

EON AI VENTURES · WORK INTELLIGENCE · MINING

EON Universal Mining

Facility-Agnostic Training & Field Intelligence

Turning any worker into a multi-year expert.

A composable equipment ontology for surface & underground mining.



White Paper Companion Deck · July 2026



THE OPPORTUNITY

Any worker. Any mine.

The people who hold **thirty years of judgment are retiring** — and remote, fly-in/fly-out sites make them scarce. The crews replacing them are green, where being wrong is a **safety & productivity problem**, not an inconvenience.



Recognise

Names every component on sight.



Guide

Composes the correct procedure, step by step.



Escalate

Stops and hands off to a human when unsure.

The worker is green. **The guidance is not.**



THE CORE INSIGHT

Composition, not enumeration

A mine isn't a monolith to memorise. Pit, plant and fleet are built from a **finite library of known equipment** — the same shovels, crushers, mills and pumps, site after site.

Think of a language. You could memorise every full sentence you'll ever need — endless and hopeless. Or you learn the **words** and build any sentence. EON Universal learns the **components** — then composes any mine, pit or plant.

Enumeration — model every facility

- **Scales** with the number of facilities — unbounded
- Every **new site is a new modelling effort**
- **Permutations** are effectively infinite

Composition — model the vocabulary

- Scales with component classes — **bounded**, ~50 to start
- **Recognise** nodes, infer topology, compose
- Every job makes the system smarter — it **compounds**

You don't model every mine. **You model the equipment every mine is built from.**



Fifty classes, not fifty mines

~50

equipment classes
to start

15

top classes carry
most daily value

80%+

of real field
interactions covered

Built on ISO 14224 taxonomy principles — the de-facto cross-industry equipment standard — tailored to the mine's asset hierarchy under ISO 55000. When the system recognises a component, its output maps straight into the mine's CMMS / EAM reliability data. It speaks their data language on day one.

TIER 1

~50 classes

Core fleet & plant a crew
touches — 80%+ of
interactions

TIER 2

~300 types

Variants & subtypes — rarely
surprised

TIER 3

1,000–2,000

Maintainable items: liners,
GET, bearings, seals

Each class carries a six-layer competence record — see next.



The six-layer competence record

1

Identity

ISO class, aliases, tag pattern

2

Geometry

3D model + multi-angle imagery

3

Anatomy

Subcomponents & boundary

4

Function

What it does; operating envelope

5

Behavior

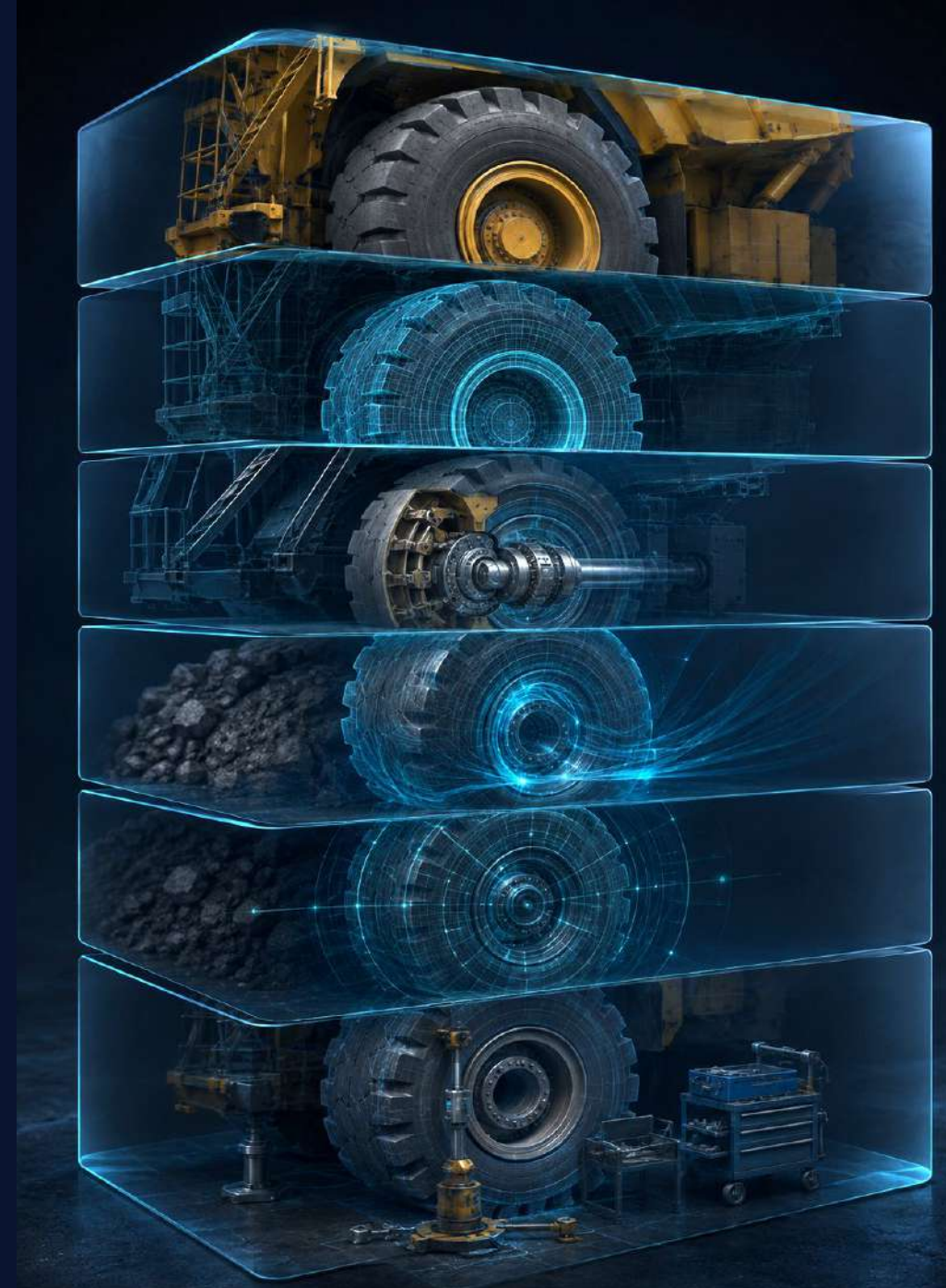
How it responds to upsets

6

Procedure

Operate · inspect · isolate · fix

Recognition keys on layers 1–2. Guidance composes from layers 3–6.



ONE METHOD, EVERY HEAVY INDUSTRY

The same engine, beyond mining

Because the system understands components rather than memorising sites, the method transfers to any operation built from a finite parts vocabulary. Learn the parts once; help every site built from them.



Mining

Surface & UG · ~50 classes

THIS DECK'S FOCUS



Oil & gas

~50 classes · ISO 14224

First library in build



Power & energy

Turbines, switchgear, BOP*

Same composition logic



Heavy mfg & MRO

Bounded part taxonomy*

High-reg, high-value



**Illustrative — class families are representative; mining is this deck's focus, oil & gas is the first library in active build.*

THE DIFFERENCE

Genesis shows the steps. EON Universal understands the work.

GENESIS — the core engine

- Needs 3D models supplied to it
- Handles sequential SOPs only — not conditional
- Knows what to do/show, but not why
- Cannot configure different capabilities
- Does not recognise things in real life

EON UNIVERSAL — intelligence + library

- The component library + the configurator
- Conditional SOPs that branch on live conditions
- Explains why each step matters
- Generalises to skids it has never seen
- Recognises equipment on sight — feeds FieldIQ + Holodeck

This is the step nobody has taken — not even a simulator. **That understanding is the entire product.**



What EON Universal makes possible



Each part explains what it is, how it works — and lets you try it.

Talking components



Branching SOPs with safety gates: release pressure before opening.

Conditional procedures



Inject a fault; the trainee must recognise and respond, not follow a script.

Fault diagnosis



Unlimited, engineering-valid skids from one component library.

Generative configurations



Defensible, scored evidence a worker is ready — against the standard.

Certification



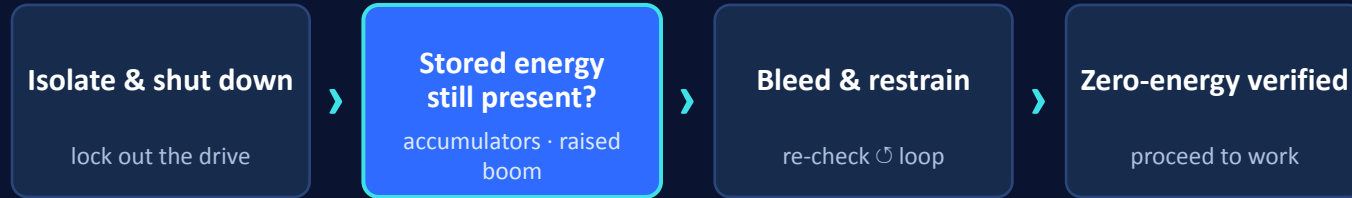
Every session improves the shared library for the next worker.

Compounds



Conditional SOPs: procedures that branch

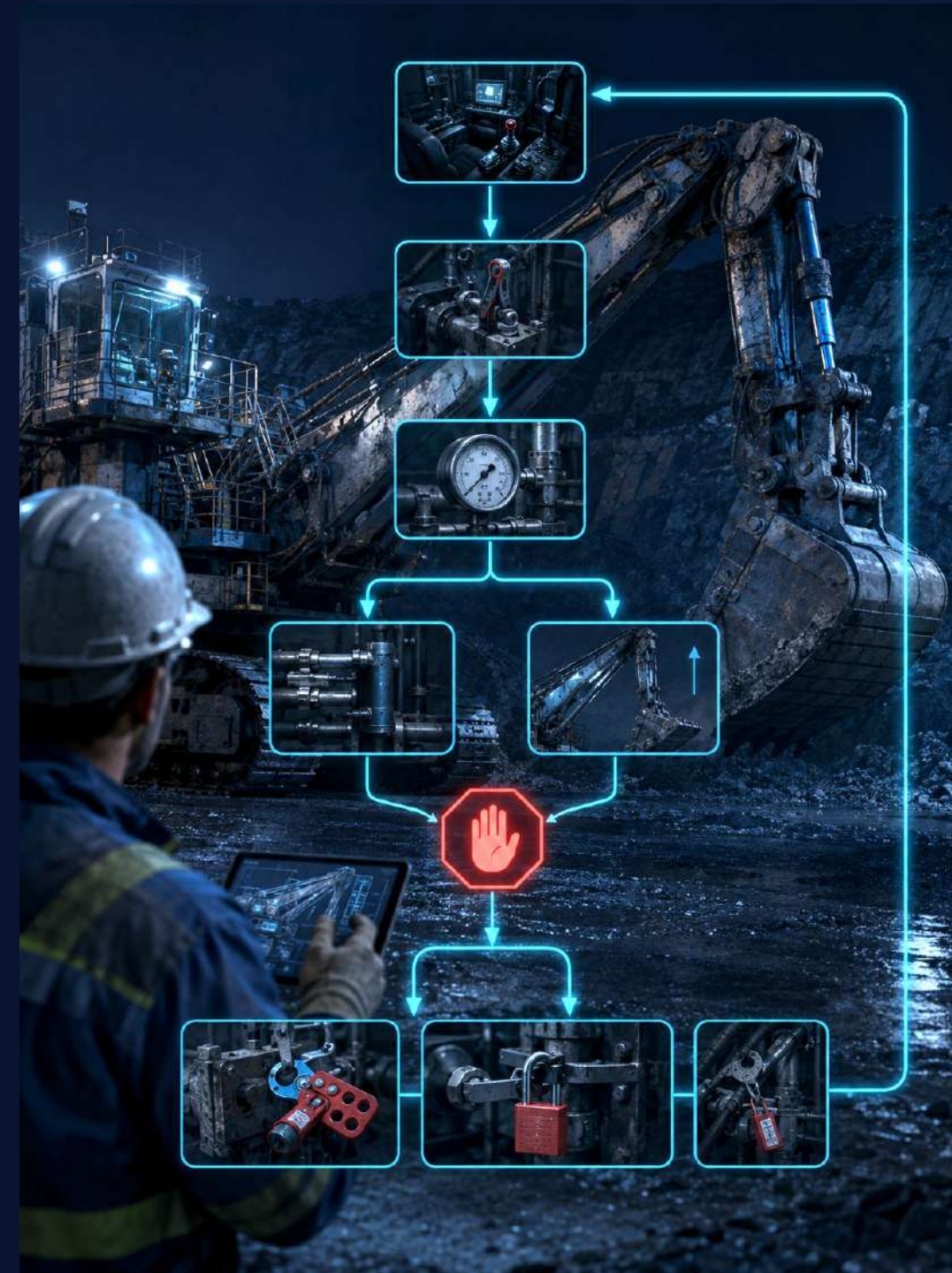
A fixed SOP is a straight line. A conditional SOP is a decision tree with safety gates — the next action depends on a live condition. Only authorable because Universal understands the equipment.



Abnormal → STOP & escalate (Verdict)

Why this is the proof. The 'stored energy still present?' branch only exists because Universal knows a shovel's hydraulic accumulators hold pressure after shutdown — and a raised boom stores gravitational energy. **Genesis has no concept of stored energy — so it cannot branch on it.**

Seven training use cases: talking components · guided & scored SOP · conditional SOPs · fault injection · generative skids · AR-only practice · certification



ONE SYSTEM, THREE SURFACES

Author once — deliver everywhere



ANYWHERE

Phone / AR glasses

AR-only at 1:1 scale.
Practice at camp or home
with no hardware at all.



ON SITE

Tablet/AR Glasses
on the machine

LiDAR overlays the digital
twin onto the real haul
truck or crusher — each
part tappable.



IMMERSIVE

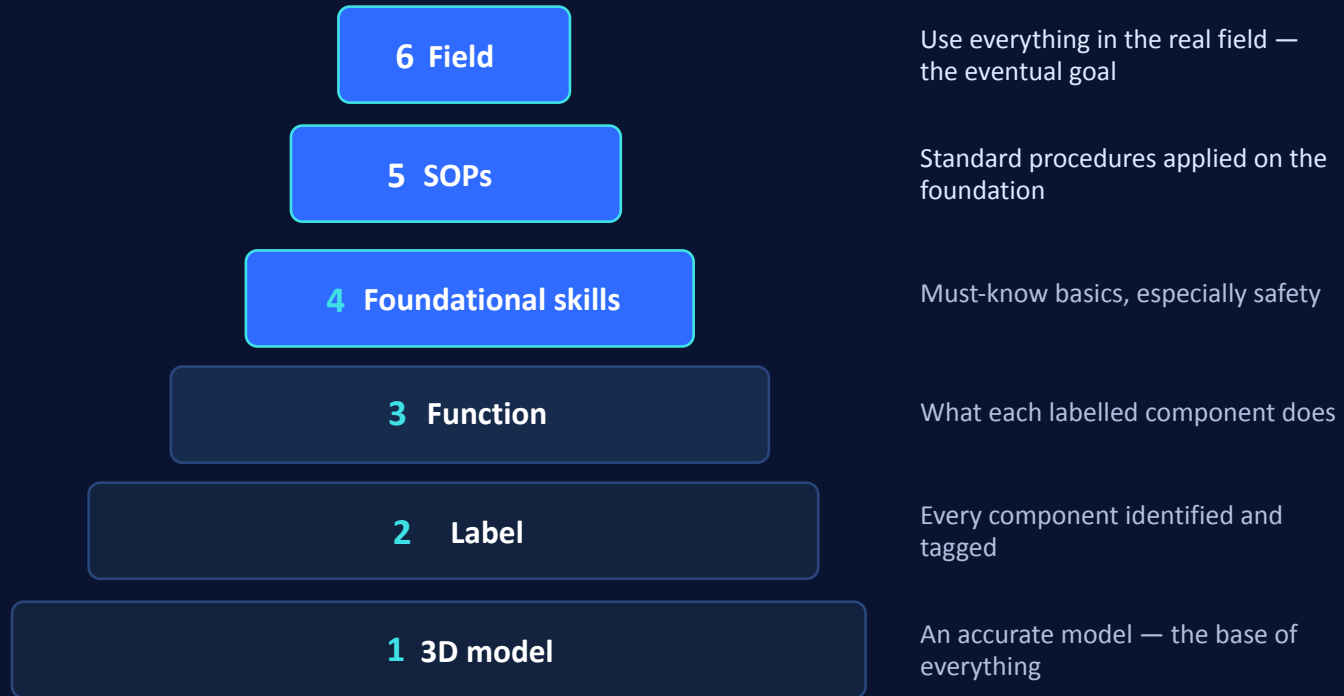
The CAVE

LED walls and floor
surround the trainee in a
generated pit or plant at
scale.

Phone at camp → tablet on the machine → CAVE for immersive, infinite training. The same understanding drives all three. The CAVE — a modern LED reborn iCube — is the premium upsell tier.



The Pyramid — layer by layer



You cannot skip a level. Layers 1–4 understand components, not facilities — which is exactly the bridge to the universal solution.



Own the work, not the weights



Genesis

The core engine. Models, labels, runs step-by-step SOPs.



EON Universal

Adds intelligence, the library, the configurator, recognition.



FieldIQ + Holodeck

Delivery: field recognition, on-the-spot guidance, scenarios.

- ✓ Every job makes the system smarter — a product that compounds.
- ✓ Works on facilities it has never seen — recognise, infer, compose.
- ✓ A bounded library you own — not a per-site modelling cost forever.

Genesis shows the steps. **EON Universal understands the work.**

