SECTOR DECISION BRIEF

Mining

Remote operations, variable conditions, heavy assets, and worker safety change the calculus for automation. A model output has value only when crews can act on it in the actual operating window.



AideDeCamp Consulting | Advisory perspective

Illustrative guidance. Scope and deliverables are agreed for each engagement.

SECTOR DECISION BRIEF / ADVISORY PERSPECTIVE

Mining

Remote operations, variable conditions, heavy assets, and worker safety change the calculus for automation. A model output has value only when crews can act on it in the actual operating window.



DECISION TO FRAME

Can a proposed signal change a safe operating or maintenance decision early enough to matter?

The image is illustrative. The example below is a proposed decision design, not a completed client project.

WHY THESE CONNECT	Intervene on an equipment condition alert at a remote site. We will map when the signal reaches site maintenance lead with operating and safety authority, then define the last useful point to answer: Inspect, adjust the plan, or continue monitoring under site rules?

An operating decision, not another alert

A remote equipment alert and a mobile-haulage proximity warning have different safety consequences. Site conditions, communications coverage, and surface-versus-underground rules must be identified before an intervention design is recommended.

EARLIER SIGNAL	DECISION	ACCOUNTABLE ACTION	PROOF
Sensor behavior indicates a potential issue before a planned maintenance window.	Inspect, adjust the plan, or continue monitoring under site rules?	Site maintenance lead with operating and safety authority. Confirm the alert locally and choose a safe intervention; record the reason.	Valid alerts, response time, unplanned stoppage, and false reassurance

CONTROL BOUNDARY	No remote recommendation overrides site safety procedure; offline fallback is explicit.

02 / DIAGNOSTIC

Where the work gets stuck

We will test three operating friction points against the action each could change.

OPERATING FRICTION	EVIDENCE WE WILL EXAMINE	DECISION TEST WE WILL RUN
Condition monitoring produces alerts faster than teams can validate them.	Incident and maintenance context, sensor coverage, and data gaps by asset or site.	We will compare alert volume with the crew's ability to validate and act on each one.
A site has patchy connectivity or inconsistent equipment records.	Network coverage, equipment-record completeness, local fallback, and recovery responsibilities.	We will test the same workflow under missing records and intermittent connectivity.
A planning optimization conflicts with safety or maintenance constraints.	Safety boundaries, maintenance windows, override authority, and impacts on crews and equipment.	We will check that optimization never hides a safety or maintenance constraint.

What our pilot will establish

WORKSTREAM	WHAT ADC WILL DO	DECISION-READY OUTPUT
Hazard path	Map exposure, sensing, operator notice, and safe-stop authority.	Site-specific intervention matrix.
Signal quality	Replay missed and false warnings across location and shift.	False/missed-alert test by operating area.
Response capacity	Check dispatch, crew, maintenance, and contractor availability.	Feasible action and escalation route.
Operating cost	Measure warning-to-action time and production disruption.	Safety-and-availability scorecard.

DECISION GATE We will recommend whether to proceed, redesign, or stop using this test: Expand only if the site can act safely on the signal when networks and records are imperfect.

Design-ready checks we will deliver

CHECK	WHAT ADC WILL VERIFY	DESIGN OUTPUT
Connectivity	Drill network, sensor, and edge-device loss with site owners.	Degraded-mode and safe-stop protocol.
Site approval	Confirm the safety lead's review and applicable site rules.	Authorized trial and change-control gate.

03 / SECTOR EXECUTIVE AGENDA

What sector leaders will ask

A site leader will put worker safety, equipment availability, communications resilience, and shift-level execution ahead of model novelty.

PRIORITY	SPONSOR QUESTION	EVIDENCE TO BRING
Hazard and intervention	Could a missed or false signal expose people or equipment to unacceptable risk?	Task hazard review, incident history, safe-stop path, and intervention authority.
Remote communications	What continues safely when a network, sensor, or edge device fails?	Coverage by location, latency, outages, local control, and recovery practice.
Fleet and asset history	Are condition signals comparable across machine age, maintenance state, and duty cycle?	Sensor calibration, repair records, utilization, and site-specific operating conditions.
Workforce and handoff	Can crews validate and act on alerts during a real shift?	Shift notes, training, dispatch load, maintenance capacity, and contractor roles.

Three opportunities we will compare

CANDIDATE	VALUE HYPOTHESIS	PROOF BEFORE INVESTMENT
Equipment condition	Plan a safer intervention	Compare alerts with site maintenance history
Hazard recognition	Warn before worker exposure	Test sensing limits and safe-stop response
Shift planning	Reduce avoidable idle time	Include crew, network, and maintenance constraints

Measures we will put on the scorecard

MEASURE	WHAT A DECISION MAKER SHOULD SEE
Safety	Near misses, unsafe interventions, and response to a degraded signal.
Availability	Unplanned stoppage avoided relative to inspection and intervention effort.
Resilience	Time operating safely under lost connectivity or missing records.

Risks we will surface early

- The pilot requires continuous connectivity where the site cannot provide it.
- Alert volume exceeds the crew's ability to inspect safely.
- A productivity gain is counted without recording the safety or maintenance cost.

04 / ADVISORY APPLICATION

How we will turn evidence into a decision

ADC will lead the work; exact outputs are agreed before kickoff.

SERVICE	WHAT ADC WILL DO
AI Strategy & Roadmap	ADC will select use cases that have an actionable response path and can be tested without weakening safety controls.
AI Adoption & Integration Advisory	ADC will design crew review, exception logging, and stop conditions with the people who operate the site.
Cloud Transformation	ADC will match edge and cloud choices to connectivity, latency, security, and support realities rather than assuming centralization.

The sequence leading to your decision

STAGE	WHAT ADC WILL DO	WHAT YOU WILL RECEIVE
Frame	We will select one equipment or proximity decision.	Hazard consequence and authority map.
Examine	We will trace sensor, dispatch, and maintenance evidence.	Coverage and response baseline.
Test	We will design and observe a client-led degraded-mode drill.	Warning, override, and safe-stop findings.
Recommend	We will present a site-specific trial recommendation.	Safety-owner gate and intervention map.

What you will receive

- Signal-to-intervention map
- Safety and data-readiness questions for one site workflow
- Edge/cloud decision criteria with offline fallback

A focused first engagement

We will test one equipment alert against communications loss, crew capacity, and safe-stop practices, then deliver a site decision map.

Independent sector reading

CDC/NIOSH: Mining and critical minerals research

NIOSH: Automation and worker safety in mining

NIOSH: Machinery struck-by injury prevention

Sources inform context; ADC is not affiliated with their publishers. Examples are illustrative, not completed client work. Scope and deliverables are agreed before kickoff.

05 / ILLUSTRATIVE ENGAGEMENT

A first engagement in practical terms

This is an example work package, not a completed client assignment. The actual scope, data access, and acceptance criteria would be agreed with the sponsor.

WORKFLOW IN SCOPE

One remote mobile-equipment condition alert, from edge reading to site-maintenance intervention under local safety rules.

The evidence we will request

- Sensor reliability, equipment duty cycle, failure history, and maintenance record quality
- Shift roster, parts, travel time, connectivity gaps, and planned shutdown windows
- Site safety procedure, radio or offline fallback, and accountable local authority

Work products and the decisions they support

WORK PRODUCT	WHAT ADC WILL PRODUCE	HOW THE CLIENT USES IT
Intervention window map	Locate when the crew can inspect, adjust the plan, or keep monitoring safely.	Show whether earlier notice would create a practical action instead of a remote dashboard.
Offline decision test	Rehearse stale readings, network loss, missing history, and false reassurance cases.	Expose where a recommendation must pause or fall back to site procedure.
Site trial charter	Name local decision authority, alert handoff, stop conditions, and maintenance measures.	Authorize a trial that works within actual shift, parts, and connectivity constraints.

SPONSOR GATE

The site chooses pilot, revise, or stop only after safe actionability, offline operation, and maintenance burden are demonstrated.

How the gate changes the next step

DIRECTION	EVIDENCE-BASED NEXT STEP
PROCEED	Pilot if the local crew can validate the signal and act within a real maintenance window.
REVISE	Revise if connectivity loss or missing history changes the recommended action.
STOP	Stop if remote advice could override site safety rules or create false reassurance.

The example describes a proposed diagnostic and pilot design. It does not claim access to a named client's data, a completed engagement, or a guaranteed result.