



MHSC

Mine Health and Safety Council

Best Practice in Shaft and Winder Engineering Governance and Professional Accountability

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Shafts and Winders



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Introduction

Critical Role of Shafts and Winders

- Shafts and winders are means of conveying people and materials between surface and underground level stations.

Consequences of Failures

- Failures in shafts and winders diligent governance can result in multiple fatalities, production losses, and reputational damage.

Engineering Governance Importance

- Governance ensures safe- **design, operation, and maintenance** through structured processes, procedures and standards.

Professional Accountability

- Engineers hold legal responsibility to ensure compliance and safe operation of winding plant. Mine health and safety act regulations 8.13

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The Three Pillars

People	Governance Systems	Leadership Accountability
Training and skills Competence & Experience Turn over New appointment On boarding Sobriety	Risk Assessments (Base line and Issue base) Machinery record book, rope inspection logbooks, shaft examinations. Quality of record keeping- instant recording Task inventory- High Risk Tasks DMPR Guidelines for MCOP DMPR Directives SANS (rope discard criteria/ sheave wheel maintenance) 10293 & 10294 Critical safety inspections- Legal inspections. Legal Requirements- MHSA regulations 8.13 Procedures/ MCOPs (shaft exam, slinging in the shaft, changing pipes in a shaft) Industry learning- Incidents Inspections and audits- Level 1 etc. Tasks that happens only when engineer is present- No compromise NB! Consistency is the name of the game Clear emphasis on the Do's and Don'ts Maintenance- brake maintenance, rope maintenance, sheave wheel, maintenance, annealing on Humble hooks	Asset Age- Corrosion prevention. Structural integrity Shaft Bunting inspection and repair schedule Capital Availability Diligent execution of Engineers Duties and Responsibilities Management of change- MOC NDTs- Shaft

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Governance 1

Legal requirements of MHSA- 8.13

- The Mine Health and Safety Act mandates safe design, operation, and maintenance of shafts and winders to protect health.

Codes and Guidelines

- Mandatory Codes of Practice and Inspectorate Guidelines specify requirements for permits for winding plants, ropes management, competency requirements, shaft examinations, safety devices, maintenance records and logbooks.

Technical Standards Support

- SANS 10293 and 10294 maintenance for ropes and sheave wheels safety systems.

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Governance 2

Critical Safety Components

- Winder safety systems include vital safety components like,
 - **Lilly controller,**
 - **ESCORT braking systems,**
 - **overspeed protection,**
 - **Over and under wind protection,**
 - emergency stops, and **limit switches** or **interlocks**
 - **Conveyance monitoring in the shaft- Plessy systems. Shadow speed control.**
 - **Jack catches** as well as **cage clamps**

Redundancy and Verification

- Safety systems must be designed with redundancy, fail-safe principles, and undergo independent verification to ensure reliability.

Testing and Audits

- Regular functional testing **TAS Audits, Level 1, Dynamic brake tests, Performance checks,** and independent audits are essential to confirm safety system operation under fault conditions. Independent rope inspections (**NDTs**)

Governance and Accountability

- Governance frameworks enforce strict controls on device overrides, define testing protocols, and ensure professional accountability.

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Leadership accountability

Legal Accountability

- Engineers hold personal legal responsibility under MHSA reg 8.13.
- Supervision of major tasks and report for investigation (eg Rope change, Back ends, overwind trips, slack rope trips, slinging in the shaft etc)
- Over inspection on Humble hook pin maintenance and casting of rope attachments, wire brush and humble hook resting schedule.

Risk Management and Safety

- Engineer to be dedicated, deliberate and available for execution of critical / High risk tasks. Ensure a well drawn up Procedure is in place and that people are trained on the RA and procedures. Also manage fatigue through out major tasks.

Professional Development

- People training and development for minder and shaft maintenance must be a targeted action. Selection of people must be based on experience and quality of work performances.

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Asset management

Comprehensive Asset Integrity

- Asset integrity management maintains shafts and winders safe and operational throughout their entire lifecycle.
- Structural integrity, shaft bunting replacement schedule, strategic structural replacements.
- Capital investment to support the life of mine.

Maintenance and Monitoring Techniques

- Risk-based maintenance, preventative programs, and condition monitoring techniques ensure early detection of issues.

Accurate Record-Keeping

- Keeping detailed rope histories, inspection reports, and maintenance logs supports informed decision-making and compliance.
- Timely entry management. Recording of input as and when inspection is done.
- Ensuring that OEM and Third-party inspectors make entries on machinery record book or rope record book.
- Countersigning of log-books by Engineer and Mine manager 3.1(a).

Professional Accountability

- Engineers proactive planning, compliance to stipulated regulation inspections on time, planning for replacement and sourcing , consistency in over inspection and driving an accurate and accountable culture.

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Conclusion

A combination of the three critical pillars, people, governance and accountable leaders enhances best practices in Shaft and Winder Engineering Governance and Professional Accountability.

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Questions ?

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