



— AUTONOMOUS DRILLING RISK INTELLIGENCE

GridShieldAI

A multi-agent AI system that reads live well-log data, predicts catastrophic drilling failures before they happen, and ships a governed, human-ready response in seconds.

9 Specialist AI Agents

Self-Correcting Governance

Human-in-the-Loop

A CORE42 VENTURE



— THE PROBLEM

Drilling failures are **expensive, fast, and deadly**

Washouts, kicks, and stuck-pipe events unfold in minutes. Today they're caught by overloaded engineers staring at dozens of noisy curves — usually too late.

\$1M+

Typical cost of a single stuck-pipe or blowout event in non-productive time

~25%

of drilling time can be lost to preventable downhole incidents (NPT)

Minutes

from first anomaly to irreversible failure — faster than manual review

— THE SOLUTION

An AI co-pilot that never blinks

GridShieldAI ingests raw LAS well logs and runs a team of specialized AI agents that detect, diagnose, predict, and prescribe — then route a governed action ticket to a human in one continuous loop.

- **Detects** joint-curve anomalies across GR, RHOB, NPHI, SP, ECD & MWP.
- **Predicts** the failure mode with confidence + matched historical incidents.
- **Prescribes** mitigation (e.g. mud-weight changes) under safety governance.

● ● ● gridshield · live run

```
> LASLoader loaded 40 rows · 21 baseline anomalies
> Detector washout signature @ 8007.5–8008.5 ft
> DrillingDynamics concern = HIGH
> Petrophysics concern = HIGH
> Predictor risk=washout conf=0.85 · HIST-001, HIST-005
> GovernanceCritic REVISE → specialist review required
> Ticketing INC-20260605 · human_review=TRUE
```

— HOW IT WORKS

One pipeline, **eight stages**, fully traceable

Every decision is logged with model, latency, and rationale — auditable end to end.



— THE AGENT TEAM

Nine specialists, **one mission**



LASLoader

Parses LAS logs, computes baseline stats, flags first-pass anomalies.



Detector

Reasons over joint-curve behavior to confirm true downhole events.



Drilling Dynamics

Hydraulics & well-control: ECD/MWP friction, kick & stuck-pipe risk.



Petrophysics

Formation evaluation & log-quality impact of borehole instability.



HSE Compliance

Health, safety, environment & regulatory exposure assessment.



Predictor

Classifies failure mode + confidence, matches historical incidents.



Optimizer

Generates a stepwise mitigation & HSE action plan.



Governance Critic

Scores & revises plans for safety before anything reaches a human.



Ticketing

Issues an auditable incident ticket flagged for human review.

— TRUST & SAFETY

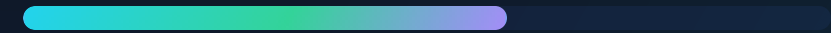
AI that checks its own work

A free-running LLM can't be trusted with a billion-dollar rig. So every recommendation passes through a dedicated **GovernanceCritic** that scores it, demands fixes, and loops the Optimizer until it meets the bar — then a human signs off.

- **Self-correction:** Optimizer $\rightleftharpoons$ Critic iterate automatically.
- **Escalation:** high-risk events auto-flag a specialist.
- **Human-in-the-loop:** nothing acts without review.

Governance score → approval

Iteration 1 — REVISE



Iteration 2 — refine



Iteration 3 — APPROVE → human



Average ~3 governance iterations per run — every fix logged and auditable.

— PROOF IT RUNS

Not a slide — a **working system**

GridShieldAI has already executed thousands of full multi-agent runs end to end, every decision captured in structured logs.

1,921

Full end-to-end runs
completed

24,708

Individual agent decisions
logged

9

Coordinated specialist
agents

~3.6s

Typical specialist reasoning
latency

Live demo served publicly via secure tunnel during evaluation. Every run is reproducible and auditable.

— DETECTION IN ACTION

Washout caught at 8,007 ft

From a real run: GridShieldAI spotted a classic washout — a simultaneous GR spike, RHOB drop, NPHI rise and negative SP excursion — that a single-curve alarm would miss.

- Secondary friction zone (ECD/MWP) flagged at 8,015 ft.
- Predicted **washout** at **0.85** confidence, matched to HIST-001 / HIST-005.
- Governance demanded specialist review → ticket **INC-20260605**.

Joint-curve anomaly signature

GR — gamma ray spike



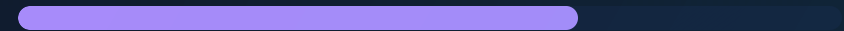
RHOB — density drop



NPHI — neutron porosity rise



SP — negative excursion



No single curve confirms a washout — GridShieldAI reads them together.

— OPPORTUNITY

A massive, **underserved** safety market



The Market

Thousands of active rigs worldwide, each generating millions in avoidable non-productive time — and rising automation budgets.



Why Now

Frontier LLMs can finally reason over multi-sensor signals in real time, while sensor data is already digitized and streaming.



The Edge

Not a chatbot — a governed, auditable agent system built for high-stakes industrial decisions where trust is non-negotiable.

Where we win vs. legacy alarms

Rule-based dashboards alarm on one curve at a time and drown crews in false positives. GridShieldAI reasons across curves, ranks risk, and explains *why*.

Where we win vs. raw LLMs

A bare model hallucinates and can't be trusted on a rig. Our governance loop + human-in-the-loop make outputs safe to act on.

— THE ASK

Let's put a **shield** on every rig

GridShieldAI already runs end to end. We're ready to pilot on live field data with a forward-leaning operator.



Pilot

One rig, one formation, 60 days — prove prevented NPT against your baseline.



Integrate

Wire into live WITSML / LAS streams and your existing incident workflow.



Scale

Expand the agent library to new failure modes and full fleet coverage.

● **GridShieldAI** — Autonomous Drilling Risk Intelligence · Thank you. Questions?

BUILT WITH



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