

Rayterton Manufacturing Execution System (MES)

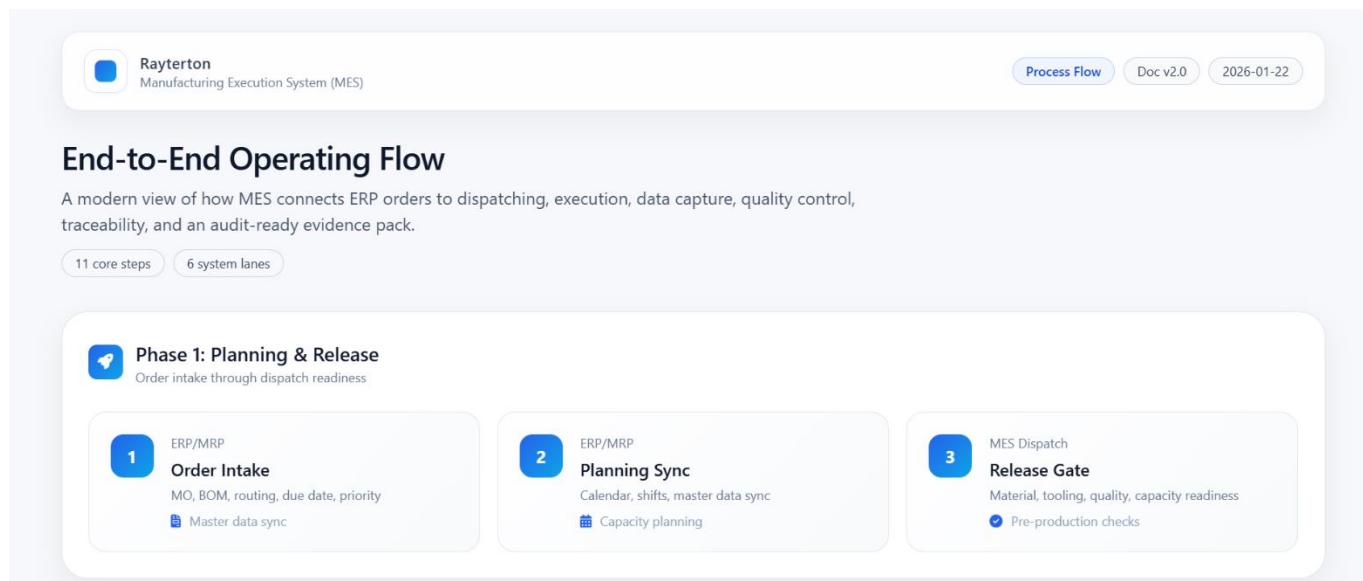
Control production execution from order release to full audit pack, with real time signals, closed loop quality, and multi plant visibility.

End to End Shop Floor Control

Rayterton Manufacturing Execution System (MES) streamlines manufacturing operations, from order dispatching to work center loading, quality checks, and real-time traceability across 3 plants, 12 lines, and 58 work centers. Our system integrates seamlessly with ERP/MRP, PLCs, IoT, QMS, and WMS for optimal efficiency.

End to End Operating Flow

Operating flow starts when ERP sends production orders. MES applies release gate checks, dispatches work to lines, guides operators with digital work instructions, records production and quality results, triggers Andon, maintains genealogy, prints compliance labels, closes the order, then publishes performance analytics and audit packs.



Phase 2: Execution

Work execution and data collection

4 MES Dispatch

Finite Dispatch

Sequence by line, changeover, constraints

Optimized sequencing

5 Operator

Execute Work Steps

Digital work instructions, e-sign, shift notes

Operator execution

6 Operator

Collect Production Data

Counts, scrap, rework, labor confirmations

Real-time capture

Phase 3: Quality & Control

Quality checks and maintenance response

7 Quality

In-Process Quality Control

Sampling, SPC rules, holds, NCR and CAPA triggers

Quality assurance

8 Maintenance

Andon and Escalation

Calls, SLA timers, owner assignment, closure

Rapid response

9 Operator

Genealogy Capture

Component scan, lot and serial linking

Traceability

Phase 4: Completion

Labeling, shipping, and closure

10 MES Dispatch

Label and Pack Trace

Print queue, carton and pallet structure

Labeling system

11 ERP/MRP

Close Posting

Confirmation, output, consumption, variance

ERP posting

Quality

Audit-Ready Evidence Pack

Results, deviations, approvals, attachments

Compliance ready

WMS Integration

Material & Shipping

Material Issue and Lot Confirmation

Pack and Ship Reference

Maintenance Response

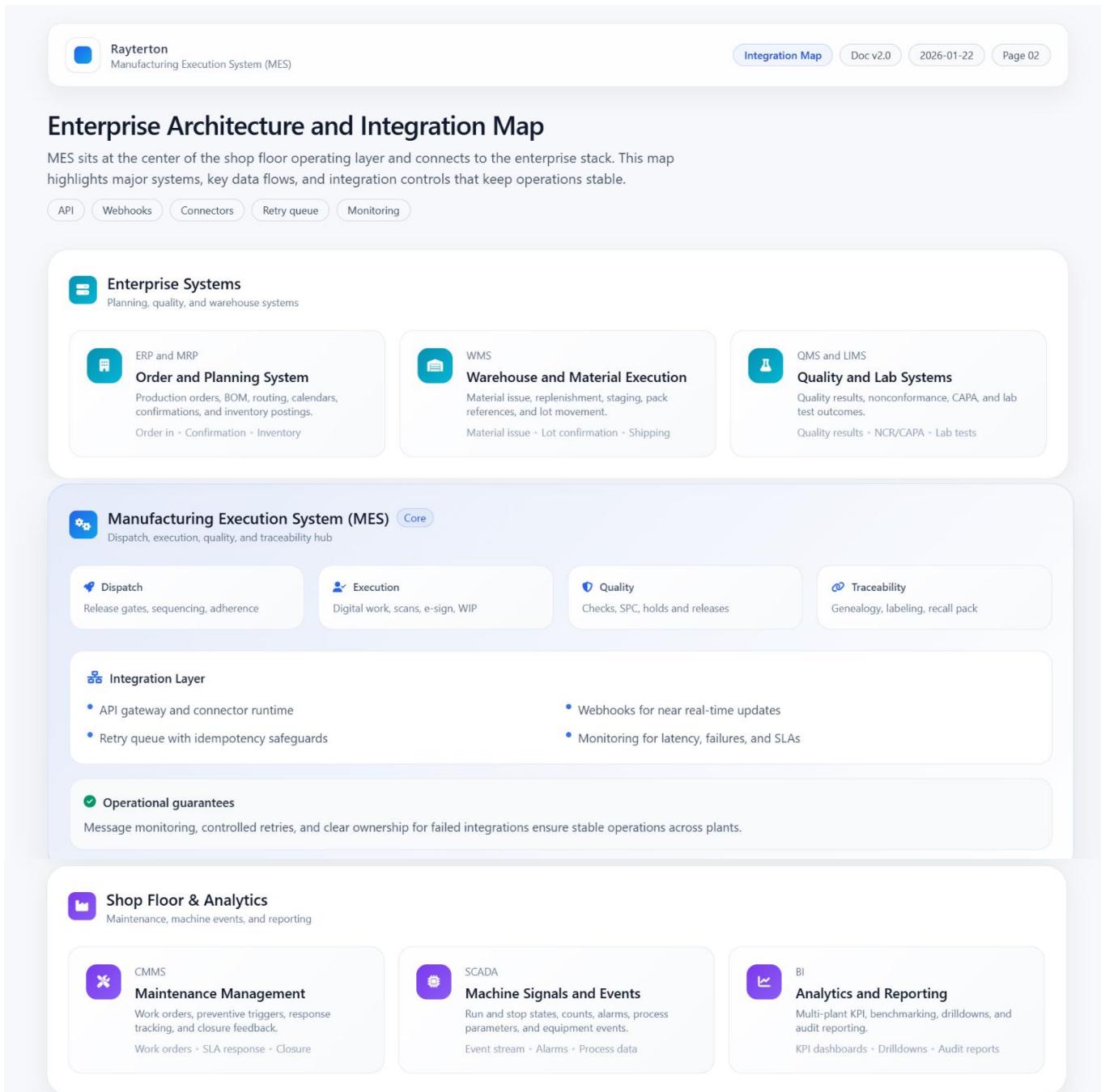
Andon & Restoration

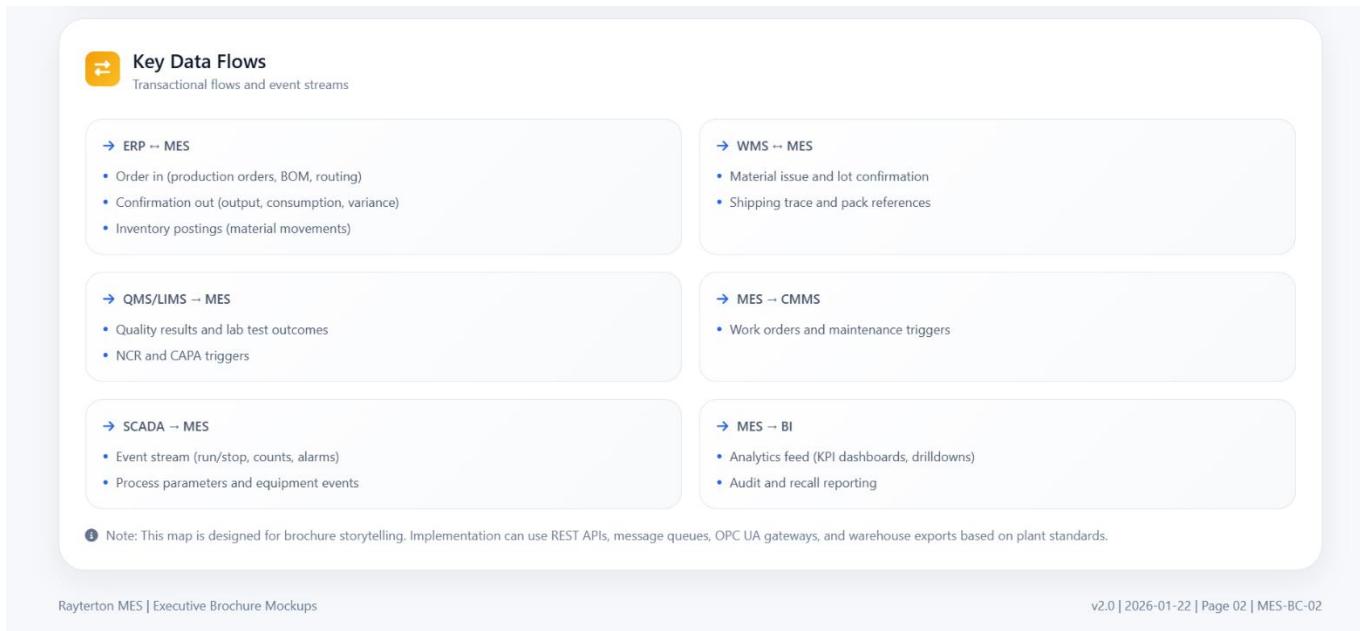
Work Order Execution

Availability Restored

Enterprise Architecture and Integration Map

Rayterton **MES** is designed as part of an enterprise stack, not a standalone app. MES sits in the middle and exchanges structured data with **ERP** or **MRP**, **WMS**, **QMS**, **LIMS**, **CMMS**, **SCADA**, and **BI**. Key integration patterns include APIs, webhooks, and connectors with monitoring, retry queue, and safe reprocess. Data flows cover order in, confirmations out, inventory postings, quality results, maintenance work orders, and event streams from edge gateways.





Production Order Inbox and Release Gate

Orders arrive from **ERP** in an inbox that supports controlled release. The release gate ensures production starts only when prerequisites are met. The release gate checks material readiness, tooling readiness, quality readiness, and capacity readiness. Orders can be approved, kept pending, or blocked with a clear reason. This reduces last minute line stops and prevents execution with missing controls.

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Production Control | Doc v1.0 | 2026-01-21 | Page 03

Production Order Inbox and Release Gate

Orders arrive from ERP and stay in the inbox until the release gate confirms readiness. Gate checks are explicit and explainable to prevent avoidable line stoppages.

Operational scale: 3 plants, 12 lines, 58 work centers | Active today: 8 lines | Daily output baseline: 18,600 units

Inbox snapshot
Updated 2 minutes ago. Horizon: next 10 working days.

Approved	Pending	Blocked
12	11	9
Ready to dispatch	Waiting for readiness	Blocked with explicit reasons

Filter: All plants | Sort: Due date | View: Orders

Release governance
Frozen window rule: 8h | Approval required: High priority | SoD check: Passed | Audit trail: Enabled

Release gate (selected order)
Order MO-2401187 | Plant PLT-B | Line LN-04
Aging 3h 12m | Due 2026-01-25

Blocked

Material ready All lots reserved 98.5% available	Tooling ready Service overdue Tool T-MD-229 locked
Quality ready First article required QA sign-off pending	Capacity ready Shift staffed Utilization 71%

Order inbox								
Minimum 30 rows. Mixed due dates, priorities, and statuses across 8 active lines.								
ORDER	PRODUCT	LINE	DUE DATE	PRIORITY	QTY	STATUS	AGING	BLOCK REASON
MO-2401174	RMX-200 Valve Body, Rev C	LN-01	2026-01-23	High	1,800	Approved	42m	-
MO-2401176	AXL-410 Gear Housing, Rev A	LN-02	2026-01-23	Medium	2,400	Approved	1h 05m	-
MO-2401179	PCB-780 Controller Board, Lot Build	LN-03	2026-01-24	High	3,000	Approved	33m	-
MO-2401181	FCT-115 Final Assembly Kit	LN-05	2026-01-24	Low	1,200	Approved	2h 11m	-
MO-2401184	RMX-200 Valve Body, Rev C	LN-04	2026-01-25	Medium	1,600	Pending	1h 44m	Waiting for QA first
MO-2401186	AXL-410 Gear Housing, Rev A	LN-06	2026-01-26	Low	2,200	Pending	58m	Material lot reserva
MO-2401188	PCB-780 Controller Board, Lot Build	LN-07	2026-01-27	High	2,800	Pending	2h 05m	Awaiting tooling re
MO-2401191	FCT-115 Final Assembly Kit	LN-08	2026-01-27	Medium	1,050	Pending	1h 18m	Capacity check run
MO-2401197	RMX-200 Valve Body, Rev C	LN-01	2026-01-25	High	1,950	Pending	3h 12m	Tool T-MD-229 lock

Dispatch Sequencing Board and Finite Schedule

Dispatch is presented as a line based board with shifts and a 2 day horizon. Sequencing supports setup family grouping, changeover awareness, and constraint badges for material, tooling, quality holds, and planned maintenance. Planners can resequence, freeze a window, and flag expedite jobs while keeping trace of what changed and why.

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Dispatch and Scheduling | Doc v1.0 | 2026-01-21 | Page 04

Dispatch Sequencing Board and Finite Schedule

A finite schedule view that shows line-level sequencing across shifts, with setup family grouping, constraint visibility, and actions to resequence, freeze windows, and expedite critical work.

Horizon: 2 days | Lines: 6 | Operations: 52 | Frozen window: 8h | Changeover families: 5

Schedule controls
Changes inside the frozen window require approval and leave an audit trail.

Reschedule **Auto-group by family** **Freeze window** **Expedite flag**

Schedule adherence risk 7 Potential late operations	Changeovers 14 Across 2-day horizon	Constraints active 9 Material, tool, quality, maintenance	Expedites 3 Customer priority
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Constraint badges
Material, Tool, Quality, Maintenance, Ready

Setup family and changeover
Grouping reduces setup time and stabilizes schedule.

Matrix: active families

FAM-A Alloy housing	avg 22m
FAM-B PCB assembly	avg 35m
FAM-C Final assembly	avg 18m
FAM-D Molded parts	avg 48m
FAM-E Heat treat	avg 62m

Changeover matrix (minutes)

Example setup times by family transition

FROM \ TO	FAM-A	FAM-B	FAM-C	FAM-D	FAM-E
FAM-A	0	28	15	34	55
FAM-B	26	0	24	48	60
FAM-C	16	22	0	30	52
FAM-D	38	50	32	0	64
FAM-E	58	62	54	70	0

Note: Setup times vary by line, tooling state, and cleaning requirements. Matrix values are stored as governed master data.

Finite schedule board

2-day horizon with 6 lines. 52 operations with mixed setup times and constraints.

Plant: PLT-B

Timezone: Asia/Jakarta

View: Day and shift

Line and shift	Jan 21 08:00	Jan 21 20:00	Jan 22 08:00	Jan 22 20:00	Jan 23 08:00
LN-01 Shift A and B Family focus: FAM-A OEE target: 80%	MO-2401291 Ready	MO-2401293 Material	MO-2401301 Frozen window Ready	MO-2401308 Quality	MO-2401315 Expedite
LN-02 Shift A and B Family mix: FAM-D, FAM-A Tooling sensitive	MO-2401288 Tool	MO-2401296 Ready	MO-2401302 Maintenance	MO-2401310 Expedite Ready	MO-2401312 Frozen window
LN-03 Shift A and B Family focus: FAM-B SCADA connected	MO-2401290 Ready	MO-2401298 Quality	MO-2401306 Ready	MO-2401312 Frozen window	MO-2401314 Expedite
LN-04	MO-2401287 Quality	MO-2401297 Ready	MO-2401304 Ready	MO-2401316 Expedite	MO-2401318 Material

Operator Station and Digital Work Instructions

Operator execution is guided by a task list for the current shift. Each task includes the active step, progress, and required scans so execution stays consistent. Digital work instructions provide clear steps with check points. Scans can be enforced for operator badge, material lot, serial, and tool ID. Actions include start, pause, complete, scrap, rework, and hold. Steps that need supervisor sign off are clearly marked and recorded.

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Operator Execution | Doc v1.0 | 2026-01-21 | Page 05

Operator Station Task List and Digital Work Instructions

A paperless operator station that guides execution step-by-step, enforces required scans, and captures production evidence with timestamps and sign-offs.

Station: STN-LN03-OP1 | Plant: PLT-B | Line: LN-03 | Shift: A (08:00 to 16:00)

Today task list
Sequenced by dispatch. Tasks reflect the finite schedule board.

Queued	In progress	Completed
6	1	3
Ready to start	Current operation	Signed and recorded

Shift progress
Completed 54% of planned output | Planned 3,200 units | Actual 1,728

Digital work instructions
Active task: MO-2401312 | Operation Op-15 | Work center: WC-SMT-07
Revision: WI-SMT-780-RevD | Effective: 2026-01-12
E-sign required

REQUIRED SCANS

Operator badge (Verified)	Material lot (Scan required)
Operator ID: OPR-11842 A. Rahman	Expected lot: LOT-SN63-77182
Training status: Valid for WI-SMT-780-RevD	Check: Validate expiry and storage conditions
Serial scan (Scan required)	Tool ID (Verified)

Task queue
Updated 1 min ago

- MO-2401312 | Op-15 SMT Assembly (In progress)
Product PCB-780 | Family FAM-B | Due 2026-01-22
Planned 480 units | Actual 262 units | Cycle 58s | Scrap 1.9%
- MO-2401306 | Op-10 SMT Placement (Queued)
Product PCB-780 | Family FAM-B
- MO-2401298 | Op-09 AOI Inspection (Queued)
Requires QA sampling window
- MO-2401290 | Op-05 Solder Paste Setup (Hold)
Blocked by tooling verification
- MO-2401286 | Op-03 Line Clearance (Done)
Completed with supervisor sign-off

Note: Task visibility is role-based. Every start, pause, completion, and exception is timestamped and recorded.

EXECUTION ACTIONS
Start | Pause | Complete | Scrap | Rework | Hold

Actions require a reason code when applicable. Scrap and rework capture quantity, cause, and disposition.

WORK INSTRUCTION STEPS (10 STEPS)

- Step 1. Line clearance and area check (Done)
Remove previous labels, confirm bins empty, confirm ESD setup.
- Step 2. Verify work order and revision (Done)
Confirm order, product revision, and effective work instruction.
- Step 3. Material lot scan and validation (Active)
Scan solder paste lot and validate expiry and storage conditions.
Required scan: Material lot | Rule: expiry check | Evidence: scan log
- Step 4. Load program and verify feeder map (Queued)
Load program PRG-780-D and verify feeder mapping checklist.

eSign, Shift Handover, and Exceptions Log

Rayterton **MES** is audit ready because approvals are structured and traceable. Electronic signatures capture who approved, when, and the reason, with the exact scope and context. Shift handover logs record issues, follow up, and next actions. Exceptions capture deviations, rework loops, and hold releases. This keeps operations aligned across shifts and makes investigations faster.

e-Sign, Shift Handover, and Exceptions Log

A controlled record of approvals, shift-to-shift handover, and production exceptions. Every decision is attributable to a person, a timestamp, and a reason, with traceable follow-up actions.

Plant: PLT-B | Line: LN-03 | Shift: A to B handover | Timezone: Asia/Jakarta

e-sign approval panel
Shows who approved, when, and why. Supports maker-checker and audit trail.

PENDING E-SIGN REQUEST • Waiting approval

Hold release approval for M0-2401290 | Operation Op-05
Hold reason: Tool verification incomplete. Release requires supervisor review and QA acknowledgement.

Requestor: Operator | OPR-11842 | Requested at: 2026-01-21 14:18

Required approver: Shift Supervisor | Policy: Maker-checker

Approval decision: Approve, Reject, Return for correction

Signature binds the user identity, role, time, and approval scope. Records appear in the audit pack.

RECENT COMPLETED E-SIGNS • Recorded

First article approval | Quality | Order M0-2401312 | Step 5 | Evidence ID EVI-019382
Approved by: QA Lead | USR-00941 | Timestamp: 2026-01-21 09:26
Reason: First article meets AOI criteria. Program revision PRG-780-D verified.

Changeover confirmation | Manufacturing | Line LN-03 | Family switch FAM-B to FAM-B | Setup checklist CHK-4421
Approved by: Shift Supervisor | USR-00408 | Timestamp: 2026-01-21 08:12
Reason: Tool and feeder map verified. No open maintenance blocks.

Deviation acceptance | Risk | Deviation ID DEV-00319 | Temporary process parameter change for nozzle cleaning interval
Approved by: Plant Manager | USR-00012 | Timestamp: 2026-01-20 18:44
Reason: Mitigation plan approved. Additional AOI sampling required for the next 2 lots.

Audit readiness snapshot
Operational logs and exceptions with status visibility.

Shift notes: 10 | Mixed status

Exceptions: 3 | Deviation, rework loop, hold release

Open follow-ups: 4 | Requires next action

Evidence records today: 126 | Scans, checks, sign-offs

AUDIT PACK COMPONENTS
Batch genealogy, e-sign approvals, exception outcomes, shift logs, and time-stamped production evidence.

Genealogy, e-Sign, Exceptions, Handover, Audit trail

Shift handover log (10 notes)

Issues, follow-ups, and next actions for the next shift.

[Export](#)

[Create note](#)

TIMESTAMP	LINE AND ORDER	ISSUE AND CONTEXT	FOLLOW-UP
2026-01-21 14:05	LN-03 MO-2401312	AOI false positives increased after nozzle clean. Sampling adjusted to every 30 minutes.	QA to review and update checklist Owner: QA Lead
2026-01-21 13:42	LN-02 MO-2401288	Tool verification blocked. Tool ID mismatch with approved setup sheet.	Supervisor to verify and request hold Owner: Shift Supervisor 15:00
2026-01-21 12:58	LN-05 MO-2401311	Furnace temperature drift detected. Run continued with temporary monitoring rule.	Maintenance to confirm calibration Owner: Maintenance 22.08:30
2026-01-21 12:15	LN-03 MO-2401298	Rework station queue increased. Defect code D14 trending.	QA to open defect rework loop Owner: QA Lead
2026-01-21 11:46	LN-01 MO-2401301	Material lot switch performed. Expiry validated and logged in MES.	No follow-up required standard sampling Owner: N/A

Exception log (3 records)

Deviations, rework loops, and hold releases with decision outcomes.

[Filter](#)

[Create exception](#)

Deviation DEV-00319

● Closed

Scope

Temporary parameter change for nozzle cleaning interval

Line and order
LN-03 | MO-2401312

Created at
2026-01-20 17:55

Approved by
Plant Manager | USR-00012

Approval timestamp
2026-01-20 18:44

Reason

Reduce stop events while maintaining AOI sampling. Mitigation includes additional sampling for the next 2 lots.

● Risk ● Quality ● Evidence: EVI-019102

Rework loop RWK-00871

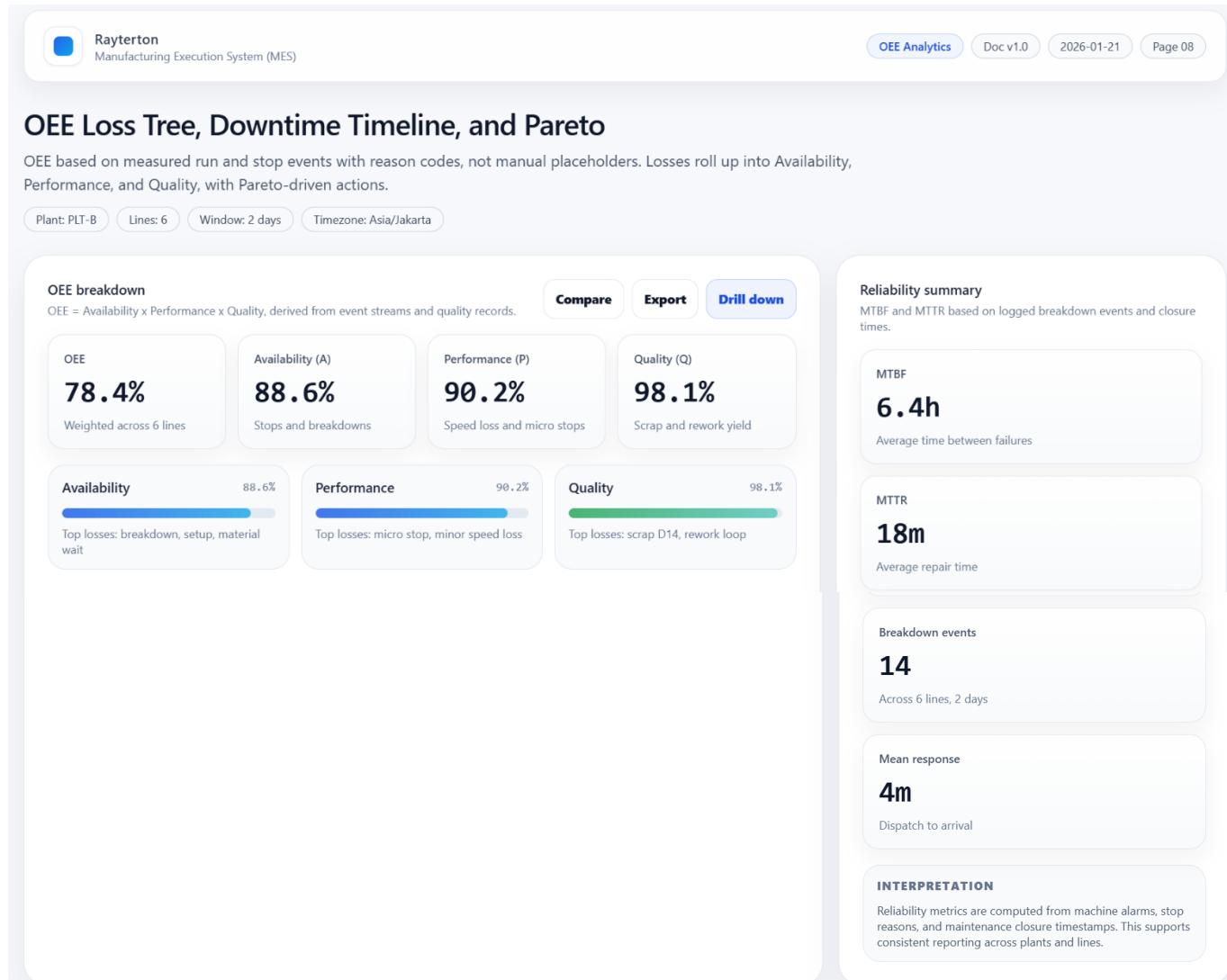
● Follow-up

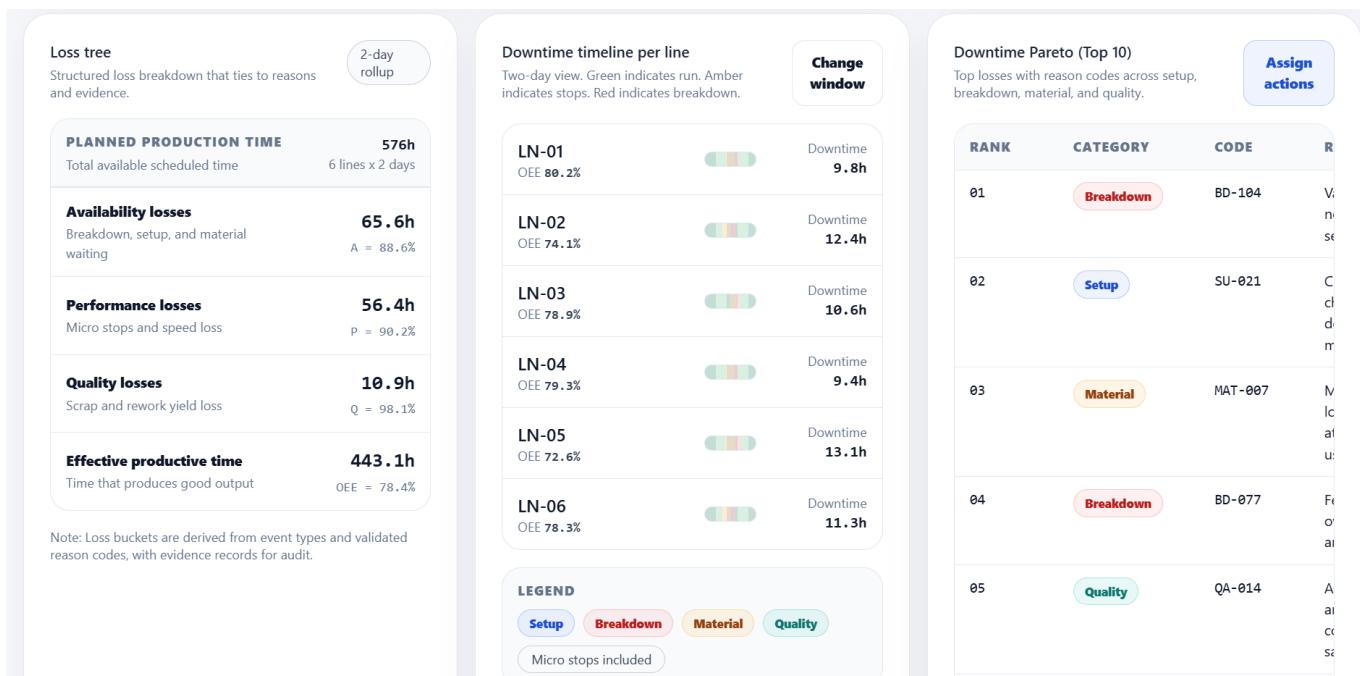
Issue

Defect code D14 trending on AOI. Reroute to rework station

OEE, Loss Tree, and Downtime Pareto

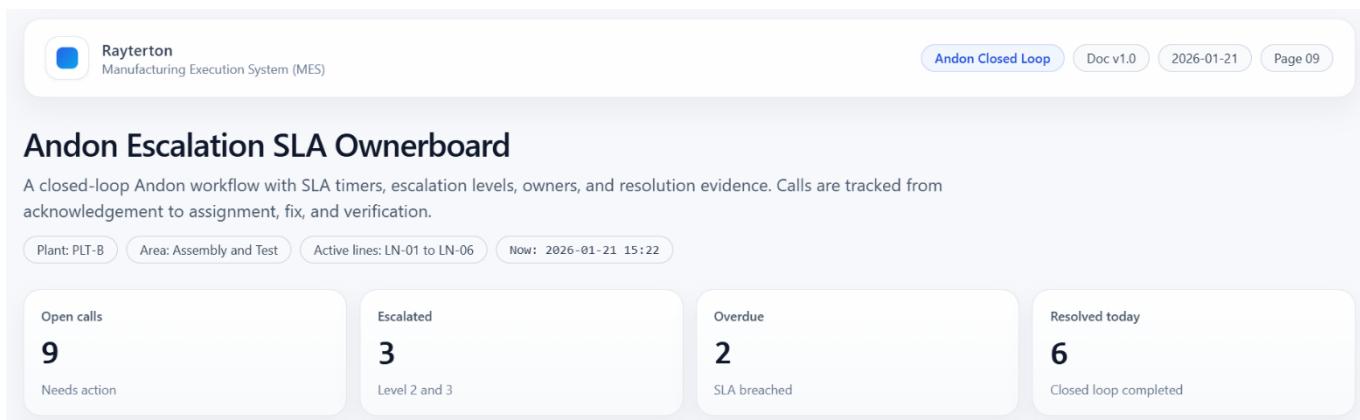
KPI is meaningful only if it can be explained. Rayterton MES breaks OEE into Availability, Performance, and Quality, and links losses to reason codes and events. Downtime timeline shows when stops happen per line. Pareto highlights the top losses and categories such as setup, breakdown, material, and quality. MTBF and MTTR provide a concise reliability view that links back to work centers and events.





Andon Escalation, SLA, and Ownerboard

Calls are tracked with SLA timer, escalation level, owner, and status. Teams can acknowledge, assign, resolve, and add notes. Overdue calls and escalations are visible at a glance so leadership can see response discipline and recurring causes.



Andon calls (15)
Material, quality, maintenance, and safety calls with SLA timers and escalations.

CALL	CATEGORY	LINE	ISSUE	SLA TIMER	ESCALATION	OWNER
AND-220401	Material	LN-03	Resistor R-Pack 10k below min, feeder starving, kitting required	+18m overdue Target: 10m Open: 15:10	Level 3	W
AND-220398	Maintenance	LN-02	Pick-and-place feeder jam, micro stops spiking, needs technician intervention	4m left Target: 20m Open: 14:58	Level 2	M
AND-220392	Quality	LN-05	Label verification mismatch, print head cleaned and label rule updated variance, requires calibration check	Resolved Target: 15m Closed: 14:41	Level 1	Q
AND-220360	Material	LN-02	IC U12 near min, call placed to supermarket, pick list created	9m left Target: 20m Open: 15:11	Level 1	M
AND-220354	Safety	LN-06	Spill near packing station, clean-up and verification required	Resolved Target: 10m Closed: 14:22	Level 1	H
AND-220349	Quality	LN-03	First article check pending after changeover, supervisor sign required	5m left Target: 20m Open: 15:07	Level 2	S
AND-220331	Maintenance	LN-05	Printer head wear	16m left Target: 60m Open:	Level 1	M

Escalation policy
How calls escalate when SLA is at risk or breached.

SLA TARGETS

Material	10m Quality	30m
Maintenance	20m Safety	20m

ESCALATION LEVELS

- Level 1
- Level 2
- Level 3

Line owner
Shift supervisor
Plant duty manager

Escalation triggers at 70% of SLA for Level 2, and at SLA breach for Level 3, with notifications and audit trail.

Selected call details
Closed-loop record with notes and timestamps.

CALL
AND-220401
Category Material | Line LN-03 | Escalation Level 3

TIMELINE

Opened	15:10
Escalated to L2	15:17
Escalated to L3	15:20
SLA target	10m
Current breach	+18m

NOTES

Consumption spike detected after resequence on LN-03. Supermarket bin empty. Pick list PICK-22031 created. Expedite requested. Temporary substitution not allowed due to controlled spec.

Pick: PICK-22031 eKanban: CALL-77102
Evidence required

ACTIONS

Acknowledge **Assign**

In Process Quality Checks, Sampling, Hold, and Release

Sampling schedules and check sheets guide what to measure and when. Results are captured as pass or fail with comments and evidence attachments when needed. A failed check can trigger a hold. Hold release is governed and traceable, and NCR can be created directly from the check outcome.

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In-Process Quality | Doc v1.0 | 2026-01-21 | Page 10

Plant: PLT-B | Line: LN-03 | Order: MO-2401312 | Product: PCB-780 | Shift A

In-Process Quality Checks, Sampling, Hold, Release

Quality runs during production with a sampling schedule, check sheets, measured results, and evidence attachments. Failed checks can trigger a controlled hold, with release and NCR creation governed by approvals.

Checks today	Pass	Fail	Active holds
20 In-process sampling	18 Within spec	2 Triggered hold	2 Awaiting disposition

Sampling schedule and check records (20)
Each record links measured results, comments, and evidence attachments.

SAMPLING PLAN Every 30 minutes First article at start, then periodic checks per lot window. Plan: SP-30M Spec rev: R7	CHECKS IN SHIFT 08:00 to 16:00 Expected 16 checks, plus event-based checks after changeover. Line: LN-03 Last check: 15:05	RULES Fail triggers hold Hold scope can be unit, lot, or time window depending on severity. Evidence required Audit trail
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CHECK	TIME	SCOPE	CHARACTERISTIC	SPEC
IPQC-12001	08:12	First article	Paste height	0.16 to 0.22 mm
IPQC-12002	08:42	Periodic	AOI defects	0 major, 0 critical
IPQC-12003	09:10	Periodic	Reflow peak temp	238 to 245 C
IPQC-12004	09:42	Periodic	Label scan match	Match required
TDRC-12005	10:12	Periodic	Torquing screw M2	0.35 to 0.45 Nm

Check sheet form
Record measured results with pass fail and evidence.

CHECK ID IPQC-12015 Auto-numbered per line	TIME 2026-01-21 15:05 Shift A
CHARACTERISTIC Paste height CTQ	SCOPE Periodic Every 30 minutes
SPEC 0.16 to 0.22 mm Spec rev R7	MEASURED 0.23 mm Gauge ID G-0091
RESULT Fail ● Out of spec Comment: High paste height. Suspected stencil wear. Stopped and cleaned. Hold items in affected window.	
EVIDENCE ATTACHMENTS	
IMG	Stencil photo EVI-33058-01.jpg
LOG	Gauge reading

IPQC-12009	12:18	Periodic	Reflow peak temp	238 to 245 °C
IPQC-12010	12:46	Periodic	Paste height	0.16 to 0.22 mm
IPQC-12011	13:12	Periodic	Torque screw M2	0.35 to 0.45 Nm
IPQC-12012	13:42	Periodic	Reflow peak temp	238 to 245 °C
IPQC-12013	14:10	Periodic	AOI defects	0 major, 0 critical
IPQC-12014	14:40	Periodic	Label scan match	Match required
IPQC-12015	15:05	Periodic	Paste height	0.16 to 0.22 mm
IPQC-12016	15:18	Event-based	Post-clean verification	All CTQ pass

Hold and release board Open queue

Two holds are active from failed checks.

HOLD-77120 Hold

Trigger: IPQC-12012 | Reflow peak temp above spec

SCOPE AND QUANTITY

Scope: Time window 13:30 to 13:52 | Affected: 18 units | WIP ID WIP-0198740

Disposition pending. Engineering review required.

Severity: Major Owner: USR-00408

Evidence: EVI-33049

Create NCR Add note Release

HOLD-77128 Under review

Trigger: IPQC-12015 | Paste height above spec

SCOPE AND QUANTITY

Scope: Lot window FG-LOT-780-21A | Affected: 12 units | Station STN-Paste-01

Containment applied. Awaiting QA sign-off after verification check.

SPC Control Chart, Rule Violations, and Action Log

Control charts show limits, data points, and rule violations such as trends, beyond limit, and run rules. Violations are listed with details, affected time window, and impact scope. An action log connects the violation to a corrective adjustment or to NCR and CAPA when the issue indicates systemic risk.

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SPC Actionable Quality
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SPC Control Chart, Rule Violations, Action Log

Control charts become actionable when rule violations create owners, due dates, evidence, and corrective actions. Each violation can link to an adjustment record or NCR to close the loop.

Plant: PLT-B | Line: LN-03 | Station: STN-Paste-01 | Metric: Paste height | Now: 2026-01-21 15:28

Points

30

Last 2 hours

Violations

2

1 beyond limit, 1 trend

Open actions

1

Corrective action created

Limits

UCL 0.22

CL 0.19 | LCL 0.16 (mm)

X chart (individual points)
UCL, CL, LCL with highlighted rule violations and linked actions.

Time range Subgroup Rules

Unit: mm Sampling: every 4 minutes Mean: 0.190 Sigma: 0.010

Limits Normal Trend rule Beyond limit

Paste height control chart (30 points)

RULES ENABLED

- Beyond limit On
- Trend (7 increasing) On
- Run (8 same side) On

LATEST POINT
0.193 mm
Within limits. No rule triggered.
Point #30 at 15:28

LINKAGE
Violations can create a hold, adjustment, or NCR. Actions remain open until verified with evidence.

Create NCR Create adjustment Assign owner

Note: 30 points are shown. Two rule violations are flagged and tied to actions.

Rule violations (2)

Acknowledge

VIO-88021

Type: Beyond UCL | Point #18 | Value 0.225

OWNER
QA Inspector USR-01102
Detected: 14:52 SLA: 30m
Evidence required

Create adjustment Create NCR

Add note

VIO-88019

Type: Trend rule | Points #6 to #12 | Increasing sequence

OWNER
Shift Supervisor USR-00711
Detected: 14:34 Monitor and verify

Add note Mark verified

Action log

Open history

TIME	ACTION	TR
14:54	ADJ-44102	VI
14:56	HOLD-77133	VI

NCR and CAPA Workflow with Root Cause and Verification

NCR records include severity, source, line, product, and status. CAPA breaks down tasks into root cause, action plan, owner, due date, evidence, and verification. Approvals and audit trail keep the workflow controlled. Verified closure means the fix was validated, not only completed.

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NCR and CAPA Governance | Doc v1.0 | 2026-01-21 | Page 12

NCR CAPA Workflow, Root Cause, Verification

A governed problem-solving workflow that connects nonconformances to root cause, corrective and preventive actions, verification evidence, and audit-ready approvals.

Plant: PLT-B | Week: W04 | Open NCR: 4 | Active CAPA: 5 | Now: 2026-01-21 15:36

NCR total	Open	In progress	Verified
10	3 Needs action	4 Root cause and CAPA running	3 Effectiveness confirmed
This week			

NCR register (10)
Severity, source, line, product, and status. Each NCR links to CAPA and audit trail.

NCR	SEVERITY	SOURCE	LINE	PRODUCT
NCR-54011	Major	SPC rule	LN-03	PCB-780
NCR-54008	Critical	In-process QC	LN-04	PCB-820
NCR-54005	Minor	Operator	LN-02	PCB-780
NCR-54003	Major	AOI	LN-05	PCB-910
NCR-54002	Minor	Incoming QC	LN-01	IC-U12
NCR-53998	Major	Maintenance	LN-06	PCB-820
NCR-53995	Critical	Customer complaint	LN-03	PCB-780

CAPA tasks (5 active)
Owners, due dates, evidence, and verification status.

CAPA-22091	
Linked NCR: NCR-54011	
OWNER	Process Engineer
USR-01210	2026-01-22 12:00
Priority: High	
EVIDENCE	
LOG	Stencil pressure change record EVI-44102-01.csv
IMG	Stencil inspection photos EVI-44102-02.zip
Add note	Request verification
Escalate	
CAPA-22088	
Linked NCR: NCR-54008	

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The interface displays a list of Non-Conformance Reports (NCRs) and a CAPA (Corrective Action Plan) section.

Non-Conformance Reports (NCRs):

- NCR-53991: Minor, In-process QC, LN-06, PCB-910
- NCR-53988: Major, SPC rule, LN-02, PCB-780
- NCR-53984: Minor, Operator, LN-01, PCB-820

CAPA (Corrective Action Plan) Section:

- CAPA-22088** (Linked NCR: NCR-54008, Open): Owner: Quality Manager (USR-00408), Due Date: 2026-01-22 10:00, Priority: Critical. Status: Root cause required. Containment hold active and shipment block applied until verification passes. Actions: Start RCA, Create containment, Add note.
- CAPA-22084** (Linked NCR: NCR-54003, In progress): Owner: AOI Engineer (USR-00811), Due Date: 2026-01-23 17:00, Priority: Medium. Status: Threshold adjustment and re-validation planned. Evidence must include golden board results and before/after metrics. Actions: Attach evidence, Request verification.
- CAPA-22079** (Linked NCR: NCR-53998, In progress): Status: Ready for QA review. Checklist pending final approval.

Note: NCRs can originate from SPC, in-process checks, equipment events, or customer complaints. Each NCR can block shipment and is linked to CAPA and evidence.

Electronic Batch Record, Review Pack, and Final Approval

The record summarizes material lots, process parameters, and sign offs per step. Deviations and holds are summarized with closure status. Attachments and review checklist form a review pack for final approval. This supports compliance, customer audits, and internal governance.

The interface displays an Electronic Batch Record (eBR) review pack and final approval status.

Header: Rayterton Manufacturing Execution System (MES), Document: Electronic Batch Record (eBR), Version: Doc v1.0, Date: 2026-01-21, Page: Page 13.

Review Pack:

- Plant: PLT-B, Line: LN-04, Product: PCB-820, Batch: BATCH-820-26W04-011, Order: MO-2401420.
- Batch steps: 12, Full execution trace.
- Sign-off points: 3, e-sign with timestamps.
- Deviations: 1, Closed with evidence.
- Final status: Ready for QA review, Checklist pending final approval.

Batch record summary

Materials, parameters, and sign-offs consolidated in one review view.

[Print pack](#)
[Export PDF](#)
[Open full eBR](#)

PLANNED QTY

1,200 units

Start: 08:10 | End: 15:22

PRODUCED

1,176 units

Yield: 98.0%

SCRAP AND REWORK

Scrap 12 | Rework 8

All linked to genealogy

MATERIAL LOTS USED

MATERIAL	LOT	QTY	IQC
Solder paste SP-93	LOT-SP93-260121A	3.6 kg	● Accepted
PCB base board BB-820	LOT-BB820-260119C	1,220 pcs	● Accepted
IC U12	LOT-U12-260118B	1,260 pcs	● Accepted
Connector CN-14	LOT-CN14-260120A	1,240 pcs	● Pending

CRITICAL PARAMETERS SNAPSHOT

PARAMETER	SPEC	OBSERVED	STATUS
Paste height	0.16 to 0.22 mm	Mean 0.190	● Within
Reflow peak temp	238 to 245 C	241 C	● Within
AOI major defects	0 allowed	0	● Within
Torque M2	0.35 to 0.45 Nm	0.41 Nm	● Within

Parameters link to SPC charts and calibration records where required.

Batch steps (12) with sign-offs

Each step includes timestamps, operator identity, and evidence.

[Expand all](#)[Jump to deviation](#)

1. Batch initiation and line clearance

Line LN-04 cleared, previous labels removed, station checks complete

Operator **USR-01910** | Start **08:10** | Evidence **EVI-EBR-001**

[Complete](#)

2. Material issue and lot scan

Scan and confirm lots for paste, PCB boards, and critical components

Material lots captured and reconciled to WIP consumption. WMS ref **GI-78110**.

[Complete](#)

3. Setup verification and first article

First article inspection required before run release

[Signed](#)

OP Operator sign

USR-01910 | 08:22

QA QA sign

USR-01102 | 08:34

4. Execute run capture parameters

Deviations and holds summary

One deviation closed. No active holds remaining for this batch.

[Open log](#)

Deviation DEV-33019

Micro stop event, sensor adjustment, verification passed

[Closed](#)

DISPOSITION

Continue with corrective maintenance

CMMS WO-77102

VERIFICATION

Passed

12:44

Evidence includes equipment check, event timeline snapshot, and maintenance completion note.

Evidence: **EVI-DEV-33019**

Linked CAPA: **CAPA-22079**

HOLDS

0 active holds

[Clear](#)

Shipment release is not blocked. Any hold would appear here with scope and release approvals.

Attachments (review pack)

Evidence set required for review and audit trace.

[Download pack](#)

SPC

SPC chart snapshot

EVI-EBR-SPC-011.pdf

[Open](#)

QC

IPQC check sheets

EVI-EBR-IPQC-011.zip

[Open](#)

EVT

Event timeline export

EVI-EBR-EVT-011.csv

[Open](#)

MNT

Maintenance completion note

EVI-EBR-CMMS-011.pdf

[Open](#)

LBL

Label reconciliation report

EVI-EBR-LBL-011.pdf

[Open](#)

Review checklist and final approval

Checklist gates final approval to ensure audit readiness.

[Approve](#)



All material lots scanned and reconciled

No missing lots or mismatch in consumption posting

Pass



Critical parameters within spec

SPC reviewed and violations addressed

Pass



Deviations closed with evidence

DEV-33019 closed, verification attached

Pass



Sign-off points completed

Operator and QA e-sign captured

Pass



Final QA review and approval

Requires QA manager sign and timestamp

Pending

Sign-off 1: First article release

QA USR-01102 | 08:34 | Reason: first article passed

Signed

Sign-off 2: Batch step completion

Supervisor USR-00711 | 12:52 | Reason: deviation closed

Signed

Sign-off 3: Final QA approval

Pending, checklist must complete before approval

QA gate

Traceability and Genealogy Explorer

Traceability is a core differentiator. The genealogy view supports backward trace from finished good to component lots, process steps, QC results, operators, and machines. Forward trace identifies where a component lot was consumed and where finished goods were shipped. Filters include date range, lot, serial, and order. Rework loops are visible so investigations are accurate.

Rayterton Manufacturing Execution System (MES)

Traceability and Genealogy Doc v1.0 2026-01-21 Page 14

Plant: PLT-B Line: LN-04 Product: PCB-820 Serial: SN-820-26W04-0110452 Order: MO-2401420

Filters
Refine genealogy by date range, lot, serial, and order.

DATE RANGE
2026-01-21 07:00 to 2026-01-21 16:00
Include upstream lots and downstream shipment

SERIAL
SN-820-26W04-0110452
Finished good unit

ORDER
MO-2401420
Batch BATCH-820-26W04-011

LOT FILTER
LOT-SP93-260121A
Highlight nodes that touched this lot

Backward trace **Forward trace** **Containment scope** **Export genealogy** **Reset** **Apply**

Nodes 12 Includes rework loop	Material lots 4 Paste, board, IC, connector	QC checkpoints 3 FAI, IPQC, AOI	Downstream Shipped DN-88011 INV-99102
---	---	---	---

Genealogy graph (12 nodes)
Select a node to view lots, process context, QC results, operator, and machine details.

Center **Expand** **Highlight lot**

View: Backward + Forward Rework loop: visible Node IDs: enabled **Lot** **QC** **Machine** **Operator**

Node details
A focused summary of the selected node.

AOI Inspection
STEP-08 | 13:10 **Rework loop**

QC RESULT
1 false reject, rework executed, re-inspected pass
QC-RES-88014

MACHINE
AOI-02 | CAM-FW 3.2
Calibration: CAL-77110 (valid)

OPERATOR
QA Inspector
USR-01102

LINKED ACTIONS

Rayterton Apps

Enterprise Software Solution

SELECTED FINISHED GOOD

SN-820-26W04-0110452

Status: Shipped. Genealogy includes one rework loop after AOL.

Pack: PK-22019

Shipment: DN-88011

CONTAINMENT SCOPE

Use lot filter or process window to find all impacted serials and shipments, then create hold and recall scope if required.

[Create hold](#)

[Recall scope](#)

TRACE LINKS

[Lots](#) [Steps](#) [QC](#)

[Operators](#) [Machines](#)

Every node is clickable and carries audit metadata.

Manufacturing Execution System

Whitepaper & Product Brochure

LINKED ACTIONS

RWK-11021 | NOTE-91018

No shipment block

[View QC evidence](#)

[View audit trail](#)

Trace tables

[Export](#)

MATERIAL LOTS

MATERIAL	LOT
Solder paste SP-93	LOT-SP93-26012
PCB base board BB-820	LOT-BB820-2601
IC U12	LOT-U12-260118
Connector CN-14	LOT-CN14-26012

Lot clicks highlight related nodes and downstream shipments.

PROCESS STEPS AND CHECKPOINTS

STEP	NAME
STEP-03	First Article Inspection
STEP-05	Reflow Profile
STEP-08	AOL Inspection
STEP-09	Rework Station

Rework loop is preserved and does not hide original inspection failure context.

FORWARD TRACE (SHIPMENT)

PACK	DELIVERY
PK-22019	DN-88011

Shipment links to WMS postings and customer trace scope.

Note: Nodes include materials, process steps, QC results, rework loop, pack, and shipment. All events are timestamped and link to audit logs.

Materials eKanban, Supermarket Call Queue, and Shortage Handling

Material readiness is managed proactively to prevent line stops. eKanban cards track min, max, and current stock, plus ETA replenishment. A call queue connects material requests to pick references and execution status. Shortage alerts include the reason and resolution note, so the system remains auditable and repeatable.

Rayterton Manufacturing Execution System (MES)

Materials eKanban and Supermarket Doc v1.0 2026-01-21 Page 15

Plant: PLT-B Supermarket: SMK-04 Lines served: LN-03, LN-04, LN-05 Now: 2026-01-21 15:36

Items monitored 20 Supermarket cards

Active calls 6 Pick in progress

Shortage alerts 2 Requires resolution note

Line stop risk Managed ETAs and escalation active

eKanban cards (20 items) Min max, current, and ETA replenishment per item. Low stock triggers auto call.

Details

CALL	ITEM	LINE
CALL-77102	Solder paste SP-93	LN-04
CALL-77103	Connector CN-14	LN-04
CALL-77104	IC U12	LN-04

Call queue (6 active) Each call includes pick reference, destination, and status. **Open WMS**

Shortage alerts (2) Shortages require a resolution note and cause classification. **Create shortage**

RESOLUTION NOTE Substituted from buffer lot LOT-U12-260118B and executed expedited pick. Added supplier follow-up for late delivery window. Owner: USR-00601 | 15:34

Create expedite **Assign owner** **Audit trail**

Details

SHORT-11021 | IC U12 supply gap **Shortage** Line LN-05 | Required 320 pcs | Available 140 pcs Risk of line stop in 28 minutes. Next replenishment ETA is outside the current takt window. **Bin: SMK-04-B12** **ETA: 16:10** **PO: PO-55102**

SHORT-11022 | Solder paste SP-93 low **Shortage** Line LN-04 | Required 1.5 kg | Available 0.6 kg Paste below min threshold. Risk increases during changeover window. Material call created, awaiting delivery

Labeling, Pack, Pallet, Serialization, and Print Queue

Shipping compliance requires controlled labeling and serialization. Label templates are versioned and linked to customer requirements. The pack and pallet structure connects units to cartons and cartons to pallets with SSCC. Print queue shows jobs, printers, quantities, and status, linked to shipment or staging. Serial ranges are clear and traceable across the hierarchy.

Rayterton Manufacturing Execution System (MES)

Labeling and Serialization | Doc v1.0 | 2026-01-21 | Page 16

Labeling, Pack and Pallet Structure, Serialization, Print Queue

Customer compliance labeling is controlled through templates, print governance, and full trace to shipment and staging. Units roll up to cartons, cartons roll up to pallets, and pallets carry SSCC for end-to-end shipping traceability.

Plant: PLT-B | Staging: STG-DOCK-02 | Shipment: DN-88011 | WMS Wave: WV-22018

Pallets	Cartons	Units	Serial range
3 SSCC labeled	24 Carton label applied	480 Serialized units	SN-820-26W04-0111201 to 0111680 Bound to cartons and pallets

Label templates
Controlled templates for unit, carton, and pallet labeling with customer and compliance fields.

Template library | **Field mapping** | **Preview print**

Unit label	Carton label	Pallet label (SSCC)
TPL-UNIT-820 v3 1D + QR PCB-820 Model: 820-A Rev: R2 Plant: PLT-B Serial: SN-820-26W04-0110452 GTIN: 08912345678901 Lot: LOT-BBB820-260119C	TPL-CTN-820 v2 Carton ID Carton CTN-820-011-03 Qty: 20 units Customer: Customer A Pack: PK-22019 DN: DN-88011 Serials: 0111241 to 0111260	TPL-PLT-SSCC v5 SSCC Pallet PLT-011-A 24 cartons total Gross: 320 kg SSCC: 003899999991234567 DN: DN-88011 Staging: STG-DOCK-02

COMPLIANCE CONTROLS
Templates are versioned, approved, and locked per customer. Print actions record who, when, printer, and reason for reprint. Shipment links validate that the correct label set is used for the destination and customer.

Template approvals enabled | Reprint requires reason | Audit trail export

Pack and pallet structure
3 pallets, 24 cartons, 480 units. Full roll-up to SSCC and shipment.

SHIPMENT ROLL-UP

Shipment DN-88011 | **Staging**
Customer A | Jakarta | Staging STG-DOCK-02

Pallet PLT-011-A
SSCC 003899999991234568
Cartons: CTN 01 to 08 | Units: 160
Serials: 0111201 to 0111360

Pallet PLT-011-B
SSCC 003899999991234568
Cartons: CTN 09 to 16 | Units: 160
Serials: 0111361 to 0111520

Pallet PLT-011-C
SSCC 003899999991234569
Cartons: CTN 17 to 24 | Units: 160
Serials: 0111521 to 0111680

Print queue
Queue by printer, priority, and shipment link. Includes unit, carton, and pallet labels.

Refresh **Pause printer** **Release batch**

JOB	TYPE	TARGET	TEMPLATE	PRINTER	QTY
PRN-55101	Unit labels	SN 0111201 to 0111400	TPL-UNIT-820 v3	PRN-ZEB-02	200
PRN-55102	Unit labels	SN 0111401 to 0111680	TPL-UNIT-820 v3	PRN-ZEB-02	280
PRN-55103	Carton labels	CTN 01 to 12	TPL-CTN-820 v2	PRN-ZEB-03	12
PRN-55104	Carton labels	CTN 13 to 24	TPL-CTN-820 v2	PRN-ZEB-03	12
PRN-55105	Pallet SSCC	PLT-011-A	TPL-PLT-SSCC v5	PRN-ZEB-04	1
PRN-55106	Pallet SSCC	PLT-011-B	TPL-PLT-SSCC v5	PRN-ZEB-04	1
PRN-55107	Pallet SSCC	PLT-011-C	TPL-PLT-SSCC v5	PRN-ZEB-04	1

PRINT GOVERNANCE

SERIALIZATION BINDING
Unit serials are bound to carton IDs at packing, then cartons are bound to pallet SSCC at palletization. Any rework or replacement serial triggers reconciliation before shipment release.

Scan carton **Scan pallet SSCC** **Reconcile mismatch**

Shipment and staging link
Connect labeling to WMS staging, dock appointment, and release controls.

Open staging map

DOCK AND STAGING
STG-DOCK-02 | Door 2 | Wave WV-22018
Staging status updates from WMS and scan confirmations

CUSTOMER COMPLIANCE
Label set locked to Customer A profile
Carton and pallet labels must match destination rules

RELEASE GATE
All labels printed, scans verified, pack complete
Blocks shipment if any SSCC mismatch or missing carton label

Integration Monitor, Retry Queue, and Error Handling

Message monitor tracks ERP orders, confirmations, and inventory postings. Latency, success rate, and failed messages are visible with correlation IDs and reason classes. Retry queue supports safe reprocess with idempotency and guardrails. Example operational scale is 2,400 messages per day with 0.7% failed and 12 items in retry queue.

 Rayterton
Manufacturing Execution System (MES)

Integration Operations | Doc v1.0 | 2026-01-21 | Page 17

Integration Monitor, Retry Queue, Error Handling

Integration does not stop at a one-time setup. This monitor provides message-level visibility, latency and success tracking, and safe retry handling with controlled reprocess actions. Failed messages are isolated with reasons, payload references, and audit trail.

Flows: ERP Orders, Confirmations, Inventory Postings | Daily volume: 2,400 | Failed: 0.7% | Retry queue: 12

Messages today 2,400 All integration channels	Success rate 99.3% End-to-end ACK received	P95 latency 2.8s Order to MES dispatch	Retry queue 12 pending Auto retry enabled with backoff
--	---	---	---

Message monitor overview
Latency trend, success rate, and failed messages by channel.

Time window **Filter channel** **Download report**

LATENCY TREND (SECONDS)
P50 1.2s P95 2.8s Max 9.6s
Spikes correlate with ERP posting bursts.

SUCCESS RATE BY HOUR
24h 99.3% Peak fail 1.1%
Includes ACK and validation checks.

FAILED MESSAGES BY CHANNEL
ERP MES WMS
ERP Orders 0.2%
Confirmations 0.3%
Inventory postings 0.2%
Fail rates are calculated from end-to-end delivery confirmations.

OPERATIONAL GUARANTEES
Messages are idempotent, ordered per business key when required, and protected with retry backoff. Each failure includes error class, correlation ID, payload hash, and a safe reprocess path that prevents duplicate postings.

Idempotency keys Correlation IDs Dead-letter handling Audit trail

Controls and actions
Governed reprocess with safeguards. **Open runbook**

RETRY POLICY
Auto retry with exponential backoff
Max attempts 6 | Backoff 30s to 15m

REPROCESS GUARDRAILS
Duplicate prevention enabled
Idempotency and ERP posting status checks

ALERT ROUTING
Ops channel + on-call escalation
SLA: P1 10m | P2 30m

OBSERVABILITY
Metrics, traces, and payload references
Correlation ID links to logs and dashboards

Retry selected **Reprocess safe**
Pause channel **Quarantine**

Message monitor (latest)
Recent messages with latency, status, and error context.

Search **Filter failed** **Export**

Timestamp	Channel	Message Type	Business Key	Latency	Correlation ID	Status	Error / Note
2026-01-21 15:52:10	ERP	Production order intake	MO-2401420	1.4s	CORR-260121-1552-9011	Delivered	ACK received. Mapped.
2026-01-21 15:51:28	WMS	Inventory posting, issue	GI-44018	3.9s	CORR-260121-1551-8832	Retry queued	Timeout from WMS. Will retry with backoff.
2026-01-21 15:50:43	ERP	Confirmation, yield report	CNF-88201	2.2s	CORR-260121-1550-8841	Delivered	Posted. Duplicate guard check passed.
2026-01-21 15:49:59	WMS	Inventory posting, receipt	GR-77110	5.6s	CORR-260121-1549-7710	Failed	Validation error: bin number mismatch. Requires manual review.

Retry queue (12 items)
Items awaiting retry or manual intervention. Includes reason, attempt, and next schedule.

Retry all safe **Bulk assign** **Quarantine selected**

Queue ID	Channel	Type	Business Key	Attempts	Next Retry	Reason Class	Action
RQ-99011	WMS	Inventory posting, receipt	GR-77110	2 of 6	2026-01-21 15:55	VALIDATION_BIN_NOT_FOUND	Retry Pause Details
RQ-99012	WMS	Inventory posting, issue	GI-44018	1 of 6	2026-01-21 15:56	CONNECTOR_TIMEOUT	Retry Pause Details
RQ-99013	ERP	Confirmation, scrap posting	CNF-88219	3 of 6	2026-01-21 16:02	ERP_LOCK_CONFLICT	Retry Pause Details
RQ-99014	ERP	Order update, BOM rev	MO-2401470	1 of 6	2026-01-21 15:58	SCHEMA_MISMATCH_FIELD	Reprocess safe Payload Assign owner
RQ-99015	WMS	Staging confirmation	STG-DOCK-02	2 of 6	2026-01-21 16:04	WMS_DUPLICATE_ACK	Retry Pause

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Multi Plant Control Tower with Drilldown

This is the executive view that connects outcomes to root causes. KPI tiles cover OEE, throughput, scrap, schedule adherence, and downtime cost, with 30 day trends. Top issues list highlights bottlenecks, quality alerts, and overdue Andon. Drilldown path is consistent and fast: plant to line to work center to event. Leadership can see ranking across 3 plants and then open the exact event chain behind performance gaps.

Rayterton
Manufacturing Execution System (MES)

Executive Multi-Plant Control Tower | Doc v1.0 | 2026-01-21 | Page 18

Multi-Plant Control Tower with Drilldown

Executive visibility across 3 plants with comparable metrics, ranked performance, and a clear drill path. Start at enterprise KPIs, move to plant ranking, then drill into line, work center, and event detail to see what drives the numbers.

Scope: 3 plants, 12 lines | 30-day window | Currency: IDR | Snapshot: 2026-01-21 15:36

OEE	THROUGHPUT	SCRAP	SCHEDULE ADHERENCE	DOWNTIME COST
78.4% +1.8 pts	18,600 +4.6% Units per day	2.1% +0.3% Top: solder defect	92.0% +2.9% Freeze window: 4h	IDR 128M Stable 30 days MTTR 22m
A 86.1% P 92.3% Q 98.6%	OT 2.1%	Rework 1.4%	Expedite: 7	

Drilldown path
Plant to line to work center to event level. Keep the same metric definitions across all sites.

Metric | **Date range** | **Open live view**

Enterprise > All plants > Plant PLT-A (Rank 2) > Line LN-03 (Rank 1) > Work center WC-0312 SMT-Placement > Event timeline

Plant ranking and trend (30 days)
Comparable KPIs with ranking across 3 plants. Trend shows how performance moves over time.

PLANT	RANK	OEE	THROUGHPUT/DAY	SCRAP	ADHERENCE	DOWNTIME
PLT-C Plant C	1	80.9%	6,540	1.8%	93.6%	IDR 38m
PLT-A Plant A	2	78.1%	6,120	2.2%	91.4%	IDR 46m
PLT-B Plant B	3	76.3%	5,940	2.4%	90.2%	IDR 43m

Top issues (enterprise)
Bottlenecks, quality alerts, and overdue Andon with clear ownership.

Bottleneck: WC-0312 feeder jam cluster (Active)
Impact: -1.6 pts OEE | 12 micro-stops | 46m lost
Owner: Maint Lead | SLA: 2h
Next action: feeder calibration

Quality alert: SPC rule violation on paste thickness (Hold)
Impact: 2 holds | 1 NCR opened | 160 units at risk
Owner: Quality Eng | Due: 2026-01-22
Action: adjust squeegee pressure

Overdue Andon: material shortage repeated (Overdue)
Impact: 3 escalations | 1 line stop | 22m lost
Owner: Procurement | Due: 2026-01-23
Action: expedite vendor delivery

Enterprise OEE Trend
Start 76.6% | End 78.4% | Best week: W03
Trend reflects downtime and yield.

Scrap Trend
Avg 2.1% | Top: solder defect
Quality holds and rework loops included.

Adherence Trend
Avg 92.0% | Expedite: 7
Dispatch resequence events tracked.

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Glossary

API (Application Programming Interface)

A standard way for software systems to exchange data automatically.

BI (Business Intelligence)

Tools used for reporting, dashboards, and business data analysis.

CAPA (Corrective and Preventive Action)

A process to fix quality problems and prevent them from happening again.

CMMS (Computerized Maintenance Management System)

Software for managing equipment maintenance and maintenance work orders.

EBR (Electronic Batch Record)

A complete digital record for one production batch.

ERP (Enterprise Resource Planning)

The main business system for managing orders, finance, inventory, and production.

IoT (Internet of Things)

Connected devices and sensors that send machine data to software systems.

KPI (Key Performance Indicator)

A key number used to measure performance, such as efficiency or downtime.

LIMS (Laboratory Information Management System)

Software for managing laboratory test data and results.

MES (Manufacturing Execution System)

Software that controls and tracks shop floor production in real time.

MRP (Material Requirements Planning)

A system that calculates what materials are needed for production.

MTBF (Mean Time Between Failures)

The average operating time before equipment breaks down.

MTTR (Mean Time To Repair)

The average time required to repair equipment after a failure.

NCR (Nonconformance Report)

A report for products or processes that do not meet requirements.

OEE (Overall Equipment Effectiveness)

A key metric that combines machine availability, speed, and quality.

PLC (Programmable Logic Controller)

An industrial computer that controls machines and reads machine signals.

QMS (Quality Management System)

Software used to manage quality processes and documentation.

SCADA (Supervisory Control and Data Acquisition)

A system for monitoring and controlling industrial processes.

SLA (Service Level Agreement)

A defined target time for responding to and resolving issues.

SPC (Statistical Process Control)

Statistical methods used to monitor and control process performance.

sscc (Serial Shipping Container Code)

A unique code used to identify pallets and shipping containers.

WMS (Warehouse Management System)

Software for managing warehouse operations and inventory.

Ready to Transform Your Policy Operations at the Enterprise Level

Share your product roadmap, distribution strategy, underwriting appetite, and compliance requirements. Rayterton will configure the Policy Administration System to accelerate product launches, standardize pricing and underwriting decisions, and automate the end to end policy lifecycle from quote to issue, servicing, billing, and renewals.

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Established in 2003, Rayterton delivers comprehensive Best Fit Software Solutions, server and hardware products, and technology services to a wide range of industries and organizations. Our core expertise lies in Business Process Improvement (BPI), IT Infrastructure, and IT Management.

At Rayterton, we are committed to empowering our clients by enhancing their business operations through tailored IT and management solutions. We combine innovation, experience, and client collaboration to ensure long-term success and digital transformation.

Our Competitive Strengths

100% Risk Free

**Best fit to
client
requirements**

**Easy to
customize**

**Software
ownership**

**No Change
Request (CR)
fees during
maintenance**

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