Dweve
Weaving Intelligence

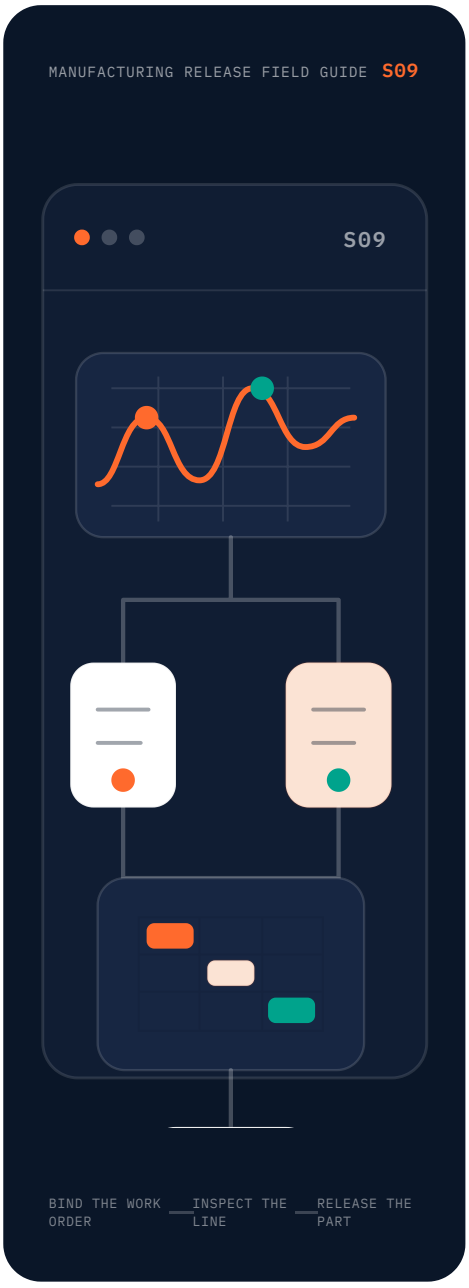
ENGLISH SOURCE EDITION · JULY 2026

MANUFACTURING RELEASE FIELD GUIDE · S09

The manufacturing release field guide

One work-order release, followed from the MES and SPC traces to the line-lead signature, serial genealogy, and audit packet.

MES AND SCADA
SPC AND CMM
SERIAL GENEALOGY
LINE-LEAD SIGNATURE



Not a generic industrial-AI brochure. One work-order release with its lot, measurements, tolerance rule, operator, rework, serial, and replay kept together.

S09

CONTENTS

The part, from work order to signed release

This field guide stays with WO-4f9e on shift 2. The SPC samples, ISO 2768-mK tolerance, CMM result, rework, line lead, serial, and recall path remain connected.

PRIMARY READERS	READING DEPTH	DECISION THIS SUPPORTS
manufacturing release field guide domain, operations and assurance teams	Sector specialist	A manufacturing working book for plant, quality, safety, maintenance, supply-chain, OT/IT, product compliance, operators, customers, and auditors.

HOW TO USE IT

Replace WO-4f9e with one real work order, incident, maintenance decision, or release. The plant supplies the actual process, specification, calibration, safety, quality, genealogy, and recall truth.

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 PRODUCTION QUESTION

The line is easy. The release history has to survive the audit.

The plant must recover the work order, material lots, measurements, standard version, rework, operator, and final effect without reconstructing today's version from paper and spreadsheets.

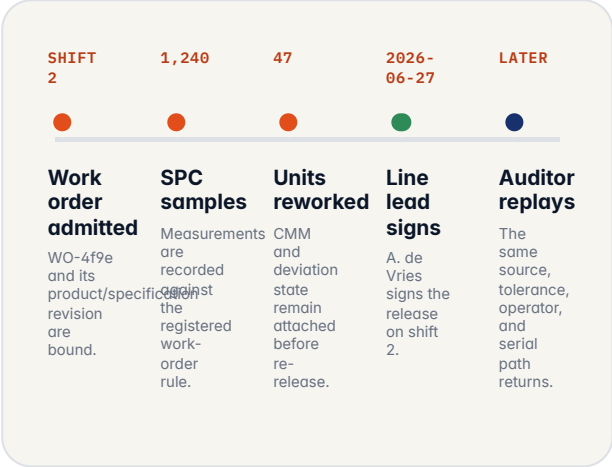
The illustrative record asks: why was WO-4f9e released with 96.2% quality yield? The answer is not "the model passed it." It is the MES production log, SPC samples across 1,240 units, ISO 2768-mK tolerance, CMM inspection, 47 reworked and re-released units, and line lead A. de Vries signing on 2026-06-27 shift 2.

A release has several audiences

The operator needs the live state and safe next action. Quality needs the measurement, deviation, and release basis. The auditor needs the specification and evidence. The customer needs serial and lot genealogy. Safety and maintenance need their own authority and method. One spreadsheet rarely binds all of them.

RELEASE TEST

If the work order, SPC trace, CMM evidence, rework, operator, and serial cannot be opened from one decision identity, the release was never inspection-ready.



The release time series is part of the product record, not just a chart behind it.

MEASUREMENT VERSUS PRODUCTION AUTHORITY

A pass is not a release decision

A model or quality rule can produce a result. The plant still needs the specification, calibration, safety state, quality role, and target effect around it.

The measurement can remain unchanged while the release becomes accountable and traceable.

The release path binds the work order, product revision, raw lots, process state, measurement quality, tolerance or safety rule, model or calculation, operator and quality role, rework, and target receipt. Existing MES, ERP, QMS, and SCADA systems can remain authoritative at their boundaries.

Keep four values separate

- source: what the sensor, SPC, CMM, or supplier record showed
- rule: which specification, tolerance, standard, or safety method applied
- compute: how the quality, OEE, risk, or maintenance result was derived
- release: who permitted the part, work order, label, or maintenance effect

NO SYNTHETIC QUALITY VOICE

A language layer can summarise a release. It should not invent a measurement, widen a tolerance, or silently substitute for quality or safety authority.

01

WORK-ORDER RELEASE

Keep one production release exact from sample to serial

The work order is small enough to replay and consequential enough to expose every hidden assumption in the plant record.

The release is a plant effect, a quality artefact, and a future customer or CE question at once.

LOT, SERIAL, MEASUREMENT, AND REWORK

The work order has a genealogy

A finished serial without its material, sub-assembly, process, test, and release history is not a complete production record.

WO-4f9e is an illustrative release record. A production contract binds the work order and product revision to raw material lots, supplier certificates, sub-assembly serials, process and measurement evidence, deviations, rework, operator and quality state, warehouse release, and final serials.

Bind the production context

- work order, product, recipe, revision, line, shift, and serial range
- raw lots, supplier certificates, sub-assemblies, and material status
- SPC/CMM readings with units, calibration, clock, quality, and sample identity
- specification, tolerance, safety standard, model, method, and effective revision
- deviation, rework, quality review, label/warehouse effect, and recall retention

`work.identity` BOUND

Work order

WO-4f9e · shift 2 · product revision

`material.genealogy` LINKED

Materials

Raw lots, supplier certificates, and sub-assembly serials

`quality.samples` MEASURED

Inspection

SPC across 1,240 units; CMM and calibration state

`quality.rework` RESOLVED

Rework

47 units reworked and re-released with deviation state

`release.owner` SIGNED

Release

A. de Vries signed 2026-06-27 on shift 2

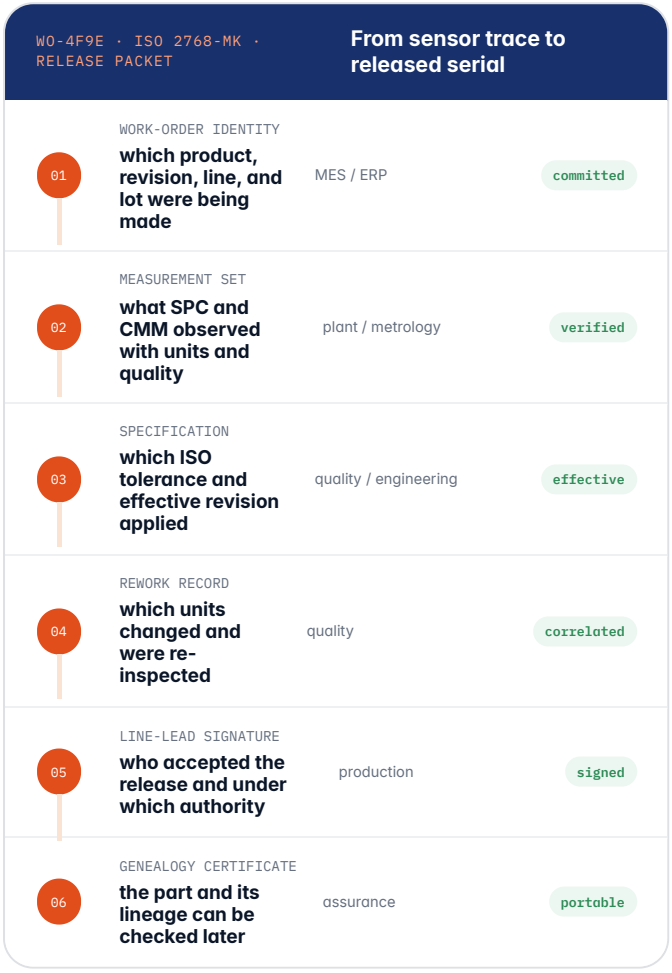
GENEALOGY RULE

The serial record should resolve its origin and release without requiring a second, contradictory genealogy in a spreadsheet or recall tool.

TOLERANCE, CALIBRATION, AND STANDARD

The specification has an effective version

A tolerance current today may not be the tolerance that released the part on the production date.



The work order, rule, measurement, rework, owner, and serial remain one chain without making a quality result look simpler than it is.

Spindle can preserve specification and standard lineage. Charter can represent change and quality ownership. Fabric can hold the release record. The plant's quality and safety roles decide which standard is applicable and what to do when measurement, calibration, or source state is incomplete.

Historical specification questions

- Which product revision, tolerance, standard, and work instruction were effective?
- Did a change notice cross the work-order or rework event?
- Can the auditor open the exact SPC/CMM evidence and source quality?
- Did the MES, QMS, warehouse, and serial record close on the same release identity?

NO CURRENT-SPEC SUBSTITUTION

Replay must resolve the tolerance in force when the part was released, not silently apply the engineering revision current after the audit.

OPERATOR, QUALITY, AND SAFETY AUTHORITY

The line lead signs the final release

A named operator or quality lead is part of the production decision, not a label added after automation has already released the part.

The plant can distinguish a measurement result, a quality judgement, an operator release, and a warehouse or customer effect.

The signature needs context

- which work order, lots, samples, calibration, and standard were visible
- which quality, safety, and rework state applied
- whether the operator or quality lead accepted, changed, or stopped release
- what MES, QMS, warehouse, label, and serial targets acknowledged
- which recall, customer, or CE evidence remains available

Nexus can represent the operator and quality task, challenge, escalation, and receipt. The plant's safety and quality procedures define who may release, override, quarantine, or stop the line.

MES, QMS, SCADA, AND GENEALOGY

The part record crosses systems, not boundaries

A production layer is useful when existing plant systems remain authoritative and the boundary around the release is observable.

The release layer helps the plant agree on one decision identity without creating a parallel MES or shadow genealogy.

Integrate through plant interfaces and OT trust boundaries. Document units, sample order, calibration, retries, idempotency, label and warehouse effect, serial correlation, operator identity, and what happens when SCADA, MES, QMS, or supplier evidence returns an unknown state.

Keep effects explicit

- no duplicate release or label after a retry
- no warehouse movement without a correlated quality state
- no operator acknowledgement mistaken for field or customer receipt
- no recipe, measurement, or genealogy export beyond the declared boundary

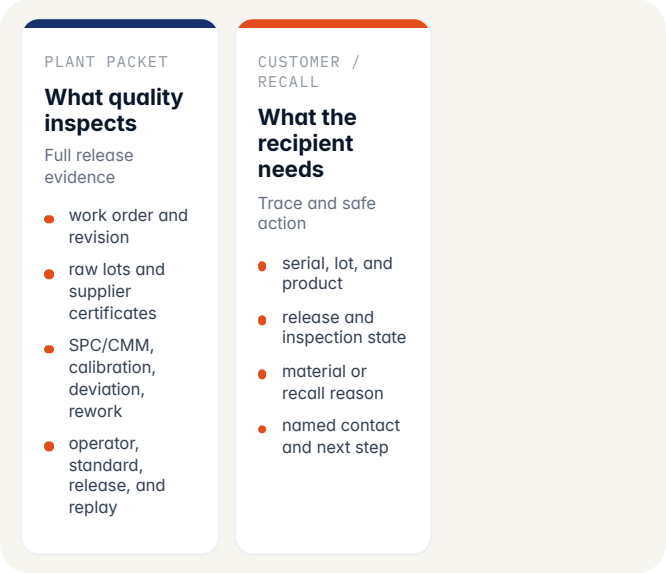
PLANT ACCEPTANCE

The release is not closed when the decision layer sends it. It is closed when the authoritative target, quality record, and serial packet agree on what happened.

GENEALOGY AND DISCLOSURE

A customer card is not the plant packet

The auditor and plant can inspect a deep release record while a customer receives the serial, batch, quality, and contact information relevant to the part.



Customer traceability is useful when it is drawn from the signed genealogy, without exposing unrelated recipe or supplier detail.

A customer, auditor, or regulator may need to trace a part back to the raw material lot and forward to affected serials. They do not automatically need confidential process parameters, unrelated supplier data, or another customer's production history.

Traceability questions

- Which work order, line, shift, lot, and serial are involved?
- Which specification, test, deviation, and release state applied?
- Were units reworked, quarantined, or re-released?
- Can affected serials be found without guessing from a spreadsheet?
- Who owns the recall, customer, warranty, or auditor response?

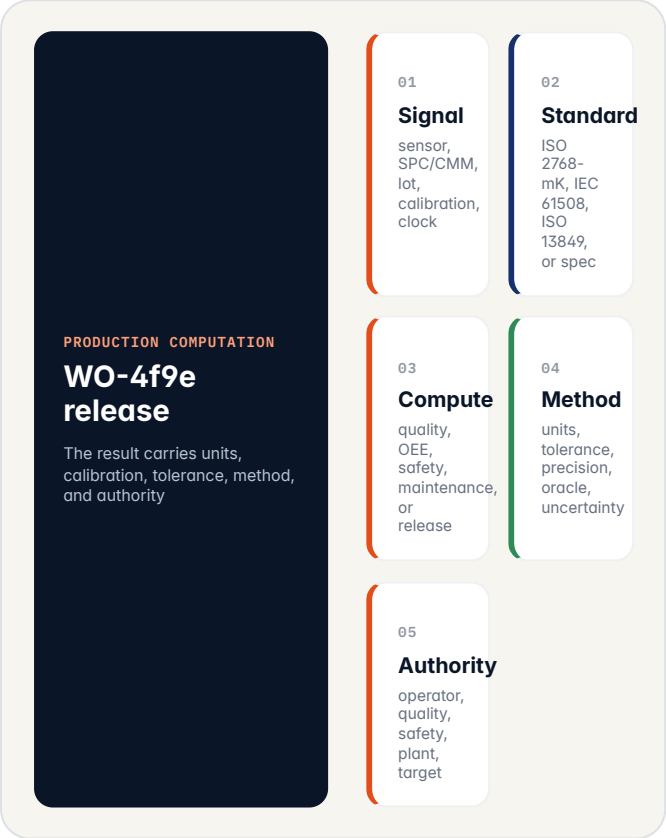
NO ANONYMOUS PART

A serial without a named release, measurement record, and genealogy is a product identifier, not a defensible production record.

EXACT CALCULATION, STANDARDS, AND UNCERTAINTY

Safety and OEE need declared methods

SIL/PL, OEE, stability, and maintenance numbers can fail through float drift, calibration, standard skew, and unrecorded assumptions.



A production number is replayable only when its unit, calibration, standard, method, uncertainty, and authority travel with it.

the published material describes SIL/PL calculation on integer arithmetic pinned to IEC 61508 and ISO 13849, and OEE or stability paths checked against MPFR 256-bit precision with a published 0 ULP result in the documented domain. Treat these as claims to reproduce under a defined plant scope, not as a blanket certification of every production method.

Method acceptance

- same samples, specification, calibration, and supported runtime produce the same result
- units, tolerances, rounding, standard, and uncertainty are declared
- high-precision reference checks the published output
- safety, OEE, maintenance, and quality edges exercise corners and ranges
- method failure becomes hold, rework, quarantine, escalate, or refuse

NO INVENTED SAFETY

A deterministic calculation does not make a machine safe by itself. The plant retains hazard analysis, validation, qualified engineering, and emergency-stop responsibility.

RELEASE, QUALITY, SAFETY, MAINTENANCE, GENEALOGY

Run the proof against plant edge cases

The audit is defined by the moments when samples, lots, standards, operators, targets, or safety states do not cooperate.

TEST SLICE	INTRODUCE	EXPECTED OBSERVATION
Normal release	WO-4f9e, 1,240 units, SPC/CMM, A. de Vries	release, serial, and packet close together
Spec boundary	standard or work-instruction change near event	historical revision remains resolvable
Measurement defect	stale, missing, skewed, uncalibrated, or conflicting sample	hold, inspect, or named degraded path
Material gap	missing supplier certificate or lot link	no release; genealogy remains incomplete
Rework	out-of-tolerance unit, correction, and re-inspection	original and final state remain linked
Safety boundary	SIL/PL method, hazard, or engineer authority uncertain	no unsafe release; escalation opens
Target uncertainty	MES, warehouse, label, or serial receipt missing	no blind retry; reconcile before effect
Recall / recovery	serial query, offline restore, and auditor replay	same packet and affected set remain available

A green release is one test case. The proof needs boundary cases across the selected plant workflow.

Measure production truth

- sample freshness, calibration, units, and clock alignment
- specification, model, numeric, and method version resolution
- operator, quality, safety, and engineering authority
- MES, QMS, warehouse, serial, customer, and recall correlation
- hold, rework, quarantine, incident, restore, and independent replay
- OT keys, egress, access, signed updates, and packet disclosure

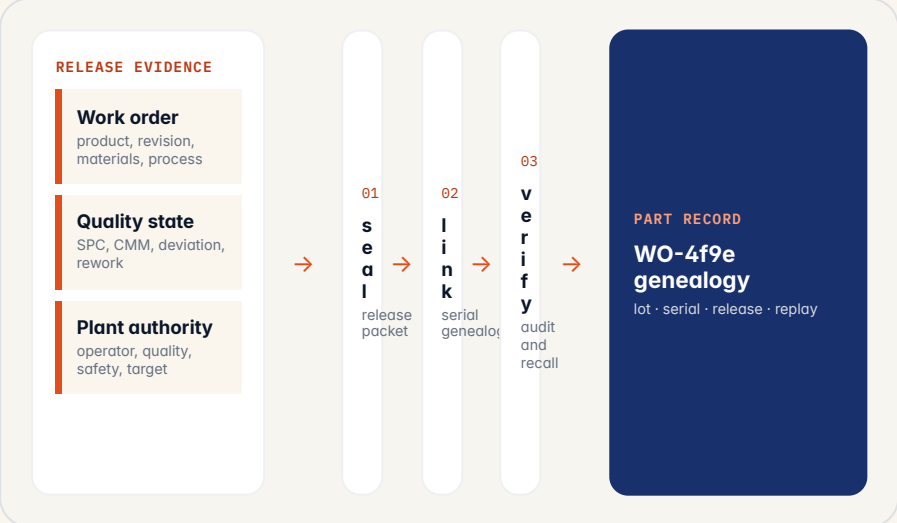
Keep the oracle, lot and serial snapshots, source standards, calibration records, test corpus, release metadata, raw outputs, rework history, genealogy, packets, and verdicts. A plant KPI is not a complete release record.

02

THE PRODUCTION PACKET

Let the release travel with the part without multiplying the genealogy

CE, quality, customer, warranty, recall, and engineering views can draw from the same signed history while preserving their different purposes.

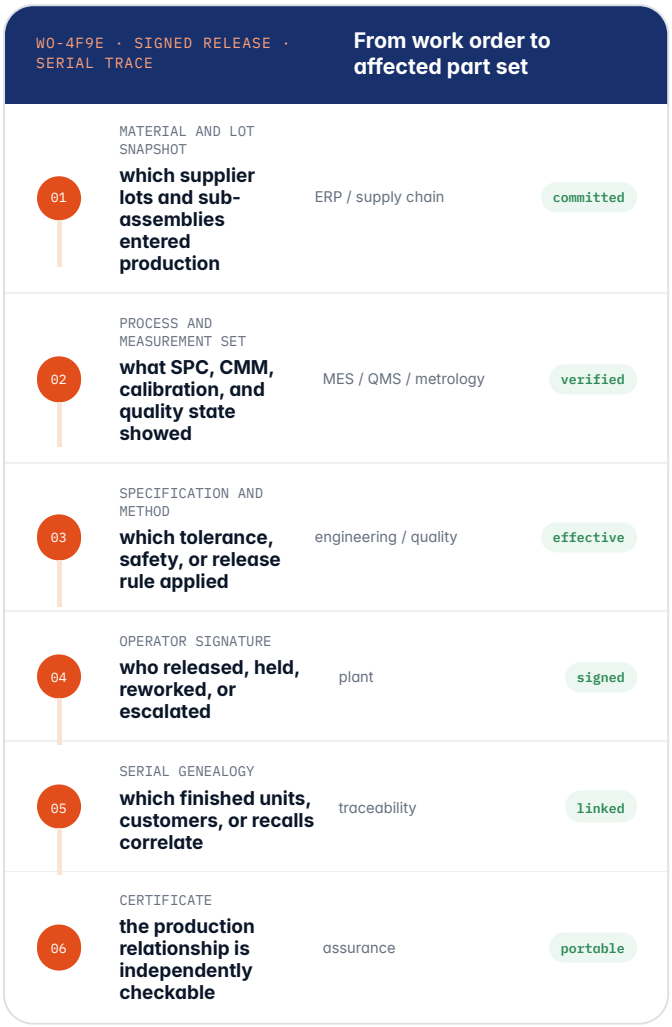


A shared packet reduces reconstruction work. It does not make every customer, plant, or safety view identical.

EVIDENCE, GENEALOGY, AND INSPECTION

The release packet is also a recall input

The auditor, quality lead, customer, warranty team, and engineer should be able to open the same release identity later without asking the shift to remember it.



The packet is a production evidence spine. Recall and inspection views consume it; they do not replace it.

AION can provide a portable certificate for the selected release. Ledger can preserve the event chain. Fabric can hold the work record. The plant still owns quality, safety, conformity, recall, warranty, and customer duties.

Replay must state its domain

- same work order, lots, samples, standard, method, and supported verifier
- same result within declared exactness or tolerance
- same operator, target, warehouse, and serial correlation
- same hold, rework, quarantine, or unknown state when evidence is unavailable

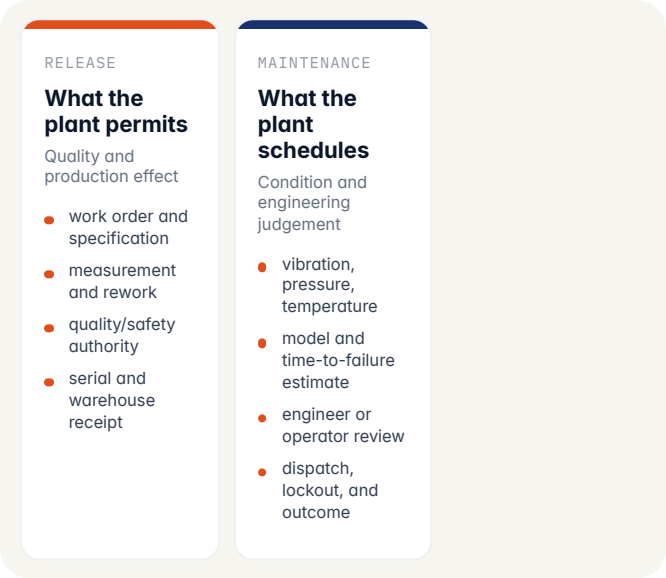
READ-ONLY AUDIT

The verifier should inspect the packet on approved hardware without gaining authority to release a part, alter a genealogy, or change a safety state.

OEE, PREDICTION, SAFETY, AND RELEASE

Maintenance is a different plant decision

The packet discipline can carry a sensor prediction without pretending that a maintenance recommendation is an emergency stop or a quality release.



The same exactness and evidence discipline can support both workflows while their effects, safety roles, and uncertainty stay distinct.

the published material describes predictive maintenance with vibration, pressure, and temperature traces, model version, deterministic prediction, and signed maintenance dispatch. A plant proof must declare sensor quality, asset identity, model domain, maintenance method, lockout/safety state, and what target received the work order.

Maintenance questions

- Which asset, sensor trace, calibration, and operating state entered?
- Which model, threshold, and version produced the prediction?
- Was the recommendation reviewed by an engineer or operator?
- Did the dispatch create a work order, lockout, or no action?
- Can the prediction and actual outcome be replayed after a model update?

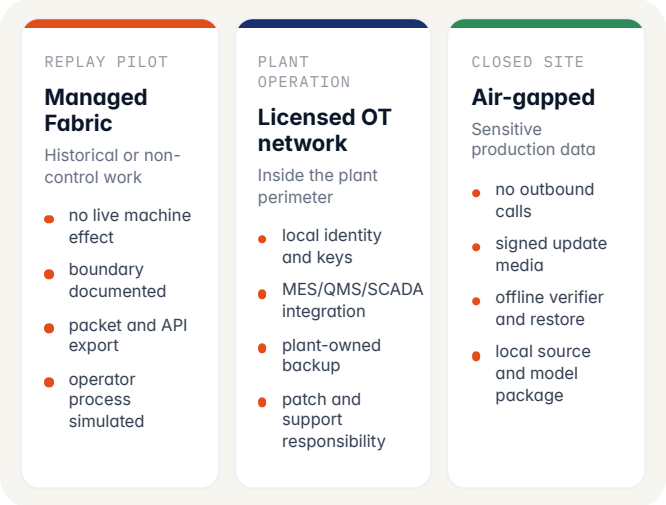
NO PREDICTIVE AUTHORITY

A time-to-failure estimate is not permission to ignore an alarm, bypass a lockout, or close a maintenance action without the plant's safety process.

MANAGED, OT-NETWORK, OR AIR-GAPPED

Deployment is a plant control decision

The production workflow can be evaluated in different postures, but each changes OT data, keys, support, update, and recovery evidence.



A plant should prove the actual data and effect paths for the posture in which it will rely on the release or maintenance decision.

Start with historical replay or shadow release. Expand only after plant, quality, safety, engineering, OT security, maintenance, supply chain, and assurance owners can inspect the same packet and agree on hold, rework, incident, recall, and recovery states.

Posture evidence

- OT ingress, egress, historian, packet, backup, and deletion paths
- key custody, signed packages, update rollback, support, and emergency operation
- MES, QMS, SCADA, model, specification, and numeric artefact availability
- release, warehouse, label, maintenance, and serial reconciliation after timeout
- offline replay, restore, incident, recall, and plant continuity

NO OT SHORTCUT

Managed, licensed, or air-gapped is a posture choice. The plant agreement and observed evidence define the real boundary around measurements, recipes, keys, models, and effects.

CUSTOMER, AUDITOR, AND SAFETY REVIEW

The recall path is part of the release

A plant can make a release reproducible without making proprietary process detail or unrelated customer genealogy public.

Traceability can be useful without turning every recipe, supplier record, or customer relationship into public data.

The recall answer needs context

- which work order, lots, serials, line, shift, and release state apply
- which standard, measurement, deviation, or rework affected the part
- which quality, safety, plant, customer, and recall role owns the response
- whether CE, warranty, regulator, or customer notification is required
- what shipment, contact, quarantine, and correction events were recorded

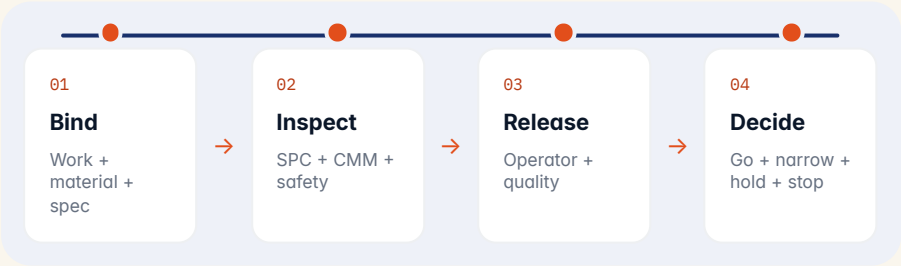
The same signed release can support a customer trace, CE audit, quality review, warranty case, and recall, with each audience receiving only the data and action authorised for it.

03

THE PRODUCTION PROOF

Prove the selected plant workflow before relying on it

Work order, measurement, safety, operator, genealogy, deployment, recovery, recall, and stop conditions turn the published proposition into evidence.



The proof ends in an evidence-backed, reversible production decision, not a pass/fail screenshot.

THE PRODUCTION TEST

Run the acceptance corpus across the plant

Release, quality, safety, maintenance, and genealogy are defined by their boundary states as much as their normal result.

TEST SLICE	INCLUDE	EXPECTED OBSERVATION
Normal release	WO-4f9e, 1,240 units, SPC/CMM, line-lead signature	release, serial, and packet close together
Spec transition	work instruction or standard changes near event	historical revision remains resolvable
Measurement correction	calibration, unit, sample, or CMM issue	hold or rework with named owner
Material defect	supplier lot or certificate missing	no release; affected set remains bounded
Safety method	SIL/PL calculation, hazard, engineer review	unsafe case refuses or escalates
Maintenance action	sensor, model, threshold, dispatch, outcome	prediction and effect remain distinct
Target uncertainty	MES, label, warehouse, or serial receipt missing	no blind retry; reconcile state
Recall / recovery	serial query, offline restore, audit replay	same packet and affected set remain available

One passing release does not prove every line, product, standard, model, or safety workflow. The selected boundary must be named.

Measure the production decision

- measurement freshness, calibration, units, and source integrity
- specification, model, numeric, and method version resolution
- operator, quality, safety, engineering, and maintenance authority
- MES, QMS, warehouse, serial, customer, and recall correlation
- hold, rework, quarantine, incident, restore, and independent replay
- OT keys, egress, support, signed updates, and packet disclosure

Keep the oracle, work-order fixtures, lot and serial snapshots, source standards, calibration records, release metadata, raw outputs, rework history, genealogy, packets, and verdicts. A plant KPI is not a complete acceptance result.

GO, NARROW, HOLD, OR STOP

The plant decides whether to proceed

A proof ends with an accountable production, quality, safety, engineering, and customer decision, not a benchmark score.

The accountable group decides whether the selected release, quality, maintenance, safety, or genealogy workflow may proceed, for which product, line, standard, material population, operator roles, deployment posture, warehouse/customer effect, recovery plan, and stop conditions. Plant, quality, safety, engineering, OT security, supply chain, procurement, and oversight owners may each own a condition.

MANUFACTURING PRODUCTION RECORD	WO-4f9e release proof decision	
WORKFLOW	**Finished work-order and serial release**	BOUNDED
PLANT BOUNDARY	**Named line, product revision, lots, serial cohort, and shift**	SCOPED
INPUTS	**MES + SPC/CMM + specification + rework + method**	LINKED
AUTHORITY	**Operator, quality, safety, warehouse, customer, recall owners**	REVIEWED
OPERATION	**OT boundary, monitor, incident, restore, support**	OWNED
EXIT	**Export, verifier, rollback, quarantine, stop trigger**	DATED
DECISION	**Go / narrow / hold / stop**	SIGNED

The record should remain useful when the standard changes, the line lead changes, or a customer asks for genealogy years later.

The smallest credible next exercise

Replay one historical work order or maintenance decision, then introduce one boundary failure selected by the plant: spec transition, calibration issue, missing certificate, rework, safety method, target timeout, recall query, or offline restore. Have plant, quality, safety, engineering, OT security, supply chain, customer, and assurance inspect the same packet.

PRIMARY ACCEPTANCE CRITERION

The plant can identify the exact work order, material and measurement evidence, specification, method, operator action, target state, genealogy, and replay verdict for every selected release.

That proves one production slice. It does not authorise generalisation across every line, product, machine, safety function, model, or customer 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

Make the release replayable before the recall arrives

Choose one release, quality, safety, maintenance, or genealogy workflow, name the production authority, and prove that its work, evidence, method, target, and packet agree.

Write the work-order identity, product revision, lots and serials, process and measurements, calibration and quality, specification and standard, model or numeric profile, deviation and rework, operator and safety authority, warehouse/customer/recall receipt, packet, verifier, deployment posture, recovery, retention, export, and stop conditions.

Then choose the result you most dread explaining: a release after a standard change, a measurement correction, a missing supplier certificate, an unsafe maintenance prediction, a serial query, or a packet that cannot verify offline. A manufacturing field guide is useful when that case can be replayed before the auditor or customer asks for it.

WORKFLOW

One bounded release, quality, safety, maintenance, or trace

Do not begin with the whole plant

SOURCE

Work order, lots, sensors, measurements, spec, and calibration

Every input has a state

METHOD

Declared units, tolerance, model, numeric, and uncertainty

Exactness must have a domain

AUTHORITY

Operator, quality, safety, engineering, target, and customer owners

Roles must stay distinct

DECISION

Go, narrow, hold, or stop

Signed with safety, genealogy, and replay conditions

THE PRODUCTION STANDARD

A pass can be plausible. A defensible release shows the work order, material, measurement, specification, method, operator, target, genealogy, and replay state that existed when the plant acted.