AI, Accountability and HSE Compliance in MENA

When AI gets it wrong in HSE, who answers?

denXpert REDLOG INOGEN ALLIANCE

16 November 2026

Trusted HSE and ESG solution

Companies that already **chose us**

500+

companies

Chosen by hundreds of companies worldwide.

Hungarian and international market experience

20+

years of experience

Software built by Hungarian sustainability experts for today's challenges.

Sustainability experts **worldwide**

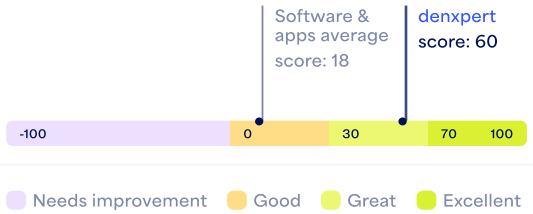
6000+

sustainability consultants

A global partner network of consultants in 85 countries.

Customer feedback from 30+ countries

- Global Net Promoter Score: 60
- Low churn: 3%



4.8

4.9

AI in HSE: What do we use it for?

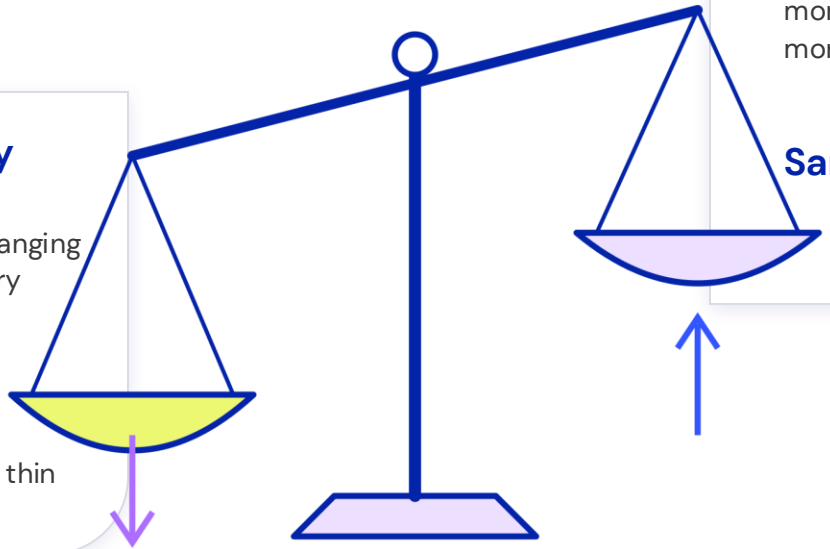
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The HSE paradox

The workload grows, capacity doesn't

Growing complexity

- More and more fast-changing rules, country by country
- Zero-accident targets from leadership
- Manual oversight wears thin



Human capacity

Same-size team,
more sites, more countries,
more risk categories.

Same hours.

HSE built on periodic inspections and after-the-fact response cannot process data fast enough to see the hazard **before the incident**.

From investigation to prevention

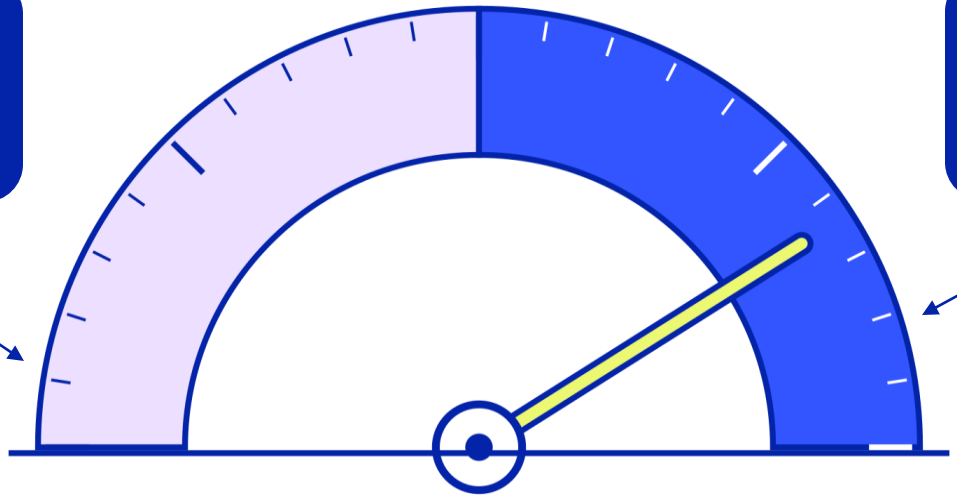
AI moves HSE from investigation toward prediction, but that requires legal clarity and transparent logic

REACTIVE

After the incident: investigation, report, action

PREDICTIVE

Before the incident: signal, forecast, intervention

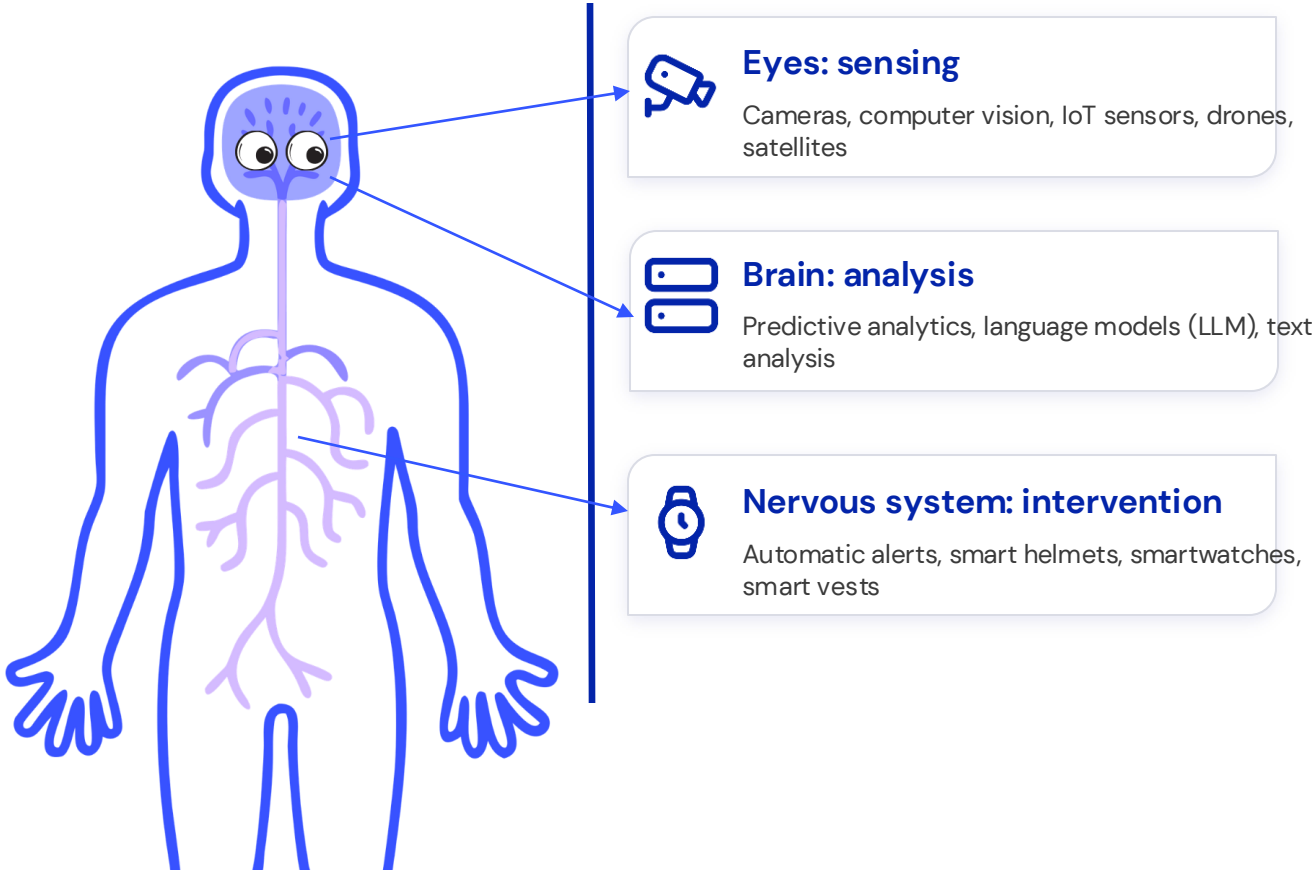


Is AI monitoring machines or **people**?

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Anatomy of an AI system

It works like we do: it senses, thinks and acts



Eyes: sensing

Cameras, computer vision, IoT sensors, drones, satellites

WHO DOES IT SEE?

Personal and **biometric data**

Brain: analysis

Predictive analytics, language models (LLM), text analysis

HOW DOES IT DECIDE?

Transparency, bias, human review

Nervous system: intervention

Automatic alerts, smart helmets, smartwatches, smart vests

WHO DOES IT MEASURE?

Health data, worker monitoring

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Where AI is truly green

Environmental use cases: monitoring machines and emissions, not people



Methane by satellite

40+

emission-reduction actions

UNEP MARS: data from 30+ satellites, AI filters out the noise, an analyst checks every alert.



Wastewater treatment

-30%

aeration energy

Cuxhaven: 1.1 million kWh saved per year while meeting regulatory limits.



Waste-sorting robots

70 → 90%

recovery rate

Construction and demolition waste. Workers move from manual sorting to lower-risk tasks.

denXpert

Sources: UNEP (2026); Xylem / EWE Wasser; ZenRobotics / SITA Finland.

China: AI sensors in safety helmets

Brainwave monitoring of workers, with no regulatory limits

Emotion AI: State Grid Zhejiang

Sensors built into helmets use AI to look for signs of anxiety, anger and depression. The company says this has added about CNY 2 bn in profit since 2014.

Fatigue monitoring: train drivers

On the Beijing–Shanghai high-speed line, a sensor in the driver's cap alerts when attention drops or the driver nods off.

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Source: South China Morning Post, 2018. Profit figure per the company.

South Korea: mandatory drones

Dongbu Construction's own decision, across all its projects

Now

Rollout

Drone stations and an AI platform on construction sites

2027

Large projects

Mandatory above KRW 220 bn (~USD 161 M)

2029

All projects

Full rollout across all company construction sites

What does the AI monitor?

- **Helmet**, hi-vis vest and safety harness use
- Results go to **site managers**
- Later also AI-based **risk assessment**

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Source: Herald Business, biz.heraldcorp.com. Company rule, not law.

When AI gets it wrong in HSE, who answers?

Five questions with Dr. Randall D. Shaw, Redlog

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AI can make HSE professionals better, or quietly worse

The good
Used as a sparring partner, AI sharpens professional judgement and removes low-value work.

The bad
Used as a substitute, it hides weak analysis behind fluent documents, weakens our checks and moves data beyond our control.

The accountable
Either way, it does not remove the organisation's existing duties, or the need for competent professional judgement.



Five questions for the next twenty minutes

1. **Adoption reality** Where is AI already being used in HSE work, including the tools nobody approved?
2. **Accountability & judgement** Who answers when it goes wrong, and what happens to judgement and independent review?
3. **Regulatory contrast** What are GCC regulators starting to expect, and what travels with multinationals?
4. **Data & third parties** Where does sensitive HSE information go, and who else is putting it into AI tools?
5. **Governance in practice** What does accountable, traceable and auditable AI use actually look like?

Then: denxpert demonstration and live Q&A

AI is already in your HSE function, approved or not

- Procedures and toolbox talks
- Translating safety briefings
- Legal register research
- Incident reports and root causes
- Monthly HSE reporting
- Photos and site observations

Shadow AI

AI use the organisation cannot see: personal accounts, phones and free tools, adopted to get through a heavy workload.

Nobody approved it. Nobody prohibited it.

In most organisations, nobody knows the extent of it.

The same tool can build competence or erode it

AI augmentation	AI substitution
“Find the applicable requirements, cite the legal reference for each, and flag where applicability is uncertain.”	“Tell me the requirements and I’ll accept them.”
“Challenge my risk assessment.”	“Write my risk assessment.”
“What hazards might I have missed?”	“Identify the hazards for me.”
“Compare my investigation against these causal models.”	“Determine the root cause.”
“Find weaknesses in my proposed controls.”	“Tell me what controls to implement.”

The first column builds competence. The second can erode it.

The fluency trap: weak analysis can now look excellent

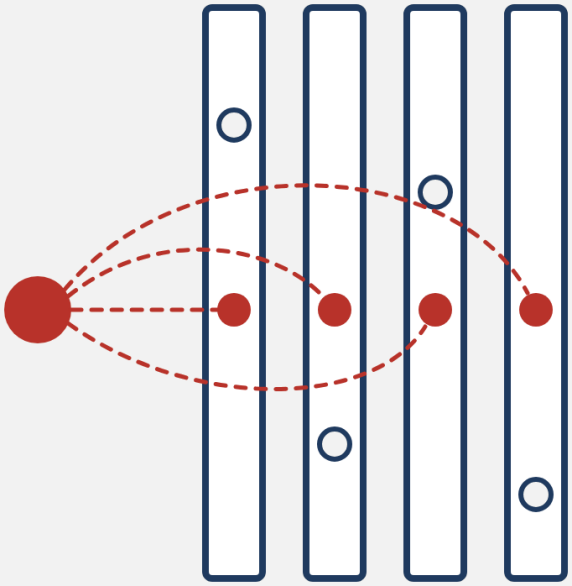
- We used to judge technical work partly by how it looked. AI breaks that shortcut.
- Skills that are not used fade: observing, interpreting, challenging.
- Juniors may never build the judgement their seniors gained by doing the work.
- **The better AI gets, the more competence you need to check it.**

28.4% → 22.4%

Detection rate of experienced endoscopists working without AI, after routine AI assistance was introduced

The Lancet Gastroenterology & Hepatology, 2025. Observational study, four centres in Poland.

When four lines of defence become one



1. **Shared reasoning**
   Everyone checks the work with the same AI, so the checks agree because they come from the same place.
2. **Anchoring**
   Reviewers edit a document the AI has already framed, rather than thinking afresh.
3. **Shared sources**
   One error in an AI-built legal register flows into every audit and review that relies on it.

Four signatures. One reasoning system.

The duty already exists in every GCC state

Country	Employer duty to protect workers from workplace hazards
UAE	Federal Decree-Law 33/2021; Ministerial Resolution 44/2022; ADOSH-SF in Abu Dhabi
Saudi Arabia	Labour Law, Chapter Eight
Qatar	Labour Law 14/2004, Article 100
Oman	Labour Law (Royal Decree 53/2023), Article 104
Kuwait	Private Sector Labour Law 6/2010, Article 83
Bahrain	Labour Law 36/2012, Article 166

No new AI law is needed for the duty to apply.

Whether a risk assessment was written by hand, copied or generated by AI, the question is the same: did the organisation identify and control the risk?

Responsibility is shared, not transferred

Employer

Retains its statutory HSE duties; the first party a regulator looks to

Individuals

Professional accountability for what they approve

Consultant

Professional and contractual exposure for AI-assisted advice

Contractor

Its own duties for the work and the risk assessments it submits

AI vendor

Contractual, and in some jurisdictions product, liability

Vendor contracts can limit what you recover from the vendor. They cannot transfer your regulatory duties.

What a defensible decision rests on

A polished lift plan. Three signatures. Nobody checked the ground-bearing capacity of the backfilled ground. The outrigger loses support.

1 Source verification

The requirement or technical guidance was checked against an authoritative, applicable and current source.

2 Competent review

Someone with the right expertise examined the substance, including omissions and assumptions, not just completeness.

3 Field verification

The assumptions and controls were checked against the actual worksite and operating conditions.

A second AI tool checking the first is not, by itself, independent verification. A documented, competent review is evidence of reasonable care, not a guarantee of immunity.

Three layers of requirements and governance

Layer 1	**Existing statutory and regulatory HSE and environmental duties** Labour law and regulations, environmental permits, statutory reporting, codes
Layer 2	**AI-specific laws, regulations and guidance** Data protection laws, free-zone rules, financial-sector AI requirements and guidance
Layer 3	**Corporate and contractual governance** Group AI policies, client and contract requirements, ISO/IEC 42001

Layer 1
is where the real HSE exposure sits.

Layer 3
is often where the first concrete AI requirements arrive.

You may have no AI-specific HSE regulation to follow. You cannot assume your AI-assisted HSE work is unregulated.

No GCC AI Act, but plenty of requirements

Data protection

- Five of six GCC states have comprehensive, GDPR-style laws; Kuwait has sector rules.
- A key binding source wherever AI processes personal data.

Financial regulators

- Qatar Central Bank: mandatory guideline, AI register, approvals for specified deployments.
- UAE Central Bank: supervisory guidance on board accountability, inventories, human oversight.

Travels both ways

- Multinationals bring group AI standards into the GCC.
- GCC exporters may fall within the EU AI Act; high-risk duties from Dec 2027 / Aug 2028.

The pathway for HSE regulation is uncertain. The direction of responsible governance is much clearer.

The leak nobody noticed

- **An incident report pasted into a free chatbot**
  witness statements, injury details, draft findings
- **An AI note-taker in the incident review**
  every name and admission transcribed by a third party
- **Spill or emissions data uploaded for a chart**
  including an unreported exceedance
- **The compliance question itself**
  "We exceeded our permit three times. Do we have to report it?"



Do you know which AI tools your consultants and contractors use on your data?

Three tests: accountable, traceable, auditable

1

Accountable

Who owns the decision?

A named owner with the competence, time and authority to overrule the tool.

2

Traceable

Can you reconstruct it?

Source, version, AI tool used, what the AI produced, what the reviewer changed, who approved it.

3

Auditable

Can it be independently verified?

Records showing the controls actually worked, including a completeness check, not just accuracy.

Checking that listed obligations are met does not show the register is complete. Both need testing.

Six steps you can start next week

1 Find what is in use

Build the AI inventory by use case, including the tools nobody approved.

2 Set approval limits

Permitted, restricted, or unsuitable without independent verification.

3 Name the owners

Competence, time and authority for each high-consequence use.

4 Protect independence

At least one check that does not rely on the original AI output.

5 Set the data rules

Which information goes into which tools, extended to consultants and contractors.

6 Keep evidence and act on failures

Test, audit, and suspend and revalidate when a material error is found.

The organisations that benefit most from AI may be those that deliberately preserve the human expertise it appears to make unnecessary

Next: denxpert demonstration, then live Q&A

Read the series: AI and HSE Management: The Good, the Bad and the Accountable

Thank you for your attention!

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