Clear Process Solutions

Pump Housing Defect Handling

Process Design Document | Version 0.1 draft | 21 November 2026

Summary

The plant machines and assembles pump housings. About 140 parts fail inspection each month, and 3 quality engineers share the handling. Today every step is done by a person: the inspector emails the defect notes, a quality technician types the notification into the **ERP** and routes it, and the owning quality engineer classifies the defect, looks up past cases, writes the report, verifies the fix and decides what happens to the lot. The technician then records the result.

The future process keeps the judgement with the quality engineer and removes the manual handling around it. The inspector enters the notes once in a guided form. Scripts create and route the notification, bring the re-inspection results, and record the result. Two AI agent steps prepare a defect class with similar past cases, and a report draft. The engineer approves each one. The future process has 15 steps and decisions: 6 Script, 2 AI agent, 4 Approval, 2 Assisted and 1 Person.

No timings or costs are captured today, so the gains are described but not yet measured.

Scope

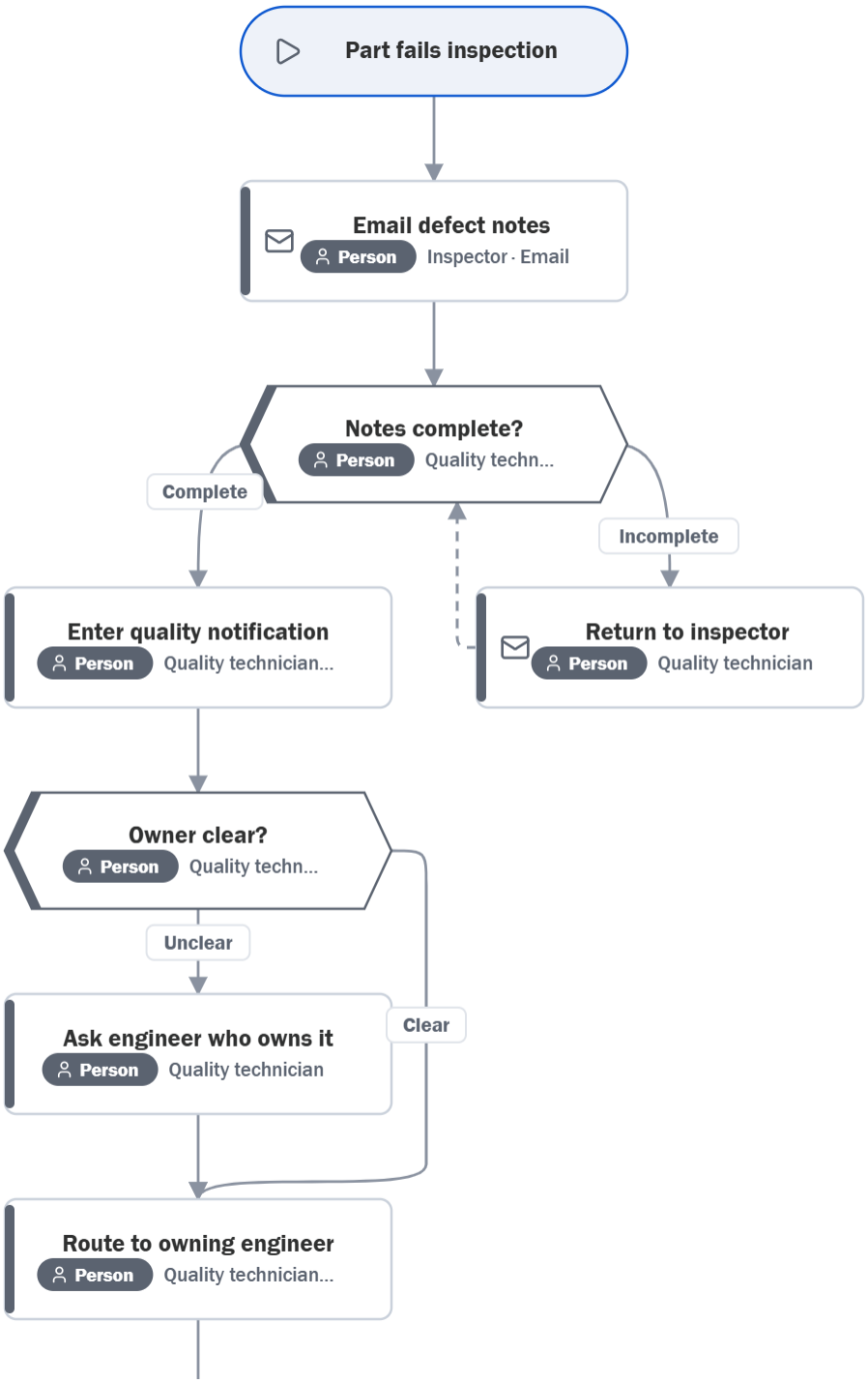
In scope:

- Failed-inspection handling for pump housings, from the moment a part fails inspection to the result recorded in the **ERP**.
- Intake of defect notes, creation and routing of the quality notification, classification, past-case lookup, the report, verification of the fix, the lot decision and the recorded result.

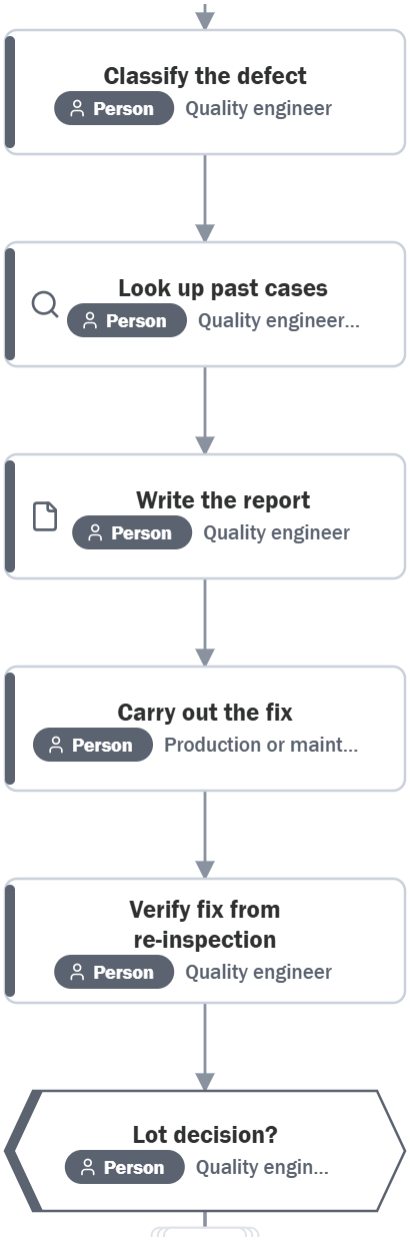
Out of scope:

- Carrying out the fix. Production or maintenance does this, and quality only verifies it (assumption A-02).
- Inspection itself and the decision that a part has failed.
- Choice of tools. The target platform is neutral and no product is named.

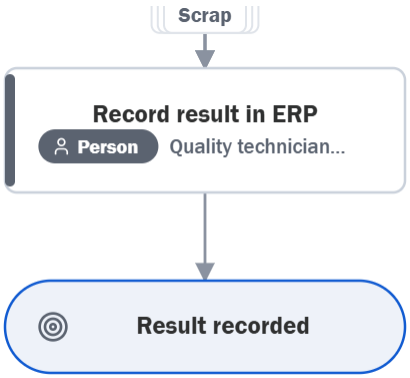
Today's Process



Current Process · Flow map · part 1 of 3



Current Process · Flow map · part 2 of 3



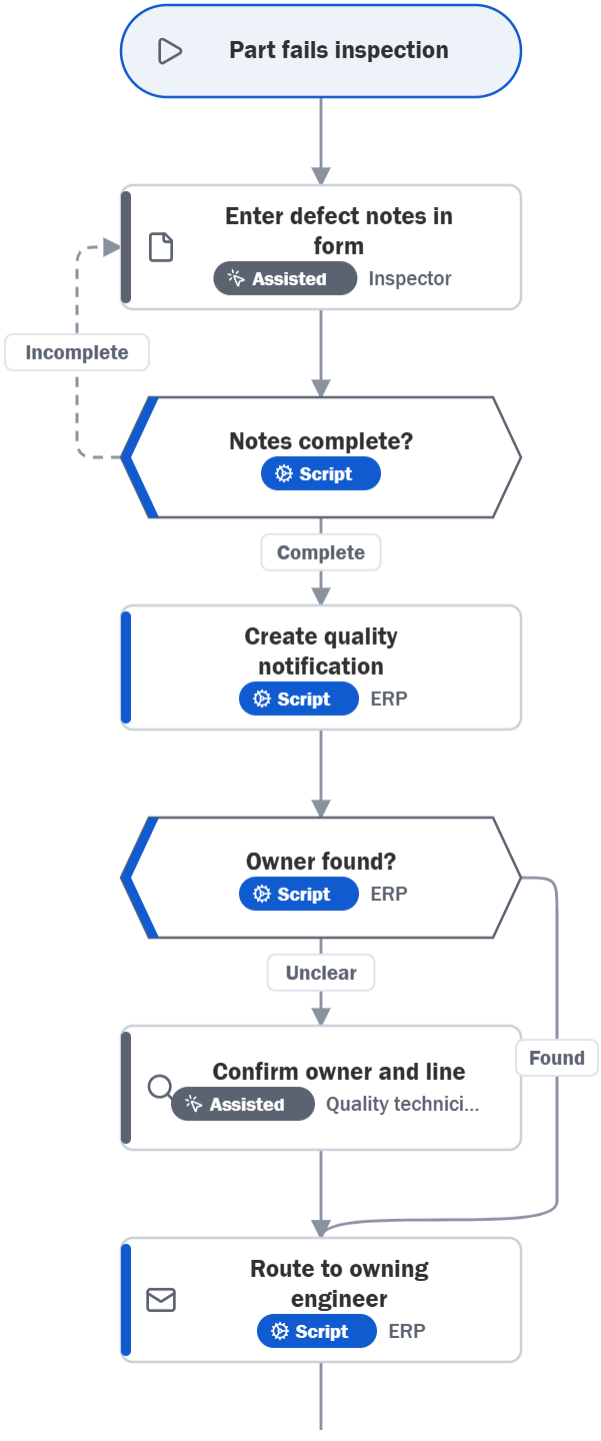
Current Process · Flow map · part 3 of 3
Color shows who runs a step: gray for a person.

All steps are done by a person. The process starts when a part fails inspection and ends when the technician records the result (assumption A-01).

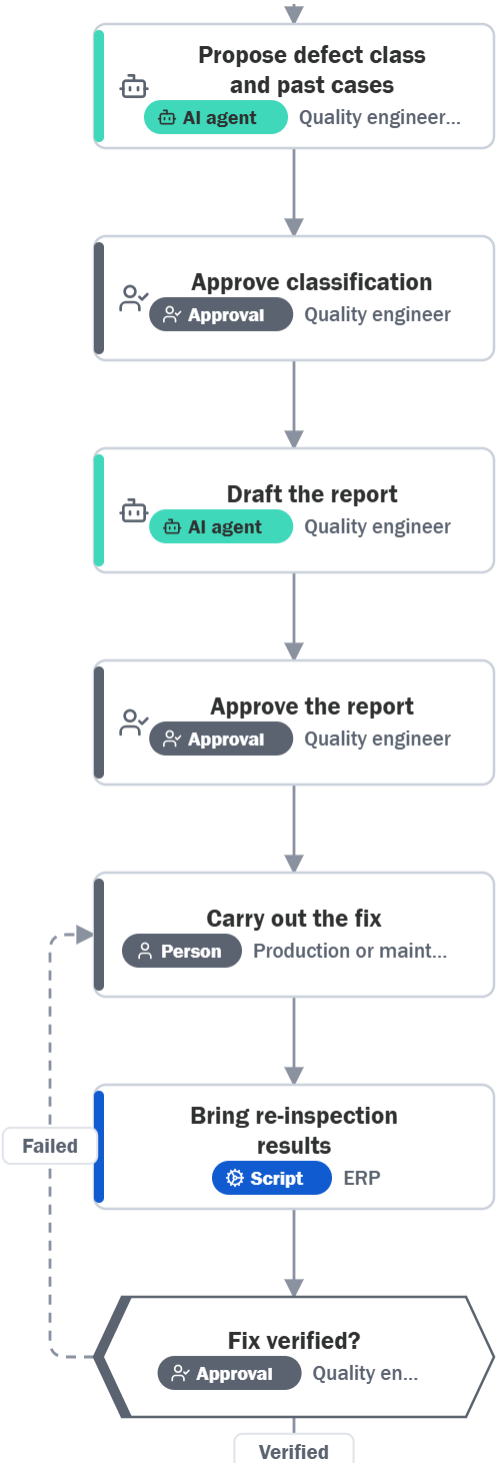
1. The inspector emails the defect notes to the **quality mailbox**.
2. The quality technician checks that the notes are complete. Incomplete notes go back to the inspector, who resends (assumed, A-04).
3. The quality technician types the quality notification into the **ERP**.
4. The technician checks that the owning engineer is clear. If the part family or line is unclear, the technician asks a quality engineer first (assumed, A-04).
5. The technician routes the notification to the quality engineer who owns that part family and line (BR-01).
6. The quality engineer classifies the defect. The classification rules are not captured.
7. The engineer looks up past cases, assumed to be earlier quality notifications in the **ERP** (A-03).
8. The engineer writes the report. The system and format are not captured.
9. Production or maintenance carries out the fix (assumed, A-02).
10. The engineer verifies the fix from the re-inspection results (BR-05). The source of the results is not captured.
11. The engineer decides the lot: release, rework or scrap (assumed options, A-05).
12. The technician records the result in the **ERP**.

The current process map has 11 steps and 3 decisions. Pain points, delays and error rates are not captured (Q-06).

Future Process



Future Process · Flow map · part 1 of 3



Future Process · Flow map · part 2 of 3



Future Process · Flow map · part 3 of 3
Color shows who runs a step: blue for a bot or script, teal for an AI agent, gray for a person.

The future process is drawn as a flow map and was confirmed by the client on 21 November 2026. It runs in six stages: intake, routing, analysis, fix and verification, lot decision, and record.

1. **Enter the defect notes.** The inspector fills in a guided form instead of sending an email (Assisted).
2. **Check the notes are complete.** The form checks the required fields (Script). Incomplete notes return to the inspector to correct.
3. **Create the quality notification.** The **ERP** record is created from the form (Script). No one re-types it.
4. **Check the owner is found.** The owner is read from the part family and line ownership data (Script).
5. **Confirm the owner and line.** The quality technician does this only where no owner is found, and asks a quality engineer if needed (Assisted).
6. **Route to the owning engineer.** The notification goes to the engineer who owns the part family and line (Script).
7. **Propose the defect class and similar past cases.** An AI agent reads the notification and earlier quality notifications in the **ERP**. It cannot change anything. If it is unsure, it hands the case to the engineer with no proposal.
8. **Approve the classification.** The quality engineer approves or changes it (Approval).
9. **Draft the report.** An AI agent drafts it from the notification, the class and the past cases. It can only save the draft, and it hands off when unsure.
10. **Approve the report.** The quality engineer approves or edits it (Approval).
11. **Carry out the fix.** Production or maintenance does this, as today (Person).
12. **Bring the re-inspection results.** A script supplies them to the engineer (Script).

13. **Verify the fix.** The quality engineer decides from the results (Approval). A failed fix goes back to step 11 (A-07).
14. **Make the lot decision.** The quality engineer chooses release, rework or scrap (Approval).
15. **Record the result and close the notification.** A script writes it to the **ERP** (Script).

No step is kept by a person because a platform cannot run it.

What changes from today:

- The email, the re-typing and the manual routing are removed.
- The technician handles only unclear owners and no longer records the result (A-11).
- Classification, past-case lookup and the report draft are prepared by AI agents. The engineer approves each one.
- Verification and the lot decision stay with the engineer.

Roles

- **Inspector:** enters the defect notes in the guided form.
- **Quality technician:** confirms the owner and line where no owner is found. No longer types notifications, routes them or records the result.
- **Quality engineer (3):** owns a part family and line. Approves the classification and the report, verifies the fix, and makes the lot decision.
- **Production or maintenance:** carries out the fix. Outside quality (A-02).
- **Who acts on the lot decision** after the engineer has made it is not captured (Q-02).

Business Rules

- BR-01: a quality notification goes to the quality engineer who owns the part family and line (client statement). In the future process a script applies it from the ownership data.
- BR-02: incomplete defect notes go back to the inspector before a notification is created (assumed, A-04). In the future process the form applies it.
- BR-03: if the owner is unclear, the technician asks a quality engineer before routing (assumed, A-04).
- BR-04: the lot decision is one of release, rework or scrap (assumed, A-05).
- BR-05: the engineer verifies the fix from re-inspection results before the lot decision (client statement).
- Future process only: a failed verification returns the case to the fix step (A-07). Each AI agent step hands the case to the engineer when it is unsure (D-04).

The classification rules and the rules for choosing release, rework or scrap are not captured.

Data and Systems

Systems:

- **Quality mailbox:** receives the defect notes today. Replaced by the guided form in the future process.
- **Intake form:** new. It checks the required fields and must pass the notes into the **ERP**.
- **ERP:** holds the quality notification and the recorded result. In the future process it creates the notification from the form, is read for earlier notifications, takes the recorded result and closes the notification. The product name is not captured (Q-01).
- **Ownership data:** read by a script to route. Where it is held is not captured (A-09).
- **Re-inspection results:** a script must be able to read them. The source is not captured (A-10, Q-01).

Data objects: defect notes, quality notification, ownership data, past cases, report, re-inspection results, lot decision.

AI agent limits:

- The classification and past-case agent reads the notification and earlier quality notifications. It is read only.
- The report agent reads the notification, the class and the past cases. It may only save a draft.
- Each hands off to the quality engineer when unsure, and the engineer checks every output by approving or changing it.

Master data:

- Dependence: routing depends on which engineer owns each part family and line.
- Faults in the evidence: not captured. The record does not say whether the ownership data is missing, out of date or different between systems.
- Opportunity, for the client to confirm and not part of the process: keep one maintained ownership list with a named cover for an absent engineer.

Integration needs: intake form to **ERP**, **ERP** read for earlier notifications, a readable source of ownership data, a readable source of re-inspection results, and a write of the result to the **ERP**.

Exceptions and Controls

Exceptions:

- Incomplete notes: the form returns them to the inspector.
- Unclear owner: the technician confirms it, then the case is routed.
- AI agent unsure: the case goes to the engineer with no proposal or draft.
- Failed fix: the case returns to the fix step (A-07).
- Not captured: an absent engineer, lost or duplicate notifications, and who acts on the lot decision.

Controls:

- The quality engineer approves the classification, the report, the verification and the lot decision.
- AI agents cannot change any record except to save a draft.
- A script writes the result only after the lot decision.
- Test cases the exceptions call for: incomplete notes, no owner found, an AI agent that is unsure, a failed fix, and each of the 3 lot outcomes.
- Timing stamps at intake, routing, verification and record are an idea for the client to confirm, so that cycle time can be measured. They are not in the process.

Value Case

Expected benefits:

- About 140 notifications a month are no longer re-typed. This comes from the form and the script that creates the notification. No time figure is captured.
- Fewer incomplete notes reach the quality team, because the form checks the fields. No figure is captured.
- Routing is faster and consistent, because a script routes by the ownership rule. No figure is captured.
- Engineers spend less time on lookup and drafting, because AI agents prepare proposals that the engineer approves. No figure is captured.
- Engineers no longer search for re-inspection results, because a script supplies them. No figure is captured.
- No separate recording step remains, because a script records the result. No figure is captured.

Measures. The record holds a volume of about 140 failed parts a month and 3 quality engineers. It holds no time, cost or error figure.

MEASURE	STATUS	WHAT WOULD MEASURE IT
FTE Reduction	Not yet measured	Technician and engineer hours per notification today and after, against about 140 a month
Cycle Time Reduction	Not yet measured	Time from inspection failure to recorded result today, and after, from timing stamps (Q-05)
Error Rate Reduction	Not yet measured	Share of notes returned as incomplete, and of misrouted notifications, today and after (Q-06)
Cost per Transaction	Not yet measured	Handling cost per notification today and after
Compliance Rate	Not yet measured	Any rules on defect records and lot disposition, and the share of cases that meet them
Throughput Increase	Not yet measured	Notifications closed per engineer per month today and after

MEASURE	STATUS	WHAT WOULD MEASURE IT
Payback Period	Not yet measured	Build cost against the savings above
ROI (3-Year)	Not yet measured	Build and running cost against 3 years of savings

Candidate Score

Worth a closer look: 10 of 15 on 3 criteria. Firm score, 21 November 2026.

CRITERION	SCORE	EVIDENCE
Value	3 of 5, moderate	About 140 failed parts a month; the future process removes the re-typing of each notification, but no timings or costs are captured to size the gain.
Fit	4 of 5, high	Future map: 15 steps and decisions; 6 Script, 2 AI agent, 4 Approval, 2 Assisted, 1 Person. Judgement stays with the engineer.
Readiness	Not enough evidence	Would be shown by the ERP product, whether it holds past cases and re-inspection results, and the quality of part family and line ownership data.
Effort	3 of 5, moderate	Future map: 6 Script steps, 2 AI agent steps, an intake form feeding the ERP, and 2 loops back (incomplete notes, failed fix).
Risk	Not enough evidence	Would be shown by any regulatory or customer rules on defect records and lot disposition, and whether a scrap decision can be reversed.

Each criterion is scored from 1 to 5, and 5 is the better case on every line: for Effort that is a light build, and for Risk a low exposure.

Assumptions, Risks and Open Questions

Assumptions, none yet confirmed by the client unless stated:

- A-01: the process starts at the inspection failure and ends when the technician records the result.
- A-02: production or maintenance carries out the fix.
- A-03: past cases are earlier quality notifications in the **ERP**.
- A-04: incomplete notes go back to the inspector, and an unclear owner is put to a quality engineer.
- A-05: the lot options are release, rework and scrap.
- A-06: no time targets exist.
- A-07: a failed verification returns to the fix step. Clairvoy's recommendation.
- A-08: the **ERP** can create a notification from a form and be read for earlier notifications.

- A-09: ownership data can be read by a script.
- A-10: re-inspection results can be read by a script.
- A-11: a script records the result after the lot decision. Clairvoy's recommendation.

Risks:

- If the **ERP** cannot take a notification from a form or be read for past cases, the intake and AI agent steps need another route (A-08).
- If ownership data is incomplete or out of date, more cases reach the technician and routing slows. Its quality is not captured.
- If re-inspection results cannot be read by a script, the verification step stays manual (A-10).
- Any regulatory or customer rules on defect records and on scrapping a lot are not captured.

Open questions:

- Q-01: Which ERP is used, and does it also hold past cases and re-inspection results?
- Q-02: Who acts on the lot decision once the engineer has made it?
- Q-03: Who carries out the fix, and how does quality learn it is done?
- Q-04: What happens if re-inspection shows the fix failed?
- Q-05: What are the time targets from failure to record, and what is the actual cycle time?
- Q-06: Where do delays, rework or errors occur today?

Next Steps

1. Answer Q-01 to Q-06 and confirm A-01 to A-11.
2. Confirm the **ERP** product and whether it can take the form, hold past cases and hold re-inspection results.
3. Locate the ownership data and the re-inspection results, and check their quality.
4. Capture a baseline: cycle time from failure to record, notes returned as incomplete, and handling time per notification.
5. Decide whether to add the ownership list with named cover and the timing stamps.
6. Plan the build and name the sign-off owners.

Appendix

Project record:

- Source material: the client's written description only. No documents were attached.
- Current process: flow map, confirmed by the client on 21 November 2026.
- Future process: flow map, confirmed by the client on 21 November 2026.
- Target platform: platform-neutral. Step types are Script, Assisted, AI agent, Approval and Person.

Decisions:

- D-01: the future process is a flow map.
- D-02: the design candidates were confirmed with the map shape.
- D-03: judgement stays with the quality engineer.
- D-04: each AI agent step hands off to the engineer when it is unsure.