RCA Picker Flowchart

Three decision questions. Three tools. Pick by the problem, not by the tool you know.

Companion to: *Fix the System*, Chapter 13. **Who uses it:** the planner or maintenance manager assigning an RCA to an asset on the repeat-failure watch list. **When:** as soon as an asset is flagged, before the investigation begins. **Why this exists:** the single most common failure mode of RCA programs is defaulting to 5 Whys on every problem. That produces thin analysis and "operator error" as a non-answer. Pick the tool to match the shape of the problem.

Start here

An asset has been flagged as a repeat failure. A work-order history shows three or more events under the same failure code in the last twelve months, or the close-out-flag checkbox was marked "recurrence," or the failure occurred in less than 50% of the expected interval for that asset class.

Before assigning the investigation, answer the three decision questions below in order.

Decision 1 — Is the cause chain linear and recent?

A linear, recent cause chain means: one clear failure event, and you can walk the chain of causes backwards in your head in under a minute. A belt broke. Why? Tension wrong. Why? Spring fatigued. Why? Never on a PM. Done. The chain is single-threaded. You can trace it without a whiteboard.

Ask:

- Was there a single, identifiable failure event?
- Can you imagine the sequence of causes as a straight line with no branches?
- Would a 20-minute conversation with the technician who did the repair likely identify the root?

If YES to all three -> go to **TOOL 1: 5 Whys. If NO to any ->** go to Decision 2.

Decision 2 — Are there multiple contributing causes?

Multiple contributing causes means: several conditions came together, and peeling the story back linearly does not capture the real picture. More than one category is in the story — some combination of people, method, machine, material, measurement, environment.

Ask:

- Are there two or more conditions, each of which had to be true for the failure to occur?
- Does the story require you to describe the operating environment, the equipment condition, AND the human behavior to make sense?
- When the technician tried to explain what happened, did they find themselves saying "and also" more than once?

If YES to any -> go to **TOOL 2: Fishbone. If NO to all ->** go to Decision 3.

Decision 3 — Is the failure a future risk to design out?

A future-risk analysis means: the asset is new, has been modified, or is being redesigned, and you want to catalog every failure mode the design could produce before it actually produces any of them.

Ask:

- Has the asset not yet failed, but you want to understand how it might?
- Was the asset recently modified (new motor, different seals, changed control logic, new service duty)?
- Is the team evaluating a redesign and needs a risk ranking of failure modes?

If YES to any -> go to **TOOL 3: FMEA. If NO to all ->** this is probably not an RCA problem. Likely a monitoring gap or a standard-work gap. Route to the condition-monitoring review or the SOP review, not to an RCA session.

Tool 1 — 5 Whys

Use when: the story is short and linear.

Time: 20 to 30 minutes.

Participants: the technician who did the repair, the planner, and the supervisor. Three people is enough. More adds noise without adding signal.

Output: a one-page 5 Whys worksheet (see toolkit artifact `ch13-wy-5-whys-worksheet`), with the chain of causes written down, a named root cause, and one or two work orders for mitigation.

Facilitation rule: stop when the answer to "why" becomes something you can actually change. If the last answer is "operator error" or "part failure," you have not walked back far enough — those are categories of cause, not causes.

Frequency: dozens per month is normal on a well-run program. 5 Whys is cheap. Run it often.

Tool 2 — Fishbone

Use when: multiple things combined.

Time: 60 to 90 minutes for the session, plus 2 to 3 weeks of follow-up investigation.

Participants: five to seven people. Always includes at least one operator, at least one technician, and at least one planner or engineer. The maintenance manager facilitates but does not dominate.

Structure: six category branches — people, method, machine, material, measurement, environment — coming off a horizontal spine with the failure event at the head.

Session flow: 1. Write the failure event at the head of the fish, specific date and specific equipment. 2. Walk each category in order. Ask: what from this category contributed? Not "could have" — "actually did." 3. Collect all causes before evaluating any. Do not rank during collection. 4. After all six categories are populated, rank causes by confidence and impact. Top 3-5 become investigation targets. 5. Assign owners and due dates for confirming or refuting each top cause through evidence (inspection, data, physical test, operator interview).

Output: the Fishbone diagram, a prioritized list of causes, owners and due dates for evidence collection, and ultimately work orders opened for each confirmed cause.

Facilitation rule: the diagram is not the analysis. The work is what the team does with the categories over the following 2-3 weeks. A Fishbone without follow-up is wall decoration.

Frequency: three to eight per quarter for a typical mid-size plant. Reserve for the genuinely multi-cause problems.

Tool 3 — FMEA

Use when: the asset hasn't failed yet — or has been modified — and you want to catalog the risks before designing the response.

Time: 3 to 6 hours total, split across 2 or 3 meetings, plus follow-up.

Participants: engineering-led, with maintenance as a participant. The maintenance manager brings failure history, operator observations, and the PM plan. Engineering brings design data, operating limits, and manufacturer documentation.

Structure: a catalog of every failure mode the asset could exhibit, with three scores per mode (Severity, Occurrence, Detection — each 1 to 10) and a resulting Risk Priority Number (RPN = S x O x D).

Session flow: 1. Scope: one asset, one function, one operating mode per session. Narrow beats broad. 2. List every way the function could fail. 3. For each mode: likely effects, likely causes, current detection method. 4. Score on three 1-to-10 scales. Use calibrated scales posted in the session room — do not score from memory. 5. Multiply to get RPN. Sort the list, highest RPN first. 6. Top 5 to 10 modes get mitigation actions: design change, PM addition, condition monitoring, spare-parts stock, operator training.

Output: the FMEA table, the RPN-ranked action list, and work orders or engineering tickets opened for each top-ranked mode.

Facilitation rule: calibrated scoring scales matter more than the session speed. If every mode scores 10/10/10, the scales are not calibrated and the RPN is meaningless.

Frequency: 2 to 4 per year for a typical mid-size plant. Triggered by new assets, modified assets, or redesign evaluations. Not used for post-hoc analysis of failures that have already happened — that is what Fishbone is for.

Common mistakes (and how to catch them)

Mistake	What it looks like	The fix

5 Whys on a multi-cause problem	Analysis ends with "operator error" or "wear and tear"	Switch to Fishbone; convene the team
Fishbone without follow-up	Diagram on the wall, no work orders opened	Audit the top causes after 3 weeks; require evidence or close the cause
FMEA on a failure that already happened	4-hour session re-litigating one event	Stop. Switch to Fishbone. FMEA is for what hasn't happened yet.
No root cause confirmation	"Probably the seal" with no evidence	Require every named root cause to pass the test: if addressed, does it prevent the chain from starting again?
"Operator error" as root cause	Analysis stops at human action	Keep asking why. Why did the operator take that action? Usually the next answer is training, procedure, or system.

What goes back into the cycle

Every RCA output lands in three places:

1. **Work orders in the CMMS.** Every confirmed cause with a mitigation action opens a work order, with an owner and a due date. No work order, no completion. 2. **The asset's CMMS record.** The RCA document, diagram, and investigation notes attach to the asset record, alongside the work-order history. Three years from now, when a different technician opens the record, the analysis is there. 3. **The procedure / standard / training library.** If the RCA changed the SOP, the PM interval, the failure code catalog, the training curriculum, or the spare-parts holding, those changes are made within 30 days and referenced in the close-out.

An RCA that does not land in all three places is an RCA that has not closed the loop.

Free toolkit downloads and updates: getov.xyz/toolkit/fix-the-system/ch13