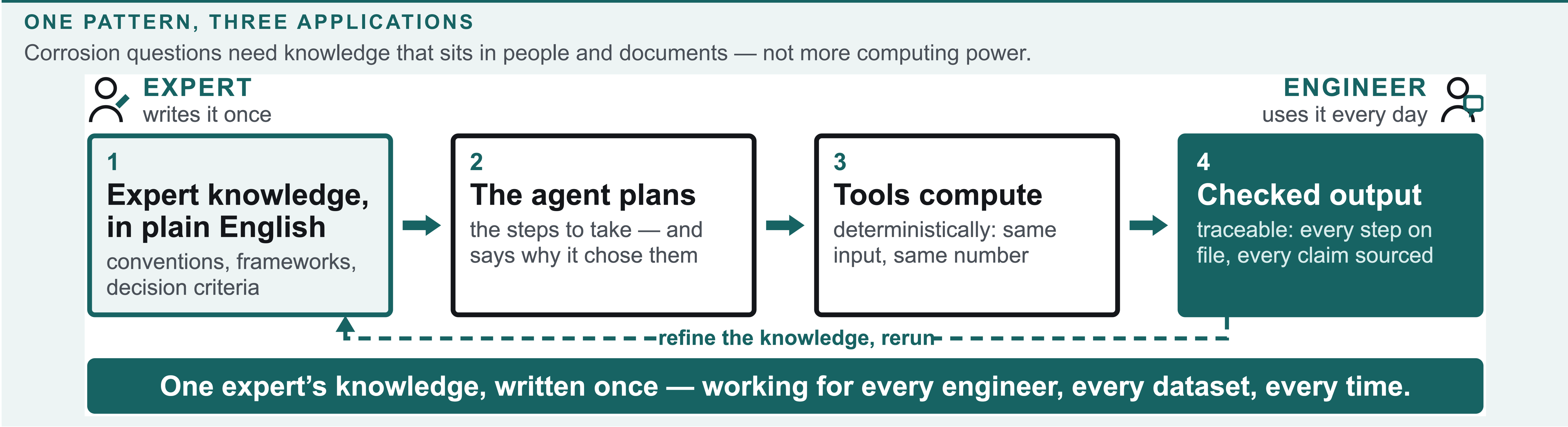


AI-ENABLED WORKFLOWS FOR CORROSION ENGINEERING: DATA ANALYSIS, KNOWLEDGE EXPLORATION, AND TRAINING

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HOW IT WORKS

The expert writes the knowledge down once; the engineer uses it every day



WHERE WE APPLY IT

Three example workflows: data analysis, knowledge exploration, training

01 Data analysis

Different tests, one question

The expert writes down how to judge. The workflow follows it — and shows its work.

THE EXPERT'S KNOWLEDGE PACK

- How to work** — the procedure the agent must follow
- How to judge** — what a signature means, and doesn't
- How to calculate** — every formula with its limits

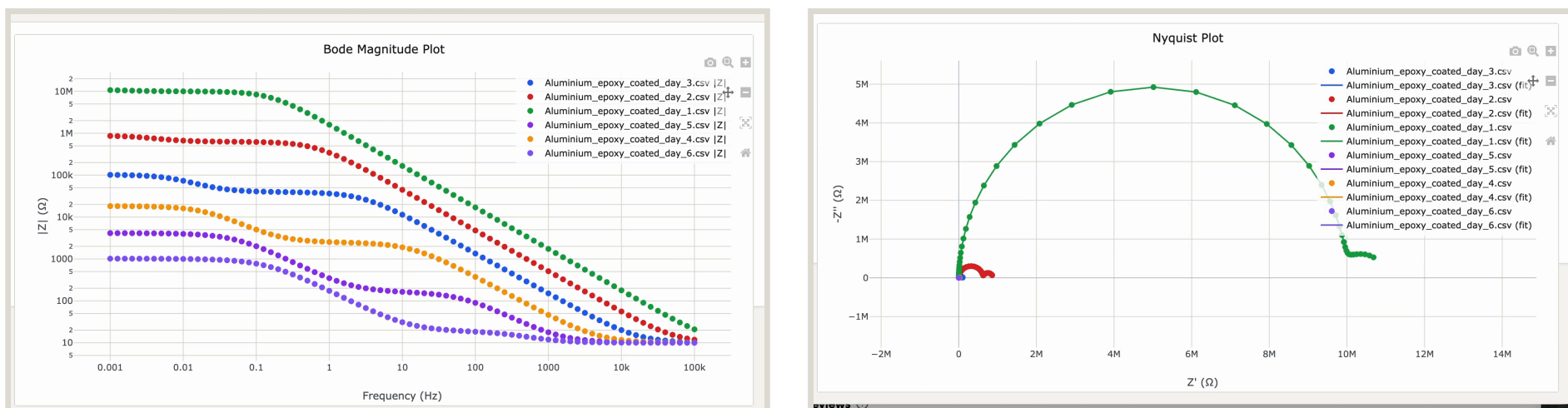
“Water uptake from coating capacitance means nothing without a dry reference from the same specimen. No day-zero, no number — report the trend and say so.”

one heuristic of ten — each with its source

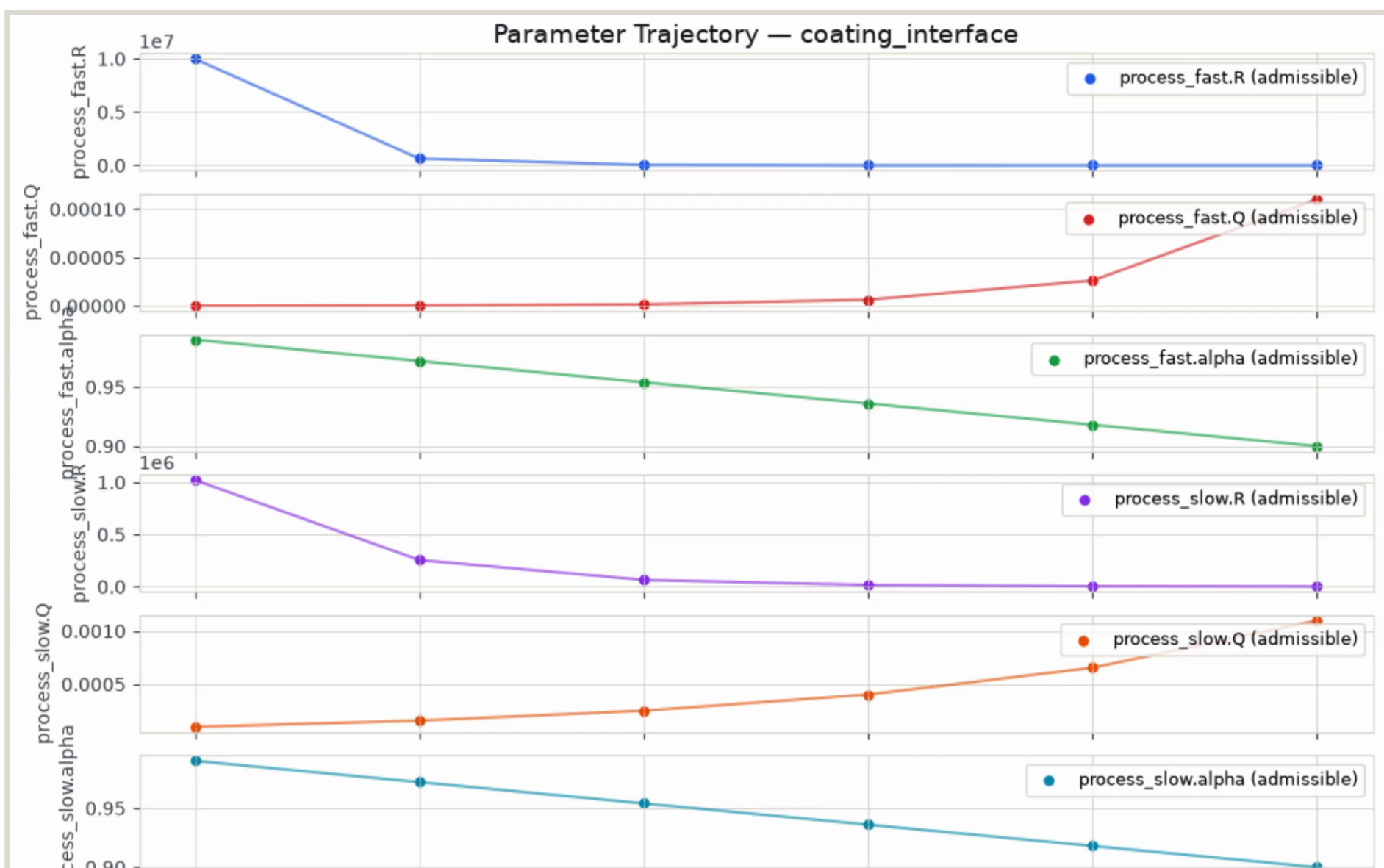
Plain language, written once — no model training.

- The knowledge pack guides the agent's choices: which circuit, which method, which figures.
- The fitting stays deterministic and is re-checked; every result is traceable.

WORKED EXAMPLE — EIS



1 Spectra, six immersion days



3 Parameters against immersion day

It also says what the data cannot settle.

02 Knowledge exploration

Sourced positions, not an average

A design choice, laid out — every position attributed to where it came from.

“Which coating system for this steel structure?”

coastal site · 25-year design life · repainting will be difficult

Published guidance
Three coats, zinc-rich primer, for this exposure class
source: standards and literature

Company experience
Same spec on a 2019 coastal job — first repair at year 11
source: in-house records

Product data
Two systems qualify — cost and recoat interval differ
source: manufacturer catalogues

The engineer weighs the trade-offs, and decides.

- Published guidance, the company's own past jobs and product data, assembled in one place.
- The engineer sees who says what — and can go and check it.

Assembling this yourself
days of reading · nothing attributed

A general-purpose model
one averaged answer · no sources

Without it, this is what the engineer gets.

The knowledge is plain text: read it, edit it, own it.

03 Training

Learn only what the job needs

One learner, one path — instead of five overlapping courses.

Site engineer moving into inspection
must understand durable reinforced concrete — not become a specialist

THE USUAL WAY

- Concrete technology · 14 h
- Electrochemistry · 10 h
- Steel in concrete · 12 h
- NDT and inspection · 8 h
- Standards · 6 h

ONE ASSEMBLED PATH

- Cover, curing, why concrete protects steel
- Chlorides and carbonation
- How rebar corrosion starts and spreads
- Inspecting new and in-service structures

Broad on purpose, deep only where the job needs it — and it says when to call a specialist.

- The expert's syllabus and lectures go in; teaching material comes out.
- The expert approves everything before it reaches a learner.

The expert's syllabus and lectures

Written lessons and figures

Questions to practise on

Other languages

PUBLISHED PODCAST SERIES



Real series, produced from the same material.

Same machinery as the analysis workflows.

Not detection, not simulation — the auditable interpretation of corrosion data.

Oral presentation — Thu 10 Sep, 11:30, Liffey Meeting Room 3 (JS5): From Impedance Data to Corrosion Insight: Automating EIS Workflows with AI Agents