672 or 6648 depending on solution generation and use case. These are examples, not a compatibility declaration for the target site. Confirm the exact radio variant, band support, compute generation, ports, fronthaul, software release, licences and power system in current Ericsson CPI and the approved BOM.

Compatibility item	Evidence required before execution
Radio and band variant	Exact product number, hardware revision, n258 or target-band support, regulatory domain and software support.
RAN Compute	Installed board / processor, free compute and cell capacity, supported radio-port mapping and approved expansion path.
Fronthaul	Interface type, optical module, wavelength, fibre path, loss budget, latency, MTU and redundancy.
Software and licences	Exact node software release, Ericsson feature support, licence keys, restart or upgrade dependency and known limitations.
Power and site	DC feed, breaker/fuse, rectifier, battery autonomy, cable size, grounding, surge protection, cooling and structural margin.

Site-specific data sheet - mandatory before approval

Completion rule

Every field below must contain a verified value or a documented N/A with an approver. Text such as 'to be confirmed' is not acceptable at the execution gate.

Change identity

Change / ticket ID	Mandatory site-specific value
Site ID and name	Mandatory site-specific value
gNB / node ID	Mandatory site-specific value
Sectors / cells in scope	Mandatory site-specific value
Maintenance window	Start, end, time zone and freeze boundaries
Change bridge	Conference details and escalation channel
Rollback decision time	Absolute time before window end
Observation period	Minimum period and responsible owner

Live baseline

Item	NR 700 layer	NR 2600 layer	Source / timestamp
Confirmed NR band	Mandatory	Mandatory	Live node export
Duplex / channel / bandwidth / SCS	Mandatory	Mandatory	Live node export
Cell identities / PCI / TAC / PLMN	Mandatory	Mandatory	Live node export
RAN architecture and serving role	Mandatory	Mandatory	HLD / LLD and live trace
Current availability and alarms	Mandatory	Mandatory	NOC baseline
Busy-hour traffic and KPIs	Mandatory	Mandatory	Performance baseline

mmWave design values

Parameter group	Approved value	Source / approver
Target FR2 band and licensed block	Mandatory	Spectrum licence / frequency plan
NR-ARFCN, centre frequency and carrier bandwidth	Mandatory	RAN design

Parameter group	Approved value	Source / approver
Carrier SCS, SSB SCS, GSCN and SSB position	Mandatory	RAN design / Ericsson CPI
TDD frame / slot pattern and synchronization domain	Mandatory	RAN and synchronization design
gNB / cell identity, NCI, PCI, TAC, PLMN, NSSAI	Mandatory	RAN / Core design
SSB beams, azimuth, mechanical/electrical tilt, height	Mandatory	RF design and as-built survey
Power / EIRP controls and EMF exclusion zone	Mandatory	RF / Regulatory / Safety
PRACH, initial BWP, data BWPs and power control	Mandatory	RAN design / Ericsson CPI
Mobility, neighbours, ANR, steering and CA/DC relations	Mandatory	Optimization design
Test devices and supported band combinations	Mandatory	UE capability matrix and lab result

Hardware, transport and synchronization

Domain	Approved value / calculation	Evidence
Radio product number and hardware revision	Mandatory	BOM / delivery / visual inspection
RAN Compute type, slots, ports and capacity headroom	Mandatory	Live inventory and Ericsson dimensioning
Mounting, loading, wind and structural approval	Mandatory	Stamped structural calculation / site approval
DC feed, breaker, cable, rectifier and battery headroom	Mandatory	Power design and live measurement
Grounding and surge protection	Mandatory	Site standard and inspection record
Optical modules, fibres and link budget	Mandatory	Approved optical design and measured result
VLAN / IP / QoS / MTU / routing / ACL / security	Mandatory	Transport and security design
PTP / SyncE / GNSS source, profile and holdover	Mandatory	Synchronization design and live status
Core / user-plane capacity and route	Mandatory	Core and transport acceptance

Roles, communications and safety

Minimum roles on the change bridge

Role	Core responsibility	Named person / contact
Change Manager	Owns scope, gate decisions, timeline, communications and final closure.	Mandatory
RAN Configuration Engineer	Captures baseline, executes approved delta / rollback, records evidence.	Mandatory
Ericsson Technical Authority	Confirms product, release, managed-object, feature and script validity.	Mandatory
Field Team Lead	Owns site access, safety, physical installation and as-built evidence.	Mandatory
Transport / Sync Engineer	Validates fronthaul, routing, QoS, MTU, timing and holdover.	Mandatory
Core / IMS Engineer	Validates 5GC/EPC, UPF/PGW, registration, PDU and voice path as applicable.	Mandatory when affected
NOC / Performance	Monitors alarms, service state, KPIs and customer impact.	Mandatory
Test Lead	Owns devices, route, test cases, logs and acceptance evidence.	Mandatory

Stop-work conditions

- Site-specific MOP values, approved Ericsson scripts or rollback assets are incomplete.
- Spectrum authorization, EMF assessment, work permit, electrical isolation or work-at-height control is missing or invalid.
- Weather, access, lifting or structure conditions are outside the approved method statement.
- A critical or major alarm exists that is unrelated to the planned work and has no written waiver.
- Backup, configuration snapshot, alarm export, KPI baseline or management connectivity cannot be verified.
- Radio, RAN Compute, optical, power, synchronization, feature licence or UE compatibility differs from the approved design.
- Any person observes unsafe work, unexpected service impact or a deviation from the authorized scope.

Safety controls

Hazard	Minimum control before work
Electrical energy	Apply approved isolation / lockout-tagout, verify polarity and absence of hazardous energy, and use rated tools and PPE.

Hazard	Minimum control before work
Work at height / lifting	Approved access and rescue plan, certified anchors and lifting gear, exclusion zone, wind limit and competent personnel.
Laser / fibre	Disable or cap optical sources as required, wear approved eye protection, inspect and clean connectors, never view an active fibre.
RF / EMF	Use the approved cumulative EMF assessment, define and control the exclusion zone, and keep the new transmitter locked until release by the responsible authority.
Weather and environment	Stop for lightning, excessive wind, precipitation or temperature outside the approved safe method.
ESD and equipment handling	Use ESD controls, vendor lifting points, connector protection and weather sealing per Ericsson installation instructions.

Safety basis: local safe-info and fibre-installation references; ICNIRP 2020 RF guidelines; applicable operator, national and Ericsson product-specific instructions take precedence.

Prerequisites and pre-change checks

Documentation and authorization gate

- Approved HLD, LLD, frequency plan, RF design, structural design, power design, transport design, synchronization design and IP/security design.
- Approved spectrum authorization and coordination, including fixed-link or other service coordination where required for 26 GHz.
- Approved cumulative EMF compliance study for all transmitters at the site after the change.
- Current Ericsson CPI / installation guide for the exact radio, RAN Compute, optical, power and mounting products.
- Approved BOM with serial-number reconciliation and all accessories, optical modules, breakers, cables, seals, labels and spares on site.
- Approved node-specific delta and rollback scripts generated for the exact software release and reviewed by a second competent engineer.
- Change ticket, outage/customer-impact statement, maintenance-window approval and bridge contacts.

Management, access and recovery gate

Check	Pass evidence	Status
OSS / ENM or approved management platform reachable	Login and node synchronization timestamp	Pass / fail
RAN node reachable over primary and backup path	Connectivity and management-plane tests	Pass / fail

Check	Pass evidence	Status
Named accounts and least-privilege roles valid	Access check without sharing credentials	Pass / fail
Current configuration backup completed	Backup ID, checksum or inventory reference, timestamp	Pass / fail
Pre-change CM export completed	Read-only node and cell snapshots stored in evidence pack	Pass / fail
Rollback package accessible off-node	Reviewed script and restoration procedure	Pass / fail
Out-of-band contact / access available	NOC and field escalation route tested	Pass / fail

Baseline health gate

Domain	Minimum precheck	Required disposition
Alarms	Export active alarms for node, site, transport, sync, power and core dependencies.	No unexplained critical/major alarm
Cell state	Verify administrative and operational state of all existing NR 700 / NR 2600 cells.	Match approved baseline
Synchronization	Verify source, quality level, phase/time status, alarms and holdover state.	Locked to approved source
Transport	Check ports, errors, discards, packet loss, latency, jitter, MTU and capacity headroom.	Within approved engineering limits
RAN KPIs	Capture at least 7-day trend and recent busy-hour sample where available.	No active degradation under investigation
Core / IMS	Check registration, PDU/session and voice indicators if in scope.	Healthy and stable
Customer impact	Check open incidents and trouble tickets in the target footprint.	No conflicting incident

Baseline KPI pack

KPI family	Examples to capture	Comparison rule
Availability	Cell availability, service state, hardware / sync / transport alarms	No new critical/major condition
Accessibility	RRC setup, registration, PDU/session setup, secondary-cell or secondary-group addition	Against approved baseline and target
Retainability	RLF, abnormal release, session drop, SCG failure	No regression beyond approved threshold
Mobility	Intra/inter-frequency HO, FR1-to-FR2 addition/removal, interruption time	No unacceptable failure or ping-pong
Radio quality	SS-RSRP, SS-RSRQ, SS-SINR, beam / SSB measurements, BLER	Meets RF design at approved test points

KPI family	Examples to capture	Comparison rule
Capacity and throughput	PRB/resource use, active users, DL/UL throughput, latency	Gain demonstrated without lower-layer harm
Voice	IMS registration, call setup, retainability, mobility, packet loss, jitter and delay	No service regression; fallback works as designed

Execution procedure

Execution discipline

Read each step aloud on the bridge, execute only the approved command or physical action, capture output, announce the result, and obtain the next gate decision. Never combine steps to save time.

Phase 0 - Open the change and freeze scope

1. Confirm the change ID, target node, site, sectors, maintenance window, bridge participants and rollback decision time.
2. Read the approved scope and exclusions. Confirm that the cell-level activation sequence is one cell or sector first.
3. Record G0-G4 approvals. If any mandatory approval is absent, stop.
4. Announce the configuration freeze for the named node and dependent transport/core objects.

Phase 1 - Capture the final live baseline

5. Export active alarms and administrative/operational state for all existing NR 700 and NR 2600 cells.
6. Export the current node, radio, transport, synchronization, feature, licence, neighbour, mobility and serving-cell configuration using approved read-only commands.
7. Capture busy-hour or immediate KPI snapshots, depending on the window, and link the longer baseline pack.
8. Complete a fresh backup and verify its identifier and successful status. Confirm rollback assets are readable from a separate location.
9. Compare live inventory, software and licences with the approved LLD and BOM. Stop on any mismatch.

Phase 2 - Perform the physical site installation

10. Apply access, electrical, RF/EMF, work-at-height, weather, lifting and fibre safety controls.
11. Verify the mounting location, azimuth, height, clear line of sight, structural capacity, wind loading and installation clearances against the approved RF and structural drawings.

12. Install the Ericsson mmWave radio and mounting hardware using the exact product installation instruction. Torque, fasteners and weather sealing must follow that instruction.
13. Install and label grounding, surge protection, DC feed, breaker/fuse and power cable. Verify polarity before energizing.
14. Route, protect, clean and connect optical fibres and approved optical modules. Record link identification and measured optical result against the engineered budget.
15. Photograph the completed mounting, cable routing, grounding, labels, weather sealing and equipment serial numbers.
16. Keep the new radio and cell barred / locked until the authorization step.

Phase 3 - Integrate hardware while service remains protected

17. Energize only under the approved power procedure and confirm voltage/current behavior and absence of abnormal site alarms.
18. Confirm the new hardware is discovered with the expected product number, revision, serial number, port and software state.
19. Validate RAN Compute capacity, radio-port mapping, fronthaul link state and optical error counters.
20. Verify existing NR 700 and NR 2600 cell state and traffic before proceeding. Stop and contain any regression.

Phase 4 - Provision transport and synchronization

21. Apply only the approved transport delta for VLAN, IP, routing, QoS, MTU, ACL/security and redundancy as applicable.
22. Verify bidirectional reachability, path, MTU, loss, latency, jitter, port utilization and error/discard counters against the approved design.
23. Configure the approved PTP, SyncE and/or GNSS synchronization path. Confirm clock class/quality, phase/time lock, reference priority and holdover behavior.
24. For n258 TDD, confirm the approved synchronization domain and compatible TDD frame/slot pattern before RF activation.

Phase 5 - Create the mmWave carrier and cell in locked state

25. Load the approved, checksum-identified Ericsson CM plan or script for the exact node software release.
26. Create the required hardware, frequency, carrier, sector-equipment and NR-cell objects with the cell administratively locked.

27. Set only approved identities, frequency, NR-ARFCN, bandwidth, SCS, SSB/GSCN, TDD pattern, beam, PRACH, BWP, power and broadcast values.
28. Validate the plan before commit. A parser success does not replace semantic review of the object model and values.
29. Commit the locked-state delta and capture the job result, object diff and alarms.
30. Verify that existing NR 700 and NR 2600 configuration has not changed outside the approved delta.

Phase 6 - Configure relations, aggregation or dual connectivity

31. Apply the approved serving-cell, neighbour, ANR, measurement, mobility, traffic-steering and load-control delta.
32. Configure only the selected SA NR-CA, SA NR-DC, SA direct-FR2 or NSA EN-DC design. Do not enable multiple architecture options by default.
33. Validate UE band-combination and feature support for each acceptance device. An unsupported combination must not be treated as a network fault.
34. Keep aggressive steering, load balancing and broad cluster relations disabled until pilot acceptance unless explicitly included in the approved design.

Phase 7 - Locked-state validation

35. Confirm configuration consistency, object references, licences, software state and absence of blocking alarms.
36. Confirm radio/fronthaul operational state, power readings, synchronization lock, transport health and security monitoring.
37. Review the post-delta CM diff against the approved delta line by line.
38. Obtain G5 authorization on the bridge to unlock exactly one named mmWave cell or sector.

Phase 8 - Controlled first activation

39. Unlock the named pilot cell only.
40. Confirm administrative and operational state, RF transmission state, SSB/beam presence and absence of new critical/major alarms.
41. Verify that the existing NR 700 and NR 2600 layers remain available and carry traffic normally.
42. If any immediate trigger is met, lock the mmWave cell and start the containment or rollback path.

Phase 9 - Service and radio acceptance

43. Use an approved test UE or CPE with a captured capability profile that supports the selected band and CA/DC combination.
44. At each approved test point, capture serving cell, FR1 and FR2 carriers/groups, PCI, NR-ARFCN, SSB beam, SS-RSRP, SS-RSRQ and SS-SINR.
45. Test registration/attach, PDU or data session, IPv4/IPv6 as applicable, DNS, downlink/uplink throughput and latency using approved servers and traffic limits.
46. Verify mmWave addition/activation and removal/deactivation behavior, not just cell visibility.
47. Perform stationary, pedestrian and drive/walk mobility tests through the target footprint and edge, including blockage and recovery where safe.
48. Where voice is in scope, test IMS registration, mobile-originated and mobile-terminated calls, retainability, mobility and designed VoNR/EPS-fallback behavior.
49. Capture UE logs, network traces, counters and timestamps for every test case.

Phase 10 - Staged expansion

50. Review pilot results and obtain G6 approval before the next cell, sector or site.
51. Repeat locked creation, health checks, single-cell unlock and acceptance for each additional object in the authorized scope.
52. Do not use bulk unlock unless the exact batch, expected object count and rollback have been approved and prevalidated.
53. After each stage, compare alarms, service state and KPIs with the pre-change baseline and prior stage.

Phase 11 - Stabilization and closure

54. Capture the final configuration snapshot, CM diff, alarms, cell states, hardware inventory, synchronization and transport status.
55. Start the agreed observation period. Monitor existing and new layers separately and as a combined service.
56. Complete as-built records, test results, photographs, script checksums, deviations and residual risks.
57. Close only after G7 approval. Transfer any optimization work to a separate controlled change.

Ericsson configuration delta checklist

This checklist defines the semantic content that the approved Ericsson script must implement. It is not a list of commands or managed-object names.

Configuration area	Required review	Evidence / status
Hardware and radio mapping	Radio product/port mapping, sector equipment, RF branch, fronthaul and RAN Compute capacity.	Approved delta / CM diff
Carrier and spectrum	Band, licensed block, NR-ARFCN, centre frequency, bandwidth, SCS, raster and guard/coexistence controls.	Frequency plan / regulator approval
Cell identity	gNB ID, NCI, cell local ID, PCI, PLMN, TAC, tracking/registration and slicing values.	RAN/Core design
TDD and timing	Frame/slot pattern, UL/DL direction, synchronization source/domain, timing offsets and co-channel coexistence.	Sync design / live lock
SSB and beams	SSB SCS, GSCN, beam/SSB pattern, azimuth/tilt, coverage intent and initial access.	RF design / field verification
PRACH and BWPs	PRACH, initial and dedicated BWPs, control/search spaces, power control and UE support.	Ericsson design record
Mobility	Measurements, thresholds, time-to-trigger, neighbours, conditional procedures if used, failure recovery and edge behavior.	Optimization design
CA / DC / serving role	PCell/PSCell/SCell or MCG/SCG role, allowed band combinations, activation/deactivation, bearer and UL strategy.	Architecture design / UE matrix
Traffic policy	Steering, load balancing, admission, QoS, slicing and energy features, initially conservative.	Approved policy delta
Core and transport	Interfaces, routes, QoS/DSCP, MTU, security, UPF/PGW path and capacity.	Transport/Core acceptance
Licences and software	Feature keys, software package, compatibility, known limitations and restart dependency.	Ericsson CPI / licence report
Rollback	Reverse object order, relation removal, cell lock/delete rules and restoration of baseline values.	Approved rollback script
Critical semantic check The cell must be created locked. Relations and CA/DC configuration must be consistent on both sides. SCell addition is distinct from activation, and release is distinct from deactivation. Acceptance must prove the intended state transitions with a supported UE.		

Acceptance test plan and pass criteria

Immediate activation checks

ID	Test	Pass criterion	Evidence
A01	Cell and hardware state	New radio, transport, sync and mmWave cell are operational with no unapproved critical/major alarm.	OSS export and screenshots
A02	Existing-layer protection	All in-scope NR 700 and NR 2600 cells remain in their approved states and traffic trend is normal.	Before/after state and KPI diff

ID	Test	Pass criterion	Evidence
A03	RF transmission	Approved SSB/GSCN and beams are detected at planned points; measurements align with the RF design tolerance.	Scanner / UE log and map
A04	Synchronization	Approved time/phase source is locked; no TDD sync or timing alarm; holdover behavior is acceptable.	Node and transport sync status
A05	Transport	No new link errors/discards; loss, latency, jitter, MTU and utilization remain within approved limits.	Transport counters and tests

Functional and mobility checks

ID	Test	Method	Pass criterion
F01	UE capability	Capture device model, firmware and network capability/band-combination report.	Device supports the selected FR2 band and architecture combination.
F02	Initial access / registration	Cold and warm start at approved points.	Registration or attach and service setup succeed repeatedly within project target.
F03	FR2 addition and use	Start traffic under FR1 coverage and enter FR2 footprint.	The intended SCell/SCG/FR2 carrier is added and carries traffic.
F04	FR2 release and recovery	Leave or block FR2 coverage, then return.	Service continues on FR1 as designed; FR2 releases and re-adds without abnormal failure.
F05	Data service	Approved DL/UL traffic and latency tests against controlled server.	Meets project target and improves hotspot capacity without harming existing layers.
F06	Mobility	Walk/drive route across center, edge, blockage and return.	No unacceptable RLF, ping-pong, drop or prolonged interruption.
F07	Voice	MO/MT calls, hold, mobility and fallback as applicable.	IMS and voice behavior matches architecture; no packet-quality regression.
F08	Multi-user / load	Controlled load with approved number of devices or traffic generator.	Stable scheduling, no resource saturation outside design and no transport bottleneck.

KPI acceptance

Absolute thresholds must come from the operator acceptance specification and the approved RF/performance design. Where no absolute threshold is specified, compare against the frozen baseline and document the agreed maximum regression before the change.

KPI family	Pilot acceptance rule	Observation rule
Availability / alarms	No new unapproved critical/major alarm and no existing-layer outage.	Stable for the full observation period.
Accessibility	Meets project target for registration, RRC/session and FR2 addition.	No worsening beyond approved delta.

KPI family	Pilot acceptance rule	Observation rule
Retainability	No abnormal release pattern, RLF or SCG failure trend.	No statistically meaningful regression.
Mobility	All route cases pass; failures are explained and accepted.	Handover/addition/removal trends remain within approved limits.
Throughput / latency	Target hotspot gain demonstrated with controlled server and radio conditions.	Busy-hour gain persists without transport saturation.
Voice	Designed voice and fallback cases pass.	No IMS, setup, drop, packet-loss, jitter or delay regression.

Acceptance decision

Pilot result	PASS / CONDITIONAL PASS / FAIL
Open defects	List defect IDs and owners
Accepted deviations	List with written approver
Expansion authorization	Approved scope and timestamp
Observation end	Timestamp and owner
Final G6 / G7 decision	Name, role, timestamp and signature

Rollback and containment plan

Rollback triggers

Trigger	Immediate action	Decision owner
Unsafe condition, EMF boundary breach or site incident	Stop work, make the site safe and keep the new transmitter locked.	Field / Safety Lead
Existing NR 700 / NR 2600 outage or material KPI regression	Lock the mmWave cell and assess whether relations or hardware caused the impact.	Change Manager / NOC
Critical/major hardware, fronthaul, transport, sync or power alarm	Contain the new layer; restore the last known-good state if not resolved inside the agreed timer.	RAN / Transport
Wrong frequency, identity, TDD pattern, SSB, power or beam behavior	Lock immediately. Do not optimize live. Execute approved rollback.	RAN Design Authority
Registration, session, mobility or voice failure above approved threshold	Stop expansion; lock the pilot layer if service impact persists.	Test Lead / Core / RAN
Rollback decision time reached without full acceptance	Rollback unless the Change Manager receives an explicit approved extension.	Change Manager

Preferred containment sequence

- Freeze further changes and announce the trigger, timestamp and affected scope on the bridge.
- Lock the new mmWave cell or cells. Confirm existing NR 700 and NR 2600 service state.
- Disable or remove only the approved mmWave CA/DC, neighbour and steering relations in reverse order if they are implicated.
- Run the approved node-specific rollback script and capture every result. Do not manually improvise object deletion order.
- If required, revert transport and synchronization deltas using their approved rollback procedures.
- If hardware isolation is required, follow the field electrical and fibre safety method. Preserve evidence and equipment state for fault analysis.
- Restore the approved configuration snapshot only through the authorized Ericsson recovery procedure if targeted rollback is insufficient.
- Verify alarms, cell states, configuration diff, KPIs, registration/session and voice on the existing layers before declaring recovery.
- Keep the failed mmWave layer locked. Open a problem record and schedule a separate corrective change.

Rollback success criteria

Check	Success criterion	Evidence
Configuration	Post-rollback diff matches the approved pre-change baseline except documented harmless metadata.	CM export and diff
Existing cells	NR 700 and NR 2600 administrative/operational state restored and stable.	OSS state export
Alarms	No new change-related critical/major alarm remains.	Alarm export
Transport / sync	Pre-change routing, counters and timing state restored.	Transport and sync checks
Service	Registration/session, data and voice checks pass on existing service.	Test log
Performance	KPIs return within the pre-agreed baseline tolerance.	Performance report

Post-change monitoring and handover

Interval	Required checks	Owner / evidence
0-30 minutes	Alarms, cell states, sync, transport, power, UE access, FR2 use, existing-layer service.	NOC / RAN live log

Interval	Required checks	Owner / evidence
30 minutes-2 hours	Accessibility, retainability, mobility, resource use, throughput, latency, voice and customer incidents.	Performance dashboard and test log
First busy hour	Traffic distribution, FR2 offload, PRB/resource utilization, transport headroom, CA/DC success and failure patterns.	Performance report
24 hours	Daily trend, recurring alarms, energy/power, sync stability, session/voice KPIs and incidents.	Operations review
7 days or project period	Weekday/weekend and busy-hour comparison, hotspot gain, mobility edge and regression analysis.	Signed acceptance report

Handover package

Artifact	Required contents
As-built design	Final band, frequency, cell IDs, PCI, beam/azimuth/height, hardware, port, fibre, power, transport and sync details.
Configuration pack	Approved delta and rollback scripts, checksums, pre/post CM exports and exact execution outputs.
Evidence pack	Alarms, states, KPIs, traces, UE logs, photographs, optical and power results, timestamps and sign-offs.
Operations record	Monitoring dashboards, known limitations, escalation path, spares and maintenance notes.
Defect register	Open issues, severity, workaround, owner, due date and explicit acceptance or rollback decision.

Appendix A - Controlled execution log

Time	Step / action	Approved command or document ID	Result	Operator / witness

Time	Step / action	Approved command or document ID	Result	Operator / witness

Appendix B - Approved command-sheet register

Command-sheet rule

Attach the generated Ericsson command or CM plan as a controlled annex. Record its checksum and two-person review here. This MOP intentionally contains no guessed AMOS, ENM or managed-object commands.

Asset	File / plan ID	Checksum	Node / release	Reviewer / approval
Precheck command sheet				
mmWave locked-cell delta				
Relations / CA / DC delta				
Unlock / activation instruction				
Rollback script				
Transport / sync delta and rollback				

Appendix C - Field and test evidence register

Evidence ID	Description	Timestamp / location	File or system reference	Accepted by

Evidence ID	Description	Timestamp / location	File or system reference	Accepted by

Appendix D - Deviation and residual-risk register

ID	Deviation / risk	Impact	Mitigation	Owner / due date	Approver

Public references and use limits

Standards and primary references

- [ETSI TS 138 104 V19.4.0 - NR base-station radio transmission and reception](#)
- [ETSI TS 138 101-2 V19.4.0 - NR UE radio transmission and reception, Range 2 standalone](#)
- [ETSI TS 138 101-3 V19.5.0 - NR UE Range 1 and Range 2 interworking](#)
- [3GPP TS 38.300 - NR and NG-RAN overall description](#)
- [Ericsson Macro radio portfolio](#)
- [Ericsson RAN Compute portfolio](#)
- [Ericsson Radio Site System](#)
- [Ericsson Network Synchronization](#)
- [European Union 26 GHz band Decision 2019/784](#)
- [CEPT ECC Report 303 - 26 GHz coexistence toolbox](#)
- [ICNIRP radiofrequency exposure guidelines](#)

Use limits

NOT A SUBSTITUTE FOR CURRENT RESTRICTED DOCUMENTATION

Public references cannot establish the managed-object model, node-release compatibility, feature keys, site-specific installation values, operator policy or national authorization. Current Ericsson CPI, live-node exports, licensed software, approved HLD/LLD and regulator conditions remain mandatory.

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About the author

Takwa Sebai works across 4G/5G RAN validation, field evidence and root-cause analysis. Her field guides connect configuration, live state, protocol evidence, KPIs and the boundary of what the data can actually prove.

NEED AN INDEPENDENT EVIDENCE REVIEW?

Use this guide to freeze the inputs and run the pilot. For an independent review of the evidence path, visit takwasebai.com/en/#contact. Do not send confidential traces through unsecured channels.

[Contact Takwa Sebai](https://takwasebai.com/en/#contact)