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Engineering Leadership in Preventing Shaft and Winder Incidents

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Background

Shaft and Winder Safety – A Leadership Imperative

- Shaft and winder systems remain among the highest-risk asset in mining.
- A single failure can result in:
 - Multiple losses of life;
 - Asset damage;
 - Regulatory action; and
 - Reputational damage.

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Why Shaft & Winder Incidents Matter

Potential Consequences

- Loss of life;
- Serious injuries;
- Infrastructure damage;
- Extended stoppages;
- Financial losses; and
- Loss of stakeholder confidence.

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Common Causes of Shafts & Winder Incidents

Technical Factors

- Rope failures
- Brake system failures
- Overwind / Underwind events
- Mechanical failures
- Electrical failures
- PLC/control system faults

Human Factors

- Poor supervision
- Fatigue
- Inadequate competency
- Procedural violations
- Weak risk assessment
- Inadequate maintenance

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Critical Engineering Controls

To Prevent Major Incidents, ensure:

- Brake integrity
- Rope condition monitoring
- Overwind/underwind protection
- Emergency braking systems
- Safety detaching hooks reliability
- Overspeed protection
- Daily inspections
- Functional testing of safety devices

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Asset Integrity Management

Engineering leadership ensures:

- Risk-based maintenance
- Predictive maintenance
- Reliability centered maintenance
- Critical spares management
- Life-cycle asset management
- Change management
- Independent technical audits

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Engineering Governance

Good governance includes:

- Technical reviews;
- Design verification;
- Independent inspections;
- Management of Change;
- Risk registers; and
- Performance assurance.

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Learning from Incidents

Common findings include:

- Deferred maintenance;
- Poor supervision;
- Inadequate inspection;
- Weak engineering governance;
- Failure to act on warning signs; and
- Organizational complacency.

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Emerging risks

Common findings include:

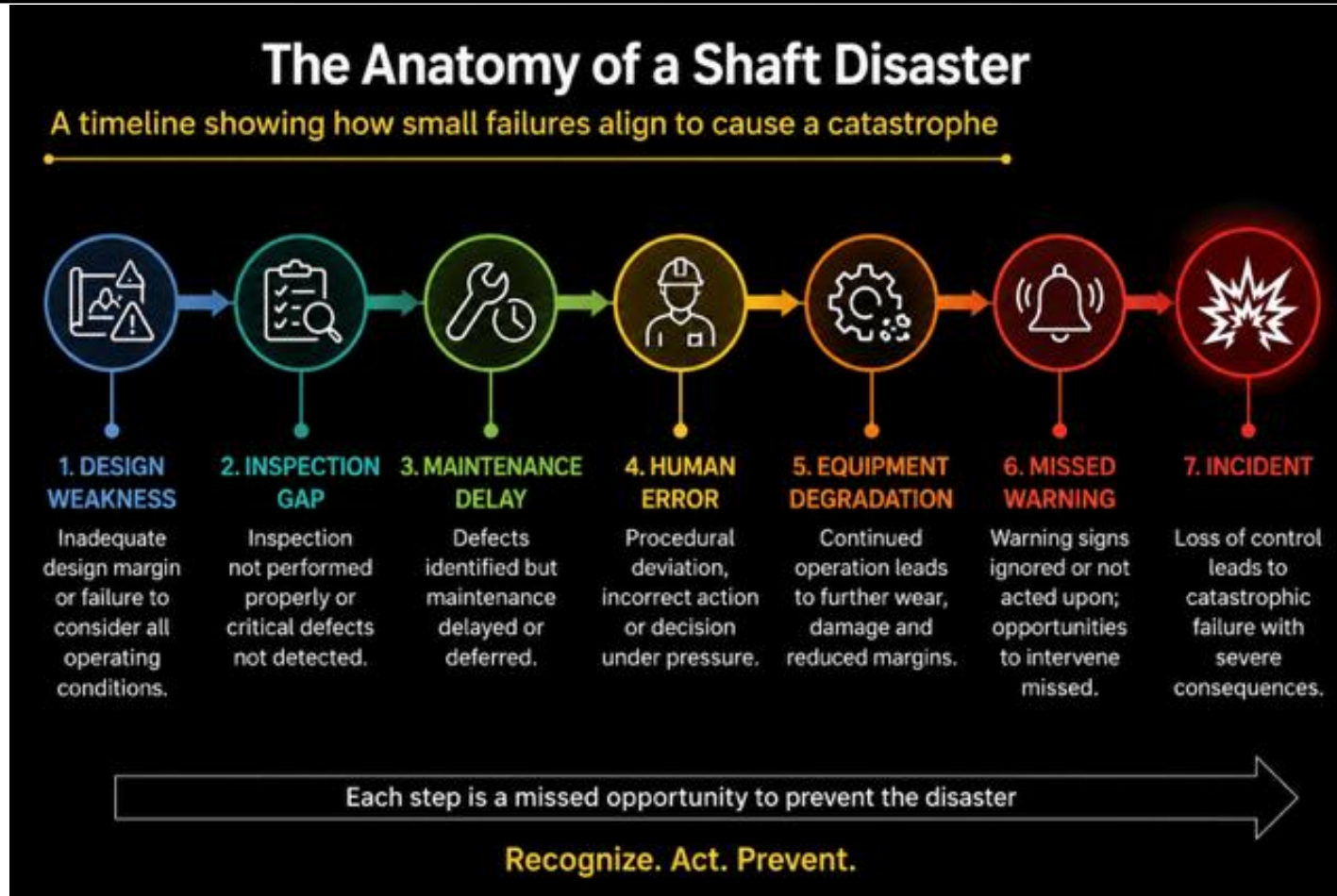
- Ageing infrastructure;
- Skills shortage;
- Automation risks;
- Human factors; and
- Production pressure.

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The Anatomy of a Shaft Disaster



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Engineering Leadership Responsibilities

Engineering Leaders must:

- Set technical standards;
- Risk-based decision making;
- Ensure legal compliance;
- Develop competent engineering teams;
- Drive reliability engineering;
- Challenge unsafe practices;
- Promote learning from incidents;
- Ensure adequate engineering resources; and
- Share lessons across industry.

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Conclusion

- Strengthen engineering governance through independent technical assurance and clear accountability.
- Modernise shaft and winder systems using condition monitoring, predictive maintenance, and automation where appropriate.
- Invest in people by developing competent engineers, supervisors and operators through structured training and mentorship.
- Foster a learning culture that values reporting, investigation and continuous improvement over blame.
- Lead with integrity, ensuring that engineering decisions consistently place safety ahead of production pressures.

“Every safe shift is a result of disciplined engineering, courageous leadership, and an unwavering commitment to protecting lives.”

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Questions ?

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