TRAINING MODULE

Control Plan

A boundary held on purpose — IE's part, and only IE's part

A working module for engineers with 1–2 years on the floor. By the end you will be able to build the IE-owned fields of a Control Plan correctly, and explain exactly why the Quality-owned fields stay blank.

AIAG-VDA Control Plan format — scoped deliberately to what Industrial Engineering data can actually determine

BEFORE WE START

What You Will Be Able to Do After This Module

1. Explain what a Control Plan is, and how it operationalizes a PFMEA's risk ranking on the floor.
2. Apply the trigger rule correctly: which PFMEA rows earn a Control Plan entry, and which don't.
3. Populate every IE-owned field — station, tool, characteristic, Reaction Plan — from data you already have.
4. Explain why the Quality-owned fields are left as a placeholder, never guessed.
5. Recognize the two most common mistakes junior IEs make when they first build a Control Plan.

A PFMEA Ranks Risk. A Control Plan Catches It.

A PFMEA can sit in a folder forever without changing what happens on the floor. A Control Plan is what makes the ranking operational:

PFMEA ASKS

“What could go wrong, and how badly, how often, and how likely are we to catch it?”

Output: a ranked list — Action Priority per failure mode.

CONTROL PLAN ASKS

“For the risks that matter most, exactly WHO checks WHAT, WHERE, and does WHAT if it's wrong?”

Output: a working document a shift actually follows.

This tool refuses to run without a PFMEA already in place — no PFMEA means nothing has been risk-ranked yet, so there is nothing to build a Control Plan from.

THE CORE IDEA

IE's Data Ends Where Quality's Judgment Begins

A full AIAG-VDA Control Plan has ten-odd columns. This tool fills exactly the ones IE data can actually support — and stops.

IE-OWNED — FILLED IN

Station, tool/machine from the Component & Tool Register, the Characteristic itself (from PFMEA's Failure Mode), Special Characteristic flag, Reaction Plan.

QUALITY-OWNED — PLACEHOLDER

Specification/Tolerance, Evaluation/Measurement Technique, Sample Size, Sample Frequency, Control Method — all left as "— Quality to define —."

Auto-generating a Sample Size or SPC method from time-study data would assert a Quality Engineering decision this suite has no authority to make — and could quietly create a SECOND control plan that conflicts with the real one Quality already owns.

WHERE THIS METHOD COMES FROM

A Boundary Is Also a Form of Engineering Honesty

You've seen this principle once already, in the Engineering Judgement Review module: don't dress up a guess as a measurement. This tool applies the same discipline to a whole department boundary. IE's own time-study and PFMEA data genuinely knows the station, the tool, and the characteristic. It genuinely does NOT know the right sampling plan or SPC method — that's Quality Engineering's expertise, not a byproduct of a stopwatch study.

A correctly pre-populated skeleton respects both departments' expertise. A guessed one respects neither.

AIAG-VDA CONTROL PLAN

The PFMEA's living companion document

NOT EVERY PFMEA ROW EARNS A CONTROL PLAN ENTRY

The Trigger Rule

Action Priority = HIGH OR Severity ≥ 8 (Special Characteristic)

A SAMPLE PFMEA — WHICH ROWS MAKE THE CUT?

Failure Mode	SEV	AP	Control Plan?
Component missing/double-loaded	8	HIGH	✓ YES — both triggers fire
Minor cosmetic scuff	3	LOW	✗ no
Torque below spec, safety fastener	9	HIGH	✓ YES — SEV≥9 alone would trigger it

This is exactly the criterion generate_pfmea.py's own printed next-steps already told you to carry forward — the two tools agree by construction, not by coincidence.

THE METHOD, IN ONE PICTURE

One Mandatory Input, Two Kinds of Output Field

1

PFMEA_Table (mandatory)

No PFMEA, no Control Plan — this tool won't run without it.

→

2

FILTER

Keep only rows where AP=HIGH or SEV≥8.

→

3

IE FIELDS (filled)

Station, tool, characteristic, SC flag, Reaction Plan.

→

4

QUALITY FIELDS (placeholder)

Spec, method, sample size/frequency, control method.

1

STEP 1

Populate the IE-Owned Fields

Every field here traces back to data your own time study or PFMEA already produced — nothing new is invented.

This is the same worked element from the PFMEA module — the tools chain together on purpose.

Process Step / Station	Station 4 — Grasp & Singulate
Tool / Machine	Bulk bin + tweezers (Component & Tool Register)
Characteristic	Component missing or double-loaded (= PFMEA Failure Mode)
Special Characteristic (SC)	YES — Severity = 8 ≥ 8

Every one of these four fields has a traceable source you could point to on request. That's what makes them safe to auto-fill — not that they're easy.

2

STEP 2

Carry the Reaction Plan Forward

Not a new judgment invented here — the Reaction Plan is PFMEA's own Recommended Action, copied forward exactly.

If the PFMEA's Recommended Action was vague, that vagueness should be fixed AT the PFMEA — not patched over here.

SOURCE — PFMEA's Recommended Action

"Add poka-yoke presence sensor at the bulk bin; stop line on a missed detection."

↓ carried forward, unchanged

CONTROL PLAN — Reaction Plan

"Add poka-yoke presence sensor at the bulk bin; stop line on a missed detection."

Why not rewrite it here? Because two versions of the same reaction plan — one in PFMEA, one in Control Plan — is exactly the kind of quiet drift that makes both documents untrustworthy over time.

3

STEP 3

Leave the Quality Fields Honest

"— Quality to define —" isn't a gap in the tool. It's the tool telling the truth about what it doesn't know.

A blank cell here is a REQUEST for Quality's expertise, not a failure to finish the document.

FIVE FIELDS, HONESTLY LEFT BLANK

Specification / Tolerance	*— Quality to define —*
Evaluation / Measurement Technique	*— Quality to define —*
Sample Size	*— Quality to define —*
Sample Frequency	*— Quality to define —*
Control Method	*— Quality to define —*

WHAT IT WOULD MEAN TO GUESS THESE

A time-study tool has no basis for choosing a Cpk-driven sample size or an SPC method — doing so anyway would put a confident-looking wrong answer in front of an auditor, which is worse than an honest blank.

PUTTING IT TOGETHER

One Complete Control Plan Row

Process Step / Station	Station 4 — Grasp & Singulate
Tool / Machine	Bulk bin + tweezers
Characteristic	Component missing or double-loaded
Special Characteristic	YES (SEV = 8)
Reaction Plan	Add poka-yoke sensor; stop line on miss
Specification / Tolerance	*— Quality to define —*
Evaluation Technique	*— Quality to define —*
Sample Size / Frequency	*— Quality to define —*
Control Method	*— Quality to define —*

BEFORE YOU GO TO THE FLOOR

Five Mistakes That Give Junior IEs Away

✗ Filling in a Sample Size or Control Method “just to be helpful” — that's Quality's call, and a guessed one can conflict with the real system.

✗ Rewriting the Reaction Plan instead of carrying PFMEA's Recommended Action forward exactly — creates two versions of the truth.

✗ Building a Control Plan row for a MEDIUM or LOW AP failure mode that never triggered the rule.

✗ Trying to run this tool before the PFMEA exists — there's nothing to filter yet.

✗ Treating a blank “— Quality to define —” cell as an error to fix, instead of a handoff to make.

FROM PENCIL-AND-PAPER TO THE SOFTWARE

What generate_control_plan.py Does For You

Three sheets, filtered and populated automatically from a PFMEA you already ran.

1	**Control_Plan_Table**	Full AIAG-VDA columns — every IE-owned field populated, every Quality-owned field honestly marked, for every row that passed the trigger rule.
2	**Reaction_Plan_Tracker**	Special Characteristics listed first — built for a floor or shift-handover reference, not a filing cabinet.
3	**Station_Summary**	Control-point count per station — shows at a glance where risk concentrates on the line.

KEY TAKEAWAYS

Recap — Say This Back In Your Own Words

- A PFMEA ranks risk. A Control Plan is what makes that ranking something a shift actually follows.
- The trigger is exact: AP=HIGH or Severity≥8 — not every failure mode earns a control point.
- Every IE-owned field traces to data you already have. The Reaction Plan is carried forward, never rewritten.
- Quality-owned fields stay honestly blank — a placeholder respects Quality's expertise; a guess would overwrite it.

TALK IT THROUGH — 3 QUESTIONS FOR YOUR NEXT LINE WALK

1. Pull up your line's real PFMEA — which rows would actually pass the trigger rule, by the numbers, not by feel?
2. Find a Control Plan on your floor with a filled-in Sample Size — do you know who actually decided that number, and how?
3. If IE and Quality's control plans ever disagreed on your line, which one would win — and does everyone actually know that?